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EXEMPT FROM FEES

SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF MONTEREY

CALIFORNIA AMERICAN WATER, Plaintiff, v. CITY OF SEASIDE, et al., Defendants.	Case No. M66343 Assigned for All Purposes to the Honorable Leslie C. Nichols **SEASIDE GROUNDWATER BASIN WATERMASTER'S CASE MANAGEMENT STATEMENT**
MONTEREY PENINSULA WATER MANAGEMENT DISTRICT, Intervenor.	Action Filed: August 14, 2003 Trial Date: December 13, 2005 Post-Judgment Case Management Conference: March 17, 2017
MONTEREY COUNTY WATER RESOURCES AGENCY, Intervenor.	
AND RELATED CROSS-ACTIONS.	

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I. INTRODUCTION

A post-judgment case management conference is scheduled in this action for March 17, 2017. This case management conference was set by the Honorable Leslie C. Nichols during the last post-judgment case management conference, held on June 17, 2016. On June 20, 2016, this office, on behalf of the Seaside Groundwater Basin Watermaster ("Watermaster") served notice of the March 17, 2017 case management conference on all parties.

The last case management conference was the first appearance before the Honorable Leslie C. Nichols following his assignment to this action for all post-judgment proceedings. In conjunction with the setting of the last case management conference, Watermaster provided the Court with a detailed report (the "2016 Status Report") explaining various historical background pertaining to this action, management of the Seaside Groundwater Basin ("Seaside Basin" or "Basin"), and contemporaneous matters that may affect the Basin. A copy of the 2016 Status Report is attached to this case management statement as Attachment 1 for the Court's convenience and ease of reference.

At the last case management conference, the Court requested that, in preparation for the upcoming case management conference, Watermaster provide additional information to the Court to assist in further familiarization with the Basin, Basin management, and other contemporaneous water planning and management activities that may affect the Basin. Specific requested information included:

1. Anticipated subjects that an informed judge would want to have addressed by Watermaster;
2. A glossary of key terms and subjects applicable to the Basin and water management on the Monterey Peninsula; and
3. An overview of Watermaster's organization.

This case management statement responds to these requests and provides other helpful information. Section II provides a glossary of key terms and subjects together with an explanation of their relevance to the Seaside Basin. This section also includes an explanation of key local and

state agencies with jurisdiction that potentially affect Basin management activities or pertinent regional water matters and an overview of Watermaster's organization. Section III discusses current Basin conditions and long-term issues to be monitored and addressed over time. Section IV discusses the status of long-term regional water management activities that may affect community water supplies and the Basin. Finally, Section V summarizes Watermaster's intended 2017 action items and recommendations for the Court's consideration.

II. GLOSSARY OF KEY TERMS, ESSENTIAL AGENCIES, AND OVERVIEW OF WATERMASTER

A. Glossary of Key Terms

The following glossary includes key terms relevant to Basin management that are not contained in the list of defined terms in the Amended Decision issued in this action, dated February 9, 2007 ("Decision"). The definitions in the Decision begin on page 11. The Decision is available on the Watermaster's website at: http://www.seasidebasinwatermaster.org/Other/Amended%20Decision0207.pdf.

Aquifer Storage and Recovery, or "ASR", means the injection of water into a groundwater aquifer for later recovery (normally by being pumped back out) and subsequent beneficial use. ASR is a water management practice employed throughout California for municipal, industrial, and agricultural uses.

Relevance to the Seaside Basin. ASR is an essential aspect of water management on the Monterey Peninsula. Pursuant to a State Water Resources Control Board ("SWRCB") diversion permit jointly held by the MPWMD and Cal-Am, wet-period flows are diverted from alluvial wells in the Carmel River Valley and then piped to the Basin where they are injected through injection wells into the Basin. The stored water is then recovered during dry periods to reduce Carmel River diversions when in-stream flow is needed to support riparian and instream habitat. ASR has been limited in quantity during the recent drought, but has been robust this year with over 750 acre-feet of ASR water stored in the basin this water year.

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Cease and Desist Order ("CDO") means the cease and desist order issued by the SWRCB on October 20, 2009 (SWRCB Order WR 2009-0060), which among other things restricts Cal-Am's unauthorized diversions from the Carmel River. At that time, Cal-Am was diverting an average of 10,978 acre-feet per annum from the Carmel River, with an average of 7,602 acre-feet diverted in excess of its valid water rights. The CDO required Cal-Am to take various actions, and to terminate all unauthorized diversions from the Carmel River by December 31, 2016. At the time the CDO was issued, Cal-Am and the SWRCB anticipated that the Coastal Water Supply Project, a proposed large desalination project, would be developed and used as the primary water supply for the Monterey Peninsula communities prior to the December 31, 2016 deadline. For a number of reasons, pursuit of the Coastal Water Supply Project was discontinued, and Cal-Am and the Monterey Peninsula community are now pursuing an alternative desalination project known as the "Monterey Peninsula Water Supply Project," or the "MPWSP." In compliance with the CDO and amended CDO (see below), Cal-Am has substantially reduced its unauthorized diversions from the Carmel River since 2009. Despite this progress, unauthorized diversions from the Carmel River continue and will continue until the MPWSP is brought on line.

On July 19, 2016, the SWRCB amended and extended the CDO and CDO scheduled to coordinate the CDO's diversion reduction schedule and provisions to the current schedule for the Monterey Peninsula Water Supply Project. The details of the amendment are discussed in Section IV of this case management statement.

Relevance to the Seaside Basin. The CDO is the driving legal impetus to develop supplemental water supplies for the Monterey Peninsula. During the interim period, until the supplemental water supplies become available, Cal-Am must balance demands from the Carmel River and the Basin to comply with the amended CDO as well as the Decision in this action.

Corral de Tierra Subarea means a portion of the Monterey Subbasin, which is a subbasin of the Salinas Valley Groundwater Basin, as defined in Department of Water Resources ("DWR") Bulletin 118. The subarea comprises the eastern portion of the former Fort Ord and other unincorporated areas and is located immediately east of the Seaside Basin. The Monterey

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Subbasin, of which the Corral de Tierra Subarea is part, was previously called the Corral de Tierra Subbasin, but the subbasin's boundaries were modified and the subbasin was renamed the Monterey Subbasin by DWR in 2016 in response to the request for basin boundary modifications to render the Bulletin 118 boundaries of the Seaside Basin coterminous with the adjudicated boundaries of the Seaside Basin.

Relevance to the Seaside Basin. As explained at pages 15and 16 of the 2016 Status Report, Groundwater levels in the Laguna Seca Subarea of the Seaside Basin have declined since the Decision was entered. The declines are attributable to production occurring both within and outside of the adjudicated Basin boundaries. Pumping from within the Corral de Tierra Subbarea by itself may be contributing to the decline in water levels within the Laguna Seca Subarca. Watermaster intends to collaborate with the Groundwater Sustainability Agency being formed for the Monterey Subbasin to address these groundwater level declines and to assess the relative effects of pumping within and outside of the subbasin.

Bulletin 118 means DWR's official statewide report on known groundwater conditions in all basins and subbasins in California. Bulletin 118 defines the boundaries and describes the known hydrologic characteristics of each of California's groundwater basins.

Relevance to the Seaside Basin. Bulletin 118 (2016) establishes the boundaries of the Seaside Basin for purposes of Sustainable Groundwater Management Act compliance. Bulletin 118's boundaries for the Seaside Basin and its neighboring subbasins were recently amended by DWR. The Seaside Basin is a subbasin of thc broader Salinas Valley Groundwater Basin. The boundaries for the Seaside Subbasin, as defined in Bulletin 118, were changed to be coterminous with the Basin's adjudicated boundaries set forth in the Decision. The portion of thc previously defined Seaside Subbasin that were located outside of the adjudicated boundaries of the Seaside Basin to the north, prior to the Bulletin 118 amendments, arc now included in the new Monterey Subbasin. The new Monterey Subbasin also includes the Corral de Tierra Subarea, which was previously defined by Bulletin 118 as the Corral de Tierra Subbasin.

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Groundwater Replenishment Project ("GWR") means the Pure Water Monterey Project, defined below.

Relevance to the Seaside Basin. Please see discussion with the description of the Pure Water Monterey Project.

Groundwater Sustainability Agency ("GSA") means the agency created in accordance with the requirements of Sustainable Groundwater Management Act that is responsible for developing and implementing a Groundwater Sustainability Plan for a basin to ensure that the basin is operated sustainably to avoid "undesirable results." The Sustainable Groundwater Management Act requires the formation of locally-controlled GSAs in the State's high and medium priority groundwater basins and subbasins by June 30, 2017.

Relevance to the Seaside Basin. As an adjudicated basin, the Seaside Basin is exempt from the requirement that a GSA be formed for the Basin. However, a GSA will be formed for the adjoining Monterey Subbasin, which includes the Corral de Tierra Subarea, and that GSA will develop a Groundwater Sustainability Plan for the Monterey Subbasin.

Groundwater Sustainability Plan ("GSP") means the plan developed by a GSA pursuant to the requirements of the Sustainable Groundwater Management Act to achieve sustainable groundwater management within 20 years of the GSP's implementation. GSPs must identify when and where groundwater conditions cause "undesirable results" (e.g., seawater intrusion), the specific projects and management actions that local agencies will implement to prevent undesirable results, and milestones to track plan progress. GSPs must also describe how local agencies will monitor groundwater and how monitoring data will be used to improve conditions in the basin.

Relevance to the Seaside Basin. As an adjudicated basin, the Seaside Basin is exempt from the requirement that a GSP be developed for the Basin. However, a GSP will be developed for the adjoining Monterey Subbasin. Watermaster will work with the GSA for the Corral de Tierra Subarea to ensure that the GSP for the subbasin is coordinated with management for the Seaside Basin to ensure that groundwater in both areas is managed as necessary to maintain sustainable

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groundwater conditions as required in the Sustainable Groundwater Management Act and the Decision.

Monterey Peninsula Water Supply Project ("MPWSP") means the project that Cal-Am and the Monterey community is presently pursuing and permitting to provide a reliable supply of water to the Monterey Peninsula and to eliminate Cal-Am's unauthorized diversions from the Carmel River pursuant to the CDO and to maintain withdrawals of groundwater from the Seaside Basin pursuant to the Decision. The MPWSP is anticipated to consist of a seawater and brackish water intake system, a 6.4 million gallons per day ("MGD") desalination plant and related facilities, desalinated water conveyance facilities, an expanded ASR system, and a water purchase agreement for GWR water from the Pure Water Monterey Project. Cal-Am's application for a Certificate of Public Convenience and Necessity ("CPCN") for the MPWSP has not yet been approved by the California Public Utilities Commission ("CPUC"), but the CPUC has authorized Cal-Am to enter into a water purchase agreement for GWR water and to construct a pipeline and pump station to maximize use of the GWR and ASR water as well as ASR injections into the Seaside Basin. A Draft Environmental Impact Report/Environmental Impact Statement ("DEIR/DEIS") for the MPWSP was released by the CPUC and the Monterey Bay National Marine Sanctuary on January 12, 2017. Further discussion of the status of development efforts for the MPWSP is set forth in Section IV below.

Relevance to the Seaside Basin. Once all components of the MPWSP are online, Cal-Am will have sufficient water supplies to meet current and projected future demands (including lots of record but not full general plan build out), consistent with Cal-Am's water rights and the amended CDO. Cal-Am will also use water from the MPWSP to offset and reduce its annual production of groundwater from the Seaside Basin by 700 acre-feet per year on average to satisfy Cal-Am's replenishment obligation under the Decision. This "in-lieu" recharge is consistent with the Decision and will replenish the Basin for Cal-Am's Over-Production/groundwater withdrawals in excess of the natural safe yield since Water Year 05/06. The recharge program

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will help to alleviate overdraft conditions and pumping depressions in the Basin that could result in seawater intrusion or other adverse impacts to the Basin.

Pure Water Monterey Project ("Pure Water") means the advanced water recycling project being jointly developed by the Monterey Peninsula Water Management District and the Monterey Regional Water Pollution Control Agency in northern Monterey County. The project will reclaim treated municipal wastewater, agricultural wash water, and urban stormwater runoff through an advanced, multi-stage treatment process, which includes ozone pre-treatment, microfiltration, reverse osmosis, and oxidation with ultraviolet light and hydrogen peroxide. The product water will exceed strict state and federal drinking water standards.

Relevance to the Seaside Basin. The CPUC has authorized Cal-Am to enter into a water purchase agreement to purchase 3,500 acre-feet per year of water from the Pure Water Project. The product water will be injected into the Seaside Basin, temporarily stored in the Basin, and recovered by Cal-Am for customer service.[1] Cal-Am's agreement to purchase water from Pure Water will allow it to reduce the size of the MPWSP desalination facility from 9.6 MGD (without Pure Water) to 6.4 MGD (with Pure Water). The smaller capacity desalination facility will reduce the potential environmental effects of the MPWSP. The 6.4 MGD desalination facility combined with 3,500 acre-feet per year ("AFY") from the Pure Water Project was deemed the environmentally superior project alternative in the recently released DEIR/DEIS for the MPWSP desalination project.

Sustainable Groundwater Management Act ("SGMA") means an act adopted by the Legislature and signed into law by the Governor in 2014 to require sustainable management of medium and high priority groundwater basins throughout the state. SGMA requires that local agencies coordinate with one another, , and with private stakeholders, including CPUC-regulated water utilities such as Cal-Am, to form GSAs prior to June 30, 2017. The new GSAs must then

[1] The water received from Cal-Am from the Pure Water Project (i.e., the water supply recovered after injection and storage in the Basin) is commonly referred to as GWR ("groundwater replenishment") because the water is replenished to the Basin before recovery by Cal-Am.

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formulate GSPs, which must be adopted and approved by the state by either 2020 or 2022, depending on basin overdraft conditions.

Relevance to the Seaside Basin. As noted above, SGMA exempts certain adjudicated groundwater basins from the act's requirements to form a GSA and to develop a GSP. The Seaside Basin was specifically identified in SGMA on the list of comprehensively adjudicated basins. As a consequence, a GSA and GSP are not required for the Seaside Basin. SGMA nevertheless requires the Watermaster to file an annual report with the Department of Water Resources concerning the Basin, including groundwater and surface water use, groundwater levels, and other basin conditions. Watermaster is complying with these SGMA reporting requirements.

SGMA will require the formation of a GSA and development of a GSP for the Monterey Subbasin, which includes the Corral de Tierra Subarea. As discussed above, Watermaster intends to collaborate with the GSA for the Monterey Subbasin to address groundwater conditions within the eastern portion of the Laguna Seca Subarea of the Seaside Basin.

Progress has been made on the formation of a GSA for the entire Salinas Valley, including the Corral de Tierra Subarea, and a GSA is expected to be formed this spring in advance of the June 30, 2017 SGMA deadline for formation of groundwater sustainability agencies.

B. Essential Agencies

This section lists and discusses agencies that affect Watermaster's management of the Seaside Basin or other regional water supplies, which, in turn, affect management of the Basin.

California Coastal Commission ("Coastal Commission"). The Coastal Commission plans and regulates land use and other development activities in the coastal zone. Development activities in the coastal zone generally require a coastal development permit ("CDP") from either the Coastal Commission or a local government that has Local Coastal Program certified by the Coastal Commission.

Relevance to the Seaside Basin. The Coastal Commission possesses the ultimate discretion to determine whether a coastal development permit should be issued for the construction and

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operation of the water intake system (including the source water wells) that will supply the MPWSP desalination plant. The wells will be located entirely within the coastal zone.

California Public Utilities Commission ("CPUC"). The CPUC regulates investor owned public utilities, including water utilities such as Cal-Am.

Relevance to the Seaside Basin. The CPUC exercises jurisdiction over Cal-Am, and will decide whether to issue a CPCN for the MPWSP. The CPUC is the lead agency for compliance with the California Environmental Quality Act for the MPWSP.

City of Marina. The City of Marina is located immediately north of the City of Seaside and the Seaside Basin.

Relevance to the Seaside Basin. Under its Local Coastal Program, and subject to appeal to the Coastal Commission, the City of Marina will exercise initial jurisdiction over Cal Am's application for a coastal development permit for the water intake system supplying the MPWSP desalination plant.

Department of Water Resources ("DWR"). DWR is a state agency responsible for the conservation and management of much of California's water supply. Working with other agencies and the public, DWR develops strategic goals, and near-term and long-term policy actions to conserve and manage water resources.

Relevance to the Seaside Basin. DWR administers portions of the state's responsibilities under SGMA including defining basin boundaries and reviewing and approving submitted GSPs. DWR will, therefore, review and determine the adequacy of the GSP developed for the Monterey Subbasin, which includes the Corral de Tierra Subarea.

Fort Ord Reuse Authority ("FORA"). FORA is responsible for the oversight of the Monterey Bay area economic recovery from the closure of and reuse planning of the former Fort Ord military base. The former Fort Ord, now referred to as the Ord Community, partially overlies the Seaside Basin.

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Relevance to the Seaside Basin. FORA sets certain land use and water and sewer service policies for Ord Community, a portion of which is located within the boundaries of the adjudicated Seaside Basin.

Marina Coast Water District ("MCWD"). The MCWD is a county water district that was originally formed in 1960 to provide potable water service to the City of Marina. In the 1970s it also began providing wastewater services and in 1997, FORA selected and awarded a contract to MCWD to manage the water and wastewater systems in the former Fort Ord (now known as the Ord Community). The water delivered by MCWD to its customers is supplied from groundwater wells pumping from the new Monterey Subbasin of the Salinas Valley Groundwater Basin.

Relevance to the Seaside Basin. MCWD serves the Ord Community, a portion of which overlies the Seaside basin. MCWD also previously contracted with the City of Seaside to exchange water for land granted by the city to MCWD. The city used the water from MCWD as a substitute for irrigation of the City of Seaside's two golf courses in lieu of groundwater use. The exchange caused in-lieu replenishment of the Basin as discussed at page 20 of the 2016 Status Report. The program is now complete. However, it is possible that a future water exchange and in-lieu replenishment program could be pursued if the City of Seaside used recycled water from MCWD to irrigate the city's golf courses.

Monterey Bay National Marine Sanctuary ("MBNMS") The MBNMS is administered by the National Oceanic and Atmospheric Administration. The MBNMS enforces fourteen federal regulatory prohibitions designed to preserve and protect the natural and cultural resources and qualities of the ocean and estuarine areas within its boundaries. Prohibitions restrict seabed disturbance, discharges, wildlife harassment, and disturbance of historical resources.

Relevance to the Seaside Basin. Authorization from the MBNMS is required for Cal-Am to construct certain components of the MPWSP. Under the National Marine Sanctuaries Act, the MBNMS must provide authorization and permits to construct, operate, maintain, and decommission subsurface water intake facilities under the sanctuary and to allow brine discharges

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through an existing ocean outfall facility within the sanctuary. The MBNMS is also the federal lead agency for compliance with the National Environmental Policy Act for the desalination project.

Monterey County Water Resources Agency ("MCWRA"). The MCWRA manages, protects, stores and conserves water resources in Monterey County for beneficial and environmental use, while minimizing damage from flooding to create a safe and sustainable water supply for present and future generations.

Relevance to the Seaside Basin. The MCWRA is a party to this action, a member of Watermaster's Board of Directors, and is a party to the CPUC proceeding processing Cal-Am's application for the MPWSP. The MCWRA also operates many of the groundwater management programs that will be essential to the future sustainable management of the Salinas Basin, which includes the Monterey Subbasin, which includes the Corral de Tierra Subarea that adjoins the Laguna Seca Subarea of the Seaside Basin.

Monterey Peninsula Water Management District ("MPWMD"). The MPWMD was formed in 1978 and serves approximately 112,000 people within the cities of Carmel-by-the-Sea, Del Rey Oaks, Monterey, Pacific Grove, Seaside, Sand City, Monterey Peninsula Airport District and portions of unincorporated Monterey County including Pebble Beach, Carmel Highlands and Carmel Valley. Among its functions, the MPWMD helps to augment water supply through integrated management of ground and surface water, promotes water conservation, promotes water reuse and reclamation of storm and wastewater, and protect environmental and recreational interests on the Monterey Peninsula and in the Carmel River Valley.

Relevance to the Seaside Basin. The MPWMD is a party to this action, a member of Watermaster's Board of Directors, and is a party to the CPUC proceeding processing Cal-Am's application for the MPWSP. The MPWMD is also a co-developer of the Pure Water Project, and in coordination with the Monterey Peninsula Regional Water Authority, advocates for water supply solutions for the Monterey Peninsula.

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Monterey Peninsula Regional Water Authority ("MPRWA"). The MPRWA is a joint powers authority formed by the six Monterey Peninsula cities to coordinate the efforts of Monterey Peninsula cities to advocate for cost-efficient and expedient water supply solutions to the Monterey Peninsula's protracted water shortage and to provide representation of Monterey Peninsula residents on important water supply matters.

Relevance to the Seaside Basin. The MPRWA is a party to the CPUC proceeding processing Cal-Am's application for the MPWSP, is a party to a "governance committee" with Cal-Am and the MPWMD to ensure public input into Monterey Peninsula water supply planning and development efforts, and is a routine advocate for water supply efforts on the Monterey Peninsula.

Monterey Regional Water Pollution Control Agency ("MRWPCA"). The MRWPCA is a joint powers authority with eleven members: Monterey County, City of Salinas, Boronda County Sanitation District, Castroville Community Services District, City of Del Rey Oaks, City of Monterey, City of Pacific Grove, City of Sand City, City of Seaside, Marina Coast Water District, Moss Landing County Sanitation District, and the U.S. Army as an ex-officio member. MRWPCA provides treatment and disposal of wastewater from each of its member entities at its regional treatment plant located north of the City of Marina, and also operates reclamation facilities providing reclaimed wastewater for agricultural irrigation in northern Monterey County.

Relevance to the Seaside Basin. MRWPCA partnered with the MPWMD to develop the Pure Water Monterey Project, which is a component of the MPWSP and will provide advance-treated waste water for injection and storage in the Seaside Basin for later recovery and use by Cal-Am.

Regional Water Quality Control Board - Central Coast Basin ("RWQCB-CCB"). The nine regional water quality control boards, which are overseen by the State Water Resources Control Board have jurisdiction to protect water quality within California through rulemaking and regulatory activities. The RWQCB-CCB has jurisdiction over water quality matters within Monterey County.

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Relevance to the Seaside Basin. Among various water quality matters in the region, the RWQCB-CCB is responsible for regulating and permitting the water quality aspects of injections of water to recharge the Seaside Basin, like the advanced treated recycled water to be injected by the Pure Water Project.

State Water Resources Control Board ("SWRCB"). The SWRCB oversees use of surface water in California and administers permits and licenses for diversion of surface water and groundwater flowing as subsurface underflow or within "subterranean streams." The SWRCB also oversees, coordinates, and supports the Regional Water Quality Control Boards in implementing the federal Clean Water Act in California.

Relevance to the Seaside Basin. The SWRCB issued the CDO that requires Cal-Am to reduce, and ultimately eliminate, its unauthorized diversions from the Carmel River system. The SWRCB also oversees the appropriation permit relied upon by the MPWMD and Cal-Am for wet period diversions from the Carmel River Valley for the ASR project.

C. Overview of Watermaster

The Watermaster was created pursuant to the Decision.

Board of Directors:

The Watermaster may only act by and through the Watermaster Board, which consists of nine members. Members are appointed by each of the parties or group of parties specified below in accordance with the procedures set forth in Section 4 of the Watermaster's Rules and Regulations. The Decision also sets forth the voting positions possessed by each member of the Watermaster Board, which are specified below.

Party/Group	Votes
California American Water	3 votes
City of Seaside	2 votes
Monterey County Water Resources Agency	2 votes
Monterey Peninsula Water Management District	2 votes
City of Sand City	1 vote
City of Monterey	1 vote
City of Del Rey Oaks	1 vote
Landowner Parties Group (Coastal Subarea)	1/2 vote
Landowner Parties Group (Laguna Seca Subarea)	1/2 vote

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The Watermaster Board also appointed two standing committees: a Budget and Finance Committee and a Technical Advisory Committee. Watermaster's operations are funded through Budget Assessments levied on parties producing groundwater pursuant to a Standard Production Allocation, as provided for in Section III.L.3.j.iv of the Decision.

Staff: Initially, the staff was composed of an Executive Officer, an Administrative Assistant, and a Technical Program Manager. In 2016 with the retirement of the Executive Officer the staff was reconfigured to consist of the Administrative Officer (Ms. Laura Dadiw) and the Technical Program Manager (Mr. Robert Jaques). The Staff prepares the meeting agendas, minutes of meetings, expenditure reports, makes presentations of a variety of items at meetings, performs all administrative and technical functions, and carries out the direction of the Board and the TAC with regard to the Watermaster's activities.

III. BASIN CONDITIONS AND LONG-TERM GROUNDWATER MANAGEMENT CONCERNS

As discussed in detail at pages 5, 6, and 13 through 16 of the 2016 Status Report, the principal groundwater management concerns within the Basin arise from the overdrafting of the Basin leading to the Decision. Overdraft has resulted in depressed groundwater levels within the Northern Coastal Subarea and the Laguna Seca Subarea. Within the Northern Coastal Subarea, the primary concern pertains to potential seawater intrusion into the Basin. In the Laguna Seca Subarea, the primary concern pertains to long-term overpumping in and adjacent to the subarea, ultimately resulting in the water table falling such that wells are unusable at present depths.

Watermaster is happy to report that cumulative production has reduced throughout the Basin such that the cumulative 2016 pumping of 2,913.48 acre-feet was less than both the 2016 allowed Operating Safe Yield of 4,565.17 AFY as well as the Decision's initially assumed Native Safe Yield of 3,000 AFY.

A. Northern Coastal Subarea Groundwater Levels and Potential Seawater Intrusion

The potential for seawater intrusion is a significant concern. Watermaster routinely monitors its "sentinel" monitoring wells along the coast for any advance indicators of seawater

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intrusion into the Basin. This past July, water quality samples from two of the four sentinel wells exhibited anomalous chloride concentrations. In response, and consistent with Watermaster's Seawater Intrusion Response Plan, these wells were resampled in December 2016. Watermaster's technical consultants (HydroMetrics, Todd Groundwater, and Martin Feeney) reviewed the results and determined that the samples do not establish that seawater intrusion is occurring. HydroMetrics explained its findings to Watermaster as follows:

> None of the samples definitively indicate incipient seawater intrusion. However, variations in groundwater quality from samples collected over the last year from wells SBWM-1 and SBWM-4 warrant increased vigilance regarding potential changes to the Basin's groundwater quality in the vicinity of the Sentinel Wells. There may be some seasonal changes in groundwater quality in the deepest portions of the aquifer that could be related to seasonal groundwater elevation changes. If this is true and groundwater elevations continue to decline, larger fluctuations might be seen in the fall when groundwater levels are at their lowest.
>
> The sources of increasing and fluctuating chlorides in wells SBWM-1 and SBWM-4 are unclear. Potential sources may include natural groundwater quality variations, upwelling or upconing of saline water in wells in response to declining groundwater levels, seawater intrusion, or downward leakage of shallow, poor quality groundwater.

HydroMetrics recommended that Watermaster:

1. Continue to sample SBWM-1 and SBWM-4 twice a year.

2. SBWM-2 should be resampled at the end of summer in 2017 and based on those results a decision should be made as to whether it should be sampled twice a year on an ongoing basis.

3. To determine if groundwater quality samples reflect the influence of fluctuating groundwater elevations, it is recommended that samples in the future be collected in the last week of September for the 4th quarter samples and in the first week of March for the 2nd quarter samples.

4. Prepare a work plan that will direct an effort towards identifying the source of fluctuating chloride concentrations. The work plan should outline the types of analyses and data to be used in identifying the chloride source. If the source of fluctuating chlorides is understood, it will help in developing management actions to prevent the higher concentrations increasing to the point that they cause groundwater degradation.

5. Conduct downhole conductivity and temperature profiles within each of the Sentinel Wells during the next sampling event. This tool measures the conductivity within the well, as opposed to induction logging which measures conductivity

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within the adjacent sediments. This technique may help identify if upwelling is occurring.

6. Continue the process that has recently been implemented to review water quality results as soon as they are received, rather than waiting until they are used to prepare the annual Seawater Intrusion Analysis Report. This will enable action to be taken, including reanalysis of samples, if appropriate, immediately instead of at the end of the year when the data have historically been analyzed.

7. Continue conducting all groundwater quality sampling and analysis conducted in accordance with standard quality assurance and quality control procedures. This includes submitting field blanks and duplicates samples to the laboratory once every couple of years.

A copy of HydroMetric's technical memorandum on the resampling and its findings and recommendations, dated February 21, 2017, is attached as Attachment 2. Watermaster intends to implement HydroMetric's recommendations. Watermaster will update the Court on further sampling of the sentinel wells and any future analysis of the cause and potential implications of water quality observations at the sentinel wells.

B. Laguna Seca Subarea Groundwater Levels and Coordination with the Future Monterey Subbasin GSA

Groundwater levels in the Laguna Seca Subarea have declined since the Decision was entered and the declines likely are attributable to production occurring both within the Basin and outside of the adjudicated Basin boundaries within the Corral de Tierra Subarea. Because the Watermaster has no control or influence over pumping outside the Seaside Basin boundaries, it is unable to prevent the decline of groundwater elevations in a portion of the Laguna Seca Subarea absent a coordinated arrangement with the future management of the Corral de Tierra Subarea.[2]

Management of the Corral de Tierra Subarea will occur through the SGMA process. As noted above, the Corral de Tierra Subarea is now part of the Monterey Subbasin following DWR's recent amendments to basin boundaries in Bulletin 118. The Monterey Subbasin is a subbasin of the larger Salinas Valley Groundwater Basin. Diverse stakeholders within the valley, including the County of Monterey, the MCWRA, various cities, agricultural interests, and

[2] Additional discussion of the Laguna Seca Subarea and concerns regarding the decline in groundwater within the subarea are provided at pages 15 and 16 of the 2016 Status Report and in Section J of the 2016 Annual Report.

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environmental organizations have reached conceptual agreement on the structure of a new joint powers agency to act as the GSA for all subbasins of the valley including the Monterey Subbasin.[3]

Pursuant to SGMA, the GSA for the Corral de Tierra Subarea must coordinate with the Watermaster for the Seaside Basin to avoid "undesirable results," as defined in SGMA, including sustained groundwater depletion, in both areas. (Wat. Code § 10721(x).) Through the SGMA process, pumping in the Corral de Tierra Subarea may be curtailed to avoid undesirable results in the Basin. (Wat. Code § 10721(u), (w), and (x); 10727.2.) Watermaster intends to coordinate with the emerging GSA for the Corral de Tierra Area Subbasin to achieve sustainable groundwater management in both areas.

Provided that this proposed Salinas Valley GSA is established prior to the June 30, 2017 GSA deadline, development of a GSP for the Corral de Tierra Subarea will be underway this year. Watermaster will then begin discussions concerning coordinated management between the Corral de Tierra Subarea and the Laguna Seca Subarea of the Seaside Basin. Watermaster will provide an update to the Court concerning these coordination efforts in its 2017 Annual Report and the 2018 case management conference if scheduled.

IV. STATUS OF REGIONAL WATER DEVELOPMENT EFFORTS AND SUPPLY

The MPWSP is anticipated to consist of a seawater and brackish water intake system, a 6.4 MGD desalination plant and related facilities, desalinated water conveyance facilities, an expanded ASR system, and a water purchase agreement for GWR water from the Pure Water Project. These projects will result in sufficient long-term water supplies for the Monterey Peninsula, when combined with Cal-Am's groundwater entitlements from the Seaside Basin and legal diversion rights from the Carmel River,[4] to: (1) meet current and projected future demands;

[3] The Salinas Valley GSA will exclude the Seaside Basin (which is technically a subbasin of the broader Salinas Valley Groundwater Basin) because it is adjudicated and exempted from SGMA's GSA and GSP requirements.

[4] Cal-Am possesses 3,316 AFY of legal right (pre-1914 appropriative rights) to divert subterranean stream flow from the Carmel River Valley. Cal-Am's allocation of the Basin's Native Safe Yield is approximately 1,474 AFY.

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(2) eliminate all unauthorized diversions from the Carmel River Valley as required by the CDO; and (3) "pay-back" its extractions from the Basin in excess of the Native Safe Yield since the entry of the Decision.

A. GWR and ASR

On September 15, 2016, the CPUC authorized Cal-Am to enter into a water purchase agreement with the MPWMD and the MRWPCA to purchase 3,500 AFY of GWR water from the Pure Water Project at a cost of $85.5 million, and for Cal-Am to invest up to $50 million in a new pipeline (the "Monterey Pipeline") and pump station. The Monterey Pipeline will allow Cal-Am to move GWR and ASR water recovered from the Seaside Basin (and ultimately desalination water) into the Cal-Am distribution system and also allow additional ASR water to be pumped from the Carmel River to the Seaside Basin for injection during wet periods.

The CPUC's approval of the water purchase agreement and Monterey Pipeline and pump station was a significant milestone for the Pure Water Project. The Montercy Pipeline is now under construction and is anticipated to be completed in December 2017. Other recently completed tasks and upcoming undertakings for the Pure Water Project include the following:

- The City of Salinas completed a connection of produce wash water and storm water systems to feed source water to the Pure Water Monterey treatment facilities, thus increasing the quantity of water that can be processed for delivery by the Pure Water Monterey Project.
- The SWRCB and RWQCB-CCB approved the connection of the Blanco Drain and Reclamation Ditch to feed additional source water to the Pure Water Monterey treatment facilities, and design of the connection facility is complete. These flows will further increase the quantity of water that can be processed for delivery by the Pure Water Monterey Project.
- The RWQCB-CCB will hold a hearing on March 9, 2017 to consider adopting an order to establish waste discharge and water recycling requirements for the Pure Water project. The staff report and draft order for this bearing is attached as Attachment 3.

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- MRWPCA secured bids for four sets of equipment for the treatment facilities and recently solicited bids for construction of the project's facilities.
- State Revolving Fund grants and loans for design and construction of the Pure Water Monterey Project will become available beginning in March 2017.
- The project proponents anticipate the U.S. Fish and Wildlife Service will soon issue a draft biological opinion regarding the project.
- The project proponents are also continuing work on the 12 remaining of the 26 required permits for the Project.

Completion of the Pure Water project is anticipated in September 2017 and water from the project should be recoverable from the Basin in January 2018 following a two-month minimum required residence time in the Basin.

To maximize water supply from the ASR project, Cal-Am and the MPWMD are also developing two additional ASR wells within the City of Seaside, to add to the four existing ASR wells operated by Cal-Am. A ground lease for the new ASR wells and associated facilities is expected to be approved by the Seaside City Council soon. The ASR ground lease will foster FORA's issuance of a right-of-entry to complete the ASR facilities.

B. MPWSP Desalination Project

Cal-Am's application for a CPCN to construct the MPWSP is still pending before the CPUC. However, progress is ongoing and a decision by the CPUC on a CPCN authorizing Cal-Am to construct and operate the project is anticipated in the second quarter of 2018. Last November, the assigned CPUC commissioner issued an updated scoping memo, which explained that an extension of the CPUC schedule on Cal-Am's application to June 30, 2018 is necessary to allow time for the currently planned completion of the environmental work, briefing, preparation of a proposed decision, and consideration of the matter by the Commission as early as March 2018, but with an additional three months to accommodate other possible limited contingencies.

On January 12, 2017, the CPUC and MBNMS released a joint DEIR/DEIS for the MPWSP consistent with the California Environmental Quality Act and the National

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Environmental Policy Act[5] and the application is progressing consistent with the CPUC's updated schedule. Once a CPCN is issued for the project, Cal-Am will pursue a coastal development permit under the Coastal Act and other land use permits, but these regulatory steps should be more expeditious because a final EIR/EIS will have already been issued by the CPUC for the project. There remains certain opposition to the project and lawsuits could be filed against the project on environmental, water rights, or other grounds. Watermaster will continue to update the Court on the status of relevant elements of the MPWSP as they progress.

A schedule for completion of the GWR and desalination projects is depicted in Attachment 5.

C. CDO Amendment and Interim Water Supply

On July 19, 2016, in advance of the CDO's December 31, 2016 deadline, the SWRCB amended the CDO to establish a new compliance schedule that maintains an ongoing diversion level of 8,310 AFY as long as specified progress on the MPWSP is met, but sharply drops allowable diversions should progress slip. The amended CDO requires that unauthorized Carmel River diversions fully cease by December 31, 2021. The CDO amendments were necessary to accommodate delays in the desalination project's schedule and avoid the CDO's most severe diversion restrictions until after the MPWSP is in operation provided that the progress on the MPWSP continues. A copy of the SWRCB's amended CDO is attached as Attachment 6.

The charts attached as Attachment 7 show the current and projected Cal-Am water supplies and a comparison of demands through anticipated project implementation. If progress on the MPWSP remains on schedule and there are not responsive reductions in allowed interim Carmel River diversions (as required by the amended CDO if project milestones are missed), Cal-Am should be able to meet demands with its available interim supplies. If circumstances change and the amended CDO schedule cannot be met, Cal-Am may be challenged to meet Monterey Peninsula water demands as available supplies are reduced. Under these circumstances Cal-Am

[5] We have attached Chapter 4.4. of the joint DEIR/DEIS concerning groundwater resources as Attachment 4 because it contains extensive background concerning groundwater resources throughout the Salinas Valley Groundwater Basin, including the Seaside Basin (Subbasin).

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and the community may be compelled to request relief from the Decision's mandated 2018 triennial ramp down.[6]

V. ACTION ITEMS AND WATERMASTER RECOMMENDATIONS

Over the course of 2017, Watermaster intends to do the following:

1. Monitor the GSA formation process for the Monterey Subbasin (inclusive of the Corral de Tierra Subarea), and once formed, begin coordination efforts with the GSA to discuss management options for the Corral de Tierra Subarea and the Laguna Seca Subarea of the Seaside Basin to arrest long-term water declines in both areas. Watermaster will monitor and discuss the development of the GSP for the Monterey Subbasin with the GSA to ensure that the GSP includes appropriate provisions concerning this matter.

2. Undertake the recommendations concerning sampling and further analysis of the chloride levels in the sentinel wells in the Northern Coastal Subarea as specified in Hydrometrics, February 21, 2017 technical memorandum.

3. Consult with Cal-Am and monitor progress on the MPWSP, as well as the Pure Water Project.

4. Update the Court on each of these subjects in its 2017 Annual Report to the Court.

Watermaster also recommends that the Court set a subsequent case management conference hearing for the first quarter of 2018 to discuss the status of these subjects and to receive further instruction from the Court.

Dated: March 2, 2017

BROWNSTEIN HYATT FARBER SCHRECK, LLP

By: _____
RUSSELL M. McGLOTHLIN
Attorneys for Seaside Groundwater Basin Watermaster

[6] A detailed discussion of this potential request and the basis for the potential request was set forth in the 2016 Status Report at pages 20 and 21.

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For a copy of related attachments, please contact:

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You may also find the attachments to this case management statement on the Seaside Groundwater Basin Watermaster website: http://seasidebasinwatermaster.org/

PROOF OF SERVICE

STATE OF CALIFORNIA)
)
COUNTY OF SANTA BARBARA)

I, Caitlin Malone, am employed by Brownstein Hyatt Farber Schreck in the County of Santa Barbara, State of California. I am over the age of 18 and not a party to the within action; my business address is: 1020 State Street, Santa Barbara, California 93101. On March 2, 2017, I served the within document:

- Seaside Groundwater Basin Watermaster's Case Management Statement

☐ **BY OVERNIGHT DELIVERY.** By placing with an overnight mail company for delivery a true copy thereof, enclosed in a sealed package, delivery fees prepaid addressed as shown on the Service List below.

☒ **BY MAIL.** By placing each envelope (with postage affixed thereto) in the U.S. Mail addressed as shown below.

☒ By personally sending a true copy via e-mail to the parties at the e-mail addresses listed on the attached Service List, on the date below.

☐ By sending a true copy of the above document to the parties as set forth on the service list at the fax numbers indicated. The facsimile machine used complied with CRC Rule 2003(3), and the transmission was reported as complete and without error. Pursuant to CRC Rule 2005(i), a transmission confirmation report was properly issued by the transmitting facsimile machine, stating the time and date of such transmission.

SEE ATTACHED SERVICE LIST

I am readily familiar with the firm's practice of collection and processing correspondence for mailing. Under that practice it would be deposited with the U.S. Postal Service on that same day with postage thereon fully prepaid in the ordinary course of business. I am aware that on motion of the party served, service is presumed invalid if postal cancellation date or postage meter date is more than on day after the date of deposit for mailing in affidavit.

I declare under penalty of perjury under the laws of the State of California that the above is true and correct. Executed on March 2, 2017, at Santa Barbara, California.

Caitlin Malone
CAITLIN MALONE

California American Water v. City of Seaside
Monterey County Superior Court Case No. M66343

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EXEMPT FROM FILING FEES
(Cal. Gov. Code § 6103)

SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF MONTEREY

CALIFORNIA AMERICAN WATER,

Plaintiff,

v.

CITY OF SEASIDE, et al.,

Defendants.

MONTEREY PENINSULA WATER MANAGEMENT DISTRICT,

Intervenor.

MONTEREY COUNTY WATER RESOURCES AGENCY,

Intervenor.

AND RELATED CROSS-ACTIONS.

Case No. M66343

Assigned for All Purposes to the Honorable Leslie C. Nichols

REQUEST FOR STATUS CONFERENCE, AND ADJUDICATION BACKGROUND REPORT AND UPDATE

([Proposed] Order Granting Status Conference Filed Concurrently)

Action Filed: August 14, 2003
Trial Date: December 13, 2005

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I. REQUEST FOR STATUS CONFERENCE

On January 29, 2016, the parties in this action were served with notice that the Honorable Leslie C. Nichols has been assigned to the within case for all purposes. (See Attachment 1, a true and correct copy of the Court's Assignment Order.) The Seaside Groundwater Basin Watermaster ("Watermaster"), through its counsel, hereby respectfully requests that the Court convene a status conference in this post-judgment action to receive updates from, and provide instructions to, Watermaster concerning the status of management of the Seaside Groundwater Basin ("Seaside Basin" or "Basin") pursuant to the amended decision ("Decision"), entered on February 9, 2007 in this matter. A true and correct copy of the Decision and all exhibits thereto is attached hereto as Attachment 2.

A proposed order setting a status conference is filed concurrently. A report explaining the background of this action and current issues pertaining to the management of the Basin follows.

II. REPORT TO COURT

A. Introduction

This case concerns the adjudication of groundwater rights within the Seaside Basin and the management of the Basin by the Watermaster pursuant to the Court's oversight through its continuing jurisdiction. A description of the Basin, the parties to this action, the complaint, defendants' responses, and the Court's ruling on a stipulation and motion for entry of judgment is set forth in the Decision.[1]

B. Description of the Seaside Groundwater Basin

1. Location

The Seaside Basin is located in northern coastal Monterey County and it underlies the Cities of Seaside, Sand City, Del Rey Oaks, Monterey, and portions of unincorporated county areas, including the southern portions of the former Fort Ord and the Laguna Seca Area. The boundaries of the Basin are depicted in Exhibit B of the Decision. Generally, the Seaside Basin is bounded by the Pacific Ocean on the west, the Salinas Valley on the north, the Toro Park area

[1] At the request of the Court, Watermaster will elaborate upon and/or will file sworn declarations or provide witnesses to substantiate any factual statement contained in this report.

on the east, and Highways 68 and 218 on the south.

2. Subareas

The Decision references four subareas of the Seaside Basin: (1) the Southern Coastal Subarea, (2) the Northern Coastal Subarea, (3) the Northern Inland Subarea, and (4) the Laguna Seca Subarea ("LSSA"). The Northern Inland Subarea is located east of the Northern Coastal Subarea and north of the LSSA. The LSSA is east and inland of the Southern Coastal Subarea and south of the Northern Inland Subarea. The Decision, however, defines only the LSSA and the Coastal Subarea, and production and storage rights are allocated only in the Coastal Subarea and the LSSA. A depiction of the Basin, including Subareas, is attached hereto as Attachment 3.

3. Hydrogeology

Groundwater under the Decision is defined as "all water beneath the ground surface in the Seaside Basin, including water for Natural Replenishment, Artificial Replenishment, Carryover and Stored Water." (Section III.A.12; p. 12.) "Groundwater" is commonly understood to include the water occurring beneath the earth's surface that completely fills (saturates) the void space of rocks or sediment. Most of California's groundwater occurs in material deposited by streams, called alluvium, which consists of sand and gravel as well as clay and silt. Sand and gravel usually provide the best source of water and are termed aquifers. Clay and silt deposits are relatively poor sources of water and are referred to as aquitards. California's groundwater basins may include one or a series of alluvial aquifers with intermingled aquitards. Groundwater is an important component of the hydrologic cycle because it accounts for nearly all of the world's fresh water readily available for use.[2]

a. Geography and Watersheds

An active dune system along the coast dominates the Basin's coastal topography, with older, less active dunes found inland, mostly within the former Ford Ord open space. This hilly coastal plain slopes both northwards to the Salinas River Valley and westwards towards the Monterey Bay. Surface elevations overlying the Basin range from sea level at the coast to 950

[2] DWR – Bulletin 118, Update 2003, p. 80.

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feet above mean sea level inland.

The land areas that contribute water to aquifers are known as watersheds. The Basin contains a number of watersheds defined by the California Department of Water Resources ("DWR") that are part of the Salinas Hydrologic Unit. Pilarcitos Canyon and Corral de Tierra Valley watersheds drain northeast to the Salinas Valley, while the Laguna Seca and Monterey watersheds drain northwest to the Pacific Ocean. There are few flowing creeks overlying the Basin because of the permeable nature of the soils. The only creek with a defined channel is the Arroyo del Rey which flows intermittently in Canyon del Rey to the south of the Basin, roughly alongside Highways 68 and 218 (Canyon del Rey Blvd), and into Laguna Grande Lake, through Roberts Lake and eventually into Monterey Bay through a series of flow control structures. Flow in the creek responds rapidly to rainfall, but is usually dry in the summer months.

There are no natural surface water bodies overlying the Basin. The coastal manmade lakes referred to as Laguna Grande and Roberts Lake are located just south of the Basin's boundary. Although these lakes do not fall directly within the Basin's boundaries, their catchments include part of the Basin.

b. Stratigraphy and Hydrostratigraphy

The Seaside Basin consists of a sequence of unconsolidated marine, fluvial and eolian sediments that overlie the relatively impermeable Monterey Formation of Miocene age and older crystalline rocks. Generally, a groundwater basin is an alluvial aquifer or a stacked series of alluvial aquifers with reasonably well-defined boundaries in a lateral direction and a definable bottom. Lateral boundaries are features that significantly impede groundwater flow such as rock or sediments with very low permeability or a geologic structure such as a fault. Bottom boundaries would include rock or sediments of very low permeability if no aquifers occur below those sediments within the basin.[3]

Overlying the Monterey Formation is Santa Margarita Sandstone, which is also referred to as the Santa Margarita aquifer or deep aquifer. The Santa Margarita Sandstone consists primarily

[3] Id. p. 88.

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of marine-derived, sedimentary sandstone. Exploratory drilling associated with the Watermaster's sentinel wells suggests that parts of the deep aquifer previously assigned to the Santa Margarita Sandstone in and near the Northern Coastal and Northern Inland subareas consist of generally finer-grained sediments that should be assigned to the Purisima Formation. The Purisima Formation "interfingers" with the Santa Margarita Sandstone in the northern portion of the Basin. The location of the transition is poorly understood because there are very few wells in the area. Like the Santa Margarita Sandstone, the Purisima Formation is a marine deposit consisting of poorly hardened gravels, sands, silts, and silty clay.

The geologic unit overlying the Santa Margarita Sandstone and Purisima Formation is a Tertiary and Quaternary continental deposit locally called the Paso Robles or shallow aquifer. This unit consists of a mixture of continentally derived gravel, sand, silt and clay sedimentary deposits. It is an unconfined aquifer overlain by the Aromas Sands. The Aromas Sands and older dune deposits are quaternary surficial deposits representing the uppermost geologic units in the Basin. These deposits are a variety of continental deposits, including: fluvial and coastal terrace, flood-plain, stream alluvium, colluviums and basin deposits. A depiction of the arrangement of Basin aquifers is attached hereto as Attachment 4.

c. Groundwater Occurrence

(1) Santa Margarita/Purisima Aquifer

The majority of production wells in the Basin produce groundwater from the deep or Santa Margarita/Purisima aquifer. Groundwater levels in this aquifer have shown a decline since production quantities increased in the 1990s. Due to overlying low conductivity sediments, the deeper Santa Margarita/ Purisima aquifer is confined. Based on observed groundwater level behavior in the Santa Margarita aquifer, there appears to be limited leakage from the overlying shallow aquifer and limited connection to the ocean.

(2) Paso Robles Aquifer

The Paso Robles aquifer (the middle aquifer) is an unconfined aquifer that is tapped by a number of production wells. Many of the wells draw water from both the Paso Robles aquifer and the underlying Santa Margarita aquifer. The water-bearing characteristics of the Paso Robles

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aquifer are variable due to the flood plain depositional environment, which formed coarse-grained channel deposits cutting into fine-grained overbank deposits. The Paso Robles aquifer is hydraulically linked to the ocean, which increases its susceptibility to seawater intrusion.

(3) Aromas Sands

The Aromas Sands (the shallowest aquifer) and other surficial deposits are unsaturated in many parts of the Basin, and are not extensively pumped for municipal use. Only near the coast are they partly saturated. These sediments are not significant sources of groundwater supply.

d. Groundwater Flow

Understanding groundwater flow patterns is necessary in order to effectively manage a groundwater basin. Among other things, changes in flow patterns can affect the water quality of a basin as well as groundwater levels.

(1) Horizontal Flow Directions

Both the Santa Margarita/Purisima and Paso Robles aquifers have pumping depressions (i.e., areas of low groundwater caused by groundwater withdrawals) — one in the Northern Coastal Subarea and one in the LSSA. In general, groundwater flows from the higher inland areas to the lower coastal areas.

(2) Vertical Flow Gradients

Monitoring well data shows that in the 1980's and early 1990's vertical gradients were upwards, or from the deep aquifer to the shallow aquifer. However, as groundwater pumping in the Basin increased, the gradients reversed to downwards, or from the shallow aquifer to the deep aquifer. In the area of Roberts Lake and Laguna Grande in the Southern Coastal subarea, there is likely an upwards vertical gradient due to the area being a groundwater discharge point. This assumption, however, cannot be confirmed with groundwater elevation data as there are no monitoring wells in this area.

e. Status of Basin Groundwater Conditions

The Decision required the Watermaster to prepare a comprehensive Basin Monitoring and Management Program ("M&MP") to ensure the Basin remains protected and managed as a perpetual source of water. The M&MP monitors current overdraft conditions and the threat of

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potential seawater intrusion into the coastal subareas of the Basin. Groundwater production, quality, and groundwater level monitoring is performed in coastal and inland production and monitoring wells.

Over the past twelve years, the Basin's groundwater levels have declined. The downward trend in groundwater levels is not sustainable in the Seaside Basin, potentially leading to water quality degradation and loss of Basin storage resulting from seawater intrusion. Continued declines in groundwater levels also could lead to pumping groundwater levels falling below the top of a well screens and pump intakes

Plans to replenish the Basin through the development of the Monterey Peninsula Water Supply Project are discussed below. To date, however, no seawater intrusion or land subsidence has been detected in the Basin, and no operational problems have been reported as a result of these lowering groundwater levels.

C. Relation of the Seaside Basin to Adjacent Groundwater Basins and Subbasins and the 2014 Sustainable Groundwater Management Act

As explained by DWR, a subbasin is created for the purposes of collecting and analyzing data, managing water resources, and managing adjudicated basins. A subbasin is created by dividing a groundwater basin into smaller units using geologic and hydrologic barriers or institutional boundaries. The designation of a subbasin boundary is flexible and could change in the future.[4] The adjudicated boundaries of the Seaside Basin are currently encompassed within the boundaries of two different subbasins designated by DWR in Bulletin 118 (described below) as subbasins of the broader Salinas Valley Groundwater Basin, specifically, the Seaside Area Subbasin (3-4.08) and the Corral de Tierra Area Subbasin (3-4.10). The DWR Bulletin 118 subbasins, including the subbasins within the Salinas Valley, are depicted in the DWR map of the basins and subbasins within the Central Coast Hydrologic Region, attached as Attachment 5.

The boundaries of the adjudicated Seaside Basin as compared to the boundaries of the Seaside Area Subbasin identified in Bulletin 118 are depicted in the map comparing the Seaside

[4] Id. p. 90.

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adjudicated Seaside Basin boundaries with the DWR Bulletin 118 Seaside Basin boundaries, developed by the MPWMD, which is attached as Attachment 6. As explained below, groundwater production in the Corral de Tierra Area Subbasin is contributing to declining groundwater levels in the eastern portion of the LSSA of the Seaside Basin.

The Seaside Basin is one of approximately two dozen groundwater basins in California that have been adjudicated by the courts and are now subject to judicial management. Historically, the majority of non-adjudicated groundwater basins have not been managed to limit groundwater extractions to prevent overdraft. To address the lack of management in these basins, in 2014, the legislature adopted a new groundwater management law called the Sustainable Groundwater Management Act ("SGMA"). SGMA requires that all alluvial basins and subbasins that are deemed high and medium priority by DWR be comprehensively managed under the new law. (Wat. Code §§ 10720 et seq.) The act requires that one or more local water and/or land use agencies establish a new "Groundwater Sustainability Agency" ("GSA") by 2017. (Wat. Code §§ 10723 and 10735.2(a)(1).) The GSA must develop a "Groundwater Sustainability Plan" ("GSP") for basin/subbasin by 2020 or 2022, the deadline depending on whether the basin/ subbasin has been identified as in a critical overdraft condition. (Wat. Code § 10720.7(a).) All of the subbasins within the Salinas Valley Groundwater Basin are either medium or high priority, including the subbasins encompassing the Seaside Basin.

The GSP must be designed to avoid adverse basin conditions, including those resulting from sustained and unmitigated overdraft. (Wat. Code §§ 10721 (t), (u), (w) and 10727.) The GSP must be designed to achieve sustainability within 20 years and must be approved by DWR as satisfying the requirements of SGMA. (Wat. Code §§ 10721(t), (u), (w), 10727, 1027.2, and 10733.)

SGMA exempts adjudicated groundwater basins from the Act's GSA/GSP requirements in recognition of the comprehensive groundwater management overseen by the courts within adjudicated basins. (Wat. Code § 10720.8.) For adjudicated basins, SGMA requires annual information filings be made to DWR, including water use data, groundwater levels, changes in basin storage, copies of annual reports submitted to the court, and other standard information.

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(*Id.*) Watermaster is complying with these new reporting requirements.

Other than the Seaside Basin, all other subbasins within the Salinas Valley Groundwater Basin are subject to SGMA's requirements for establishment of a GSA and the development of a GSP. As discussed below, the application of SGMA to the Corral de Tierra Area Subbasin, which adjoins the eastern boundary of the Seaside Basin, will be important to efforts to address overdraft conditions within the LSSA of the Seaside Basin as well as within the Corral de Tierra Area Subbasin.

DWR defines basins within California through the basin boundary descriptions set forth in a DWR publication referred to as Bulletin 118. These basin boundaries are used pursuant to SGMA for basin management planning requirements. (Wat. Code § 10722.) Pursuant to SGMA, local agencies may petition DWR to adjust basin boundaries. (Wat. Code § 10722.2.) The Monterey Peninsula Water Management District ("MPWMD"), a local water management agency and a party to this action, is seeking a boundary modification that will recognize the adjudicated boundaries of the Seaside Basin for purposes of Bulletin 118. The boundary modification request is logical and practical for managing the areas outside of the adjudicated boundaries pursuant to SGMA, while clearly recognizing and excluding the adjudicated basin boundaries, which are exempted from the SGMA's GSA/GSP requirements. Watermaster supports MPWMD's basin boundary modification request and will update the Court on its progression.

D. Summary of the Court's Decision and Basin Management Structure

As a general overview, the Decision:

- Calculates the Basin's "safe yield;"
- Limits the quantity of groundwater available for cumulative production pursuant to a series of 10% triennial rampdowns in allowed annual production until total Basin production is no more than the safe yield;
- Allocates the allowed annual production between the parties and establishes two "classes" of adjudicated production rights, referred to as Standard Production Allocation and Alternative Production Allocation;
- Allows for groundwater replenishment and storage;

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- Allows for "carryover" of unused Standard Production Allocation from year to year;
- Allows for transfers of Standard Production Allocation;
- Establishes the Watermaster, as a special master to the Court, to assist in the implementation of the Decision and management of the Basin;
- Requires the Watermaster to assess administrative budget and replenishment assessments to finance its administrative activities and Basin replenishment; and
- Reserves continuing jurisdiction to the Court to modify the Decision as appropriate and to resolve any future disputes.

1. Natural Safe Yield

Consistent with California common law, the Decision defines the "Natural Safe Yield" as the quantity of groundwater existing in the Basin that occurs solely as a result of natural replenishment under existing conditions. (Section III.A; p.8.) The Natural Safe Yield of the Seaside Basin as a whole was determined to be between 2,581 to 2,913 acre-feet per year ("AFY"). Divided between the subareas, the Decision determined that Natural Safe Yield was between 1,973 to 2,305 AFY for the Coastal subareas and 608 AFY for the LSSA. (Section II.B; p.13.)

2. Operating Safe Yield

The Decision defines the "Operating Safe Yield" of the Basin as the maximum amount of groundwater allowed to be produced from each subarea. (Section III.A; p. 13.) The Operating Safe Yield is designed to decrease over time to afford a gradual rampdown of historical production quantities until the Basin's Operating's Safe Yield equals its Natural Safe Yield. The Operating Safe Yield for the Basin as a whole was originally set at 5,600 acre-feet, divided among the subareas as 4,611 acre-feet for the Coastal Subareas and 989 acre-feet for the LSSA. (*Id.*)

3. Rampdown

Under the Decision, the Basin's Operating Safe Yield is reduced by 10 percent every three years until it is equivalent to the Basin's Natural Safe Yield unless:

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a. The Watermaster has secured and is adding an equivalent amount of non-native water to the Basin on an annual basis; or

b. The Watermaster has secured reclaimed water in an equivalent amount and has contracted with one or more of the water producers to utilize this water in lieu of their production allocation; or

c. Any combination of conditions (a) and (b), above, which results in the decrease in production of native water required by the Decision; or

d. The Watermaster has determined that groundwater levels within the Basin are sufficient to ensure a positive offshore gradient to prevent seawater intrusion into the Basin. (Section III.B.2; pp.17-18.)

Further, if a "Material Injury," as defined in the Decision, arises, Watermaster, with the concurrence of the Court, shall reduce the Basin's Operating Safe Yield as necessary to avoid the Material Injury. (*Id.*)

4. Production Allocations

As noted above, the Decision establishes two forms of groundwater production allocations. The first is the Standard Production Allocation, which is akin to an appropriative groundwater right under California common law. It allows for municipal and other "non-overlying" uses of Basin groundwater. (Section III.B.2; pp.17-19.) The second form is the Alternative Production Allocation, which is akin to an overlying groundwater right under California common law. It affords a first priority groundwater right to use Basin groundwater on identified overlying parcels. (Section III.B.3; pp.19-21.)

Parties holding Alternative Production Allocation ("Alternative Producers") are afforded a right to produce the quantity of their allocation specified in Table 2 of the Decision, which right is prior and paramount to the Standard Production Allocation and is not subject to future reductions for the benefit of Standard Producers. (Section III.B.3; pp.19-21.) However, the Alternative Production Allocation is limited to parcels identified in Exhibit C to the Decision and may not be transferred for use by others unless the Alternative Production Allocation is converted into a Standard Production Allocation, as discussed further below. (Section III.B.3(a); p.20.) Alternative

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Producers are also not afforded storage or carryover rights.

Parties holding Standard Production Allocation ("Standard Producers") are afforded a right to produce the Basin's residual Operating Safe Yield that is surplus to the cumulative production by the Alternative Producers. (Section III.B.2; pp.17-19.) The Operating Safe Yield is divided amongst Standard Producers pursuant to the percentages set forth in Table 1 of the Decision. (Section III.B.2; p. 19.) The Standard Production Allocation may be used on any property overlying the Basin, but only Cal-Am may export water outside the Basin to its customers. (Section III.M.3.; pp 42-43.) Those parties possessing Standard Production Allocation may also store water and carry over their unused Standard Production Allocation from one year to the next. (Section III.H; pp 25-28.)

An Alternative Producer may make a one-time election to convert Alternative Production Allocation to Standard Production Allocation. (Section III.B.3; p.21.) By doing so, the allocation converted to Standard Production Allocation may then be transferred for use off of the overlying land. The beneficiary of the allocation also obtains comparable storage and carryover opportunities. However, upon conversion, the allocation then becomes subject to the rampdown in the Operating Safe Yield and liable for replenishment assessments imposed on the production of Standard Production Allocation. (Section III.B.2; pp. 17-18.)

5. Replenishment Assessments

The Decision instructs Watermaster to levy "replenishment assessments" on each acre-foot of production by a producer in excess of their share of the Basin's Native Safe Yield and the Operating Safe Yield. (Section III. L.1.j.iii; pp 32-34.) Replenishment assessments are not imposed upon production under an Alternative Production Allocation so long as the production is within the fixed amount established for that producer. (*Id.*) The amount of the assessment must cover the cost of artificial replenishment in an amount necessary to off-set that producer's production in excess of their share of the Native Safe Yield and the Operating Safe Yield. (*Id.*) The replenishment assessment is determined annually based upon Watermaster's estimate of the cost of providing non-native water to replenish the Basin. (*Id.*) Because non-native water is not presently available to replenish the Basin, Watermaster makes this calculation based on its best

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estimate of the future cost of obtaining non-native water for replenishment when it becomes available.

6. Storage and Carryover Rights

The Decision established that underground storage within the Basin is a public resource. (Section III.H; pp 25.) Subject to supervision by the Watermaster and the Court, the Standard Producers are permitted to utilize available storage space for groundwater storage projects. (Section III.H; pp 25-28.) The Watermaster is to determine the total useable storage space in the Basin, and may adjust its determination as it deems appropriate. (*Id.*) Standard Producers are also granted the right to carry over unused Standard Production Allocation from year to year, subject a percentage decrease consistent with percentage decreases in the Operating Safe Yield. (Section III.F; pp 23.)

7. Transferability of Water Rights

Standard Producers may assign and transfer any portion of their Standard Production Allocation on an annual basis or in perpetuity to any person for use within the Basin. (Section III.M.2; p. 42.) The Parties may also assign and transfer the right to extract any quantity of water stored or carried over. (*Id.*)

8. Watermaster

Section III.L of the Decision establishes the Watermaster to administer and enforce the provisions of the Decision and any subsequent instructions or orders of the Court. The Watermaster consists of thirteen voting positions held among nine representatives. Cal-Am, City of Seaside, City of Sand City, City of Monterey, and City of Del Rey Oaks each appoint a representative. The "Landowner Group," representing the overlying landowners, appoints two representatives: one representative from the Coastal Subarea and one representative from the LSSA. The Monterey Peninsula Water Management District and the Monterey County Water Resources Agency ("MCWRA") also each appoint a representative. The Cal-Am representative possesses three voting positions; the Seaside, MPWMD, and MCWRA representatives each possess two voting positions; and every other representatives possesses one voting position. Each representative from the Landowner Group is to carry one-half of the Landowner representative

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vote. (Section III.L.1; p 29.)

9. Continuing Jurisdiction

The Decision reserves full jurisdiction, power and authority to the Court to make such further or supplemental orders or directions as may be necessary or appropriate for interpretation, enforcement, or implementation of the Decision. (Section III.O.1; p. 44.) The Court may also modify, amend or amplify any of the Decision's provisions, except adjustments to water rights and production allocation unless necessary to accommodate the intervention of a new party. The Court may also join, through intervention, new parties that produce or propose to produce groundwater from the Basin. (Section III.O.1; p. 45.) Pursuant to the Court's continuing jurisdiction, the Court also review a decision issued by Watermaster. (Section III.N; pp. 43-44.)

E. Summary of Historical Basin Production, Basin Conditions, Seawater Intrusion Monitoring and Management Plan, and Other Watermaster Actions

Historical production from the Basin is summarized in the following table:

SEASIDE BASIN WATER USAGE
Decision-Allowed v. Actual

Water Year (Annual Report Year)	Decision-Allowed Operational Yield, in AF	Actual Total Basin Production in AF
2006	**5,600.0**	5,020.1
2007	**5,600.0**	5,384.6
2008	5,600.0	5,272.0
2009	5,180.0	4,392.6
2010	5,040.0	4,547.6
2011	5,040.0	4,151.5
2012	4,480.0	3,832.9
2013	4,480.0	3,895.8
2014	4,480.0	4,040.2
2015	3,920.0	3,762.0
Total	49,420.00	44,299.30

As this table shows, actual production has been continuously below the cumulative Operating Safe Yields since the entry of the Decision. Total production has been 5,121 acre-feet less than the total Operating Safe Yield. As anticipated, groundwater levels have continued to decline in the areas of pumping depressions in the Northern Coastal Subarea and the LSSA. Summertime static (non-pumping) groundwater levels within a key well in the Northern Coastal

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Subarea fell from 24.01 to 31.01 feet below mean sea level between 2009 and 2015, and summertime static groundwater levels within a key well in the LSSA fell from 160.37 to 142.55 feet above mean sea level over that same period. The most recent groundwater elevation maps for the Basin developed by Hydrometrics LLC are attached as Attachment 7. It is anticipated that these groundwater declines are being and will be addressed by rampdown and replenishment obligations in accordance with the Decision.

1. Preventing Seawater Intrusion

As part of implementing the M&MP, Watermaster installed a series of "sentinel" monitoring wells along the coast within the Coastal Subarea to monitor a number of indicators that will provide advance notice of potential seawater intrusion into the Basin. Data collected from these sentinel wells, as well as many other wells located within the Basin, are analyzed in the Seawater Intrusion Analysis Reports ("SIAR") prepared for the Watermaster by its consultant, HydroMetrics LLC. These reports have been prepared annually since 2007. The geochemical analyses contained in the reports have consistently shown that no seawater intrusion has been detected in either of the Basin's principal aquifers – the Paso Robles Formation (shallow) or Santa Margarita Sandstone (deep).

Although seawater intrusion into the Basin has not been detected, the potential for it to occur exists as long as groundwater levels within the Basin are below mean sea level.[5] Groundwater levels in the Northern Coastal Subarea must be returned to above sea level to achieve a positive offshore gradient, which will preclude seawater intrusion into the Basin.

In February 2009, as mandated by the Decision and as part of the Watermaster's

[5] In the Northern Coastal Subarea's shallow aquifer (Paso Robles), groundwater levels have stabilized over the past several years and are above sea level, except within a pumping depression centered around the main production wells in this subarea where levels are in some locations more than 25 feet below sea level. In the deep aquifer (Santa Margarita) of the Northern Coastal Subarea, groundwater levels continue to be well below sea level. Within a pumping depression centered around the main production wells in this subarea, levels in some locations are up to 50 feet below sea level. The trend shows an overall long-term decline in groundwater levels since the Decision was entered. In the Southern Coastal Subarea groundwater levels have always been above sea level and have continued to remain stable over time.

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implementation of the M&MP, HydroMetrics LLC prepared a Seawater Intrusion Response Plan ("SIRP"). The SIRP is the Watermaster's contingency plan for responding to seawater intrusion in the Basin, if and when it occurs.

Section 3 of the SIRP establishes indicators of seawater intrusion. These indicators are used in preparing the SIARs each year. Section 4 of the SIRP lists response measures that will be implemented if seawater intrusion is observed in the Basin. These actions consist of the following steps:

- Immediate sample verification (resampling) if any of the seawater intrusion indicators is detected.
- Issuance by the Watermaster of a Declaration of Seawater Intrusion if verification confirms the occurrence of seawater intrusion.
- Notification to groundwater producers in the Basin that the contingency actions contained in the SIRP have been triggered.
- Implementation of a pumping redistribution plan to contain the area where intrusion has been detected and to protect production wells against intrusion.
- Initiation of efforts to strategically use supplemental water supplies to protect the Basin and to restore it to pre-seawater intrusion conditions.

No sources of supplemental water are identified in the SIRP, but potential sources are listed in the Basin Management Action Plan ("BMAP") prepared for the Watermaster by HydroMetrics LLC in February 2009. That document describes supplemental water supplies and management actions that may be implemented to help prevent seawater intrusion by allowing groundwater levels to recover in the Basin. Of the supplemental sources described in the BMAP, the principal one currently being pursued is the Monterey Peninsula Water Supply Project ("MPWSP"), described below.

2. Stabilizing Groundwater Levels in the LSSA

Groundwater levels in the LSSA have gradually declined since the Decision was entered. The declines are attributable to production occurring both within the Basin and outside of the adjudicated boundaries within the Corral de Tierra Area Subbasin.

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Recent groundwater modeling studies prepared for the Watermaster by HydroMetrics indicate that the eastern side of the LSSA (adjacent to the neighboring Corral de Tierra Area Subbasin) will suffer the most severe and persistent declines. Pumping in the Corral de Tierra Area Subbasin reduces the amount of groundwater that flows from that area into the LSSA. This results in a reduced amount of naturally occurring recharge of the LSSA, which contributes to the decline of groundwater levels within the LSSA. The modeling results showed that, without further management, groundwater elevations will gradually decline and that levels will fall below the top of the well screens in several of the wells in the LSSA prior to 2041.

One hypothetical scenario modeled the effect of completely discontinuing all pumping in the LSSA and allowing unrestrained pumping in the Corral de Tierra Area Subbasin consistent with current production quantities in that subbasin. Under that scenario, the groundwater flow direction in the easterly portion of the LSSA would shift northeasterly by 2041, resulting in groundwater flowing out of the LSSA and into the Corral de Tierra Subbasin. In this hypothetical scenario the model showed that groundwater levels in the eastern portion of the LSSA would continue to decline, despite elimination of pumping in the LSSA.

Because the Watermaster has no control or influence over pumping outside the Seaside Basin boundaries, it is unable to prevent declining groundwater elevations in a portion of the LSSA without assistance from the MCWRA, which has groundwater management jurisdiction over the area to the east of the LSSA. Watermaster has contacted the MCWRA to develop mutually acceptable solutions to the declining groundwater levels in both areas. Watermaster anticipates that a robust collaborative effort will develop in relation to the GSP planning process for the Corral de Tierra Area Subbasin under SGMA. Under SGMA, the GSA for the Corral de Tierra Area Subbasin must coordinate with the Watermaster for the Seaside Basin to avoid "undesirable results," as defined in SGMA, in both areas. (Wat. Code § 10721(t).) Through the SGMA process, excessive pumping in the Corral de Tierra area must be curtailed. (Wat. Code § 10721(t),(u) and (w); 10727.2.) Watermaster intends to coordinate with the emerging GSA for the Corral de Tierra Area Subbasin to achieve sustainable groundwater management in both areas.

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F. Overview of Monterey Peninsula Water Issues and Seaside Basin's Role

1. Carmel River and Seaside Basin

The Monterey Peninsula has endured water supply challenges for decades stemming from the fact that, unlike many areas of California, the community relies exclusively on locally-generated water supply. Cal-Am is the Monterey Peninsula's principal water supplier. Its primary source of supply has been, and presently continues to be, diversions from underflow of the Carmel River system. Cal-Am also extracts groundwater from the Seaside Basin in both the Northern Coastal Subarea and the LSSA. Its largest well (the Peralta Well) was installed within the Coastal Subarea in 1993 to augment supplies from the Carmel River Valley.

2. SWRCB Orders (WR Order 95-10 and WR Order 2009-0060) and Historical Replacement Water Supply Efforts

As a result of filed complaints, in 1995 the State Water Resources Control Board ("SWRCB") issued WR Order 95-10, ruling that the Carmel River underflow where Cal-Am's wells are located is a "subterranean stream" subject to the SWRCB's permitting jurisdiction, that Cal-Am did not possess a valid basis of right to appropriate Carmel River subterranean streamflow in excess of 3,316 AFY, and that Cal-Am had extracted a total of about 10,730 AFY (approximately 70 percent of its historical diversions) without a valid basis of right. The order required Cal-Am to diligently pursue efforts to develop a legal supply of water to replace its unauthorized diversion.

Cal-Am initially sought to obtain the necessary water from a proposed new dam on the Carmel River proposed by the MPWMD, which would have been called the New Los Padres Dam. However, MPWMD was unable to secure public support for funding and that dam was never constructed. Cal-Am then filed an application with the California Public Utilities Commission ("CPUC") for its own dam project, the "Carmel River Dam." which was never constructed. However, while that CPUC application was pending, the state legislature adopted legislation directing the CPUC to identify a long-term water supply contingency plan to replace Cal-Am's unauthorized water diversions from the Carmel River. This process ultimately led to a determination to pursue desalination as the principal replacement water supply instead of a new

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reservoir on the Carmel River

In 2009, the SWRCB issued a cease and desist order upon Cal-Am in WR Order 2009-0060 (the "CDO"), which imposed an immediate reduction on Cal-Am's diversions, a schedule of additional annual reductions through 2016, and a requirement that all unauthorized diversions by Cal-Am cease no later than December 31, 2016.

3. The Monterey Peninsula Water Supply Project

Currently, Cal-Am is seeking to permit and construct the MPWSP, which includes a seawater well intake system, a desalination plant, conveyance facilities, and an aquifer storage and recovery system ("ASR"). The MPWSP also includes a variation that combines a reduced-capacity desalination plant with a water purchase agreement ("WPA") for product water from the proposed Pure Water Monterey Groundwater Replenishment Project ("GWRP"), which would use advanced water treatment procedures to treat effluent water and other degraded water supplies for injection into and subsequent recovery from the Seaside Basin.

4. The Basin's Role in Monterey Peninsula's Water Supply

The Basin will provide a permanent supply of groundwater to Cal-Am, the City of Seaside, and various overlying land users indefinitely, but in a reduced amount consistent with the Basin's long-term safe yield. In addition to its supply of native groundwater, the Basin will provide an essential subterranean reservoir to store water produced from the GWRP and the ASR.

Studies conducted by the Watermaster and others have concluded that the Basin can serve as a reliable long-term source of water to water purveyors and overlying landowners, but not at the historical rates of well pumping. The Natural Safe Yield of the Basin was established in the Decision as approximately 3,000 AFY. Historical pumping rates just prior to the Decision were approximately 5,600 AFY. Due in part to conservation measures and compliance with the Decision's mandated triennial pumping reductions, annual pumping from the Basin dropped to less than 3,800 AF in Water Year 2015.

Cal-Am's allocation of the Basin's Natural Safe Yield is approximately 1,474 AFY, and Cal-Am intends to continue producing from the Basin at this level after its current pumping is ramped down pursuant to the Decision. Cal-Am is sizing the MPWSP to allow it to meet its water

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customer demands by augmenting its entitlement to 1,474 AFY of Basin groundwater.

As part of the sizing of the MPWSP, Cal-Am has included capacity to produce an additional 700 AFY of desalinated water for a period of at least 25 years in order to replenish the Basin in an amount equal to its historical overpumping dating back to the date of the Decision. This will enable Cal-Am to reduce its pumping of native groundwater from the Basin to 774 AFY (rather than its allowed 1,474 AFY) for a period of at least 25 years.

5. Schedule for MPWSP and GWRP

Cal-Am has applied to the CPUC for a certificate of public convenience and necessity ("CPCN") for the MPWSP. The matter is pending in Application A.12-04-019. Unfortunately, processing of the application has been delayed and the CPUC recently indicated that a draft Environmental Impact Report/Environmental Impact Statement will be issued for public comment on December 21, 2016. As a result, the startup date for the desalination plant is now anticipated to occur during the first half of the year 2020.

Notably, the CPUC may issue an earlier separate decision authorizing Cal-Am to enter into a WPA to purchase water from the GWRP. If the CPUC determines a separate WPA decision is desirable, that decision is currently anticipated to be made in or around August of 2016. Once a WPA is executed, construction on the GWRP can commence shortly thereafter since the project has already been approved by the Monterey Regional Water Pollution Control Agency and the MPWMD and an EIR has been certified for the project. The startup date for the GWRP is scheduled for 2018.

6. Proposed CDO Extension

Because of delays in the permitting and processing of the MPWSP, Cal-Am will not have a substitute water supply to allow it to cease all unauthorized diversions from the Carmel River Valley by the CDO's present deadline of December 31, 2016. Therefore, Cal-Am, the MPWMD, and the Monterey Peninsula Regional Water Authority ("MPRWA") have filed an application for an extension of the CDO that would impose incremental further reductions to Carmel River pumping in the near term, with full cessation of unauthorized diversions by the end of 2020. The proposal was discussed extensively with SWRCB staff before it was submitted to the SWRCB.

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Cal-Am anticipates that a decision on the proposed modified CDO will be issued by the SWRCB during the second half of 2016.

G. Potential Request for Relief From the 2018-2021 Triennial Rampdown

Pursuant to terms of the proposed CDO extension, the most challenging years for the Monterey Peninsula will be 2018-2020. Depending on the SWRCB's actions on the proposed CDO extension, demand projections, and developments concerning the MPWSP, Cal-Am has indicated that it may request Watermaster to seek the Court's permission to postpone the 2018-2021 rampdown to the Operating Safe Yield of 560 AFY. Such relief from the Operating Safe Yield is currently justified and consistent with the Decision, in the view of Watermaster, principally because Watermaster, through an arrangement with the City of Seaside, has already replenished 2,500 acre-feet of non-native water into the Basin. This has occurred through the City of Seaside's acquisition of 2,500 acre-feet of imported water, which it has used in-lieu of producing the Alternative Production Allocation to which it is entitled for irrigation of two golf courses owned by the city. Watermaster, with the Court's concurrence, entered into an agreement with the City to grant it a credit against the replenishment assessment liability that it incurred in relation to the City's production of Standard Production Allocation for its small municipal water system. Thus, effectively, Watermaster has purchased this 2,500 acre-feet of replenishment supply for the Basin's benefit.

The Decision allows relief from the triennial rampdown if "Watermaster has secured and is adding an equivalent amount of Non-Native water to the Basin on an annual basis" (Cite.) Watermaster's in-lieu replenishment program with the City of Seaside does not meet the express criteria of replenishing equivalent Non-Native water *on an annual basis*. However, there currently is, in Watermaster's view, a reasonable basis to postpone the 2018-2021 rampdown for the following reasons:

- The three-year rampdown total is 1,680 AF (560 AF x 3 years) and 2,500 acre-feet of replenishment has occurred. Thus, the quantity of replenishment water is 149% of the quantity of rampdown relief that may be requested.

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- Watermaster has implemented a robust monitoring and seawater intrusion response program, and there is no evidence of seawater intrusion or any other imminent adverse impact to the Basin.
- Relief from the rampdown may be critical to avoid deleterious economic and social consequences to the region associated with Cal-Am's CDO extension request.
- Once it is operational, the MPWSP will be able to provide water allowing for replenishment of the Basin in an amount equivalent to the postponed rampdown.

Although it has not yet been determined whether relief from the 2018-2021 rampdown will be requested, Watermaster apprises the Court of this issue now to afford the Court advanced notice and, given the importance of this issue in the context of the CDO extension, to provide the Court with an opportunity to ask questions and provide any early direction concerning the issue.

H. Next Steps and Proposed 2017 Status Conference

Watermaster will monitor and, to the extent possible, participate in the GSA formation process for the Corral de Tierra Area Subbasin and begin coordination efforts once the GSA is established. Cal-Am and the MPWMD will continue to update Watermaster on progress for the MPWSP and GWRP.

In addition to reporting to the Court at the 2016 Status Conference requested herein, Watermaster will report on the status of the issues described in this report in its 2016 Annual Report to the Court. Watermaster also proposes that the Court set a subsequent status conference hearing for the first quarter of 2017. At that status conference, Watermaster will update the Court on the development of the MPWSP and the requested CDO extension from the SWRCB, report on any updates to the strategy to address groundwater level declines in the LSSA, and discuss whether a motion for relief from the 2018-2021 rampdown is anticipated in 2017.

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Dated: May 23, 2016

BROWNSTEIN HYATT FARBER SCHRECK, LLP

By: _____
RUSSELL M. MCGLOTHLIN
Attorneys for Seaside Groundwater Basin Watermaster

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Attachment 1

SUPERIOR COURT OF CALIFORNIA,
COUNTY OF MONTEREY

California American Water, **Plaintiff,**	Case No. M6643
v.	**ASSIGNMENT ORDER**
City of Seaside, et al, **Defendants.**	

THE HONORABLE LESLIE C. NICHOLS, Retired Judge of the Superior Court of California, County of Santa Clara, is hereby assign by Chief Justice of California and Chairperson of the Judicial Council, Tani G. Cantil-Sakauye, to sit as a Judge of the Superior Court of California, County of Monterey for all purposes on the matter referenced above.

Effective January 27, 2016, assignment number: 1043757-16.

Dated: 1/29/16

Renee Inofuentes, Deputy Clerk

CERTIFICATE OF MAILING

I do hereby certify that I am not a party to the within stated cause and that on January 29, 2016, I deposited true and correct copies of the attached ASSIGNMENT ORDER, each in sealed envelopes with postage thereon fully prepaid, in the mail at Salinas, California, directed to each of the following-named persons at their respective addresses, as hereinafter set forth:

See attached Service List

CONNIE MAZZEI,
Clerk of the Superior Court
Of California, County of Monterey.

By: _____
Deputy

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WATERMASTER EXECUTIVE OFFICER

Attachment 2

IN THE SUPERIOR COURT OF THE STATE OF CALIFORNIA

IN AND FOR THE COUNTY OF MONTEREY

CALIFORNIA AMERICAN WATER,

Plaintiff,

vs.

CITY OF SEASIDE; CITY OF MONTEREY; CITY OF SAND CITY; CITY OF DEL REY OAKS; SECURITY NATIONAL GUARANTY, INC.; GRANITE ROCK COMPANY, INC.; D.B.O. DEVELOPMENT COMPANY NO. 27, INC.; MURIEL E. CALABRESE 1987 TRUST; ALDERWOODS GROUP (CALIFORNIA), INC.; PASADERA COUNTRY CLUB, LLC; LAGUNA SECA RESORT, INC; BISHOP MC INTOSH & MC INTOSH, a general partnership; THE YORK SCHOOL, INC.; COUNTY OF MONTEREY; and DOES 1 through 1,000, Inclusive,

Defendants.

MONTEREY PENINSULA WATER MANAGEMENT DISTRICT,

Intervenor.

MONTEREY COUNTY WATER RESOURCES AGENCY,

Intervenor.

AND RELATED CROSS-ACTIONS

Case No. M66343

AMENDED DECISION

Action Filed: August 14, 2003
Trial Date: December 13, 2005
Dept.: 21

I. INTRODUCTION

This Decision sets forth the adjudicated rights of the parties to this lawsuit (with certain exceptions noted in section I.D. below), including Plaintiff California American Water, and Defendants the City of Seaside, the City of Monterey, the City of Sand City, the City of Del Rey Oaks, Security National Guaranty, Inc., Granite Rock Company, D.B.O. Development Company No. 27, Muriel E. Calabrese 1987 Trust, Alderwoods Group (California), Inc., Pasadera Country Club, LLC, Laguna Seca Resort, Inc., Bishop, McIntosh & McIntosh, and The York School, Inc. (hereinafter "Water User Defendants") to use the water resources of the Seaside Groundwater Basin ("Seaside Basin" or "Basin") and provides for a physical solution for the perpetual management of the Basin, which long-term management will provide a means to augment the water supply for the Monterey Peninsula.

A. Seaside Groundwater Basin.

The Seaside Basin is located in Monterey County and underlies the Cities of Seaside, Sand City, Del Rey Oaks, Monterey, and portions of unincorporated county areas, including the southern portions of Fort Ord, and the Laguna Seca Area. The boundaries of the Basin are depicted in Exhibit B of this Decision. Generally, the Seaside Basin is bounded by the Pacific Ocean on the west, the Salinas Valley on the north, the Toro Park area on the east, and Highways 68 and 218 on the south. The Seaside Basin consists of subareas, including the Coastal subarea and the Laguna Seca subarea in which geologic features form partial hydrogeologic barriers between the subareas.

B. The Parties.

1. Plaintiff California American Water ("Plaintiff" or "California American") is an investor-owned public utility incorporated under the laws of the State of California. *(See* Pub. Utilities Code, §§ 1001 et seq. and 2701 et seq.) California American produces groundwater from the Seaside Basin and delivers it for use on land within its certificated service area that both overlies portions of the Seaside Basin, and is located outside of the Seaside Basin Area, all within the County of Monterey.

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2. Defendant City of Seaside ("Seaside") is a general law city situated in the County of Monterey. Seaside produces groundwater from the Seaside Basin (1) for use on two city-owned golf courses that overly the Basin, and (2) for municipal water service to its residents. *(See* Call. Const., Art. XI, § 9; Gov. Code, § 38730.)

3. Defendant City of Sand City ("Sand City") is a charter city situated in the County of Monterey. Sand City produces groundwater from the Seaside Basin and delivers it for use on private and publicly owned lands within its incorporated boundaries, all of which overlie the Seaside Basin. *(See* Cal. Const., Art. XI, § 9; Gov. Code, § 38730.)

4. Defendant City of Del Rey Oaks ("Del Rey Oaks") is a general law city situated in the County of Monterey. Land within Del Rey Oaks' incorporated boundaries overlies the Seaside Basin. The two wells Del Rey Oaks presently operates for irrigation of public lands are located outside the Seaside Basin area and are, therefore, excluded from this Stipulation. *(See* Cal. Const., Art. XI, § 9; Gov. Code, § 38730.)

5. Defendant City of Monterey ("Monterey") is a charter city situated in the County of Monterey. Monterey owns and controls land that overlies the Seaside Basin area.

6. Defendant Security National Guaranty, Inc. ("SNG") is a California corporation with its principal place of business in the City and County of San Francisco. SNG's primary business activity is real estate development. As part of its operation, SNG and/or its predecessors-in-interest have produced groundwater from the Seaside Basin. SNG also owns land overlying the Seaside Basin.

7. Defendant Granite Rock Company ("Granite") is a California corporation with its principal place of business in the County of Santa Cruz. Granite's primary business activity is the production and sale of concrete aggregate and building materials. As part of its Seaside concrete and building materials plant, Granite has produced groundwater from the Seaside Basin. Granite also owns land overlying the Seaside Basin.

8. Defendant D.B.O. Development No. 27 ("D.B.O."), erroneously sued herein as D.B.O. Development Company, is a California limited liability company with its principal place of business in the County of Monterey. D.B.O.'s primary business activity is the ownership and

development of real property for commercial, industrial, residential, and public uses. As part of their ownership and development of land overlying the Seaside Basin, D.B.O. and/or its predecessor in interest have produced groundwater from the Basin. D.B.O. also owns and controls land overlying the Seaside Basin.

9. Defendant Muriel E. Calabrese 1987 Trust ("Calabrese") is an irrevocable trust that holds property in the County of Monterey. Calabrese and/or its predecessor in interest have produced groundwater from the Seaside Basin in relation to the operation of its paving, grading and construction business and operation of a concrete batch plant in Sand City. Calabrese also owns and controls land overlying the Seaside Basin.

10. Defendant Alderwoods Group (California), Inc. ("Alderwoods Group"), DBA Mission Memorial Park ("Mission Memorial") is a California corporation with its principal place of business in the County of Monterey. Mission Memorial's primary business activity is the operation of a cemetery in the City of Seaside. As part of maintenance of the cemetery, Mission Memorial has produced groundwater from the Seaside Basin. Mission Memorial also owns land overlying the Seaside Basin.

11. Defendant Pasadera Country Club, LLC ("Pasadera") is a California limited liability company with its principal place of business in the County of Monterey. Pasadera's primary business activity is the operation of a private golf course. As part of its golf course operations, Pasadera has produced groundwater from the Seaside Basin. Pasadera also owns land overlying the Seaside Basin.

12. Defendant Bishop, McIntosh & McIntosh ("Bishop") is a general partnership, with its principal place of business in the County of Monterey. Bishop owns land overlying the Laguna Seca Subarea of the Seaside Basin. Defendant Laguna Seca Resort, Inc.("Laguna Seca") is a California corporation with its principal place of business in the County of Monterey. Laguna Seca's primary business activity is the operation of a public golf course on land owned in fee by Bishop. Laguna Seca operates the golf course pursuant to a lease with Bishop. As part of the golf course's operations, groundwater is produced from the Laguna Seca Subarea of the Seaside Basin for irrigation purposes. Laguna Seca filed a cross-complaint against California

American, and Bishop filed a cross-complaint against California American and all defendants other than Laguna Seca Defendants Laguna Seca Resort, Inc. and Bishop, McIntosh & McIntosh shall collectively be referred to as "Laguna Seca/Bishop." However, the pumping allocation established in Section III.B., below, is held only by Bishop, as the overlying property owner. Laguna Seca is a Water User Defendant now exercising Bishop's pumping allocation and operating the golf course facilities. The damages provided for in Section III.G. shall be based on the Average Gross Annual Income of the entity operating thee golf course facilities, which is now Laguna Seca (Bishop's lessee).

13. Defendant County of Monterey owns land on which is operates the Laguna Seca Park. County of Monterey has produced groundwater from the Seaside Basin for use at Laguna Seca Park. County of Monterey owns land overlying the Seaside Basin.

14. Intervenor Monterey Peninsula Water Management District ("MPWMD") is a district formed pursuant to Water Code Appendix sections 118-1 et seq. MPWMD intervened as a party defendant as against California American, cross-complained against the other parties as a plaintiff, and is a defendant in a cross-complaint filed by Seaside and joined in by City defendants.

15. Intervenor Monterey County Water Resources Agency ("MCWRA") is a duly constituted Water Resources Agency created pursuant to California Water Code Appendix section 52-3 et seq. MCWRA intervened inn this action as a plaintiff as against all parties.

16. Defendant The York School, Inc. ("York" or "York School"), is a nonprofit corporation, founded in 1959 as an independent day school providing college preparatory education. Its primary activity is the operation of a school. York leases approximately 31.4 acres of property from the United States, Department of the Army, on the former Fort Ord. This property is located immediately north of the main campus, across York Road, and is a portion of a larger parcel, approximately 107 acres in size, that is scheduled to be transferred as a public benefit conveyance to York from the federal government. This parcel overlies the Seaside Basin and is subject to this Decision. York has produced groundwater from the Seaside Basin. York is not an agent of the United States, nor can York bind the United States to this Decision.

C. The Complaint.

On or about August 14, 2003, Plaintiff filed a complaint against Defendants and Does 1 through 1,000 requesting a declaration of Plaintiff's and Defendants' individual and collective rights to groundwater and a mandatory and prohibitory injunction requiring the reasonable use and coordinated management of groundwater within the Seaside Basin pursuant to Article X, Section 2 of the California Constitution. The pleadings further allege that Plaintiff and Defendants collectively claim substantially all rights of groundwater use, replenishment and storage within the Seaside Basin area, that the Natural Safe Yield (as defined in Section III.A.) is being exceeded, and that absent a physical solution and coordinated groundwater management strategy, the Seaside Basin is in imminent risk of continued lowering of water levels, increased pump-lifts, diminution of water supply and quality, seawater intrusion, and possible land subsidence. Accordingly, Plaintiff requested: (1) a determination of the Seaside Basin's safe yield; (2) an operating plan for the management of the Basin; (3) a declaration of the rights of the parties named in this Complaint; (4) a declaration and quantification, as part of a physical solution, of the parties' respective rights to make use of the Seaside Basin's available storage space; and (5) the appointment of a Watermaster to administer the Court's Decision. Subsequently, Plaintiff has twice amended its complaint and the operative complaint is now the Second Amended Complaint, which sets forth the same general allegations as the original complaint.

D. Defendants' Responses.

Water User Defendants in this action have all responded to the Complaint pursuant to Answers. In addition, they have all joined in a motion seeking Court approval of a Stipulated Judgment. The Monterey Peninsula Water Management District and the County of Monterey, including the Monterey County Water Resources Agency, did not join in the Stipulation.

On or about September 24, 2003, Intervenor MPWMD filed a complaint in intervention against the defendants named in the Complaint. Defendants to that complaint responded to the cross-complaint pursuant to an Answer, containing a general denial and affirmative defenses.

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Seaside, on or about January 9, 2004, filed a cross-complaint against MPWMD. MPWMD responded to the cross-complaint by filing an Answer, containing a general denial and affirmative defenses.

Laguna Seca, on or about April 23, 2004, filed a cross-complaint against California American. California American responded to the cross-complaint pursuant to an Answer, containing a general denial and affirmative defenses.

Bishop, on or about September 23, 2004, filed a cross-complaint against California American and against all defendants other than Laguna Seca. California American, Granite, Sand city, Alderwoods Group, York School, D.B.O., Monterey, MPWMD, Seaside, and Pasadera responded to the cross-complaint pursuant to Answers containing general denials and affirmative defenses.

SNG, on or about July 26, 2005, filed a cross-complaint against MPWMD. MPWMD responded to the cross-complaint by filing an Answer, containing a general denial and affirmative defenses.

At the conclusion of argument on December 22, 2005, the various defendant cross-complainants agreed that the relief they had sought via their cross-complaints had been subsumed in the litigation of the complaint and complaints in intervention, the answers thereto, and the Settlement Agreement and General Mutual Release executed by all parties save the intervenors and the County of Monterey.

E. Joint Motion for Entry of Judgment.

Plaintiff and Water User Defendants filed a Motion for the Entry of Judgment along with a Stipulation for Entry of Judgment, which was opposed by both intervenors. The Motion for Entry of Judgment requested that the Court approve the Stipulation and enter the Judgment. The motion was heard by this Court on December 12, 2005. At the request of the moving parties, it deferred its ruling until it had taken evidence in the trial of this matter.

Having now received the evidence, and having considered written and oral argument from the various parties, the Court denies the Motion for Entry of Judgment. The Court accepts the stipulation of certain of the parties entitled "Settlement Agreement and General Mutual Release"

filed with the Court during trial insofar as the stipulation does not conflict with the ruling set forth herein.

F. Jurisdiction. This Court has jurisdiction to enter a Judgment declaring and adjudicating Plaintiff's and Water User Defendants' rights to the reasonable and beneficial use of groundwater in the Seaside Basin Area, including the imposition of a physical solution, pursuant to Article X, Section 2 of the California Constitution.

II. FINDINGS

A. Importance of Groundwater. Groundwater is an important water supply source for businesses, individuals and public agencies that overlie or Extract groundwater from the Seaside Basin. The overwhelming majority of the groundwater appropriated from the Seaside Basin has been and continues to be dedicated to a public use in accordance with the provisions of the California Constitution, Article X, Section 5. The Plaintiff and the Water User Defendants rely upon continued availability of groundwater to meet their demands. The intervenors, MPWMD and MCWRA, have a legislatively mandated interest in the preservation and enhancement of groundwater in the Basin.

B. Status of the Groundwater Basin.

1. Perennial Natural Safe Yield. The Perennial Natural Safe Yield (as defined in Section III.A. and hereinafter referred to as "Natural Safe Yield") of the Seaside Basin is solely the result of natural percolation from precipitation and surface water bodies overlying the Basin. The Court finds that the Natural Safe Yield of the Basin as a whole, assuming no action is taken to capture subsurface flow exiting the northern boundary of the Basin, is from 2,581 to 2,913 acre feet per year. The Natural Safe Yield for the Coastal Subarea is estimated from 1,973 to 2,305 acre feet per year, and the Natural Safe Yield for the Laguna Seca Subarea is 608 acre feet per year.

2. Groundwater Production. Production records demonstrate that the cumulative annual groundwater production of the Parties from the Seaside Basin area in each of the five (5) years immediately preceding the filing of this action has been between approximately 5,100 and 6,100 acre feet. Therefore, the Court finds that groundwater production has exceeded the Natural

Safe Yield during the preceding five (5) years throughout the Seaside Basin and in each of its subareas. While no one can predict with precision when it will occur, all parties agree continued indefinite production of the Basin Groundwater in excess of the Natural Safe Yield will ultimately result in seawater intrusion, with deleterious effects on the Basin. The evidence demonstrates that the stage is set for such an occurrence in the foreseeable future.

C. Legal Claims.

1. Groundwater Rights. Certain Parties allege that they have produced groundwater openly, notoriously, continuously, and without interruption in excess of the Natural Safe Yield of the Basin for more than five (5) years. As a result, these Parties allege that they have accrued prescriptive rights as articulated by the California Supreme Court in *City of Pasadena v. City of Alhambra* (1948) 33 Cal.2d 908. In defense of these claims, other Parties deny that the elements of prescription have been satisfied, and further allege the affirmative defense of "self help" as recognized in *Pasadena, supra,* 33 Cal.2d at pp. 932-32. Those Parties responsible for public water service also raise Civil Code section 1007 as an affirmative defense against prescription.

The Court finds that there is merit to the claim that certain prescriptive rights have accrued, but also finds that there is merit to the aforementioned affirmative defenses. Accordingly, the Court finds that the Parties collectively possess a variety of rights based in prescription and other original rights (including overlying and appropriative rights). Each Party's right to produce naturally occurring groundwater from the Seaside Basin therefore reflects the amount of their historical production from the Basin, and respects the priority of allocations under California law. The physical solution set forth by this Decision is intended to ultimately reduce the drawdown of the aquifer to the level of the Natural Safe Yield; to maximize the potential beneficial use of the Basin; and to provide a means to augment the water supply for the Monterey Peninsula.

2. Storage Rights. The Court finds that the public interest is served by augmenting the total yield of the Seaside Basin through artificial groundwater recharge, storage, and recovery. It is well established that an entity which artificially recharges a groundwater basin with the intent to later recapture that water maintains an exclusive right to recapture that quantity of water by which said recharge augments the retrievable water supply of the groundwater basin, so long as

such recharge and recapture (i.e., storage) does not materially harm the groundwater basin or any other entity's prior rights associated with the groundwater basin. *(City of Los Angeles v. City of San Fernando* (1975) 14 Cal.3d 199, 264; *City of Los Angeles v. City of Glendale* (1943) 23 Cal.2d 68, 76-77; see also Water Code, § 7075.) The Court finds, therefore, that the right to store and recover water from the Seaside Basin shall be governed by the provisions of the Decision, and the rules and regulations promulgated by the Seaside Basin Watermaster, the basic provisions of which are described in Section III.H.

3. *De Minimis* Production. The Court finds that production of groundwater by any person or entity less than five (5) acre feet per year is not likely to significantly contribute to a Material Injury (as defined in Section III.A.) to the Seaside Basin or any interest related to the Seaside Basin. Accordingly, this Decision is not intended to govern the production of groundwater by any person or entity that produces a total quantity of groundwater that is less than five (5) acre feet peer year. However, to the extent the Court determines in the future that this exemption has contributed to or threatens to contribute to a Material Injury to the Seaside Basin or any interest related to the Seaside Basin, including any contribution caused by production subject to this exemption in combination with all other production from the Seaside Basin, the Court will modify or eliminate this exemption as it deems prudent pursuant to its reserved jurisdiction provided in Section M.O.

4. Transferability of Seaside Basin Rights. The Court finds that maximum beneficial use of the Seaside Basin's resources is encouraged by the ability to sell and lease production allocations. Such transferability will also provide necessary flexibility to satisfy future water supply needs. Accordingly, the Court finds that production allocations should be assignable, subject to the rules and regulations promulgated by the Watermaster, and subject to certain Parties' participation in the Alternative Production Allocation, described in Section III.B.3, which election will restrict their transfers of water.

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III. DECISION

IT IS HEREBY ORDERED, ADJUDGED AND DECREED:

A. Definitions.

1. "Alternative Production Allocation" is the amount of Groundwater that a Producer participating in this allocation method may Produce from a Subarea of the Seaside Basin as provided in Section III.B.3.

2. "Artificial Replenishment" means the act of the Watermaster, directly or indirectly, engaging in or contracting for Non-Native Water to be added to the Groundwater supply of the Seaside Basin through Spreading or Direct Injection to offset the cumulative Over-Production from the Seaside Basin in any particular Water Year pursuant to Section III.L.3.j.iii. It shall also include programs in which Producers agree to refrain, in whole or in part, from exercising their right to produce their full Production Allocation where the intent is to cause the replenishment of the Seaside Basin through forbearance in lieu of the injection or spreading of Non-Native Water.

3. "Base Water Right" is the percentage figure or the fixed amount assigned to each Party as provided in Section III.B.2, which is used to determine various rights and obligations of the Parties as provided in Sections III.B.2, III.B.3, III.L.3.c, and III.L.3.j.iii.

4. "Brackish Water" means water containing greater than 1,000 parts of chlorides to 1,000,000 parts of Water.

5. "Carryover" means that portion of a Party's Production Allocation that is not Extracted from the Basin during a particular Water Year. Each acre-foot of Carryover establishes an acre-foot of Carryover Credit.

6. "Carryover Credit(s)" means the quantity of Water established through Carryover, that a Party is entitled to Produce from the Basin pursuant to Section III.F.

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7. "Coastal Subarea" means those portions of the Seaside Basin that are west of North-South Road, and further as shown on the Basin map attached as Exhibit B to this Decision.

8. "Direct Injection" means a method of Groundwater recharge whereby Water is pumped into the Basin through wells or other artificial channels.

9. "Extraction," "Extractions," "Extracting," "Extracted," and other variations of the same noun or verb, mean pumping, taking, diverting or withdrawing Groundwater by any manner or means whatsoever from the Seaside Basin.

10. "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.

11. "Fiscal Year" means the twelve (12) month period from January 1 through December 31.

12. "Groundwater" means all Water beneath the ground surface in the Seaside Basin, including Water from Natural Replenishment, Artificial Replenishment, Carryover, and Stored Water.

13. "Laguna Seca Subarea," or "Laguna Seca Area," means those portions of the Basin that are east of the Southern Coastal Subarea and south of the Northern Inland Subarea, as shown on the Seaside Basin map attached as Exhibit B to this Decision.

14. "Landowner Group" means all Producers that own or lease land overlying the Seaside Basin and Produce Groundwater solely for use on said land, except California American, Seaside (Municipal), Monterey, Del Rey Oaks, and Sand City.

15. "Material Injury" means a substantial adverse physical impact to the Seaside Basin or any particular Producer(s), including but not limited to: seawater intrusion, land subsidence, excessive pump lifts, and water quality degradation. Pursuant to a request by any Producer, or on its own initiative, Watermaster shall determine whether a Material Injury has occurred, subject to review by the Court as provided for in Section M.N.

16. "Natural Replenishment" means all processes by which Water may become a part of the Groundwater supply of the Seaside Basin without the benefit of the Physical Solution and the coordinated management it provides. Groundwater that occurs in the Seaside Basin as a result of the Physical Solution, which is not Natural Replenishment, includes, but is not limited to Storage, Carryover, and Artificial Replenishment.

17. "Natural Safe Yield" or "Perennial Natural Safe Yield" means the quantity of Groundwater existing in the Seaside Basin that occurs solely as a result of Natural Replenishment. The Natural Safe Yield of the Seaside Basin as a whole, assuming no action is taken to capture subsurface flow exiting the northern boundary of the Basin, is from 2,581 to 2,913 acre feet per year. The Natural Safe Yield for the Coastal Subareas is from 1,973 to 2,305 acre feet per year. The Natural Safe Yield for the Laguna Seca Subarea is 608 acre feet per year.

18. "Non-Native Water" means all Water that would not otherwise add to the Groundwater supply through natural means or from return flows from surface applications other than intentional Spreading.

19. "Overdraft" or "Overdrafted" refers to a condition within a Groundwater basin resulting from long-term depletions of the basin over a period of years.

20. "Operating Safe Yield" means the maximum amount of Groundwater resulting from Natural Replenishment that this Decision, based upon historical usage, allows to be produced from each Subarea for a finite period of years, unless such level of production is found to cause Material Injury. The Operating Safe Yield for the Seaside Basin, as a whole, is 5,600 acre feet. The Operating Yield is 4,611 acre feet for the Coastal Subarea and 989 acre feet for the Laguna Seca Subarea. The Operating Yield established here will be maintained for three (3) years from the date of this Decision or until a determination is made by the Watermaster, concurred in by this Court, that continued pumping at this established Operating Yield will cause Material Injury to the Seaside Basin or to the Subareas, or will cause Material Injury to a Producer due to unreasonable pump lifts. In either such event the Watermaster shall determine the modified Operating Yield in accordance with the Principles and Procedures attached hereto as Exhibit A, and through the application of criteria that it shall develop for this purpose.

21. "Over-Production" and other variations of the same term means (1) with regard to all Production from the Seaside Basin, that quantity of Production which exceeds an initially assumed Natural Safe Yield of 3,000 afy (or such adjusted calculation of Natural Safe Yield as further study of the Basin by the Watermaster shall justify); or (2) with regard to each Producer, that quantity of Water Produced in any Water Year in excess of that Producer's Base Water Right, as applied to an initially assumed Natural Safe Yield of 3,000 afy (subject to adjustment as further study shall justify). For a Party producing under the Alternative Production Allocation, the calculation shall be based upon the Base Water Right assigned to them in Table 1, infra, only to the extent that Party has elected to convert all or part of an Alternative Production Allocation into a Standard Production Allocation, pursuant to Section III.B.3.e.

22. Operating Yield Over-Production means pumping of Native Water by Producers in excess of their Standard Production Allocation or Alternative Production Allocation, as discussed in Section III.L.3.j.iii.

23. "Person" or "Persons" includes individuals, partnerships, associations, governmental agencies and corporations, and any and all types of entities.

24. "Physical Solution" means the efficient and equitable management of Groundwater resources within the Seaside Basin, as prescribed by this Decision, to maximize the reasonable and beneficial use of Water resources in a manner that is consistent with Article X, Section 2 of the California Constitution, the public interest, and the basin rights of the Parties, while working to bring the Production of Native Water to Natural Safe Yield.

25. "Produce," "Produced," or "Production" means (1) the process of Extracting Water or (2) the gross amount of Water Extracted.

26. "Producer" means a Party possessing a Base Water Rights.

27. "Production Allocation" is the amount of Groundwater that a Producer may Produce from a Subarea of the Seaside Basin based on the Parties' election to proceed under either the Standard Production Allocation or the Alternative Production Allocation set forth in Sections III.B.2 and III.B.3, respectively.

28. "Replenishment Assessment" means an assessment levied by the Watermaster per each acre-foot of Over-Production against each party Over-Producing Groundwater in the previous Water Year. The amount of the assessment shall be sufficient to cover the cost of Artificial Replenishment in an amount necessary to off-set that Producer's Over-Production, and levied as provide in Section III.L.3.j.iii. The assessment must of necessity be initially determined based upon the estimated cost of providing Non-Native water to replenish the Basin, as determined by the Watermaster.

29. "Seaside Basin" is the underground water basin or reservoir underlying the Seaside Basin Area, the exterior boundaries of which are the same as the exterior boundaries of the Seaside Basin Area.

30. "Seaside Basin Area" is the territory depicted in Exhibit B to this Decision.

31. "Spreading" means a method of introducing Non-Native Water into the Seaside Basin whereby Water is placed in permeable impoundments and allowed to percolate into the Seaside Basin.

32. "Standard Production Allocation" is the amount of Groundwater that a Producer participating in this allocation method may Produce from a Subarea of the Seaside Basin as provided in Section III.B.2, which is determined by multiplying the Base Water Right by the Operating Yield.

33. "Storage" means the existence of Stored Water in the Seaside Basin.

34. "Storage Allocation" means that quantity of Stored Water in acre feet that a Party is allowed to Store in the Coastal Subarea or the Laguna Seca Subarea at any particular time.

35. "Storage Allocation Percentage" means the percentage of Total Usable Storage Space allocated to each Producer proceeding under the Standard Production Allocation. Producers proceeding under the Alternative Production Allocation are not allocated Storage rights and, consequently, their share of the Total Usable Storage Space is apportioned to the Producers proceeding under the Standard Production Allocation. Pursuant to the terms of Section III.B.3, Parties proceeding under the Alternative Production Allocation enjoy a one-time right to change

to the Standard Production Allocation. Due to the recalculation of the Storage Allocation Percentage necessitated when a Party changes to the Standard Production Allocation, the Watermaster will maintain the up-to-date Seaside Basin Storage Allocation Percentages.

36. "Storage and Recovery Agreement" means an agreement between Watermaster and a Party for Storage pursuant to Section III.L.3.j.xx.

37. "Store" and other variations of the same verb refer to the activities establishing Stored Water in the Seaside Basin.

38. "Stored Water" means (1) Non-Native Water introduced into the Seaside Basin by a Party or any predecessors-in-interest by Spreading or Directly Injecting that Water into the Seaside Basin for Storage and subsequent Extraction by and for the benefit of that Party or their successors-in-interest; (2) Groundwater within the Seaside Basin that is accounted for as a Producer's Carryover; or (3) Non-Native water introduced into the Basin through purchases by the Watermaster, and used to reduce and ultimately reverse Over-Production.

39. "Stored Water Credit" means the quantity of Stored Water augmenting the Basin's Retrievable Groundwater Supply, which is attributable to a Party's Storage and further governed by this Decision and a Storage and Recovery Agreement.

40. "Subarea(s)" means either the Laguna Seca Subarea or the Coastal Subarea.

41. "Total Useable Storage Space" means the maximum amount of space available in the Seaside Basin that can prudently be used for Storage as shall be determined and modified by Watermaster pursuant to Section III.L.3.j.xix, less Storage space which may be reserved by the Watermaster for its use in recharging the Basin.

42. "Transfer" and other variations of the same verb refers to the temporary or permanent assignment, sale, or lease of all or part of any Producer's Production Allocation, Storage Allocation, Carryover Credits, or Stored Water Credits. Pursuant to Section III.B.3., Transfer does not include the use of Water on properties identified in Exhibit C for use under an Alternative Production Allocation.

43. "Water" includes all forms of Water.

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44. "Watermaster" means the court-appointed Watermaster pursuant to Section III.L. of this Decision for the purpose of executing the powers, duties, and responsibilities assigned therein.

45. "Watermaster Rules and Regulations" means those rules and regulations promulgated by the Watermaster consistent with the terms of this Decision.

46. "Water Year" means the twelve (12) month period from October P^{t} through September 30th.

B. Physical Solution.

1. Groundwater Rights. The Parties have Produced Groundwater from the Seaside Basin openly, notoriously, continuously, and without interruption, which Production has been determined to be in excess of the Natural Safe Yield of the Seaside Basin and each of its Subareas for more than five (5) years. Accordingly, Parties have accrued mutual prescriptive rights and/or have preserved their overlying, appropriative, and prescriptive rights against further prescription by self-help. These individual and competitive rights, whether mutually prescriptive, appropriative or overlying rights, can be most efficiently exercised and satisfied by the implementation of this Physical Solution and in the manner expressly set forth herein.

2. Standard Production Allocation. Each Producer is authorized to Produce its Production Allocation within the designated Subarea in each of the first three Water Years. Except for those certain Parties electing to proceed under the Alternative Production Allocation, as set forth in Section III.B.3., each Producer's Production Allocation for the first three Water Years shall be calculated by multiplying its Base Water Right, as set forth in Table 1 below, by that portion of the Operating Yield which is in excess of the sum of the Alternative Production Allocations. The Operating Yield for the Seaside Basin, as a whole, is set at 5,600 acre feet annually (afa). The Operating Yield for the Coastal Subarea is 4,611 afa, with 743 afa committed to Alternative Production Allocations and 3,868 afa committed to Standard Production Allocations. The Operating Yield for the Laguna Seca Subarea is 989 afa, with 644 afa committed to Alternative Production Allocations and 345 afa committed to Standard Production Allocations. The Operating Yield established here will be maintained for three (3) Water Years

from the date Judgment is granted or until a determination is made by the Watermaster, concurred in by this Court, that continued pumping at this established Operating Yield will cause Material Injury to the Seaside Basin or to the Subareas or will cause Material Injury to a Producer due to unreasonable pump lifts. In the event of such Material Injury the Watermaster shall determine the modified Operating Yield in accordance with the Principles and Procedures attached hereto as Exhibit A, and through the application of criteria that it shall develop for this purpose.[1] Commencing with the fourth Water Year[2], and triennially thereafter the Operating Yield for both Subareas will be decreased by ten percent (10%) until the Operating Yield is the equivalent of the Natural Safe Yield unless:

a. The Watermaster has secured and is adding an equivalent amount of Non-Native water to the Basin on an annual basis; or

b. The Watermaster has secured reclaimed water in an equivalent amount and has contracted with one or more of the Producers to utilize said water in lieu of their Production Allocation, with the Producer agreeing to forego their right to claim a Stored Water Credit for such forbearance; or

a. Any combination of a and b which results in the decrease in Production of Native Water required by this decision; or

b. The Watermaster has determined that Groundwater levels within the Santa Margarita and Paso Robles aquifers are at sufficient levels to ensure a positive offshore gradient to prevent seawater intrusion.

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[1] If the Operating Yield changes, Standard Production Allocations will be calculated by multiplying the portion of the changed Operating Yield committed to Standard Production Allocations by the Standard Producers' Base Water Rights. This calculation will result in a remaining quantity of water already committed to Standard Production Allocations (due to the Base Water Right percentages assigned to Alternative Producers but which are not used to calculate the Standard Production Allocations), which will be further allocated to the Standard Producers in proportion to their Base Water Rights until no quantity remains unallocated.

[2] As ordered by the Court at the January 12, 2007 hearing, the initial potential 10% reduction in Operating Yield will occur, if at all, on January 1, 2009. The 10% reduction would apply to 75% of the Operating Yield, because 25% of the Water Year would have already elapsed. Assuming the current Operating Yield of 5600 acre-feet, the Basin-wide Operating Yield would be reduced to 3,780 acre-feet for the remainder of the Water Year. Subsequent potential Operating Yield reductions would occur on the Water Year schedule set forth in the MMP.

TABLE 1[3]

Standard Production Allocations

Party:	Percentage of Operating Yield Coastal Subarea
California American Water	77.55%
City of Seaside (Municipal)	6.36%
City of Seaside (Golf Courses)	10.47%
City of Sand City	0.17%
Granite Rock Company	0.60%
SNG	2.89%
D.B.O. Development No. 27	1.09%
Calabrese	0.27%
Mission Memorial Park	0.60%

Producer:	Percentage of Operating Yield for Laguna Seca Sec area
California American Water Company	45.13%
Pasadera Country Club	22.65%
Bishop	28.88%
York School	2.89 %
Laguna Seca County Park	0.45%*

* Because the County of Monterey has not joined in the Settlement Agreement and General Mutual Release, its right to Produce water will be governed by the provisions made for those Producers selecting Alternative Production Allocations.

3. Alternative Production Allocation. The following Parties, which all assert overlying Groundwater rights, have chosen to participate in an Alternative Production Allocation: Seaside with regard to the Groundwater that it Produces for irrigation of its golf courses; Sand City, SNG, Calabrese, Mission Memorial, Pasadera, Bishop, York School, and Laguna Seca.

The Alternative Production Allocation provides the aforementioned Parties with a prior and paramount right over those Parties Producing under the Standard Production Allocation to Produce the amount set forth in Table 2 in perpetuity, and said Alternative Production shall not be

[3] Certain Parties including Seaside (Golf Courses), Sand City, SNG, Calabrese, Mission Memorial, Pasadera, Bishop and York School hold an Alternative Production Allocation in the fixed amount shown in Table 2. If any of these Parties subsequently elects to convert to the Standard Production Allocation, then the Base Water Right shown in Table 1 for such converting Party will be used to determine that Party's Standard Production Allocation consistent with the terms provided in Section III.B.3.e.

subject to any reductions under Section III.B.2 or at such times as the Watermaster determines to reduce the Operating Yield in accordance with Section III.L.3.j.ii., subject to the following terms:

a. The Alternative Production Allocation may not be transferred for use on any other property, but shall be limited to use on the respective properties (including subdivisions thereof) identified in Exhibit C;

b. The Party electing the Alternative Production Allocation may not establish Carryover Credits or Storage rights;

c. The Party electing the Alternative Production Allocation is obligated to adopt all reasonably Feasible Water conservation methods, including methods consistent with generally accepted irrigation practices;

d. In the event a Party electing the Alternative Production Allocation is required to utilize reclaimed Water for irrigation purposes, pursuant to the terms of sections 13550 and 13551 of the California Water Code, that Party shall have the first opportunity to obtain and substitute reclaimed Water for its irrigation demands. Should that Party not pursue such substitution with due diligence, any other Party may provide reclaimed Water for the irrigation purpose pursuant to the terms of sections 13550 and 13551 of the California Water Code. Under either circumstance, the Party providing the reclaimed Water for substitution shall obtain a credit to Produce an amount of Groundwater equal to the amount of substituted reclaimed Water in that particular Water Year, provided that such credit shall be reduced proportionately to all reductions in the Operating Yield in accordance with Section III.L.3.j.ii. The Alternative Production Allocation of the Party utilizing the reclaimed Water shall be debited in an amount equal to the reclaimed Water being substituted.

e. In the event that this Court, the Watermaster, or other competent governmental entity requires a reduction in the Extraction of Groundwater from the Seaside Basin or either of its Subareas, then Parties exercising a Standard Production Allocation in the affected subarea shall reduce their Groundwater Extractions *pro rata* to accommodate the required reduction. Only after such Parties exercising a Standard Production Allocation reduce their Extractions to zero, may Parties exercising an Alternative Production Allocation in the affected

subarea be required to reduce their Groundwater Extractions. In such case, those Parties exercising an Alternative Production Allocation shall reduce their pumping in an amount correlative to each other in accordance with the California law pertaining to allocation of rights to Overdrafted Groundwater basins between overlying landowners.

TABLE 2

Alternative Production Allocations

Party:	**Coastal Subarea**
Seaside (Golf Courses)	540 afa
S NG	149 afa
Calabrese	14 afa
Mission Memorial	31 afa
Sand City	9 afa

Producer:	**Alternative Production Allocation**
Pasadera	251 afa
Bishop	320 afa
York School	32 afa
Laguna Seca County Park	41 afa*

* The County of Monterey possesses certain water rights based upon its use of water from the aquifer for maintenance of Laguna Seca Park. Its historic Production of Groundwater has averaged 41 afy. It has not joined in the stipulation of the other Producers, but is entitled to draw up to 41 afy from the Laguna Seca Subarea as if it were a party to the Alternative Production Allocations.

At any time prior to the expiration of the initial three-year operating period of this Decision, as designated in Section III.B.2, any of the aforementioned Parties, except the County of Monterey, may choose to change all or a portion of their Alternative Production Allocation to the Standard Production Allocation method set forth in Section III.B.2 and shall be entitled to all of the privileges associated with said Production Allocation as set forth herein (e.g., transferability, Storage rights, and Carryover rights). A Party choosing to change to the Standard Production Allocation shall do so by filing a declaration with the Court, and serving said declaration on all other parties. Once a Party chooses to change to the Standard Production Allocation method set forth in Section III.B.2, that Party shall not be allowed to thereafter again choose to participate in the Alternative Production Allocation. The Parties under the Standard

Production Allocation shall not be allowed at any time to change from the Standard Production Allocation to the Alternative Production Allocation.

C. Production of Brackish Water. Sand City shall have the right to Produce Brackish Water from the brackish Groundwater aquifer portion of the Coastal Subarea of the Seaside Basin for the purpose of operating its proposed desalinization plant, said Production being limited to the Aromas Sands Formation, so long as such Production does not cause a Material Injury. Upon receiving a complaint supported by evidence from any Party to this Decision that the Production of Brackish Water by Sand City is causing a Material Injury to the Seaside Basin or to the rights of any Party to this Decision as set forth herein, the Watermaster shall hold a noticed hearing. The burden of proof at such hearing shall be on the Party making the complaint to show, based on substantial evidence, that the Production of Brackish Water by Sand City is causing a Material Injury. If the Watermaster determines, based on substantial evidence, that the Production of Brackish Water by Sand City is causing a Material Injury to the Seaside Basin or to the rights of any Party to this Decision as set forth herein, the Watermaster may impose conditions on such Production of Brackish Water that are reasonably necessary to prevent such Material Injury.

D. Injunction of Unauthorized Production. Each Producer is prohibited and enjoined from Producing Groundwater from the Seaside Basin except pursuant to a right authorized by this Decision, including Production Allocation, Carryover, Stored Water Credits, or Over-Production subject to the Replenishment Assessment. Further, all Producers are enjoined from any Over-Production beyond the Operating Yield in any Water Year in which Watermaster has declared that Artificial Replenishment is not available or possible.

E. No Abandonment. It is in the interest of reasonable beneficial use of the Seaside Basin and its Water supply, that no Producer be encouraged to take and use more Water in any Water Year than is actually required, Therefore, failure to Produce all of the Water to which a Producer is entitled hereunder for any amount of time shall, in and of itself, not be deemed to be, or constitute an abandonment of such Producer's Base Water Right or Production Allocation, in whole or in part. The Water unused by any Party (either as Production or Carryover) will

otherwise contribute to the ongoing efficient administration of the Decision and the Physical Solution.

F. Right to Carryover Unused Production Allocation; Carryover Credits. Except for those certain Parties electing to proceed under the Alternative Production Allocation, as set forth in Section III.B.3., for the first three Water Years each Producer who, during a particular Water Year, does not Extract from the Basin a total quantity equal to such Producer's Standard Production Allocation for the particular Water Year may establish Carryover Credits, up to the total amount of that Producer's Storage Allocation; provided, however, in no circumstance may the sum of a Producer's Storage Credits and Carryover Credits exceed that Producer's available Storage Allocation. Use (Extraction) of Carryover Credits shall be governed as otherwise provided in this Decision and the Watermaster Rules and Regulations. In consideration of the Seaside Basin's hydrogeologic characteristics, the Watermaster may discount the quantity of Water that may be Extracted pursuant to a Carryover Credit.

G. Damages and Prohibition on Enjoining Municipal Pumping. The Parties recognize that California American's pumping is for municipal purposes, including drinking Water supplies for most of the Monterey Peninsula, including within all of the Defendant Cities and to all of the Defendant landowners. In this context, if California American's Groundwater pumping causes an "Intrusion" upon a Water User Defendant's Production Allocation, then it shall compensate the Water User Defendant for damages caused by this Intrusion. An "Intrusion" occurs when a Water User Defendant exercising an Alternative Production Allocation is directed by the Watermaster, this Court or any other competent governmental entity to reduce its Groundwater pumping to a level below that Water User Defendant's Alternative Production Allocation, while California American continues pumping Groundwater from the same subarea. This damages provision does not alter the priority of the Alternative Production Allocation over the Standard Production Allocation pursuant to Section III.B.3, and is intended to address potential exigent circumstances that might arise regarding California American's municipal water service.

1. Damages from an Intrusion shall be calculated based upon the losses incurred by the Water User Defendant that are caused by the Intrusion. These losses may include the loss of

crop yield and associated income, measured against the average achieved over the preceding five (5) years from the date of the loss. Where an Intrusion occurs with respect to a Water User Defendant's exercise of an Alternative Production Allocation for golf course irrigation (i.e., an Intrusion to a "Golf Course Water User"), the Intrusion may cause discoloration, thinning and damage to the golf course turf and may require replacement of golf course turf and other golf course landscaping. Such conditions may, in turn, cause the loss of income from reduced golf course facilities usage and loss of good will. It may be difficult to quantify such damages to a sum certain. Accordingly, where a Golf Course Water User demonstrates that an Intrusion caused discoloration, thinning or loss of golf course turf, the following criteria shall be utilized to determine damages for an Intrusion to a Golf Course Water User.

a Lost Income.

i. The Golf Course Water User's "Average Gross Annual Income" shall be determined by summing its gross annual income from each of the five (5) years preceding the year of the Intrusion and dividing that sum by five, except where a Golf Course Water User (Pasadera) has not been in operation for seven (7) years at the time of the Intrusion, the Average Gross Annual Income shall be determined by summing the gross annual income from each of the three years preceding the year of the Intrusion and dividing that sum by three;

ii. The Golf Course Water User's gross annual income during the year of an Intrusion shall be subtracted from its Average Gross Annual Income, with the resulting difference constituting the amount of lost income damages for that year of Intrusion; and

iii. If an Intrusion occurs in two or more years within a five-year period, damages shall be calculated using an Average Gross Annual Income based on the last consecutive five-year period preceding the first year of Intrusion, or if a Golf Course Water User (i.e., Pasadera) has not been in operation for a full seven (7) years at the time of the Intrusion, damages shall be calculated using an Average Gross Annual Income based on the last consecutive three-year period proceeding the first year of Intrusion. Gross Annual Income shall not be calculated based upon a year in which an Intrusion occurred.

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iv. Water User Defendants shall make Feasible efforts to mitigate damages caused by an Intrusion (e.g., including use of evapotranspiration rates to schedule turf grass irrigation).

b. Property Damage/Out-of-Pocket Repair Costs.

i. Actual costs of repairing and/or replacing golf course turf and/or other golf course landscaping and associated labor costs shall be added to the lost income damages calculated as set forth in subparagraph (1), above.

ii. The Golf Course Water User shall make Feasible efforts to mitigate damages by employing the best irrigation practices, including use of evapotranspiration rates to schedule turf grass irrigation.

2. A damages Claim with all substantiating gross annual income data shall be provided to California American within 120 days after December 31 of the year in which the Intrusion occurred. California American shall accept or reject the Claim within 30 days thereafter. If within 35 days after receipt of a Claim, California American fails to notify the claimant of California American's acceptance or rejection of that Claim, such Claim is deemed accepted. If the Claim is affirmatively accepted, payment will be made at the time of Claim acceptance. If the Claim is deemed accepted by California American's failure to timely accept or reject the Claim, payment will be made within 30 days after the date the Claim is deemed accepted. If the Claim is rejected, all or in part, the Water User Defendant may proceed to a hearing before the Court to determine the appropriate damages, considering the above referenced criteria. The hearing shall be by motion with all supporting documentation and contest thereto submitted and supported by declaration.

H. Allowed Storage.

1. Public Resource. Underground Storage within the Seaside Basin is and shall remain a public resource. Subject to this paramount public right, the Parties hereto shall be permitted to utilize available Storage space for bona fide Groundwater Storage projects. This use shall be subject to the supervision of the Watermaster and this Court and shall be governed by the following more specific provisions.

2. In General. Except for those certain Parties electing to proceed under the Alternative Production Allocation as set forth in Section 111.B.3., each Producer is entitled to Store Water in the Basin as provided for in this Decision and Watermaster's Rules and Regulations up to the amount of their Storage Allocation. Each Producer's Allowed Storage Allocation in each Subarea shall be calculated by multiplying its Storage Allocation Percentage by the Total Useable Storage Space, less space reserved by the Watermaster as herein below set forth. The initial Storage Allocation Percentages are equal to the Base Water Rights, Table 1, less Storage reserved for the Watermaster and certain public agencies. Parties with an Alternative Production Allocation are entitled to their Storage Production Allocation when they elect to change to Standard Production Allocation

3. California American Storage Allocation. All Storage Allocation held by California American shall be held in trust by California American: (i) first for the benefit of California American's retail Water service customers within its service territory on the Monterey Peninsula and the County of Monterey and cities within its service territory which it serves; and (ii) then for other purposes as California American deems appropriate. In the event of a reduction in service from the Seaside Basin, California American will allocate service, including that which is associated with its Storage Allocation, in a manner that is consistent with and proportionate to its historic deliveries to all then current customers. Further, to the extent that California American has excess Storage Allocation available after meeting its responsibilities to its retail Water service customers within its service territory on the Monterey Peninsula and the cities which it serves, upon request by the County of Monterey, Monterey, Seaside, Sand City, or Del Rey Oaks, California American shall make available portions of its Storage Allocation within the Coastal Subarea for use by the requesting city in the Coastal Subarea as provided herein. Specifically, the city's request shall be made in writing and generally describe the public purpose and proposed use of the Storage Allocation by the requesting city. California American shall not deny the request unless making the requested portion of the Storage Allocation available to the city would unreasonably interfere with California American's ability to operate its system or to otherwise provide service to its customers. Should California American not be able to accommodate all

requests by all cities without unreasonably interfering with its operations and service responsibilities, first priority to excess Storage Allocation shall be given to each respective city requesting the use of a portion of the Storage Allocation up to an amount equal to the percentage that the total quantity of Water delivered by California American for retail service to the requesting city bears to the total quantity of Water delivered to all cities at the date the Decision is entered. Notwithstanding the paramount rights of each city described in this section, 5 percent of any Storage Allocation held in trust by California American will be reserved for *de minimis* Storage opportunities and made available for the benefit of any requesting city on the basis of first in time, first in right. Additionally, provision of Storage Allocation by California American to a requesting city shall not be construed as a waiver of California American's rights under section 1501 et seq. of the California Public Utilities Code or consent to duplication of its retail Water service. Moreover, California American shall not charge any fee for use of its Storage Allocation by Monterey, Seaside, Sand City, or Del Rey Oaks. However, the capital or other value of California American's Storage Allocation shall belong to California American. Finally, no city may request use of California American's Storage Allocation unless it has first used all of its own. Storage Allocation as provided herein.

4. Determination of Total Useable Storage Space. Watermaster shall determine and declare the Total Useable Storage Space in the Basin, and may annually adjust the Total Useable Storage Space pursuant to Section III.L.3.j.xix of this Decision,. If and when Watermaster adjusts the Total Useable Storage Space in the Basin, each Producer's Storage Allocation shall be adjusted accordingly.

Each Storage Allocation is of the same legal force and effect, and each is without priority with reference to any other Producer's Storage Allocation. Watermaster shall, however, consider each proposal to Store Water independently pursuant to Section III.L.3.j.xx.

5. Carryover. Each Producer operating under the Standard Production Allocation shall have the right to use their respective Storage Allocation to Store any Carryover Water subject to the provisions of this Decision. Unused (not Extracted) Stored Water Credits and Carryover Credits shall be carried over from year to year for the first three Water Years.

Thereafter Carryover Water withdrawal is subject to a percentage decrease consistent with percentage decreases in the Operating Yield, according to the terms of this Decision. Due to the hydrogeologic characteristics of the Seaside Basin, naturally occurring losses of stored Water may require Watermaster to discount the percentage of Stored Water that may be Extracted. Watermaster shall study the efficiencies of Storage in the Seaside Basin and set a uniform percentage for withdrawals of Stored Water.

6. Injection and/or Spreading. Each Producer operating under the Standard Production Allocation, and the Watermaster, and certain public agencies, shall have the right to Store Water by Direct Injection, Spreading, or other artificial means so long as such Storage does not cause Material Injury to any other Party. Except as provided in Section III.H.5., no Producer herein granted a Storage Allocation may Store Water in the Seaside Basin without first executing a Storage and Recovery Agreement with Watermaster, pursuant to Section III.L.3.j.xx. Each Storage and Recovery Agreement shall further define the terms and conditions by which a Producer may exercise its Storage Allocation and associated Stored Water Credits.

I. Injunction Against Unauthorized Storage. Each Producer is enjoined and restrained from Carrying Over or Storing any quantity of Water in the Seaside Basin greater than that Producer's Storage Allocation. Further, each Producer is enjoined from Storing any Water in the Seaside Basin except as provided in Section III.H.5. (establishment of Carryover Credits) or as authorized by a Storage and Recovery Agreement issued by Watermaster pursuant to Section III.L.3.j.xx.

J. Measurement of Extractions and Storage. All Producers shall install, maintain, and use adequate measuring devices on all Groundwater Production facilities as directed by Watermaster and report accurate measurements of all Groundwater Produced from the Seaside Basin in the manner required by Watermaster's Rules and Regulations. Such measuring devices shall not conflict with any monitoring devices required by MPWMD. All Producers shall comply with the provisions for measurement of any Storage of Water in the Seaside Basin, as provided in Watermaster's Rules and Regulations, and as may be further provided for in a Storage and Recovery Agreement issued by Watermaster for such Storage.

K. Order of Accounting for the Production of Groundwater. Unless otherwise requested by a Producer in writing to Watermaster, Watermaster shall account for all Production of Water form the Seaside Basin by a Producer in any Water Year as follows: Production shall first be deemed Production of that Producer's Production Allocation up to that Producer's total Production Allocation, and thereafter shall be deemed Production of that Producer's Carryover Credits, if any, and thereafter shall be deemed Production of that Producer's Stored Water Credits, if any. So long as consistent with this section, Watermaster may prescribe administrative rules within its Rules and Regulations concerning the method and manner of accounting for the Production of Groundwater.

L. Appointment of Watermaster; Watermaster Administrative Provisions.

1. Establishment of Watermaster. A Watermaster shall be established for the purposes of administering and enforcing the provisions of this Decision and any subsequent instructions or orders of the Court. The Watermaster shall consist of thirteen (13) voting positions held among nine (9) representatives. California American, Seaside, Sand City, Monterey, and Del Rey Oaks shall each appoint one (1) representative to Watermaster for each two-year term of Watermaster. The Landowner Group shall appoint two (2) representatives to Watermaster for each two-year term of Watermaster. The MPWMD shall have one (1) representative and the MCWRA shall have one (1) representative. The representatives elected to represent the Landowner Group shall include one (1) representative from the Coastal Subarea and one (1) representative from the Laguna Seca Subarea. The California American representative shall possess three (3) voting positions; the. Seaside, MPWMD, and MCWRA representatives shall each possess two (2) voting positions; and every other representatives shall posses one (1) voting position. Each representative from the Landowner Group shall carry one-half of the Landowner Representative vote. Each representative under the Landowner Group may also act as an alternate for the other.

The right to assign a representative to Watermaster and the representative's respective voting power shall only transfer upon permanent sale of 51 percent or more of the Party's Base Water Right. but not upon the lease of any portion of the member's Base Water Right.

2. Quorum and Agency Action. A minimum of six (6) representatives shall be required to constitute a quorum for the transaction of Watermaster affairs. Unless otherwise provided herein, the affirmative vote of seven (7) voting positions shall be required to constitute action by Watermaster.

3. Qualification, Nomination, Election, and Administrative Procedures.

a. Qualification. Any duly authorized agent of the entities or groups provided for in Section III.L.1. is qualified to serve as a representative on the Watermaster board.

b. Term of Office. Each new Watermaster board shall assume office at the first regular meeting in January of every second year. Each Watermaster board member shall serve for a two-year term, subject to the retained jurisdiction of the Court. Should a vacancy arise on the Watermaster board for any reason, the respective entity or group from which that vacancy arises shall appoint a replacement representative in the manner prescribed by Watermaster Rules and Regulations. Such replacement shall complete the remainder of the term of the vacated office. Within 30 days of the appointment of any new Watermaster board member, any Party may file a motion with the Court challenging the appointment. The Court, acting *sua sponte,* may reject any Watermaster board appointment within the 30-day period. Challenges shall be based on allegations that the appointed board member does not possess the requisite skills necessary to effectively serve as a member of the Watermaster board.

c. Nomination and Election of Landowner Representative. The nomination and election of the Landowner Group representatives shall occur in November of every second year in the manner designated by Watermaster Rules and Regulations. The nomination and election of the Landowner Group representatives shall be by cumulative voting with each member of the Landowner Group entitled to one (1) vote for each acre-foot of annual entitlement under the member's Alternative Production Allocation. Voting rights may only be transferred upon permanent sale of 51 percent or more of the Landowner Party's Base Water Right.

d. Organization. At he first meeting of each newly comprised Watermaster board, the Watermaster shall elect a chairman and a vice-chairman from its membership. It shall

also select a secretary, a treasurer and such assistant secretaries and assistant treasurers as may be appropriate, any of whom may, but need not, be representatives appointed to Watermaster.

e. Minutes. Minutes of all Watermaster meetings shall be kept and shall reflect a summary of all actions taken by the Watermaster. Copies thereof shall be furnished to all Parties and interested Persons as provided for inn Section III.P.2. Copies of minutes shall constitute notice of any Watermaster action therein reported.

f. Regular Meetings. The Watermaster shall hold regular meetings at places and times to be specified in the Watermaster Rules and Regulations. Its first meeting must be held within 15 days from the date Judgment is granted in this case. Notice of the scheduled or regular meetings of the Watermaster and of any changes in the time or place thereof shall be mailed to all Parties and interested Persons as provided for in Section III.P.2.

g. Special Meetings. Special meetings of the Watermaster may be called at any time by the chairman or vice chairman or by any three (3) representatives appointed to Watermaster by written notice delivered personally or mailed to all Parties and interested Persons as provided for in Section III.P.2., at least twenty-four (24) hours on a business day before the time of each such meeting in the case of personal delivery, and five (5) days' notice prior to such meeting in the case of mail if the special meeting is being called under urgent circumstances. If a special meeting is called and no urgent circumstance exists, then at least ten (10) days' notice must be provided to all Parties. The notice shall specify the time and place of the special meeting and the business to be transacted at such meeting. No other business shall be considered at such meeting.

h. Meeting Procedures. Watermaster shall designate the procedure for conducting meetings within its Rules and Regulations. Rules and regulations for conducting meetings shall conform to the procedures established for meetings of public agencies pursuant to the California Open Meetings Law ("Brown Act"), California Government Code section 54950 et seq., as it may be amended from time to time.

i. Appointment of the Initial Watermaster Board. The initial Watermaster board, which shall take office immediately from the date Judgment is granted, shall be composed

of the duly authorized representatives of California American, Seaside, Sand City, Del Rey Oaks, Monterey, MCWRA, MPWMD, and two individuals to be designated by the landowners as the initial representatives of the Landowner Group for the Coastal and Laguna Seca Subareas, respectively.

j. Duties, Powers and Responsibilities of the Watermaster. To assist the Court in the administration and enforcement of the provisions of this Decision, the Watermaster shall have and is limited to the following duties, powers, and responsibilities:

i. Preparation of Monitoring and Management Plan. Within sixty (60) days from the date Judgment is granted, Watermaster will prepare a comprehensive monitoring and management plan for the Seaside Basin ("Monitoring and Management Plan"). The Monitoring and Management Plan must be consistent with the criteria set forth in Exhibit A.

ii. Declaration of Operating Yield. Based upon the evidence at trial concerning historic Production in the Basin, the Court sets the Operating Yield for the Seaside Basin, as a whole, as 5,600 acre feet. The Operating Yield for the Coastal Subarea is 4,611 acre feet and 9889 acre feet for the Laguna Seca Subarea. The Operating Yield established here will be maintained for three (3) years from the date Judgment is granted, or until a determination is made by the Watermaster, concurred in by this Court, that continued pumping at this established Operating Yield will cause Material Injury to the Seaside Basin or to the Subareas or will cause Material Injury to a Producer due to unreasonable pump lifts. In that event, the Watermaster shall determine the modified Operating Yield in accordance with the Principles and Procedures attached hereto as Exhibit A, and through the application of criteria that it shall develop for this purpose.

iii. Artificial Replenishment and Replenishment Assessments. Each Water Year, the Watermaster will determine a Replenishment Assessment for Artificial Replenishment of the Seaside Basin necessary to offset the cumulative Basin Over-Production (as defined in Section III.A.21.), and levy a Replenishment Assessment. Said Replenishment Assessment does not apply to Production under an Alternative Production Allocation so long as such Production is within the fixed amount established for that Producer in Table 2 of

Section III.B.3. Funds so generated may be accumulated for multiple Water Years, if necessary, and shall be utilized solely for replenishment of the Basin Groundwater supply with Non-Native water.

An additional Watermaster Replenishment Assessment shall be levied after the close of each Water Year against all Producers that incurred Operating Yield Over-Production during the Water Year. Said assessment shall be in addition to the Replenishment Assessment addressed in Section III.A.21. The Replenishment Assessment based upon Operating Yield Over-Production shall be levied against the Parties participating in the Alternative Production Allocation for only such Production that exceeds the Parties' respective fixed Alternative Production Allocation identified on Table 2. In the event Watermaster cannot procure Artificial Replenishment Water to offset Operating Yield Over-Production during the ensuing Water Year, the Watermaster shall so declare in December and no Operating Yield Over-Production then in effect may occur during the ensuing Water Year. Funds generated by the Operating Yield Over-Production Assessment shall be utilized by the Watermaster to engage in or contract for Replenishment of the Operating Yield Over-Production occurring in the Preceding Water Year as expeditiously as possible.

Replenishment Assessments based on Over-Production and on Operating Yield Over-Production shall be assessed within 60 days of the end of each Water Year on a per acre-foot basis on each acre-foot, or portion of an acre-foot, of Over-Production, and payment shall be due no later than January 15th of the following year. The per acre-foot amount of the Replenishment Assessments shall be determined and declared by Watermaster in October of each Water Year in order to provide Parties with advance knowledge of the cost of Over-Production in that Water Year.

Payment of the Replenishment Assessment shall be made by each Producer incurring a Replenishment Assessment within 40 days after the mailing of a statement for the Replenishment Assessment by Watermaster. If payment by any Producer is not made on or before said date, the Watermaster shall add a penalty of 5 percent thereof to such Producer's statement. Payment required of any Producer hereunder may be enforced by execution issued outside of this Court, by order of this Court, or by other proceedings by the Watermaster or by any Producer on the

Watermaster's behalf. All proceeds of Replenishment Assessments shall be used to procure Non-Native water, including, if appropriate, substitute reclaimed water.

iv. Budget Assessments. The Watermaster budget for each Fiscal Year, and for the initial funding of the Monitoring and Management Plan, shall be funded by Budget Assessments. The Watermaster budget will be composed of three separate budgets. The first budget is solely for the funding of the Monitoring and Management Plan. The initial, onetime funding for the Monitoring and Management Plan shall not be in excess of $1,000,000. The annual budget for the Monitoring and Management Plan shall not be in excess of $200,000 for the first Fiscal Year, and thereafter as determined by the Watermaster. The Budget Assessment for the Monitoring and Management budget shall be assessed against each Producer (except *those in the Landowner Group) by multiplying the amount of the Monitoring and Management Plan budget for the ensuing Fiscal Year by the following percentages:

(1)	California American	91%
(2)	City of Seaside	7%
(3)	Granite Rock Company	1%
(4)	D.B.O. Development No. 27	1%

At such times as a Party within the Coastal Subarea chooses to change its Alternative Production to a Standard Production Allocation that Party will be assessed a proportionate share of the Budget Assessment for the Monitoring and Management Plan Budget based upon a modification of the percentages to include any new Standard Production.

The administrative budget shall be fixed at $100,000 annually for the first Fiscal Year, and thereafter as determined by the Watermaster. The Budget Assessment for the administrative budget shall be assessed against each Producer (except those inn the Landowner Group) by multiplying the amount of the budget for the ensuing Fiscal Year by the following percentages:

(1)	California American	83%
(2)	City of Seaside	14.4%
(3)	City of Sand City	2.6%

The Replenishment Budget shall be calculated based upon the anticipated cost of obtaining replenishment water, and shall be assessed as set forth in Section III.A.21, and in Section III.L.3.j.iii.

Except for the initial Budget Assessment which shall be due 30 days from the date Judgment is granted, payment of the Administrative Assessment and the Monitoring and Management Assessment, subject to any adjustment by the Court as provided in Section III.N., shall be made on or before January 15th of the Fiscal Year for which the assessments have been levied. If such payment by any Producer is not made on or before said date, the Watermaster shall add a penalty of 5 percent thereof to such Producer's statement. Payment required of any Producer hereunder may be enforced by execution issued outside of this Court, by order of this Court, or by other proceedings by the Watermaster or by any Producer on the Watermaster's behalf.

v. Reports, Information, and Records. The Watermaster will require Parties to furnish such reports, information, and records as may be reasonably necessary to determine compliance or lack of compliance by any Party with the provisions of this Decision.

vi. Requirement of Measuring Devices. The Watermaster will require all Parties owning or operating any Groundwater Extraction and/or Storage facilities to install appropriate Water measuring devices, and to maintain said Water measuring devices at all times in good working order at such Party's own expense. Such devices shall not interfere with any measuring gauges required by MPWMD.

vii. Inspections by the Watermaster. The Watermaster will make inspections of Water Production facilities and measuring devices at such times and as often as may be reasonable under the circumstances, and to calibrate or test such devices.

viii. Collection of Arrears. The Watermaster will undertake any and all actions necessary to collect the arrears of any Party with regard to any and all components of the Budget Assessment and/or the Replenishment Assessment.

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ix. Hearing Objections; Review and Approvals. The Watermaster will hear all objections and/or review and determine approval or denial of the action(s) of any Party as provided for by any other provision of this Decision.

x. Annual Report. The Watermaster will prepare, file with the Court and mail to each of the Parties on or before the 15th day of November, an annual report for the preceding Water Year, the scope of which shall include but not be limited to the following:

- Groundwater Extractions;
- Groundwater Storage;
- Amount of Artificial Replenishment, if any, performed by Watermaster;
- Leases or sales of Production Allocation;
- Use of imported, reclaimed, or desalinated Water as a source of Water for Storage or as a Water supply for lands overlying the Seaside Basin;
- Violations of the Decision and any corrective actions taken;
- Watermaster administration costs;
- Replenishment Assessments;
- All components of the Watermaster budget; and
- Recommendations.

xi. Annual Budget and Appeal Procedure in Relation Thereto. The Watermaster will annually adopt a tentative budget for each Fiscal Year stating the anticipated expense for administering the provisions of this Decision, including reasonable reserve funds. The adoption of each Fiscal Year's tentative budget shall require the affirmative vote of seven (7) voting positions. The Watermaster shall mail a copy of said tentative budget to each of the Producers hereto at least 60 days before the beginning of each Fiscal Year. The Landowner Group representative shall not participate in any vote concerning the approval of the Watermaster budget.[f] If any Producer hereto has any objection to said tentative budget, it shall present the same in writing to the Watermaster within 15 days after the date of mailing of said tentative budget by the Watermaster. If no objections are received within said period, the tentative budget shall become the Final budget. If objections are received, the Watermaster shall, within 10 days

thereafter, consider such objections, prepare a Final budget, and mail a copy thereof to each Producer, together with a statement of the amount assessed to each Producer (Administrative Assessment). Any Producer may apply to the Court within 15 days after the mailing of such Final budget for a revision thereof based on specific objections thereto in the manner provided in Section III.N. The Producer challenging the budget shall make the payments otherwise required of them to the Watermaster, despite the filing of the request for revision with the Court. Upon any revision by the Court, the Watermaster shall either remit to the Producers their pro rata portions of any reduction in the budget, or credit their accounts with respect to their Administrative Assessment for the next ensuing Fiscal Year, as the Court shall direct. The amount of each Producer's Budget Assessment shall be determined as provided in Section III.L.3.j.iv.

Any money in Watermaster's budget not expended at the end of any Fiscal Year shall be applied to the budget of the succeeding Fiscal Year.

xii. Rules and Regulations. The Watermaster will adopt and amend from time to time such Rules and Regulations as may be reasonably necessary to carry out its duties, powers and responsibilities under the provisions of this Decision. The Rules and Regulations and any amendments thereto, shall be effective on such date after the mailing thereof to the Parties as is specified by the Watermaster, but not sooner than thirty (30) days after such mailing. The Watermaster shall adopt initial Watermaster Rules and Regulations within ninety (90) days from the date Judgment is granted.

xiii. Acquisition of Facilities. The Watermaster may purchase, lease, acquire and hold all necessary property and equipment as necessary to perform the duties, powers, and responsibilities provided to Watermaster by this Decision; provided, however, that Watermaster shall not acquire any interest in real property in excess of year-to-year tenancy for necessary quarters and facilities.

xiv. Employment of Staff and Consultants. The Watermaster may employ such administrative, engineering, geologic, accounting, legal, or other specialized personnel or consultants as may be deemed appropriate to the carrying out of its duties, powers,

and responsibilities and to require appropriate bonds from all officers and employees handling the Watermaster funds.

xv. Investment of Funds. The Watermaster may hold and invest any and all funds that the Watermaster may possess in investments authorized from time to time for public agencies in the State of California.

xvi. Borrowing. The Watermaster may borrow in anticipation of receipt of assessment proceeds an amount not to exceed the annual amount of assessments levied but uncollected.

xvii. Contracts. The Watermaster may enter into contracts for the performance of any administrative power herein granted.

xviii. Cooperation with Public and Private Entities. The Watermaster may act jointly or cooperate with any public or private entity to the end that the purposes of the Physical Solution may be fully and economically carried out. Where it is more economical to do so, Watermaster is directed to use such facilities of a public or private entity as are available to it to execute the duties, powers, and responsibilities provided to Watermaster under this Decision.

xix. Declaration of Total Usable Storage Space. The Watermaster will declare the Total Useable Storage Space and periodically issue adjustments to the same.

xx. Review of Storage Applications; Regulation of Storage; Issuance of Storage and Recovery Agreements. The Watermaster will review applications for Storage in the Seaside Basin, regulate the Storage of Non-Native Water in the Seaside Basin, and issue Storage and Recovery Agreements, all as provided below. All applications for Storage in the Seaside Basin shall be considered and voted on before a noticed meeting of the Watermaster. However, all such applications shall be approved absent the issuance of findings that a Material Injury to the Seaside Basin or Producers will or is likely to occur as a result of the proposed Storage program and no reasonable conditions could be imposed to eliminate such risk. If a Storage application is approved, the Watermaster shall issue a Storage and Recovery Agreement. The Storage and Recovery Agreement may include, among other possible elements and/or provisions, the following conditions to avoid Material Injury: (1) the quantity of Water authorized

to be Spread or Directly Injected into the Seaside Basin, (2) the location of the authorized Spreading or Direct Injection, (3) the location(s) where the Water may be recaptured, (4) the particular Water quality characteristics that are required pursuant to the Storage and Recovery Agreement, (5) the amount of Water that may be recaptured pursuant to the Stored Water Credits calculated by Watermaster, (6) any other terms and conditions deemed necessary to protect the Seaside Basin and those areas affected by the Seaside Basin. Such Storage and Recovery Agreements may provide for different locations for introduction and Extraction of Stored Water if deemed appropriate by the Watermaster.

xxi. Monitoring and Study of the Seaside Basin and All Seaside Basin Activities. The Watermaster will monitor and perform or obtain engineering, hydrogeologic, and scientific studies concerning all characteristics and workings of the Seaside Basin, and all natural and human-induced influences on the Seaside Basin, as they may affect the quantity and quality of Water available for Extraction, that are reasonably required for the purposes of achieving prudent management of the Seaside Basin in accord with the provisions of this Decision.

xxii. Relocation of Authorized Production Locations. The Watermaster will order relocation of the authorized quantity of Production pursuant to any Producer's Production Allocation from a specific location or from a specific aquifer within the same Subarea of the Seaside Basin, provided that it allows equivalent Production from any other location/aquifer in the Seaside Basin within the same Subarea that would not also create a reasonable potential for Material Injury. Watermaster may only order relocation of Production after issuing findings that a Material Injury has occurred or is likely to occur as a result of the then-authorized quantity and geographic distribution of Production. Watermaster may not order the relocation of Production by any Producer that is a member of the Landowner Group.

xxiii. Water Quality. The Watermaster will take any action within the Seaside Basin, including, but not limited to, capital expenditures and legal actions, which in the discretion of Watermaster is necessary or desirable to accomplish any of the following:

· Prevent contaminants from entering the Groundwater supplies of the Seaside Basin, which present a significant threat to the Groundwater quality of the Seaside Basin, whether or not the threat is immediate;

· Remove contaminants from the Groundwater supplies of the Seaside Basin presenting a significant threat to the Groundwater quality of the Seaside Basin;

· Determine the existence, extend, and location of contaminants in, or which may enter, the Groundwater supplies of the Seaside Basin;

· Determine Persons responsible for those contaminants; and

· Perform or obtain engineering, hydrologic, and scientific studies as may be reasonably required for any of the foregoing purposes.

xxiv. Other Specified Powers Pursuant to Decision Terms. The Watermaster will undertake any other powers, duties, or responsibilities provided through any other provision of this Decision.

xxv. No Power to Alter Allocation or Rights. Watermaster has no power to adjust any Producer's Base Water Right or the formula for determining Production Allocation, except to accommodate the intervention of a new Party pursuant to Section 1110.1.b. However, should an adjustment of Base Water Right and/or Production Allocation within a Subarea be required to accommodate the intervention of a new Party, no adjustment shall be made to the Base Water Right or Production Allocations possessed by any Party operating under the Alternative Production Allocation within the Landowner Group until the Production Allocations for that Subarea possessed by Parties operating underthe Standard Production Allocation have been reduced to zero.

xxvi. Effect of Non-Compliance by Watermaster With Time Provisions. Failure of the Watermaster to perform any duty, power or responsibility set forth in this Decision within the time limitation herein set forth shall not deprive the Watermaster of authority to subsequently discharge such duty, power, or responsibility, except to the extent that any such failure by the Watermaster may have rendered some otherwise required act by a Party impossible.

xxvii. Public Records. Watermaster shall conform to the procedures established under the California Public Records Act, California Government Code section 54950 et seq., as it may be amended from time to time.

M. Additional Provisions of Physical Solution.

In order to provide flexibility to the injunctive provisions set forth in Section III.D of this Decision, and to assist in a Physical Solution to meet Water requirements in the Basin, the determination of rights and responsibilities, and the injunctive provisions so set forth are subject to the following provisions:

1. California American Obligation to Augment Water Supply

a. Long-Term Supplemental Water Supplies. California American shall undertake all reasonable best efforts to promptly and diligently pursue, and if necessary collaborate with other entities, to obtain and develop sufficient long-term supplemental Water supplies to augment the Water supply available for its service territory within Monterey County.

b. Interim Supplemental Water Supplies. During the interim period, until long-term supplemental Water supplies are available, California American shall undertake all reasonable best efforts to ensure that it has sufficient Water supplies to meet all present Water supply needs, including the Water credits allocated to the various political subdivisions pursuant to the MPWMD's Water Allocation Program, in such quantities as set forth in Exhibit D, and the Water credits issued to various properties pursuant to the MPWMD's Water Allocation Program.

c. Regulatory Authorization. California American's duties under Sections III.M.1.a and III.M.1.b above will be measured and construed in the context that there are various regulatory approvals that must be obtained for California American to successfully implement the measures reasonably contemplated to secure supplemental Water. For example, it is acknowledged and understood that California American's ability to complete a supplemental Water supply project will require approvals and authorizations from the State Water Resources Control Board ("SWRCB") and the California Public Utilities

Commission ("CPUC"). Accordingly, California American will not be considered in default under this Section III.M.1 if it uses reasonable best efforts to obtain the required approvals and authorizations.

d.Credit Toward Replenishment Assessment. California American's expenditures for water supply augmentation may also provide replenishment water for the Basin. Accordingly, on an annual basis, California American will provide the Watermaster with an accounting of all expenditures it has made for water supply augmentation that it contends has or will result in replenishment of the Basin. The Watermaster shall review these expenditures and if it concurs reduce California American's Replenishment Assessment obligation, for that year, by an amount equal to the amount claimed by California American. To the extent that the Watermaster rejects any of the claimed amounts, it shall provide California American with an explanation for the rejection and allow California American an opportunity to meet and confer on the disputed amount. In the event that the Watermaster and California American cannot agree, the matter may be referred to the Court through a request filed by California American.

2. Assignment and Transfer of Production Allocation. Subject to other provisions of this Decision, and any applicable Watermaster Rules and Regulations, the Parties may assign and transfer any portion of their respective Production Allocation either on an annual Water Year basis or in perpetuity to any Person for use within the Basin.

The Parties may also assign and transfer the right to Extract any quantity of Water associated with an existing Stored Water Credit or Carryover Credit, subject to other provisions of this Decision, and any applicable Watermaster Rules and Regulations.

3. Export of Groundwater Outside of Subarea or Seaside Basin.

a. Exports Authorized from the Coastal Subarea. Producers may export Water Produced from the Coastal Subarea for reasonable and beneficial uses within another Subarea of the Seaside Basin. Only California American may export water outside the Basin, and then only to provide water to its current customers. This means that, in any Water Year, any Producer may export from the Coastal Subarea up to, but not in excess of, a quantity

equal to the sum of that Producer's Production Allocation, plus Stored Water Credits, plus Carryover Credits. Export of Groundwater in excess of a Producer's total rights (Production Allocation, plus Stored Water Credits, plus Carryover Credits), however, is prohibited.

b. Exports of Natural Replenishment Water Prohibited from the Laguna Seca Subarea. Exports from the Laguna Seca Subarea of Natural Replenishment Water and Carryover Credits not caused by Artificial Replenishment are prohibited.

c. Portability Authorized Within Subareas; Portability Prohibited Between Subareas. Any Producer may change the location of its Production facilities within its respective Subarea or join other Production facilities within its Subarea, so long as such relocation does not cause a Material Injury or threat of Material Injury to the Basin or interfere with the Production by any pre-existing Production facilities operated by another Producer(s). No Party may Produce Groundwater from the Coastal Subareas pursuant to any right recognized by this Decision in the Laguna Seca Subarea, and vice versa.

N. Watermaster Decision Review Procedures. Any action, decision, rule or procedure of the Watermaster pursuant to this Decision shall be subject to review by the Court on its own motion or on timely motion by any Party, as follows:

1. Effective Date of the Watermaster Action. Any order, decision or action of the Watermaster pursuant to this Decision on noticed specific agenda items shall be deemed to have occurred on the date of the order, decision or action.

2. Notice of Motion. Any Party may, by a regularly noticed motion, petition the Court for review of the Watermaster's action or decision pursuant to this Decision. The motion shall be deemed to be filed when a copy, conformed as filed with the Court, has been delivered to the Watermaster together with the service fee established by the Watermaster sufficient to cover the cost to photocopy and mail the motion to each Party. The Watermaster shall prepare copies and mail a copy of the motion to each Party or its designee according to the official service list which shall be maintained by the Watermaster according to Section III.P.2. A Party's obligation to serve notice of a motion upon the Parties is deemed to be satisfied by filing the motion as provided herein. Unless ordered by the Court, any such

petition shall not operate to stay the effect of any Watermaster action or decision that is challenged.

3. Time for Motion. A motion to review any Watermaster action or decision will be filed within thirty (30) days after such Watermaster action or decision, except that motions to review Budget Assessments and Replenishment Assessments hereunder shall be filed within fifteen (15) days of mailing of notice of the Assessment.

4. De Novo Nature of Proceedings. Upon filing of a petition to review a Watermaster action, the Watermaster shall notify the Parties of a date when the Court will take evidence and hear argument. The Court's review shall be de novo and the Watermaster decision or action shall have no evidentiary weight in such proceeding.

0. Reserved Jurisdiction and Other Remedies.

1. Continuing Jurisdiction.

a. Jurisdiction Reserved. Full jurisdiction, power and authority are retained by and reserved by the Court upon the application of any Party or by the Watermaster, by a noticed motion to all Parties, to make such further or supplemental orders or directions as may be necessary or appropriate for interpretation, enforcement, or implementation of this Decision. The Court may also modify, amend or amplify any of the provisions of this Decision upon noticed motion to all the Parties. The Court, through its reserved and retained jurisdiction, however, shall not have the authority to adjust any Producer's Base Water Right or Production Allocation, except to accommodate the intervention of a new Party pursuant to Section 111.0.1.b. However, should an adjustment of Base Water Right and/or Production Allocation within a Subarea be required to accommodate the intervention of a new Party, no adjustment shall be made to the Base Water Right or Production Allocations possessed by any Party operating under the Alternative Production Allocation within the Landowner Group until the Production Allocations within that Subarea possessed by Parties operating under the Standard Production Allocation have been reduced to zero.

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b. Intervention After Decision. Any non-party who is Producing or proposes to Produce Groundwater from the Seaside Basin in an amount equal to or greater than five (5) acre feet per year, may seek to become a Party to this Decision through (1) a stipulation for intervention entered into with the Watermaster or (2) any Party or the Watermaster filing a complaint against the non-party requesting that the non-party be joined in and bound by this Decision. The Watermaster may execute said stipulation on behalf of the other Parties herein, but such stipulation shall not preclude a Party from opposing such intervention at the time of the Court hearing thereon. A stipulation for intervention must be filed with the Court, and the Court will then consider an order confirming said intervention following thirty (30) days' notice to the Parties. Thereafter, if approved by the Court, such intervenor shall be a Party bound by this Decision and entitled to the rights and privileges accorded under the Physical Solution herein.

2. Reservation of Other Remedies.

a. Claims By and Against Non-Parties. Nothing in this Decision shall expand or restrict the rights, remedies or defenses available to any Party in raising or defending against claims made by any non-party. Any Party shall have the right to initiate an action against any non-party to enforce or compel compliance with the provisions of this Decision.

b. Claims Between Parties on Matters Unrelated to the Decision. Nothing in this Decision shall either expand or restrict the rights or remedies of the Parties concerning any subject matter that is unrelated to the use of the Seaside Basin for Extraction and/or Storage of Water as allocated and equitably managed pursuant to this Decision.

P. General Provisions.

1. Decision Constitutes Inter Se Adjudication. This Decision constitutes an inter se adjudication of the respective rights of all Parties.

2. Service Upon and Delivery to Parties and Interested Persons of Various Papers. This Decision and all future notices, determinations, requests, demands, objections, reports and other papers and processes Produced from this Court shall be served on all

Parties by first class mail, postage prepaid, addressed to the designee and at the address designated for that purpose in the list attached as Exhibit E to this Decision, or in any substitute designation filed with the Court.

Each Party who has not heretofore made such a designation, within thirty (30) days from the date Judgment is granted, shall file with the Court, with proof of service of a copy upon the Watermaster, a written designation of the Person to whom, and the address at which, all future notices, determinations, requests, demands, objections, reports and other papers and processes to be served upon that Party or delivered to that Party are to be so served or delivered.

A later substitute designation filed and served in the same manner by any Party shall be effective from the date of the filing as to the then future notices, determinations, requests, demands, objections, reports and other papers and processes to be served upon or delivered to that Party.

Watermaster shall maintain at all times a current list of Parties to whom notices are to be sent and their address for purposes of service. Copies of such lists shall be available to any Person. If no designation is made, a Party's designee shall be deemed to be, in order of priority: (a) the Party's attorney of record; (b) if the Party does not have an attorney of record, the Party itself at the address on the Watermaster list.

Watermaster shall also maintain a list of interested Persons that shall include all Persons whom, by written request to Watermaster, request to be added to Watermaster's list of interested Persons. All notices, determinations, requests, demands, objections, reports and other papers and processes required to be delivered to interested Persons shall be delivered to all Parties and all Persons on Watermaster's list of interested Persons.

Delivery to or service upon any Party or interested Person by Watermaster, by any other Party, or by the Court, of any document required to be served upon or delivered to a Party under or pursuant to this Decision shall be deemed made if made by deposit thereof (or by copy thereof) in the mail, first class postage prepaid, addressed to the designee of the Party and at the address shown in the latest designation filed by that Party.

Any Party desiring to be relieved of receiving deliveries from Watermaster may file a waiver of notice on a form to be provided by Watermaster.

3. Decision Binding on Successors. All provisions contained in this Decision are applicable to and binding upon and inure to the benefit of not only the Parties to this action, but also to their respective heirs, executors, administrators, successors, assigns, lessees, licensees and to the agents, employees and attorneys in fact of any such Persons.

Q. The Complaints in Intervention

The Complaint in Intervention of MPWMD seeks declaratory relief regarding its statutory right to manage and control pumping in the Basin, to store water in and Extract water from the Basin, to store and use reclaimed water, to manage all water distribution facilities within the Basin, and "the quantification and prioritization of its water and storage rights". It also sought a Physical Solution for the management of the Basin's water resources, with MPWMD being appointed as Watermaster to administer the Court's judgment. It also sought parallel injunctive relief against the parties to the lawsuit.

The Complaint in Intervention of MCWRA sought declaratory and injunctive relief regarding its right to manage and control water resources including, inter alia, those within the boundaries of the Seaside Basin, and a permanent injunction prohibiting any party to the lawsuit from exercising control "in any fashion" of the Basin in contravention of its water management authority.

On December 12, 2005, the Court asked the parties to brief the issue of whether MPWMD should be designated as Watermaster. Briefs were submitted by MPWMD, Plaintiff, Cal Am, and the City of Seaside. The court had previously received an Amicus brief from the Sierra Club which dealt with the issue of the powers of MPWMD land the effect on those powers if the court were to appoint a Watermaster other than MPWMD. The Court has read and considered each submitted brief. It has also read the Act which created MPWMD (Water Code Appendix, Chapter 118), and has had the benefit of the arguments of the parties concerning the subject. Being so informed it has concluded that the appointment of a collaborative Watermaster does not interfere with the powers of the District.

The District has argued that appointment of a Watermaster other than itself would violate the Separation of Powers doctrine. It urges that the legislature has vested it with the power to regulate pumping, and therefore only it is qualified to serve as Watermaster. On the other hand, the District has asked the Court to adopt a Physical Solution for the Basin. In so arguing, it necessarily concedes that this Court possesses power to regulate use of the Basin beyond any power the District currently possesses. Furthermore, the undisputed evidence in this case has shown that, although the District is empowered to adopt a Groundwater management plan it has never done so. The language of Water Code Section 10753 is instructive regarding the issue of the Separation of Powers:

> "(a) Any local agency, whose service area includes a groundwater basin... that is not subject to groundwater management pursuant to... a court order, judgment, or decree, may... adopt and implement a groundwater management plan."
>
> (Emphasis added.)

Pursuant to the quoted provisions of the foregoing section, the District will not be able in the future to adopt a Groundwater management plan for the Seaside Basin. Clearly the legislature contemplated that courts had the power to develop management plans for aquifer management even if a water management district already existed in a geographical area.

The District further argues that if the Court appoints a Watermaster other than itself, the authority of the Watermaster must not conflict with the MPWMD's authority. It is certainly true that the District possesses certain authority, which it is free to exercise according to the legislative mandate which created it. However, it is apparent the legislature did not intend that all of the powers it granted to the District be held exclusively by the District, else it would not at a later time have created the Monterey County Water Resources Agency and endowed it with many of the powers granted to the MPWMD. Rather, in creating the MCWRA, the legislature mandated that the two agencies cooperate with one another (Water Code Appendix Section 52-85). Similarly, the judgment contemplated in this Decision requires the Watermaster to "... act jointly or cooperate with any public...entity to the end that the purposes of the Physical Solution may be fully... carried out." (Section III.L.3.j.xviii)

On pages 15-16 of its brief, the District lists 9 powers and asserts those powers would "encompass the duties of any appointed watermaster." The Court has compared those 9 asserted powers and has concluded that those powers, to the extent that they exist or are currently being utilized by the District, do not encompass all the duties of a Watermaster appointed by the judgment. Furthermore, to the extent the Watermaster may be given powers akin to those of the District, this Court retains jurisdiction to determine any conflict which may arise in the future. For example, the Decision directs that any metering of Production wells by the Watermaster shall be done in a way which does not conflict with the MPWMD gauging already in place on all producing wells. The MPWMD is still able to develop water resources within its boundaries and can store water for the benefit of the District in the Basin, although it has not to date done either of those things with regard to the Seaside Basin.

One asserted power deserves more precise attention: the asserted "...power and duty to manage and regulate the transferability of the water among users- (Water Code Appendix) Section 328(g)." The plain reading of the referenced section does not encompass the right asserted. Furthermore, to the extent those that section purports to grant the District the power to "...declare rights in the natural flow of any subterranean supply of water..." it is apparent that the legislature did not intent to interfere with the ultimate right of the courts to determine the water rights of parties claiming such rights. To read the section otherwise would be to create a true Separation of Powers issue.

In fairness to the District, it had, of necessity, to confine its analysis of the duties of the proposed Watermaster to those set forth in the Proposed Stipulated Judgment. The Decision, while obviously relying on the structure and format of the Stipulated Judgment, does not track all provisions of said Judgment. For example, many of the concerns of the District revolve around its statutory right to store water in subterranean reservoirs. The Decision preserves that right. Similarly, while the Decision allows the assignment of Production rights (which the District is not empowered to affect by its referenced legislation, Water Code Section 328(g)), it does not provide for the transferability of Storage rights, a matter which might be of concern to the District under certain circumstances.

The District argues that the proposed powers of the Watermaster regarding maintenance and modification of the Operating Safe Yield would conflict with the District's authority. Much of its argument is addressed to language in the Proposed Stipulated Judgment which does not appear in the Decision. The Decision grants certain rights of control to the Watermaster for the purpose of maintaining the viability of the aquifer. However, it does not purport to forbid any regulation of the Basin which may be required by a public agency possessing the power to impose such regulation. In this regard it should be noted that the complaint in this case first raised the issue of the Overdraft status of the Basin, and the initial pleadings of the District stated that it did not know if that were true or not. The Decision does not conflict with any procedure or plan currently in place by the District to establish an Operating Yield for the Basin.

Of concern to the District is the fact that the Watermaster will be empowered to augment the underground water supply. While Water Code Section 118-343 gives the District the power to levy a Groundwater charge for the purpose of augmenting underground water supplies, in fact from the time of its creation in 1977 to the present the District has established no such charge, and has not augmented the underground water supply of the Basin. The fact that the Watermaster is authorized in the contemplated judgment to assess charges for replenishment of the Basin does not prevent the District in the future from undertaking such augmentation, if it determines it is appropriate to do so.

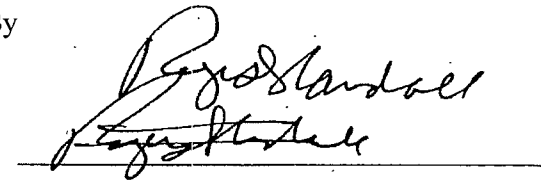
Based upon the evidence adduced at trial, which demonstrated that a collaborative Watermaster will likely provide more tangible results than any single individual or entity Watermaster, the Court has decided to appoint a collaborative board as Watermaster.

The prayer of MPWMD for injunctive relief is denied, except insofar as the court will issue injunctive relief as set forth in the Decision at the request of all parties. The prayer that the Court adopt a Physical Solution for the Seaside Basin is granted. The request for declaratory relief is granted to the extent that the court finds that the statutory rights of MPWMD are not in conflict with the Physical Solution and the appointment of a Watermaster in this proceeding.

The Complaint in Intervention of MCWRA also seeks declaratory and injunctive relief, but does not urge the appointment of itself or any other entity as Watermaster. The request for

injunctive relief is denied as moot, since the lawsuit does not challenge the statutory authority of the Agency. The request for declaratory relief is granted to the extent that the Court finds that the statutory rights of MCWRA are not in conflict with the Physical Solution adopted by the Court in this proceeding.

A statement of decision, if requested by any party, will be prepared by Plaintiff. If no party within ten days of the filing of this Decision specifies controverted issues or makes proposals not covered in the Decision this Decision shall become the Statement of Decision, and Plaintiff shall prepare a judgment thereon.

By 

Dated:

9 February 07

Honorable Roger D. Randall

Principles and Procedures of the Seaside Basin Monitoring and Management Plan

Introduction

This document sets forth the criteria that will guide the Watermaster in creating the Seaside Basin Monitoring and Management Plan. It also establishes a procedure for dealing with seawater intrusion, should the same occur, during the time the Watermaster is developing its plan of action to deal with such an eventuality.

Plan Criteria

Within sixty days of entry of the Judgment by the Court, the Watermaster will submit for the Court's approval a Monitoring and Management Plan containing details for implementation of the following actions:

a. *Exploratory borehole drilling program.* About four exploratory boreholes shall be drilled along the shoreline and the northern boundary of the Basin to depths ranging from 500 to 1500 feet, the depth being controlled by the depth of the Monterey formations. Lithologic samples shall be collected and classified for every one foot of drilling. A full suite of geophysical logs shall be collected. The data collected as part of this program shall be compared to other well data in the Seaside Basin to further refine the hydrogeologic conceptual model in the areas between the production wells and saline groundwater.

b. *Geophysical surveys.* Geophysical surveys shall be performed along the shoreline and the northern boundary of the Basin, intersecting the test borehole locations. The results of the geophysical surveys shall be calibrated against the test borehole data. The borehole data and the surveys shall be analyzed to characterize the near shore hydrology and to locate and design new monitoring wells.

c. *New monitoring wells.* About four to six monitoring well clusters shall be drilled and installed along the shoreline and the northern boundary of the Basin. Each cluster shall consist of at least four to five wells to provide a detailed vertical characterization of head and water quality through the aquifer system. The Watermaster shall coordinate the placement of the wells with MPWMD, which already has some monitoring wells in place with plans to drill more, to avoid duplication of effort and cost inefficiencies.

d. *Design and implementation of a piezometric and water quality monitoring program.* Pressure transducers and ionic probes (EC and Cl) shall be installed in each well at each cluster. These probes will record water levels and water quality on a frequent interval (every 15 minutes for water levels, and every day for water quality). Where possible, similar probes will be installed in the pumping wells to record water levels and on/off cycles. Grab samples will be obtained periodically to true up the ionic probes. These data will be analyzed to assess the state of seawater

intrusion, reveal groundwater barriers within the aquifer system, and more accurately estimate aquifer system parameters.

e. *Development and implementation of a management program.* The objectives of the management program will be to optimize pumping, halt seawater intrusion, and return the Basin to equilibrium through implementation of conservation methods; replacement of water drawdown by substitution of reclaimed water, where appropriate, infusion of imported water into the aquifer; and utilization of controlled pumping schedules through analysis of real-time monitoring.

f. *Develop criteria for use by the Watermaster in determining any modification of the Operating Yield.*

The management program will include periodic review of monitoring information and the use of this review to guide near-term and long-term groundwater pumping. If seawater is detected by the MPWMD monitoring wells currently in place, or by pumping wells, or by the monitoring well system contemplated by this document, the Watermaster shall follow the procedures developed pursuant to the mandate of the following paragraph. If it is detected before such procedures are in place, the Watermaster shall follow the procedure set forth in the *Interim Contingency Procedure to Contain Seawater Intrusion*, infra.

Within one year after entry of the Judgment by the Court, the Watermaster will: (a) develop improved estimates of the natural and secondary recharge within the Seaside Basin; (b) develop and implement a program for collecting groundwater production, water use, and land use data for the Seaside Basin and appropriate adjacent areas; (c) develop a suitable groundwater model of the Seaside Basin and appropriate adjacent areas; (d) develop a plan of action to be implemented to avoid various adverse effects in the Basin, including seawater intrusion; and (e) develop a plan of action to contain seawater intrusion, should it occur. The plan of action to avoid adverse effects in the Basin shall include a timeline for the importation of Non-Native water for spreading or injection into the Basin, and for acquisition of recycled water in lieu of Native Water production, and shall outline concrete steps to be taken to secure both Non-Native Water and recycled water.

Interim Contingency Procedure to Contain Seawater Intrusion

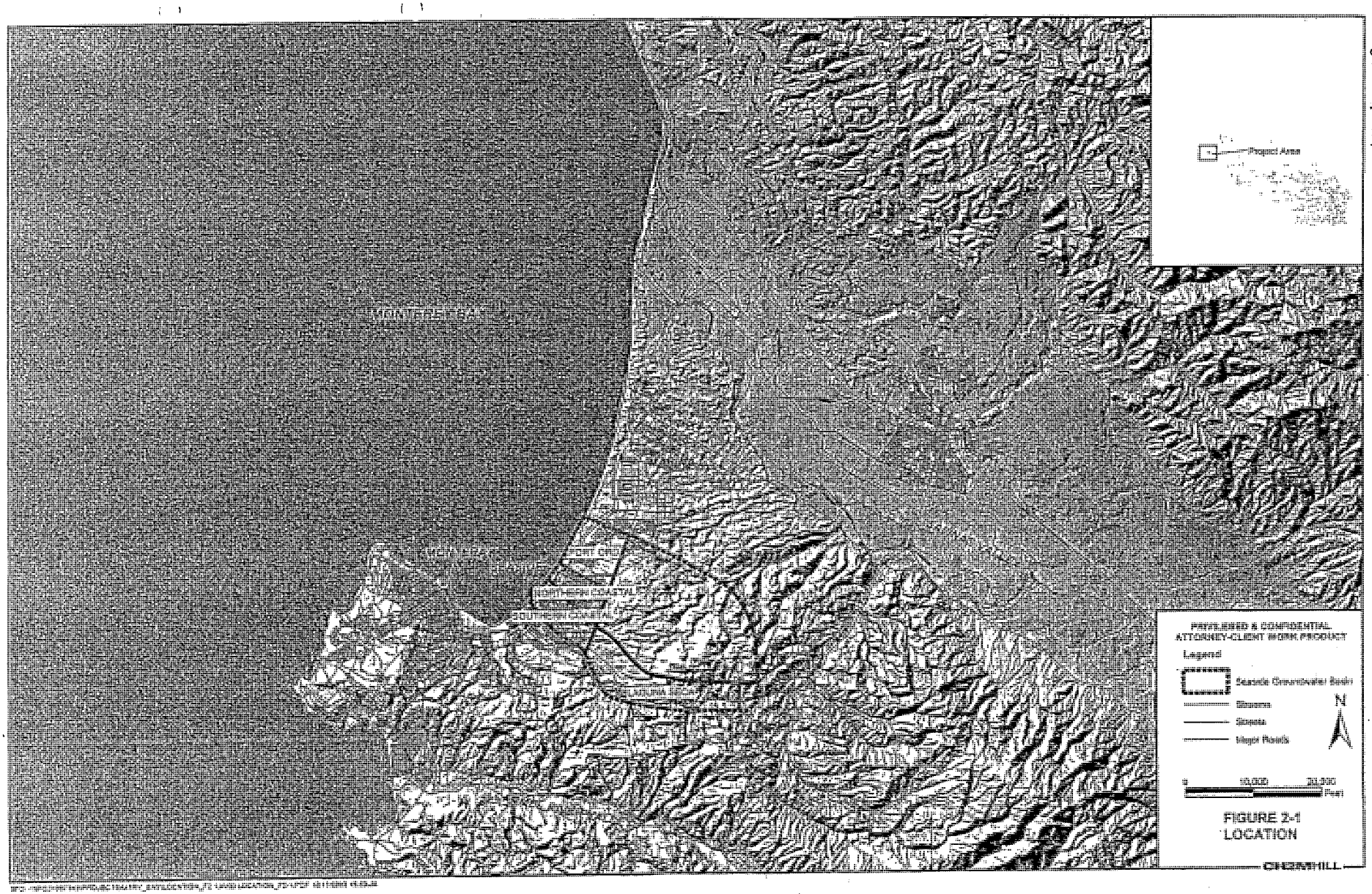
If Seawater intrusion is detected in the Basin during the development of the Watermaster's Management Plan, the following contingency plan will be set in motion to prevent seawater from contaminating larger portions of the Basin:

a. *Detection in a coastal monitoring well.* If seawater intrusion is detected in a coastal monitoring well, it is imperative that pumping stresses be reduced so that seawater is not pulled inland to producing wells. To accomplish this, all wells that produce from the intruded aquifer that are within one-half mile of the affected monitoring well will reduce their production to the equivalent of one-half their previous five-year pumping average. Monitoring of groundwater levels within the one-half mile radius

of the affected well will be increased to determine if groundwater gradients following reductions in pumping have been modified sufficiently to prevent further seawater intrusion. This increase in monitoring effort will include installing at least one new monitoring well as a sentinel between the affected monitoring well and the nearest down-gradient active production well. After six months of reduced pumping, the threat of further seawater intrusion will be re-evaluated. If there continues to be a groundwater gradient that would pull the detected seawater toward producing wells, the pumping wells within one-half mile of the affected monitoring well will further reduce pumping to one-third of their previous five-year pumping average. After another six months of monitoring, the direction of groundwater gradients will again be evaluated. If there continues to be a groundwater gradient that would pull the detected seawater towards producing wells, then the wells with reduced pumping will discontinue pumping. If, after the initial discovery of intrusion, seawater is encountered in an additional monitoring well, pumping reductions will be required for nearby producing wells in the same manner as for the first intruded monitoring well.

b. *Detection in a production well.* If seawater intrusion is encountered in a production well, that well will discontinue pumping. In addition, all wells that produce from the intruded aquifer that are within one-half mile of the affected well will reduce their production to the equivalent of one-half of their previous five-year pumping average. The sequence of threat evaluation, subsequent pumping reductions, and installation of new monitoring wells will be the same as for that in subparagraph a.

If the implementation of the procedures set forth above causes a production well to reduce its pumping or to cease pumping altogether, all reasonable efforts must be undertaken by the Watermaster to insure that lost production will be replaced by redistributing pumping, further conservation efforts on the part of all parties, or provision of replacement water from other sources.


Project Area
MONTEREY BAY
PRIVILEGED & CONFIDENTIAL
ATTORNEY-CLIENT WORK PRODUCT
Legend
Seaside Groundwater Basin
Streams
Streets
Major Roads
N
0
10,000
20,000
Feet
FIGURE 2-1
LOCATION
CH2MHILL

Legal description:

Parcel I:

A part of Rancho Noche Buena and Monterey City Lands Tract No. 1 in County of Monterey, State of California, being a part of that certain 86.75 acre tract of land conveyed by T.A. Work, et ux, to Mrs. E. Roberts by Deed dated May 16, 1921, recorded in Vol. 13 of Official Records at page 444, Records of Monterey County, and particularly described as follows:

Beginning at a 4" x 4" post standing at northeasterly corner of the above mentioned 86.75 acre tract of land and in the westerly boundary of that certain strip of land, 100 feet wide, as conveyed by David Jacks, to Monterey Railroad Company by Deed dated May 1, 1880, recorded in Vol. Z of Deeds at page 472, Records of Monterey County (now known as the right of way of the Southern Pacific Railroad, Monterey Branch) and from which point of beginning the S.P.R.R. Engineer's station 594 + 60.0.C.C.T. 201/2 in center line of tract bears S. 60° 10' E., 50.3 feet distant; thence southerly along westerly boundary of said 100 foot strip of land for a distance of 1570 feet, a little more or less, to a 4" x 4" post marked "AT 1386.6" "SPRR LINE," from which SPRR Engineer's Station 610 + 51.0, CC.T2 in centerline of tract bears S. 63° 21' E., 61.1 feet distant; thence leave said westerly boundary and running N. 53° 06' W., 1386.6 feet, at 765.6 feet to a 4" x 4" post marked "A + 621.0" "LINE", at 1243.1 feet at a 4" x 4" post marked "AT 143.5" "LINE" "WP", 1386.6 feet to a point in the mean high water line of Monterey Bay; thence along mean high water of Monterey Bay, N. 32° 08 1/2'E., 1500 feet to a point in the Northerly boundary of said 86.75 acre tract; thence along said northerly boundary up middle of canyon S. 53° 06' E., 1115.0 feet, at 132.6 feet a 4" x 4" post marked "AT 132.6 "WP" at 523.8 feet to a 4" x 6" post marked "AT 523.8" at 905.0 feet a 4" x 4" fencepost, 1115.0 feet to the place of beginning. Courses all true, declination of magnetic needle being 17° 30' East.

Excepting therefrom all that certain real property described in the Final Order of Condemnation issued out of the Superior Court of the State of California for the County of Monterey, Case No. 55706 entitled The People of the State of California, acting by and through the Department of Public Works, plaintiff, vs. Bank of America National Trust and Savings Association, et al, defendants, recorded April 1, 1966 in Reel 455 of Official Records of Monterey County at Page 620.

Parcel II:

That certain tract of land conveyed by T.A. Work, et ux, to Edith A. Roberts by Deed dated January 3, 1927 and recorded in Volume 102 of Official Records at page 129, records of Monterey County, particularly described as follows:

Beginning at the above mentioned 4" x 4" post standing at the northeast corner of the first above described tract; thence northerly along westerly boundary of the above mentioned 100 foot strip of railroad property for a distance of 210.0 feet; thence in a direct line to a 4" x 4"

EXHIBIT C

Legal description -- page 2:

fence post in the northerly boundary of the said 86.75 acre tract which bears N. 53° 06' W., 210.0 feet from the place of beginning; thence along said northerly boundary S. 53° 06' E., 210.0 feet to the place of beginning. Courses all true, variation of the magnetic needle 17° 30' East.

APNS: 011-501-004
011-501-014

END OF DOCUMENT

Legal Description of York School Parcels Subject to Stipulated Judgment

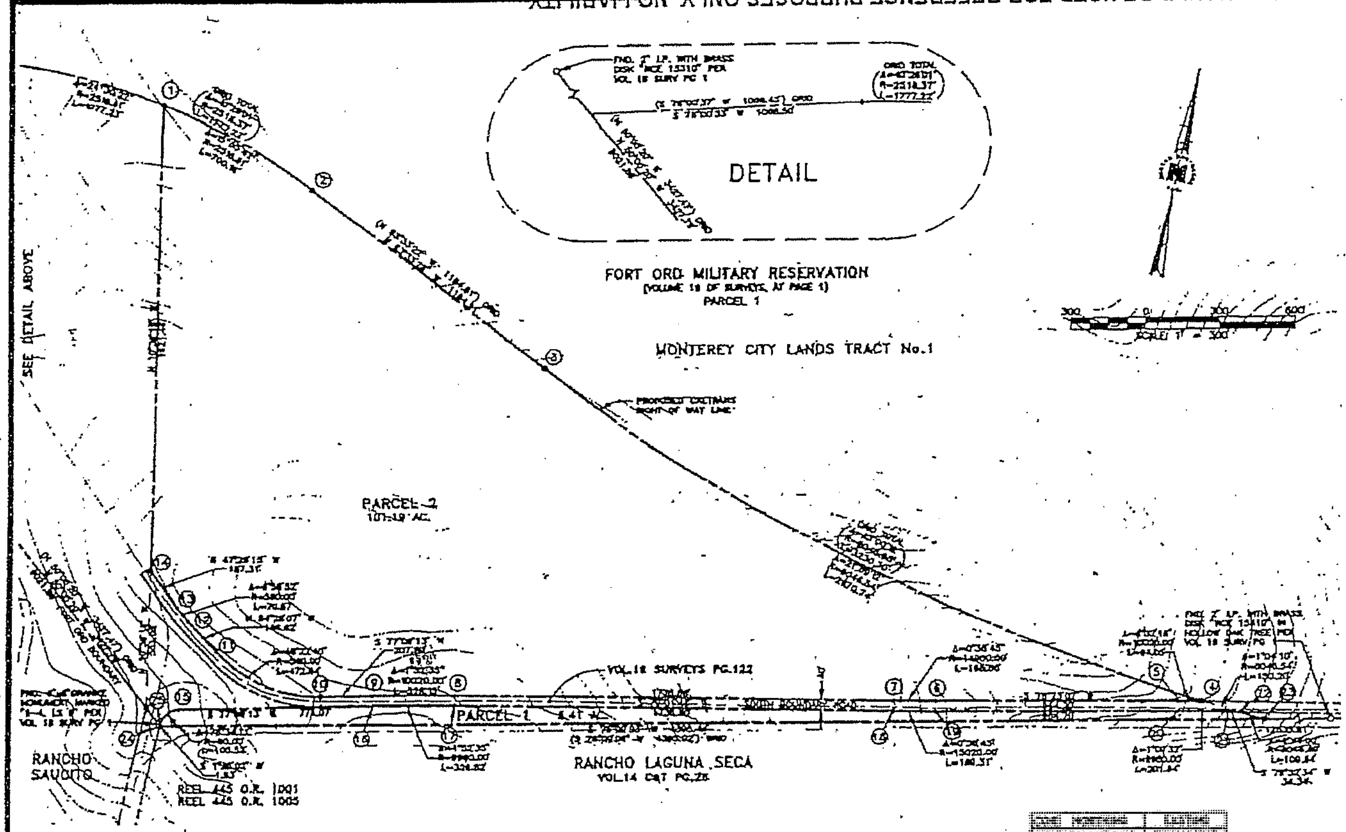
Legal Description

Parcels 1 and 2, as shown and designated on that certain Record of Survey filed on September 27, 1996 in Volume 20 of Surveys at Page 75, records of Monterey County, California.

APN 031-131-005 [5.41 acre parcel]
APN 031-131-006 [101.19 acre parcel]

COMPLY WITH LOCAL SUBDIVISION OR BUILDING ORDINANCES.
IS ASSUMED FOR THE ACCURACY OF THE DATA SHOWN. PARCELS MAY NOT
THIS MAP SHOULD BE USED FOR REFERENCE PURPOSES ONLY. NO LIABILITY

Vol 20 Surv. Pg. 75



SURVEYOR'S STATEMENT

THIS MAP CORRECTLY REPRESENTS A SURVEY MADE BY ME OR UNDER MY DIRECTION IN CONFORMANCE WITH THE REQUIREMENTS OF THE LAND SURVEYOR'S ACT AT THE REQUEST OF THE YORK SCHOOL IN MARCH 1996.

JOHN M. VAN ZANDER
R.C.E. #15310
STATE OF CALIFORNIA
EXPIRES 31 MARCH 1997

L.S. #3754
STATE OF CALIFORNIA
EXPIRES 30 JUNE 2000

RECORDER'S STATEMENT

FILED FOR RECORD AT THE REQUEST OF BESTOR ENGINEERS, INC. THIS 27th DAY OF SEPT 1996, AT 2:27 P.M., IN VOLUME 20 OF SURVEYS MAPS AT PAGE 75, RECORDS OF MONTEREY COUNTY, CALIFORNIA.

BRUCE A. REEVES
COUNTY RECORDER

DEPUTY

SERIAL NO. 57286

FEE: $ 7.00

COUNTY SURVEYOR'S STATEMENT

THIS MAP HAS BEEN EXAMINED IN ACCORDANCE WITH SECTION 8766 OF THE LAND SURVEYOR'S ACT THIS 23 DAY OF SEPTEMBER 1996.

COUNTY SURVEYOR DEPUTY

STATE OF CALIFORNIA
EXPIRES:

LICENSED LAND SURVEYOR FRED L. NIELSEN STATE OF CALIFORNIA

NOTE REGARDING DERIVATION OF COORDINATES:

STATE PLANE COORDINATES BASED ON THE NORTH AMERICAN DATUM OF 1983 (1992), ZONE 4 WERE DETERMINED FOR THE BOUNDARY CORNERS USING GLOBAL POSITIONING SYSTEM (GPS) "FAST STATIC" SURVEYING TECHNIQUES. THESE COORDINATES WERE THEN SCALED BY A MEAN PROJECT COMBINATION FACTOR OF .999938023 TO PRODUCE "GROUND" COORDINATES. THE COORDINATES LISTED ARE THEREFORE NOT STATE PLANE COORDINATES. TO OBTAIN GRID DISTANCES, MULTIPLY THE GROUND DISTANCES BY THE MEAN PROJECT COMBINATION FACTOR. NO ROTATION WAS APPLIED WHEN THE STATE PLANE COORDINATES WERE SCALED, THEREFORE, THE BEARINGS SHOWN ARE GRID BEARINGS BASED ON THE LAMBERT PROJECTION FOR CALIFORNIA STATE PLANE ZONE 4.

BASIS OF BEARINGS:

THE BASIS OF BEARINGS FOR THIS SURVEY IS THE GRID BEARING OF N 37°05'40" E BETWEEN CALIFORNIA HIGH PRECISION GEODETIC NETWORK (HPGN) CONTROL POINTS "CA HPGN 05 13" AND "941 3450 H TIDAL". THE HORIZONTAL DATUM IS THE NORTH AMERICAN DATUM OF 1983 (1992). THE GRID BEARING IS BASED ON THE LAMBERT PROJECTION FOR CALIFORNIA STATE PLANE ZONE 4. THE COORDINATES FOR THE TWO CONTROL POINTS WERE ESTABLISHED BY THE CALIFORNIA DEPARTMENT OF TRANSPORTATION (CALTRANS) IN CONJUNCTION WITH THE NATIONAL GEODETIC SURVEY (NGS) IN 1992. THE BEARINGS FOR THIS SURVEY WERE ESTABLISHED USING GLOBAL POSITIONING SYSTEM (GPS) "FAST-STATIC" SURVEYING TECHNIQUES.

LEGEND

- ● DENOTES SET 1" IRON PIPE WITH PLASTIC PLUG "RCE 15310"
- ○ FOUND 1 1/2" IRON PIPE WITH BRASS DISK "R.C.E. 15310", UNLESS OTHERWISE NOTED.
- —+— DENOTES NOTHING SET.
- —— PROPERTY LINE
- (23) BOUNDARY CORNER NUMBER
- ALL DISTANCES ARE SHOWN IN FEET AND DECIMALS THEREOF.
- ( ) DENOTES RECORD INFORMATION PER LEGAL DESCRIPTION 05-MON-68-4.0/15.0 DATED MARCH 13, 1995.

RECORD OF SURVEY

BOUNDARY OF A 101.19 & 5.41 ACRE PARCEL
BEING A PORTION
OF FORT ORD MILITARY RESERVATION
IN
MONTEREY CITY LANDS TRACT No. 1
MONTEREY COUNTY, CALIFORNIA
FOR THE
YORK SCHOOL
BY

BESTOR ENGINEERS, INC.
CIVIL ENGINEERING – SURVEYING – LAND PLANNING
9701 BLUE LARKSPUR LANE, MONTEREY, CALIFORNIA 93940
SCALE: 1"=300' DATE: AUGUST 1996 WO: 5604
SHEET 1 OF 1

Legal Description of a 5.41 Acre Parcel
On the Former Fort Ord Military Reservation
(Designated as Parcel L3.1)

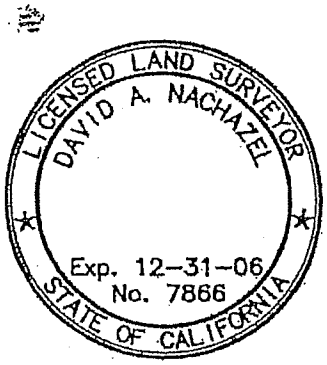
Certain real property situate in Monterey City Lands Tract No. 1, in the County of Monterey, State of California described as follows:

Parcel 1 as shown on that certain Record of Survey filed in Volume 20, Page 75 of Surveys in the office of the County Recorder of said county, more particularly described as follows:

Beginning at a 1 inch iron pipe with plastic plug stamped "RCE 15310" marking the most easterly corner of said Parcel 1; thence

1) South 78°00'03" West, 4,395.44 feet to a 6" x 8" granite monument marked "S-4, LS 8" marking the most westerly corner of said Parcel 1; thence
2) North 01°35'02" East, 1.93 feet to the beginning of a curve concave to the southeast having a radius of 80.00 feet; thence
3) Northeasterly 105.52 feet along said curve through a central angle of 75°34'11"; thence
4) North 77°09'13" East, 776.07 feet to the beginning of a curve concave to the south having a radius of 9,980.00 feet; thence
5) Easterly 326.82 feet along said curve through a central angle of 01°52'35"; thence
6) North 79°01'48" East, 1,738.80 feet to the beginning of a curve concave to the north having a radius of 15,020.00 feet; thence
7) Easterly 169.31 feet along said curve through a central angle of 00°38'45"; thence
8) North 78°23'02" East, 964.20 feet to the beginning of a curve concave to the south having a radius of 9,980.00 feet; thence
9) Easterly 201.84 feet along said curve through a central angle of 01°09'32"; thence
10) North 79°32'34" East, 36.34 feet to the beginning of a non-tangent curve concave to the north having a radius of 8,046.54 feet, and to which beginning a radial bears South 04°13'13" West; thence
11) Easterly 109.62 feet along said curve through a central angle of 00°46'50" to the **Point of Beginning.**

Containing 5.41 Acres, more or less.



Dated: March 22, 2005

Bestor Engineers, Inc.
David Nachazel
Licensed Surveyor #7866
State of California
Expires: 31 December 2006

L:\5604\docs\Parcel 1 Legal.doc

Legal Description of a 101.19 Acre Parcel
On the Former Fort Ord Military Reservation
(Designated as Parcel L3.2)

Certain real property situate in Monterey City Lands Tract No. 1, in the County of Monterey, State of California described as follows:

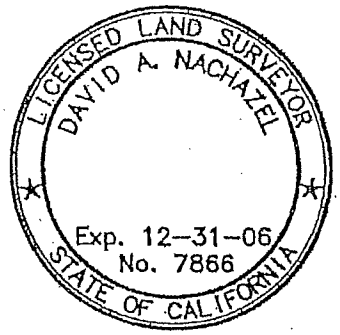
Parcel 2 as shown on that certain Record of Survey filed in Volume 20, Page 75 of Surveys in the office of the County Recorder of said county, more particularly described as follows:

Beginning at a 1 inch iron pipe with plastic plug stamped "RCE 15310" marking the most easterly corner of said Parcel 2, said point being the beginning of a non-tangent curve concave to the south having a radius of 10,020.00 feet, and to which beginning a radial bears North 11°04'42" West, said point also being on the northerly boundary of that certain 40 foot wide right-of-way of South Boundary Road as said right-of-way is shown and designated as Parcel 3 as per map filed in Volume 19, Page 122 of Surveys in the office of the County Recorder of said county; thence along said northerly boundary

1) Westerly, 94.05 feet through a central angle of 00°32'16"; thence
2) South 78°23'02" West, 964.20 feet feet to the beginning of a curve concave to the north having a radius of 14,980.00 feet; thence
3) Westerly, 168.86 feet along said curve through a central angle of 00°38'45"; thence
4) South 79°01'48" West, 1,738.80 feet feet to the beginning of a curve concave to the south having a radius of 10,020.00 feet; thence
5) Westerly, 328.13 feet along said curve through a central angle of 01°52'35"; thence
6) South 77°09'13" West, 207.00 feet feet to the beginning of a curve concave to the north having a radius of 560.00 feet; thence
7) Westerly, 472.84 feet along said curve through a central angle of 48°22'40"; thence
8) North 54°28'07" West, 166.62 feet feet to the beginning of a curve concave to the northeast having a radius of 580.00 feet; thence
9) Northwesterly, 70.67 feet along said curve through a central angle of 06°58'52"; thence
10) North 47°29'15" West, 187.31; thence
11) North 10°36'16" West, 1,921.46 feet feet to the beginning of a non-tangent curve concave to the south having a radius of 2,518.61 feet, and to which beginning a radial bears North 10°30'53" East; thence
12) Easterly, 700.18 feet along said curve through a central angle of 15°55'42"; thence
13) South 63°33'25" East, 1,184.91 feet feet to the beginning of a curve concave to the north having a radius of 8,046.54 feet; thence
14) Easterly, 2,970.74 feet along said curve through a central angle of 21°09'12" to the most easterly corner of said Parcel 2 and to the **Point of Beginning.**

Containing 101.19 Acres, more or less.

Dated: September 15, 2005



Bestor Engineers, Inc.
David Nachazel
Licensed Surveyor #7866
State of California
Expires: 31 December 2006

L:\5604\docs\Parcel 2 Legal.doc

SAND CITY PARCELS

PARCEL I

A PARCEL OF LAND IN THE CITY OF SAND CITY LOCATED WITHIN THE "MAP OF EAST MONTEREY, MONTEREY COUNTY, CA" BEGINNING AT THE MOST SOUTHERLY CORNER OF LOT 14 IN BLOCK 33 AS SHOWN ON THAT CERTAIN MAP ENTITLED "MAP OF EAST MONTEREY, MONTEREY COUNTY, CA., SURVEYED BY W.C. LITTLE," FILED FOR RECORD OCTOBER 18, 1887 IN THE OFFICE OF THE COUNTY RECORDER OF THE COUNTY OF MONTEREY, STATE OF CALIFORNIA IN VOLUME 1 OF MAPS, "CITIES AND TOWNS" AT PAGE 22, THENCE:

- NORTH 0°05'45" WEST, 271.91 FEET; THENCE
- NORTH 89°54'15" EAST, 50.00 FEET; THENCE
- NORTH 0°05'45" WEST, 50.00 FEET; THENCE
- NORTH 89°54'15" EAST, 50.00 FEET; THENCE
- NORTH 0°05'45" WEST, 149.82 FEET; THENCE
- NORTH 89°54'15" EAST, 300.00 FEET; THENCE
- SOUTH 0°05'45" EAST, 192.16 FEET TO THE NORTHERN RIGHT-OF-WAY LINE OF THE FORMER SOUTHERN PACIFIC RAILROAD (TAMC PROPERTY); THENCE
- ALONG SAID RIGHT-OF-WAY NORTH 55°02'51" EAST, 904.00 FEET MORE OR LESS TO THE INTERSECTION WITH THE SOUTHERN RIGHT-OF-WAY LINE OF REDWOOD AVENUE AS SHOWN ON SAID "MAP OF EAST MONTEREY"; THENCE
- SOUTH 34°57'09" EAST, 35.00 FEET; THENCE
- SOUTH 55°02'51" WEST, 1527.83 FEET MORE OR LESS TO A POINT WHICH IS SOUTH 34°57'09" EAST OF THE INTERSECTION OF THE NORTHERN RIGHT-OF-WAY LINE OF THE FORMER SOUTHERN PACIFIC RAILROAD (TAMC PROPERTY) AND THE NORTHERN RIGHT-OF-WAY LINE OF ORANGE AVENUE AS SHOWN ON SAID "MAP OF EAST MONTEREY"; THENCE
- NORTH 34°57'09" EAST, 35.00 FEET TO THE INTERSECTION OF SAID LINES; THENCE
- NORTH 55°02'51" EAST, 136.39 FEET TO THE POINT OF BEGINNING.

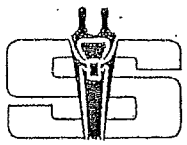
CONTAINING 3.88 ACRES MORE OR LESS.

PARCEL II

A PARCEL OF LAND IN THE CITY OF SAND CITY LOCATED WITHIN THE "MAP OF EAST MONTEREY, MONTEREY COUNTY, CA" AND THE "SEASIDE ADDITION TO THE MAP OF EAST MONTEREY, MONTEREY, CA" BEGINNING AT THE MOST WESTERLY CORNER OF LOT 1 IN BLOCK 40 AS SHOWN ON THAT CERTAIN MAP ENTITLED "MAP OF EAST MONTEREY, MONTEREY COUNTY, CA., SURVEYED BY W.C. LITTLE," FILED FOR RECORD OCTOBER 18, 1887 IN THE OFFICE OF THE COUNTY RECORDER OF THE COUNTY OF MONTEREY, STATE OF CALIFORNIA IN VOLUME 1 OF MAPS, "CITIES AND TOWNS" AT PAGE 22, THENCE:

- NORTH 0°17'58" WEST, 197.63 FEET TO THE INTERSECTION OF THE MOST EASTERLY LINE OF BLOCK 4 OF THE SEASIDE ADDITION; THENCE
- NORTH 31°36'14" WEST, 126.44 FEET; THENCE
- SOUTH 74°12'10" WEST, 106.54 FEET; THENCE
- NORTH 15°47'31" WEST, 163.92 FEET; THENCE
- NORTH 63°39'31" EAST, 24.52 FEET; THENCE
- NORTH 29°04'20" EAST, 42.40 FEET; THENCE
- SOUTH 60°55'40" EAST, 75.72 FEET; THENCE
- NORTH 66°23'15" EAST, 160.35 FEET; THENCE
- SOUTH 31°53'22" EAST, 227.98 FEET; THENCE
- NORTH 74°24'06" EAST, 115.97 FEET; THENCE
- SOUTH 15°35'54" EAST, 50.00 FEET; THENCE
- SOUTH 74°24'06" WEST, 101.20 FEET; THENCE
- SOUTH 32°12'24" EAST, 103.74 FEET TO THE NORTHERLY LINE OF BLOCK 4 AS SHOWN ON THE "MAP OF EAST MONTEREY"; THENCE
- SOUTH 74°34'15" WEST, 175.96 FEET; THENCE
- SOUTH 0°17'58" EAST, 125.00 FEET; THENCE
- NORTH 89°49'37" WEST, 75.21 FEET TO THE POINT OF BEGINNING.

CONTAINING 2.44 ACRES MORE OR LESS.



Sanctity of Contract

ESCROW OFFICE:
STEWART TITLE OF CALIFORNIA, INC
450 Lincoln, Suite 101
Salinas, California 93901
(831)424-0334/FAX (831)424-9867
www.stewartmonterey.com
Contact: CLARA BABER

STEWART TITLE OF CALIFORNIA, INC.

PRELIMINARY REPORT

PROPERTY ADDRESS:

1 MCCLURE WAY
SEASIDE, CA

OUR ORDER NO.: 01114905

REFERENCE NO: FT. ORD GOLF COURSES

In response to the above referenced application for a policy of title insurance, Stewart Title of California, Inc. hereby reports that is prepared to issue, or cause to be issued, as of the date hereof a Policy or Policies of Title Insurance describing the land at the estate or therein hereinafter set forth, insuring against loss which may be sustained by reason of any defect, lien or encumbrance not shown or referred to as an Exception in Schedule B or not excluded from coverage pursuant to the printed Schedules, Conditions, and Stipulations of said Policy forms.

The printed Exceptions and Exclusions from the coverage of said Policy or Policies are set forth in the attached list. Copies of the Policy forms should be read. They are available from the office which issued this report.

Please read the exceptions shown or referred to below and the exceptions and exclusions set forth in Exhibit B of this report carefully, The exceptions and exclusions are meant to provide you with notice of matters which are not covered under the terms of the title insurance policy and should be carefully considered.

It is important to note that this preliminary report is not written representation as to the condition of title and may not list all liens, defects, and encumbrances affecting title to the land.

THIS REPORT (AND ANY SUPPLEMENTS OR AMENDMENTS HERETO) IS ISSUED FOR THE PURPOSE OF FACILITATING THE ISSUANCE OF A POLICY OF TITLE INSURANCE AND NO LIABILITY IS ASSUMED HEREBY. IF IT IS DESIRED THAT LIABILITY BE ASSUMED PRIOR TO THE ISSUANCE OF A POLICY OF TITLE INSURANCE, A BINDER OR COMMITMENT SHOULD BE REQUESTED.

SCHEDULE A

Order No.: 01114905

Dated as of: August 02, 2001 at 7:30 A.M.

The form of policy of title insurance contemplated by this report is:

American Land Title Association Loan Policy

California Land Title Association Owners Policy

The estate or interest in the land hereinafter described or referred to covered by this report is:

A FEE AS TO PARCEL(S) 1, 2, AND 3 HEREIN DESCRIBED AND EASEMENT(S) MORE PARTICULARLY DESCRIBED AS TO PARCEL(S) 3A, 3B, 3C, 4, 5 AND 6

Title to said estate or interest at the date hereof is vested in:

THE CITY OF SEASIDE, a political subdivision of the State of California

The land referred to in this report is situated in the State of California, County of MONTEREY, in City of SEASIDE and is described as follows:

SEE LEGAL ATTACHMENT

LEGAL DESCRIPTION

Order No.: 01114905

The land referred to herein is situated in the State of California, County of MONTEREY, City of SEASIDE described as follows:

PARCEL 1:

CERTAIN REAL PROPERTY SITUATE IN RANCHO NOCHE BUENA, COUNTY OF MONTEREY, STATE OF CALIFORNIA, PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT AN ANGLE POINT ON THE NORTHWESTERLY BOUNDARY OF THAT CERTAIN 375.134 ACRE PARCEL (FORT ORD GOLF COURSES), AS SAID BOUNDARY AND PARCEL ARE SHOWN ON THAT CERTAIN RECORD OF SURVEY MAP FILED NOVEMBER 16, 1994 IN VOLUME 19 OF SURVEY MAPS, AT PAGE 21, RECORDS OF MONTEREY COUNTY, CALIFORNIA, SAID POINT ALSO BEING SHOWN AND DESIGNATED AS CORNER NUMBERED TWENTY-TWO (22) ON SAID MAP (HAVING COORDINATES: NORTHING = 2125520.43 AND EASTING = 5731464.95): THENCE ALONG SAID BOUNDARY

(1) N. 44° 39' 19" E. 1733.18 FEET; THENCE

(2) EASTERLY, 414.10 FEET ALONG THE ARC OF A TANGENT CURVE TO THE RIGHT HAVING A RADIUS OF 470.00 FEET, THROUGH A CENTRAL ANGLE OF 50° 28' 54"; THENCE TANGENTIALLY

(3) S. 84° 51' 47" E., 1476.58 FEET; THENCE

(4) NORTHEASTERLY, 468.31 FEET ALONG THE ARC OF A TANGENT CURVE TO THE LEFT HAVING A RADIUS OF 530.00 FEET, THROUGH A CENTRAL ANGLE OF 50° 37' 37"; THENCE TANGENTIALLY

(5) N. 44° 30' 36" E., 436.91 FEET TO THE MOST NORTHERLY CORNER OF SAID PARCEL; THENCE ALONG THE NORTHEASTERLY BOUNDARY OF SAID PARCEL

(6) S. 45° 29' 24" E., 82.00 FEET; THENCE

(7) S. 61° 45' 31" E., 311.38 FEET; THENCE

(8) S. 20° 21' 57" E., 41.35 FEET; THENCE

(9) S. 28° 46' 07" E., 98.84 FEET; THENCE

(10) S. 32° 16' 38" E., 220.10 FEET; THENCE

Continued on next page

STEWART TITLE
Guaranty Company

(11) S. 56° 17' 20" E., 103.07 FEET; THENCE

(12) S. 52° 37' 09" E., 174.13 FEET; THENCE

(13) S. 50° 36' 52" E., 376.85 FEET; THENCE

(14) S. 41° 44' 54" E., 311.38 FEET TO THE NORTHEASTERLY CORNER OF SAID PARCEL; THENCE ALONG THE EASTERLY BOUNDARY OF SAID PARCEL

(15) S. 23° 22' 44" W., 855.21 FEET; THENCE

(16) S. 09° 09' 39" E., 430.68 FEET; THENCE LEAVING SAID EASTERLY BOUNDARY

(17) S. 66° 45' 05" E., 79.92 FEET; THENCE

(18) S. 23° 14' 55" W., 1707.26 FEET TO THE NORTHEASTERLY CORNER OF THAT CERTAIN 40.092 ACRE PARCEL SHOWN AND DESIGNATED AS "PARCEL 3" ON THAT CERTAIN RECORD OF SURVEY MAP FILED NOVEMBER 18, 1994 IN VOLUME 19 OF SURVEYS, AT PAGE 22, RECORDS OF MONTEREY COUNTY, CALIFORNIA; THENCE ALONG THE NORTHERLY BOUNDARY THEREOF

(19) N. 79° 34' 35" W., (AT 77.60 FEET, A POINT ON SAID EASTERLY BOUNDARY OF SAID 375.134 ACRE PARCEL), 1025.59 FEET TO THE NORTHWESTERLY CORNER OF SAID PARCEL 3; THENCE ALONG THE COMMON BOUNDARY OF BOTH SAID PARCELS

(20) S. 23° 14' 55" W., (AT 1852.03 FEET, THE SOUTHEASTERLY CORNER OF SAID 375.134 ACRE PARCEL), 1897.43 FEET TO THE SOUTHWESTERLY CORNER OF SAID PARCEL 3; THENCE LEAVING THE BOUNDARY OF SAID PARCEL 3

(21) S. 23° 14' 55" W., 77.69 FEET; THENCE

(22) N. 87° 38' 15" W., 417.95 FEET; THENCE

(23) N. 02° 10' 44" W., 293.61 FEET; THENCE

(24) N. 41° 23' 40" W., 33.31 FEET TO AN ANGLE POINT ON THE SOUTHWESTERLY BOUNDARY OF SAID 375.13 ACRE PARCEL; THENCE ALONG

Continued on next page

SAID SOUTHWESTERLY BOUNDARY

(25) N. 41° 23' 40" W., 225.85 FEET; THENCE

(26) N. 54° 48' 21" W., 116.12 FEET; THENCE

(27) N. 70° 30' 41" W., 79.18 FEET; THENCE

(28) N. 52° 56' 22" W., 364.27 FEET; THENCE

(29) N. 48° 34' 36" W., 301.92 FEET; THENCE

(30) N. 01° 05' 39" W., 245.40 FEET; THENCE

(31) N. 00° 02' 24" W., 238.08 FEET; THENCE

(32) N. 08° 39' 13" W., 196.46 FEET; THENCE

(33) N. 10° 58' 04" W., 239.05 FEET; THENCE

(34) N. 14° 02' 58" W., 479.24 FEET; THENCE

(35) N. 25° 14' 12" W., 188.26 FEET; THENCE

(36) N. 45° 42' 30" W., 230.28 FEET; THENCE

(37) N. 57° 01' 36" W., 147.39 FEET; THENCE

(38) N. 74° 45' 09" W., 263.40 FEET; THENCE

(39) N. 08° 25' 05" W., 475.89 FEET; THENCE

(40) N. 12° 55' 30" E., 35.88 FEET; THENCE

(41) N. 22° 53' 19" W., 544.56 FEET TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM THAT PORTION OF SAID LAND MORE PARTICULARLY DESCRIBED AS FOLLOWS:

CERTAIN REAL PROPERTY SITUATE IN RANCHO NOCHE BUENA, COUNTY OF MONTEREY, STATE OF CALIFORNIA, PARTICULARLY DESCRIBED AS FOLLOWS:

Continued on next page

COMMENCING AT THE MOST NORTHERLY CORNER OF THAT CERTAIN 375.134 ACRE PARCEL, AS SAID CORNER AND PARCEL ARE SHOWN ON THAT CERTAIN RECORD OF SURVEY MAP FILED NOVEMBER 16, 1994 IN VOLUME 19 OF SURVEYS, AT PAGE 21, RECORDS OF MONTEREY COUNTY, CALIFORNIA, SAID CORNER ALSO BEING DESIGNATED AS CORNER NUMBERED TWENTY-SEVEN (27) AND BEARS N. 44° 30' 36" E., 436.91 FEET; DISTANT FROM CORNER NUMBERED TWENTY-SIX (26), AS SHOWN ON SAID MAP; THENCE

(A) S. 24° 11' 58" W., 1410.85 FEET TO THE TRUE POINT OF BEGINNING; THENCE

(1) S. 59° 00' 00" E., 270.00 FEET; THENCE

(2) S. 31° 00' 00" W., 350.00 FEET; THENCE

(3) N. 59° 00' 00" W., 270.00 FEET; THENCE

(4) N. 31° 00' 00" E., 350.00 FEET TO THE TRUE POINT OF BEGINNING.

EXCEPTING THEREFROM ALL WATER RIGHTS TO POTABLE WATER DERIVED FROM THE SALINAS AQUIFER, AS SET FORTH IN THE DEED RECORDED JANUARY 15, 1997 IN REEL 3468, PAGE 1515, OFFICIAL RECORDS.

PARCEL 2:

CERTAIN REAL PROPERTY SITUATE IN RANCHO NOCHE BUENA, COUNTY OF MONTEREY, STATE OF CALIFORNIA, PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT A GRANITE MONUMENT MARKED "NB4A", BEING AN ANGLE POINT ON THE SOUTHWESTERLY BOUNDARY OF THAT CERTAIN PARCEL 1 OF THE FORT ORD MILITARY RESERVATION AS SAID PARCEL 1 IS SHOWN ON THAT CERTAIN RECORD OF SURVEY MAP FILED SEPTEMBER 7, 1994 IN VOLUME 19 OF SURVEY MAPS, AT PAGE 1, RECORDS OF MONTEREY COUNTY, CALIFORNIA (HAVING COORDINATES: NORTHING = 2121541.64 AND EASTING = 5734939.34); THENCE

(A) N. 66° 43'46' W., 3957.11 FEET TO THE TRUE POINT OF BEGINNING (HAVING COORDINATES: NORTHING = 2123104.99 AND EASTING

Continued on next page

(= 5731304.14); THENCE

(1) S. 77° 49' 37" W., 11.76 FEET; THENCE

(2) SOUTHWESTERLY, 145.91 FEET ALONG THE ARC OF A TANGENT CURVE TO THE LEFT HAVING A RADIUS OF 85.00 FEET, THROUGH A CENTRAL ANGLE OF 98° 21' 00"; THENCE TANGENTIALLY

(3) S. 20° 31' 23" E., 32.81 FEET; THENCE

(4) S. 55° 53' 55" W., 57.43; THENCE

(5) NORTHWESTERLY 174.74 FEET ALONG THE ARC OF A TANGENT CURVE TO THE RIGHT HAVING A RADIUS OF 220.00 FEET, THROUGH A CENTRAL ANGLE OF 45° 30' 32"; THENCE TANGENTIALLY

(6) N. 78° 35' 33" W., 90.16 FEET; THENCE

(7) N. 11° 46' 00" E., 271.23 FEET; THENCE

(8) NORTHEASTERLY , 48.21 FEET ALONG THE ARC OF A TANGENT CURVE TO THE RIGHT HAVING A RADIUS OF 30.00 FEET, THROUGH A CENTRAL ANGLE OF 92° 04' 19"; THENCE TANGENTIALLY

(9) S. 76° 09' 41" E., 182.36 FEET; THENCE

(10) SOUTHEASTERLY, 109.41 FEET ALONG THE ARC OF A TANGENT CURVE TO THE RIGHT HAVING A RADIUS OF 220.00 FEET, THROUGH A CENTRAL ANGLE OF 28° 29' 38" TO THE CURVE POINT OF BEGINNING. AND BEING A PORTION OF SAID PARCEL 1.

EXCEPTING THEREFROM ALL WATER RIGHTS TO POTABLE WATER DERIVED FROM THE SALINAS AQUIFER, AS SET FORTH IN THE DEED RECORDED JANUARY 15, 1997 IN REEL 3468, PAGE 1515, OFFICIAL RECORDS.

PARCEL 3:

CERTAIN REAL PROPERTY SITUATE IN MONTEREY CITY LANDS TRACT NO. 1, COUNTY OF MONTEREY, STATE OF CALIFORNIA, PARTICULARLY DESCRIBED AS FOLLOWS:

Continued on next page

COMMENCING AT A GRANITE MONUMENT MARKED "NB4A", BEING AN ANGLE POINT ON THE SOUTHWESTERLY BOUNDARY OF THAT CERTAIN PARCEL 1 OF THE FORT ORD MILITARY RESERVATION AS SAID PARCEL 1 IS SHOWN ON THAT CERTAIN RECORD OF SURVEY MAP FILED SEPTEMBER 7, 1994 IN VOLUME 19 OF SURVEY MAPS, AT PAGE 1, RECORDS OF MONTEREY COUNTY, CALIFORNIA (HAVING COORDINATES: NORTHING = 2121541.64 AND EASTING = 5734939.34); THENCE

(A) N. 65° 14' 42" E., 1172.01 FEET TO THE TRUE POINT OF BEGINNING (HAVING COORDINATES: NORTHING = 2122032.41 AND EASTING (= 5736003.65); THENCE

(1) N. 23° 20' 00" E., (AT 207.55 FEET, A POINT HEREINAFTER REFERRED TO AS "POINT A"; AT 293.18 FEET, A POINT HEREINAFTER REFERRED TO AS "POINT B") 300 FEET; THENCE

(2) S. 66° 40' 00" E., (AT 118.91 FEET, A POINT HEREINAFTER REFERRED TO AS "POINT C"; AT 149.02 FEET, A POINT HEREINAFTER REFERRED TO AS "POINT D"), 300.00 FEET; THENCE

(3) S. 23° 20' 00" W., (AT 24.05 FEET, A POINT HEREINAFTER REFERRED TO AS "POINT D", AT 55.76 FEET, A POINT HEREINAFTER REFERRED TO AS "POINT E"), 300.00 FEET; THENCE

(4) N. 66° 40' 00" 300.00 FEET TO THE TRUE POINT OF BEGINNING AND BEING A PORTION OF SAID PARCEL 1.

EXCEPTING THEREFROM ALL WATER RIGHTS TO POTABLE WATER DERIVED FROM THE SALINAS AQUIFER, AS SET FORTH IN THE DEED RECORDED JANUARY 15, 1997 IN REEL 3468, PAGE 1515, OFFICIAL RECORDS.

PARCEL 3A:

TOGETHER WITH A 70 FOOT-WIDE EASEMENT FOR WATER LINE PURPOSES OVER THE FOLLOWING DESCRIBED PARCEL.

BEGINNING AT HEREINABOVE DESCRIBED "POINT A"; THENCE

(1) N. 31° 30' 00" W., 874.03 FEET; THENCE

(2) N. 70° 00' 00" W., 120.92 FEET TO A POINT ON THE

Continued on next page

SOUTHEASTERLY BOUNDARY OF THAT CERTAIN 40.092 ACRE PARCEL SHOWN AND DESIGNATED AS "PARCEL 3 (FITCH SCHOOL)" ON THAT CERTAIN RECORD OF SURVEY MAP FILED NOVEMBER 14, 1994 IN VOLUME 19 OF SURVEY MAPS, AT PAGE 22, RECORDS OF MONTEREY COUNTY, CALIFORNIA, AS SAID POINT BEARS (ALONG SAID BOUNDARY) S. 23° 14' 55" W., 278.82 FEET DISTANT FROM THE MOST EASTERLY CORNER OF SAID PARCEL 3; THENCE ALONG SAID BOUNDARY

(3) N. 23° 14' 55" E., 70.11 FEET; THENCE LEAVING SAID BOUNDARY

(4) S. 70° 00' 00" E., 141.39 FEET; THENCE

(5) S. 31° 30' 00" E., 849.15 FEET TO HEREINABOVE DESCRIBED "POINT B"; THENCE

(6) S. 23° 20' 00" W., 85.63 FEET TO THE POINT OF BEGINNING.

PARCEL 3B:

AND TOGETHER WITH A 30 FOOT-WIDE EASEMENT FOR OVERFLOW PIPE PURPOSES OVER THE FOLLOWING DESCRIBED PARCEL:

BEGINNING AT HEREINABOVE DESCRIBED "POINT C"; THENCE

(1) N. 28° 11' 00" E., 112.29 FEET; THENCE

(2) S. 61° 49' 00" E., 30.00 FEET; THENCE

(3) S. 28° 11' 00" W., 109.74 FEET TO A POINT HEREINABOVE DESCRIBED AS "POINT D"; THENCE

(4) N. 66° 40' 00" W., 30.11 FEET TO THE POINT OF BEGINNING.

PARCEL 3C:

TOGETHER WITH A 30 FOOT-WIDE EASEMENT FOR ROAD PURPOSES OVER THE FOLLOWING DESCRIBED PARCEL:

BEGINNING AT HEREINABOVE DESCRIBED "POINT E"; THENCE

Continued on next page

(1) S. 47° 45' 00" E., 85.80 FEET; THENCE

(2) S. 43° 45' 00" E., 219.42 FEET; THENCE

(3) S. 56° 00' 00" W., 30.44 FEET; THENCE

(4) N. 43° 45' 00" W., 213.22 FEET; THENCE

(5) N. 47° 45' 00" W., 74.47 FEET TO HEREINABOVE DESCRIBED "POINT F"; THENCE

(6) N. 23° 20' 00" E., 31.71 FEET TO THE POINT OF BEGINNING.

PARCEL 4:

AN EASEMENT FOR ROAD AND UTILITY PURPOSES BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A GRANITE MONUMENT MARKER "NB4A", BEING AN ANGLE POINT ON THE SOUTHWESTERLY BOUNDARY OF THAT CERTAIN PARCEL 1 OF THE FORT ORD MILITARY RESERVATION AS SAID PARCEL 1 IS SHOWN ON THAT CERTAIN RECORD OF SURVEY MAP FILED SEPTEMBER 7, 1994 IN VOLUME 19 OF SURVEY MAPS, AT PAGE 1, RECORDS OF MONTEREY COUNTY, CALIFORNIA (HAVING COORDINATES: NORTHING EQUALS 2121541.64 AND EASTING EQUALS 5734939.34); THENCE

(1) N. 87° 38' 15" W., 2620.44 FEET; THENCE LEAVING SAID BOUNDARY,

(2) N. 34° 09' 07" W., 1118.93 FEET; THENCE

(3) N. 55° 50' 53" E., 62.65 FEET; THENCE

(4) S. 33° 54' 04" E., 759.29 FEET; THENCE

(5) S. 40° 09' 33" E., 114.92 FEET; THENCE

(6) S. 48° 11' 17" E., 206.18 FEET; THENCE

(7) SOUTHEASTERLY, 179.02 FEET ALONG THE ARC OF A TANGENT CURVE TO THE LEFT HAVE A RADIUS OF 260.00 FEET, THROUGH A CENTRAL

Continued on next page

ANGLE OF 39° 26' 58" THENCE TANGENTIALLY

(8) S. 87° 38' 15" E., 1279.68 FEET; THENCE

(9) N. 23° 14' 55" E., 77.69 FEET TO THE MOST WESTERLY CORNER OF THAT CERTAIN 40.092 ACRE PARCEL SHOWN AND DESIGNATED AS PARCEL 3 (FITCH SCHOOL) ON THAT CERTAIN RECORD OF SURVEY MAP FILED NOVEMBER 16, 1994 IN VOLUME 19 OF SURVEY MAPS, AT PAGE 22, RECORDS OF MONTEREY COUNTY, CALIFORNIA; THENCE ALONG THE SOUTHERLY AND EASTERLY BOUNDARY OF SAID 40.092 ACRE PARCEL,

(10) S. 87° 38' 15" E., 429.80 FEET; THENCE

(11) NORTHEASTERLY 1121.83 FEET ALONG THE ARC OF A TANGENT CURVE TO THE LEFT HAVING A RADIUS OF 930.00 FEET, THROUGH A CENTRAL ANGLE OF 69° 06' 50"; THENCE LEAVING LAST SAID BOUNDARY,

(12) S. 19° 26' 42" W., 753.69 FEET TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM ALL WATER RIGHT TO POTABLE WATER DERIVED FROM THE SALINAS AQUIFER, AS SET FORTH IN THE DEED RECORDED JANUARY 15, 1997 IN REEL 3468, PAGE 1515, OFFICIAL RECORDS.

PARCEL 5:

AN EASEMENT FOR ROAD AND UTILITY PURPOSES BEGIN MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT AN ANGLE POINT ON THE NORTHWESTERLY BOUNDARY OF THAT CERTAIN 375.134 ACRE PARCEL (FORT ORD GOLF COURSES), AS SAID BOUNDARY AND PARCEL ARE SHOWN ON THAT CERTAIN RECORD OF SURVEY MAP FILED NOVEMBER 16, 1994 IN VOLUME 19 OF SURVEY MAPS, AT PAGE 21, RECORDS OF MONTEREY COUNTY, CALIFORNIA, SAID POINT ALSO BEING SHOWN AND DESIGNATED AS CORNER NUMBERED TWENTY-TWO (22) ON SAID MAP (HAVING COORDINATES: NORTHING EQUALS 2125520.43 AND EASTING EQUALS 5731464.95); THENCE ALONG SAID BOUNDARY,

(1) N. 44° 39' 19" E., 1733.18 FEET; THENCE

(2) EASTERLY, 414.10 FEET ALONG THE ARC OF A TANGENT CURVE TO

Continued on next page

THE RIGHT HAVE A RADIUS OF 470.00 FEET, THROUGH A CENTRAL ANGLE OF 50° 28′ 54"; THENCE TANGENTIALLY

(3) S. 84° 51′ 47" E., 1476.58 FEET; THENCE

(4) NORTHEASTERLY, 468.31 FEET ALONG THE ARC OF A TANGENT CURVE TO THE LEFT HAVING A RADIUS OF 530.00 FEET, THROUGH A CENTRAL ANGLE OF 50° 37′ 37"; THENCE TANGENTIALLY

(5) N. 44° 30′ 36" E., (AT 436.91 FEET, LEAVING SAID BOUNDARY) 1214.31 FEET; THENCE

(6) N. 52° 45′ 18" W., 60.49 FEET; THENCE

(7) S. 44° 30′ 36" W., 1206.66 FEET; THENCE

(8) WESTERLY, 415.30 FEET ALONG THE ARC OF A TANGENT CURVE TO THE RIGHT HAVING A RADIUS OF 470.00 FEET, THROUGH A CENTRAL ANGLE OF 50° 37′ 37"; THENCE TANGENTIALLY

(9) N. 84° 51′ 47" W., 1476.58 FEET; THENCE

(10) SOUTHWESTERLY, 466.97 FEET ALONG THE ARC OF A TANGENT CURVE TO THE LEFT HAVING A RADIUS OF 530.00 FEET, THROUGH A CENTAL ANGLE OF 50° 28′ 54"′ THENCE TANGENTIALLY

(11) S. 44° 39′ 19" W., 2088.27 FEET; THENCE

(12) SOUTHWESTERLY, 153.84 FEET ALONG THE ARC OF A TANGENT CURVE TO THE RIGHT HAVING A RADIUS OF 4770.00 FEET, THROUGH A CENTRAL ANGLE OF 18° 45′ 16"; THENCE TANGENTIALLY

(13) S. 63° 24′ 35" W., 649.45 FEET; THENCE

(14) SOUTHWESTERLY, 167.68 FEET ALONG THE ARC OF A TANGENT CURVE TO THE LEFT HAVING A RADIUS OF 1830.00 FEET, THROUGH A CENTRAL ANGLE OF 05° 15′ 00"; THENCE TANGENTIALLY

(15) S. 58° 09′ 35" W., 39.73 FEET; THENCE

(16) S. 57° 59′ 07" W., 255.83 FEET; THENCE

Continued on next page

(17) SOUTHWESTERLY, 257.69 FEET ALONG THE ARC OF A NON-TANGENT CURVE TO THE RIGHT HAVING A RADIUS OF 570.00 FEET WHOSE CENTER BEARS N. 32° 03' 19" W., THROUGH A CENTRAL ANGLE OF 25° 54' 09"; THENCE TANGENTIALLY

(18) S. 83° 50' 50" W., 173.72 FEET; THENCE

(19) SOUTHWESTERLY, 336.66 FEET ALONG THE ARC OF A TANGENT CURVE TO THE LEFT HAVING A RADIUS OF 605.00 FEET, THROUGH A CENTRAL ANGLE OF 31° 52' 59"; THENCE NON-TANGENTIALLY

(20) S. 39° 02' 05" W., 48.88 FEET; THENCE

(21) SOUTHWESTERLY, 235.98 FEET ALONG THE ARC OF A NON-TANGENT CURVE TO THE LEFT HAVING A RADIUS OF 620.04 FEET WHOSE CENTER BEARS S. 42° 02' 56" E., THROUGH A CENTRAL ANGLE OF 21° 48' 23"; THENCE NON-TANGENTIALLY

(22) S. 48° 10' 09" W., 16.00 FEET; THENCE

(23) S. 04° 07' 13" W., 16.00 FEET; THENCE

(24) S. 26° 08' 41" W., 1035.15 FEET; THENCE

(25) SOUTHWESTERLY, 213.21 FEET ALONG THE ARC OF A TANGENT CURVE TO THE RIGHT HAVING A RADIUS OF 680.04 FEET, THROUGH A CENTRAL ANGLE OF 17° 57' 48"; THENCE TANGENTIALLY

(26) S. 44° 06' 29" W., 255.19 FEET; THENCE

(27) SOUTHWESTERLY 255.41 FEET ALONG THE ARC OF A TANGENT CURVE TO THE LEFT HAVING A RADIUS OF 820.05 FEET, THROUGH A CENTRAL ANGLE OF 17° 50' 43"; THENCE TANGENTIALLY

(28) S. 26° 15' 46" W., 187.90 FEET; THENCE

(29) S. 03° 01' 44" W., 367.64 FEET TO AN ANGLE POINT ON THE SOUTHWESTERLY BOUNDARY OF THAT CERTAIN PARCEL 1, AS SAID BOUNDARY AND PARCEL ARE SHOWN ON THAT CERTAIN RECORD OF SURVEY MAP FILED SEPTEMBER 7, 1994 IN VOLUME 19 OF SURVEYS, AT PAGE 1, RECORDS OF MONTEREY COUNTY, CALIFORNIA, SAID POINT ALSO BEING SHOWN AND DESIGNATED AS CORNER NUMBERED THREE HUNDRED TWENTY-SIX

Continued on next page

(326) ON SAID MAP; THENCE ALONG SAID BOUNDARY,

(30) N. 31° 41′ 48" E., 182.78 FEET; THENCE

(31) N. 08° 14′ 06" E., 113.99 FEET; THENCE

(32) S. 88° 09′ 44" E., 49.74 FEET; THENCE

(33) N. 01° 50′ 16" E., 60.00 FEET; THENCE

(34) N. 69° 37′ 11" W., 47.18 FEET; THENCE

(35) N. 04° 32′ 55" E., 45.01 FEET; THENCE

(36) N. 18° 23′ 45" E., 133.46 FEET; THENCE

(37) N. 39° 37′ 46" E., 233.97 FEET; THENCE

(38) N. 32° 49′ 26" E., 152.97 FEET; THENCE

(39) N. 48° 49′ 46" E., 154.06 FEET; THENCE

(40) N. 35° 27′ 17" E., 106.34 FEET; THENCE

(41) N. 28° 43′ 45" E., 404.39 FEET; THENCE

(42) N. 23° 49′ 01" E., 35.65 FEET; THENCE LEAVING LAST SAID BOUNDARY,

(43) N. 63° 51′ 19" W., 19.64 FEET; THENCE

(44) N. 26° 08′ 41" E., 693.51 FEET; THENCE

(45) NORTHEASTERLY, 217.71 FEET ALONG THE ARC OF A TANGENT CURVE TO THE RIGHT HAVING A RADIUS OF 560.04 FEET, THROUGH A CENTRAL ANGLE OF 22° 16′ 23"; THENCE NON-TANGENTIALLY

(46) N. 39° 02′ 05" E., 46.70 FEET; THENCE

(47) NORTHEASTERLY, 296.65 FEET ALONG THE ARC OF A NON-TANGENT CURVE TO THE RIGHT HAVE A RADIUS OF 545.00 FEET WHOSE CENTER BEARS S. 37° 20′ 22" E., THROUGH A CENTRAL ANGLE OF 31° 11′ 12";

Continued on next page

THENCE TANGENTIALLY

(48) N. 83° 50' 50" E., 173.72 FEET; THENCE

(49) NORTHEASTERLY, 284.81 FEET ALONG THE ARC OF A TANGENT CURVE TO THE LEFT HAVING A RADIUS OF 630.00 FEET; THROUGH A CENTRAL ANGLE OF 25° 54' 09"; THENCE NON-TANGENTIALLY

(50) N. 57° 59' 07" E., 255.69 FEET; THENCE

(51) N. 58° 09' 35" E., 39.64 FEET; THENCE

(52) NORTHEASTERLY, 162.18 FEET ALONG THE ARC OF A TANGENT CURVE TO THE RIGHT HAVING A RADIUS OF 1770.00 FEET THROUGH A CENTRAL ANGLE OF 05° 15' 00"; THENCE TANGENTIALLY

(53) N. 63° 24' 35" E., 649.45 FEET; THENCE

(54) NORTHEASTERLY, 173.48 FEET ALONG THE ARC OF A TANGENT CURVE TO THE LEFT HAVING A RADIUS OF 530.00 FEET, THROUGH A CENTRAL ANGLE OF 18° 45' 16"; THENCE TANGENTIALLY

(55) N. 44° 39' 19" E., 355.09 FEET TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM ALL WATER RIGHTS TO POTABLE WATER DERIVED FROM THE SALINAS AQUIFER, AS SET FORTH IN THE DEED RECORDED JANUARY 15, 1997 IN REEL 3468, PAGE 1515, OFFICIAL RECORDS.

PARCEL 6:

A NON-EXCLUSIVE EASEMENT VARIOUSLY 12 AND 10 FEET IN WIDTH FOR THE OPERATION, MAINTENANCE, REPAIR AND REPLACEMENT OF INFRASTRUCTURE PERTAINING TO NON-POTABLE IRRIGATION SYSTEM AS CREATED BY AND UNDER THE TERMS OF THE QUITCLAIM DEED FOR TRANSFER OF BAYONET AND BLACK HORSE GOLF COURSES TO THE CITY OF SEASIDE, CALIFORNIA, RECORDED JANUARY 15, 1997 IN REEL 3468, PAGE 1515, OFFICIAL RECORDS OVER THROUGH OR UNDER "HAYES PARK", AS DEPICTED BY DASHED LINES ON THE FINAL PAGE OF EXHIBIT A OF SAID DEED AND AS REFERENCED IN THE SECOND PARAGRAPH OF THAT CERTAIN DOCUMENT ENTITLED NOTICE RECORDED JANUARY 15, 1997 IN REEL 3468, PAGE 1507, OFFICIAL RECORDS.

Continued on next page

LEGAL DESCRIPTION - continued
Order No.:01114905

A.P.N.: 031-051-005

SCHEDULE B

At the date hereof, exceptions to coverage in addition to the printed exceptions and exclusions in a Policy of Title Insurance are as follows:

1. 2001/2002 General Taxes are exempt.

2. Unsecured Taxes assessed to BSL Golf of California, Assessment No: 800-024-360, Assessor's Parcel No. 031-051-005 due in one installment of $1,100.00 on August 31, 2001.
   Affects: Leasehold interest.

3. Unsecured Taxes assessed to BSL Golf of California, Assessment No: 860-002-438, Assessor's Parcel No. 031-051-005 due in one installment of $116,238.98.
   Affects: Leasehold interest.

4. The lien of supplemental taxes, if any, assessed pursuant to the provisions of Chapter 3.5 (commencing with Section 75) of the Revenue and Taxation Code of the State of California.

5. Premises may lie within the boundaries of the Monterey Regional Water Pollution Control Agency and may be subject to assessments and obligations therein. Verification of current status should be made prior to the close of this transaction. Phone No.: (831) 372-2385

6. A non-exclusive easement for public utilities, subject to the conditions contained therein, granted to Coalinga Oil Transportation Company, recorded December 29, 1904 in Volume 82 of Deeds, at page 292, Official Records.

   NOTE: Said easement can not be located from information set forth in said document.

7. Easement for public utilities, sewer lines, gas pipelines, wells, roads, electrical pole lines and wires, subject to the conditions contained therein, and incidents thereto reserved by David J. Jacks Corporation, a corporation, in deed recorded August 21, 1917 in Book 151, of Deeds, page 140.
   Affects: Those portions of said land as described therein.

   Said easements were quitclaimed to the United States of America by Deed recorded October 3, 1940 in Book 692 at Page 10, Official Records.

8. Terms and conditions as contained in the Deed executed by David J. Jacks Corporation, a corporation, to the United States of America, recorded August 21, 1917 in Book 151 of Deeds at page 140.
   Affects: Said land and other property.

9. Easement for electrical pole lines and wires, and road purposes, subject to the conditions contained therein, and incidents

Continued on next page

thereto granted to Coast Valley Gas & Electric Company, a California corporation, by deed recorded July 26, 1924 in Book 39, of Official Records, page 490, and as delineated on that certain Record of Survey Map filed in the Office of the Recorder of the County of Monterey, State of California, on September 7, 1994 in Volume 19 of Surveys, at Page 1, and corrected by Certificate of Correction thereto recorded October 21, 1994 in Reel 3163 at Page 1216, Official Records.
Affects: Those portions of said land as described therein.

Modification of said easements thereunder recorded February 11, 1931 in Book 280 at page 127, Official Records.

Amendment to said easements thereunder recorded October 24, 1954 in Book 1562 at page 81, Official Records.

10. Easement for water pipeline, subject to the conditions contained therein, and incidents thereto granted to Likins-Foster Ord Corp., a corporation, by deed recorded February 13, 1951 in Book 1281, of Official Records, page 1, and as delineated on that certain Record of Survey Map filed in the Office of the Recorder of the County of Monterey, State of California, on September 7, 1994 in Volume 19 of Surveys, at Page 1, and corrected by Certificate of Correction thereto recorded October 21, 1994 in Reel 3163 at Page 1216, Official Records.
Affects: Said land as described therein.

11. Easement for gas and water pipelines and public utility pole lines, subject to the conditions contained therein, and incidents thereto granted to the Pacific Gas and Electric Company, a corporation, by deed recorded November 17, 1972 in Reel 810, of Official Records, page 669, and as delineated on that certain Record of Survey Map filed in the Office of the Recorder of the County of Monterey, State of California, on September 7, 1994 in Volume 19 of Surveys, at Page 1, and corrected by Certificate of Correction thereto recorded October 21, 1994 in Reel 3163 at Page 1216, Official Records.
Affects: Those strips of land as described therein lying with said land.

12. Terms and conditions as contained in the Department of the Army License for ingress and egress over established roads on former Fort Ord, Monterey County, California, open to the public to allow public access to the property known as Bayonet and Black

Continued on next page

Horse Golf Course, executed by Marvin D. Fisher, Chief, Real Estate Division, Sacramento District, on behalf of the Secretary of the Army, to the City of Seaside, a political subdivision of the State of California, recorded January 15, 1997 in Reel 3468 at Page 1508, Official Records.

NOTE: No description of said roads is described in said license.

13. Terms and conditions as contained in a Quitclaim Deed for Transfer of Bayonet and Black Horse Golf Courses to the City of Seaside, California, which sets forth, among other things, reservations and easements for infrastructures for irrigation system, water pipelines, public utilities and road access, and references to asbestos, lead-based paint, unexploded ordnance, hazardous materials and toxic substances, executed by the United States of America, acting by and through the Secretary of the Army, to the City of Seaside, a political subdivision of the State of California, recorded January 15, 1997 in Reel 3468 at Page 1515, Official Records.

14. Terms and conditions as contained in an unrecorded Lease dated January 15, 1997 executed by and between the City of Seaside, a municipal corporation, as Lessor, and BSL Golf of California, Inc., a California corporation, as Lessee, for a term of 30 years commencing on January 15, 1997 and ending on January 14, 2027, subject to extension for up to two 5-year Option Terms, as disclosed by a Memorandum of Commencement Date, recorded January 15, 1997 in Reel 3468 at Page 1575, Official Records.

15. A financing statement filed in the office of the County Recorder showing:
Debtor: BSL Golf of California, Inc., a California corporation
Secured Party: Wells Fargo Bank, National Association
Additional Secured Party: Reliance Trust Company
Recorded January 15, 1997 in Reel 3469, of Official Records of Monterey County, page 47.

16. A financing statement filed in the office of the County Recorder showing:
Debtor: BSL Golf of California, Inc., a California corporation
Secured Party: Wells Fargo Bank, National Association

Continued on next page

Recorded January 15, 1997 in Reel 3469, of Official Records of Monterey County, page 101, and Re-recorded February 10, 1997 in Reel 3479 at page 163, Official Records.

Amendment thereunder recorded June 26, 1998 as Recorder's Serial No. 9841729, Official Records.

17. Terms and conditions as contained in the Department of the Army Easement for Electric Power and for Natural Gas Pipeline Right-of-Way Located on Presidio of Monterey Annex and Certain Excess Lands Formerly Designated as Fort Ord Military Installation, Monterey, California, executed by and between the United States of America, through the Secretary of the Army, as Grantor, and Pacific Gas and Electric Company, a California corporation, as Grantee, recorded April 17, 1997 in Reel 3506 at page 1533, Official Records.

Affects: Those strips of land as described therein lying within said land.

Notice of Final Description for Easement executed by Pacific Gas and Electric Company, recorded September 9, 1997 as Recorder's Serial No. 9751897, Official Records.

Correction Deed thereunder executed by Pacific Gas and Electric Company, a California corporation, recorded October 1, 1997 as Recorder's Serial No. 9756845, Official Records.

Affects: Those strips of land as described therein lying within said land.

18. Deed of Trust to secure payment of $15,000,000.00, and any other amounts secured thereby, dated May 15, 1998, recorded June 16, 1998 as Recorder's Serial No. 9841732, of Official Records of Monterey County

Trustor	:	BSL Golf of California, Inc., a California Corporation
Trustee	:	American Securities Company, a corporation
Beneficiary	:	Wells Fargo Bank, National Association
Loan No.	:	not shown

Terms and conditions as contained in a Consent by Lessor of Real Property executed by and between Wells Fargo Bank, National Association, as Bank, the City of Seaside, as Lessor, and BSL

Continued on next page

Golf of California, Inc., a California corporation, as Lessee, recorded June 26, 1998 as Recorder's Serial No. 9841733, Official Records.

19. Terms and conditions as contained in an unrecorded Option Agreement dated November 24, 1997, executed by and between BSL Golf of California, Inc., a California corporation, and the Firefighters' Pension & Relief Fund for the City of New Orleans, a disclosed by a Memorandum of Option Agreement recorded November 26, 1997 as Recorder's Serial No. 9770629, Official Records.

Said Option Agreement was subordinated to the lien of the Deed of Trust shown as Exception No. 18 herein by Subordination Agreement recorded June 26, 1998 as Recorder's Serial No. 9841731, Official Records.

NOTES:

NOTE 1:
This report is preparatory to the issuance of an ALTA Loan Policy of Title Insurance. We have no knowledge of any fact which would preclude the issuance of said ALTA Loan Policy with Endorsements 100 and 116 attached.

The Property Address of said land herein is known as:

1 MCCLURE WAY
SEASIDE, CA

NOTE 2:
No conveyances affecting the herein described real property have been recorded in the two years preceding the date of this report.

NOTE 3:
Short Term Rate applicable:
YES

NOTE 4:
California "Good Funds" Law

Effective January 1, 1990, California Insurance Code Section 12413.1 (Chapter 598, Statutes of 1989) prohibits a title insurance company, controlled escrow company, or underwritten title company from disbursing funds from an escrow or

Continued on next page

SCHEDULE "B" CONTINUED:
Order No. 01114905

NOTE (Continued):
sub-escrow account, (except for funds deposited by WIRE TRANSFER or ELECTRONIC PAYMENT) until the day those funds are made available to the depositor pursuant to Part 229 of Title 12 of the Code of Federal Regulations, (REG.CC). Items such as CASHIER'S, CERTIFIED OR TELLERS CHECKS may by available for disbursement on the business day following the business day of deposit, however, other forms of deposits may cause extended delays in closing the escrow or sub-escrow.

STEWART TITLE OF CALIFORNIA, INC. will not be responsible for accruals of interest or other charges resulting from compliance with the disbursement restrictions imposed by State law.

BT/CB/JC 08/15/01

EXHIBIT A

CLTA PRELIMINARY REPORT FORM
LIST OF PRINTED EXCEPTIONS AND EXCLUSIONS

SCHEDULE B

1. CALIFORNIA LAND TITLE ASSOCIATION STANDARD COVERAGE POLICY - 1990
EXCLUSIONS FROM COVERAGE

THE FOLLOWING MATTERS ARE EXPRESSLY EXCLUDED FROM THE COVERAGE OF THIS POLICY AND THE COMPANY WILL NOT PAY LOSS OR DAMAGE, COSTS, ATTORNEYS' FEES OR EXPENSES WHICH ARISE BY REASON OF:

1. (A) ANY LAW, ORDINANCE OR GOVERNMENTAL REGULATION (INCLUDING BUT NOT LIMITED TO BUILDING OR ZONING LAWS, ORDINANCES, OR REGULATIONS) RESTRICTING, REGULATING, PROHIBITING OR RELATING TO (I) THE OCCUPANCY, USE, OR ENJOYMENT OF THE LAND; (II) THE CHARACTER, DIMENSIONS OR LOCATION OF ANY IMPROVEMENT NOW OR HEREAFTER ERECTED ON THE LAND; (III) A SEPARATION IN OWNERSHIP OR A CHANGE IN THE DIMENSIONS OR AREA OF THE LAND OR ANY PARCEL OF WHICH THE LAND IS OR WAS A PART; OR (IV) ENVIRONMENTAL PROTECTION, OR THE EFFECT OF ANY VIOLATION OF THESE LAWS, ORDINANCES OR GOVERNMENTAL REGULATIONS, EXCEPT TO THE EXTENT THAT A NOTICE OF THE ENFORCEMENT THEREOF OR A NOTICE OF A DEFECT, LIEN OR ENCUMBRANCE RESULTING FROM A VIOLATION OR ALLEGED VIOLATION AFFECTING THE LAND HAS BEEN RECORDED IN THE PUBLIC RECORDS AT DATE OR POLICY.
   (B) ANY GOVERNMENTAL POLICE POWER NOT EXCLUDED BY (A) ABOVE, EXCEPT TO THE EXTEND THAT A NOTICE OF THE EXERCISE THEREOF OR NOTICE OF A DEFECT, LIEN OR ENCUMBRANCE RESULTING FROM A VIOLATION OR ALLEGED VIOLATION AFFECTING THE LAND HAS BEEN RECORDED IN THE PUBLIC RECORDS AT DATE OF POLICY.
2. RIGHTS OF EMINENT DOMAIN UNLESS NOTICE OF THE EXERCISE THEREOF HAS BEEN RECORDED IN THE PUBLIC RECORDS AT DATE OF POLICY, BUT NOT EXCLUDING FROM COVERAGE ANY TAKING WHICH HAS OCCURRED PRIOR TO DATE OF POLICY WHICH WOULD BE BINDING ON THE RIGHTS OF A PURCHASER FOR VALUE WITHOUT KNOWLEDGE.
3. DEFECTS, LIENS, ENCUMBRANCES, ADVERSE CLAIMS OR OTHER MATTERS:
   (A) WHETHER OR NOT RECORDED IN THE PUBLIC RECORDS AT DATE OF POLICY, BUT CREATED, SUFFERED, ASSUMED OR AGREED TO BY THE INSURED CLAIMANT;
   (B) NOT KNOWN TO THE COMPANY, NOT RECORDED IN THE PUBLIC RECORDS AT DATE OF POLICY, BUT KNOWN TO THE INSURED CLAIMANT AND NOT DISCLOSED IN WRITING TO THE COMPANY BY THE INSURED CLAIMANT PRIOR TO THE DATE THE INSURED CLAIMANT BECAME AN INSURED UNDER THIS POLICY;
   (C) RESULTING IN NO LOSS OR DAMAGE TO THE INSURED CLAIMANT;
   (D) ATTACHING OR CREATED SUBSEQUENT TO DATE OF POLICY; OR
   (E) RESULTING IN LOSS OR DAMAGE WHICH WOULD NOT HAVE BEEN SUSTAINED IF THE INSURED CLAIMANT HAD PAID VALUE FOR THE INSURED MORTGAGE OR FOR THE ESTATE OR INTEREST INSURED BY THIS POLICY.
4. UNENFORCEABLILITY OF THE LIEN OF THE INSURED MORTGAGE BECAUSE OF THE INABILITY OR FAILURE OF THE INSURED AT DATE OF POLICY, OR THE INABILITY OR FAILURE OF ANY SUBSEQUENT OWNER OR INDEBTEDNESS, TO COMPLY WITH THE APPLICABLE DOING BUSINESS LAWS, OF THE STATE IN WHICH THE LAND IS SITUATED.
5. INVALIDITY OR UNENFORCEABILITY OF THE LIEN OF THE INSURED MORTGAGE, OR CLAIM THEREOF, WHICH ARISES OUT OF THE TRANSACTION EVIDENCED BY THE INSURED MORTGAGE AND IS BASED UPON USURY OR ANY CONSUMER CREDIT PROTECTION OR TRUTH IN LENDING LAW.
6. ANY CLAIM, WHICH ARISES OUT OF THE TRANSACTION VESTING IN THE INSURED THE ESTATE OR INTEREST INSURED BY THIS POLICY OR THE TRANSACTION CREATING THE INTEREST OF THE INSURED LENDER, BY REASON OF THE OPERATION OF FEDERAL BANKRUPTCY, STATE INSOLVENCY OR SIMILAR CREDITORS' RIGHTS LAWS.

EXCEPTIONS FROM COVERAGE

THIS POLICY DOES NOT INSURE AGAINST LOSS OR DAMAGE (AND THE COMPANY WILL NOT PAY COSTS, ATTORNEYS' FEES OR EXPENSES) WHICH ARISE BY REASON OF:

1. TAXES OR ASSESSMENTS WHICH ARE NOT SHOWN AS EXISTING LIENS BY THE RECORDS OF ANY TAXING AUTHORITY THAT LEVIES TAXES OR ASSESSMENTS ON REAL PROPERTY OR BY THE PUBLIC RECORDS.
   PROCEEDINGS BY A PUBLIC AGENCY WHICH MAY RESULT IN TAXES OR ASSESSMENTS, OR NOTICES OF SUCH PROCEEDINGS, WHETHER OR NOT SHOWN BY THE RECORDS OF SUCH AGENCY OR BY THE PUBLIC RECORDS.
2. ANY FACTS, RIGHTS, INTERESTS OR CLAIMS WHICH ARE NOT SHOWN BY THE PUBLIC RECORDS BUT WHICH COULD BE ASCERTAINED BY AN INSPECTION OF THE LAND OR WHICH MAY BE ASSERTED BY PERSONS IN POSSESSION THEREOF.
3. EASEMENTS, LIENS OR ENCUMBRANCES, OR CLAIMS THEREOF, WHICH ARE NOT SHOWN BY THE PUBLIC RECORDS.
4. DISCREPANCIES, CONFLICTS IN BOUNDARY LINES, SHORTAGE IN AREA, ENCROACHMENTS, OR ANY OTHER FACTS WHICH A CORRECT SURVEY WOULD DISCLOSE, AND WHICH ARE NOT SHOWN BY THE PUBLIC RECORDS.
5. (A) UNPATENTED MINING CLAIMS; (B) RESERVATIONS OR EXCEPTIONS IN PATENTS OR IN ACTS AUTHORIZING THE ISSUANCE THEREOF; (C) WATER RIGHTS. CLAIMS OR TITLE TO WATER, WHETHER OR NOT THE MATTERS EXCEPTED UNDER (A), (B) OR (C) ARE SHOWN BY THE PUBLIC RECORDS.

(LIST OF PRINTED EXCEPTIONS AND EXCLUSIONS CONTINUED ON NEXT PAGE)

2. AMERICAN LAND TITLE ASSOCIATION
RESIDENTIAL TITLE INSURANCE POLICY (6-1-87)
EXCLUSIONS

IN ADDITION TO THE EXCEPTIONS IN SCHEDULE B, YOU ARE NOT INSURED AGAINST LOSS, COSTS, ATTORNEYS' FEES, AND EXPENSES RESULTING FROM:

1. GOVERNMENTAL POLICE POWER, AND THE EXISTENCE OR VIOLATION OF ANY LAW OR GOVERNMENTAL REGULATION. THIS INCLUDES BUILDING AND ZONING ORDINANCES AND ALSO LAWS AND REGULATIONS CONCERNING:
   - LAND USE
   - LAND DIVISION
   - IMPROVEMENTS ON THE LAND
   - ENVIRONMENTAL PROTECTION

   THIS EXCLUSION DOES NOT APPLY TO VIOLATIONS OR THE ENFORCEMENT OF THESE MATTERS WHICH APPEAR IN THE PUBLIC RECORDS AT POLICY DATE.
   THIS EXCLUSION DOES NOT LIMIT THE ZONING COVERAGE DESCRIBED IN ITEMS 12 AND 13 OF COVERED TITLE RISKS.

2. THE RIGHT TO TAKE THE LAND BY CONDEMNING IT, UNLESS:
   - A NOTICE OF EXERCISING THE RIGHT APPEARS IN THE PUBLIC RECORDS ON THE POLICY DATE
   - THE TAKING HAPPENED PRIOR TO THE POLICY DATE AND IS BINDING ON YOU IF YOU BOUGHT THE LAND WITHOUT KNOWING OF THE TAKING

3. TITLE RISKS:
   - THAT ARE CREATED, ALLOWED, OR AGREED TO BY YOU
   - THAT ARE KNOWN TO YOU, BUT NOT TO US, ON THE POLICY DATE - - UNLESS THEY APPEARED IN THE PUBLIC RECORDS
   - THAT RESULT IN NO LOSS TO YOU
   - THAT FIRST AFFECT YOUR TITLE AFTER THE POLICY DATE - - THIS DOES NOT LIMIT THE LABOR AND MATERIAL LIEN COVERAGE IN ITEM 8 OF COVERED TITLE RISKS

4. FAILURE TO PAY VALUE FOR YOUR TITLE.

5. LACK OF A RIGHT:
   - TO ANY LAND OUTSIDE THE AREA SPECIFICALLY DESCRIBED AND REFERRED TO IN ITEM 3 OF SCHEDULE A OR
   - IN STREETS, ALLEYS, OR WATERWAYS THAT TOUCH YOUR LAND

   THIS EXCLUSION DOES NOT LIMIT THE ACCESS COVERAGE IN ITEM 5 OF COVERED TITLE RISKS.

EXCEPTIONS FROM COVERAGE

THIS POLICY DOES NOT INSURE AGAINST LOSS OR DAMAGE (AND THE COMPANY WILL NOT PAY COSTS, ATTORNEYS' FEES OR EXPENSES) WHICH ARISE BY REASON OF:

1. ANY RIGHTS, INTERESTS, OR CLAIMS OF PARTIES IN POSSESSION OF THE LAND NOT SHOWN BY THE PUBLIC RECORDS.

2. ANY EASEMENTS OR LIENS NOT SHOWN BY THE PUBLIC RECORDS. THIS DOES NOT LIMIT THE LIEN COVERAGE IN ITEM 8 OF COVERED TITLE RISKS.

3. ANY FACTS ABOUT THE LAND WHICH A CORRECT SURVEY WOULD DISCLOSE AND WHICH ARE NOT SHOWN BY THE PUBLIC RECORDS. THIS DOES NOT LIMIT THE FORCED REMOVAL COVERAGE IN ITEM 12 OF COVERED TITLE RISKS.

4. ANY WATER RIGHTS OR CLAIMS OR TITLE TO WATER IN OR UNDER THE LAND, WHETHER OR NOT SHOWN BY THE PUBLIC RECORDS.

(LIST OF PRINTED EXCEPTIONS AND EXCLUSIONS CONTINUED ON NEXT PAGE)

3. AMERICAN LAND TITLE ASSOCIATION LOAN POLICY (10-17-92) WITH ALTA ENDORSEMENT - FORM 1 COVERAGE AND AMERICAN LAND TITLE ASSOCIATION LEASEHOLD LOAN POLICY (10-17-92) WITH ALTA ENDORSEMENT - FORM 1 COVERAGE EXCLUSIONS AND COVERAGE

THE FOLLOWING MATTERS ARE EXPRESSLY EXCLUDED FROM THE COVERAGE OF THIS POLICY AND THE COMPANY WILL NOT PAY LOSS OR DAMAGE, COSTS. ATTORNEY'S FEES OR EXPENSES WHICH ARISE BY REASON OF:

1. (A) ANY LAW, ORDINANCE OR GOVERNMENTAL REGULATION (INCLUDING BUT NOT LIMITED TO BUILDING AND ZONING LAWS, ORDINANCES, OR REGULATIONS) RESTRICTING, REGULATING, PROHIBITING OR RELATING TO (I) THE OCCUPANCY, USE, OR ENJOYMENT OF THE LAND; (II) THE CHARACTER, DIMENSIONS OR LOCATION OF ANY IMPROVEMENT NOW OR HEREAFTER ERECTED ON THE LAND; (III) A SEPARATION IN OWNERSHIP OR A CHANGE IN THE DIMENSIONS OR AREA OF THE LAND OR ANY PARCEL OF WHICH THE LAND IS OR WAS A PART; OR (IV) ENVIRONMENTAL PROTECTION, OR THE EFFECT OF ANY VIOLATION OF THESE LAWS, ORDINANCES OR GOVERNMENTAL REGULATIONS, EXCEPT TO THE EXTENT THAT A NOTICE OF THE ENFORCEMENT THEREOF OR A NOTICE OF A DEFECT, LIEN OR ENCUMBRANCE RESULTING FROM A VIOLATION OR ALLEGED VIOLATION AFFECTING THE LAND HAS BEEN RECORDED IN THE PUBLIC RECORDS AT DATE OF POLICY.
   (B) ANY GOVERNMENTAL POLICE POWER NOT EXCLUDED BY (A) ABOVE, EXCEPT TO THE EXTENT THAT A NOTICE OF THE EXERCISE THEREOF OR A NOTICE OF A DEFECT, LIEN OR ENCUMBRANCE RESULTING FROM A VIOLATION OR ALLEGED VIOLATION AFFECTING THE LAND HAS BEEN RECORDED IN THE PUBLIC RECORDS AT DATE OF POLICY.
2. RIGHTS OF EMINENT DOMAIN UNLESS NOTICE OF THE EXERCISE THEREOF HAS BEEN RECORDED IN THE PUBLIC RECORDS AT DATE OF POLICY, BUT NOT EXCLUDING FROM COVERAGE ANY TAKING WHICH HAS OCCURRED PRIOR TO DATE OF POLICY WHICH WOULD BE BINDING ON THE RIGHTS OF A PURCHASER FOR VALUE WITHOUT KNOWLEDGE.
3. DEFECTS, LIENS, ENCUMBRANCES, ADVERSE CLAIMS OR OTHER MATTERS:
   (A) CREATED, SUFFERED, ASSUMED OR AGREED TO BY THE INSURED CLAIMANT;
   (B) NOT KNOWN TO THE COMPANY, NOT RECORDED IN THE PUBLIC RECORDS AT DATE OF POLICY, BUT KNOWN TO THE INSURED CLAIMANT AND NOT DISCLOSED IN WRITING TO THE COMPANY BY THE INSURED CLAIMANT PRIOR TO THE DATE THE INSURED CLAIMANT BECAME AN INSURED UNDER THIS POLICY;
   (C) RESULTING IN NO LOSS OR DAMAGE TO THE INSURED CLAIMANT;
   (D) ATTACHING OR CREATED SUBSEQUENT TO DATE OF POLICY (EXCEPT TO THE EXTENT THAT THIS POLICY INSURES THE PRIORITY OF THE LIEN OF THE INSURED MORTGAGE OVER ANY STATUTORY LIEN FOR SERVICES, LABOR OR MATERIAL OR TO THE EXTENT INSURANCE IS AFFORDED HEREIN AS TO THE ASSESSMENTS FOR STREET IMPROVEMENTS UNDER CONSTRUCTION OR COMPLETED AT DATE OF POLICY); OR
   (E) RESULTING IN LOSS OR DAMAGE WHICH WOULD NOT HAVE BEEN SUSTAINED IF THE INSURED CLAIMANT HAD PAID VALUE FOR THE INSURED MORTGAGE.
4. UNENFORCEABILITY OF THE LIEN OF THE INSURED MORTGAGE BECAUSE OF THE INABILITY OR FAILURE OF THE INSURED AT DATE OF POLICY, OR THE INABILITY OR FAILURE OF ANY SUBSEQUENT OWNER OF THE INDEBTEDNESS, TO COMPLY WITH APPLICABLE DOING BUSINESS LAWS OF THE STATE IN WHICH THE LAND IS SITUATED.
5. INVALIDITY OR UNENFORCEABILITY OF THE LIEN OF THE INSURED MORTGAGE, OR CLAIM THEREOF, WHICH ARISES OUT OF THE TRANSACTION EVIDENCED BY THE INSURED MORTGAGE AND IS BASED UPON USURY OR ANY CONSUMER CREDIT PROTECTION OR TRUTH IN LENDING LAW.
6. ANY STATUTORY LIEN FOR SERVICES, LABOR OR MATERIALS (OR THE CLAIM OF PRIORITY OF ANY STATUTORY LIEN FOR SERVICES, LABOR OR MATERIALS OVER THE LIEN OF THE INSURED MORTGAGE) ARISING FROM AN IMPROVEMENT OR WORK RELATED TO THE LAND WHICH IS CONTRACTED FOR AND COMMENCED SUBSEQUENT TO DATE OF POLICY AND IS NOT FINANCED IN WHOLE OR IN PART BY PROCEEDS OF THE INDEBTEDNESS SECURED BY THE INSURED MORTGAGE WHICH AT DATE OF POLICY THE INSURED HAS ADVANCED OR IS OBLIGATED TO ADVANCE.
7. ANY CLAIM, WHICH ARISES OUT OF THE TRANSACTION CREATING THE INTEREST OF THE MORTGAGEE INSURED BY THIS POLICY, BY REASON OF THE OPERATION OF FEDERAL BANKRUPTCY, STATE INSOLVENCY, OR SIMILAR CREDITORS' RIGHTS LAWS, THAT IS BASED ON:

   (I) THE TRANSACTION CREATING THE INTEREST OF THE INSURED MORTGAGEE BEING DEEMED A FRAUDULENT CONVEYANCE OR FRAUDULENT TRANSFER; OR

   (II) THE SUBORDINATION OF THE INTEREST OF THE INSURED MORTGAGEE AS A RESULT OF THE APPLICATION OF THE DOCTRINE OR EQUITABLE SUBORDINATION; OR

   (III) THE TRANSACTION CREATING THE INTEREST OF THE INSURED MORTGAGEE BEING DEEMED A PREFERENTIAL TRANSFER EXCEPT WHERE THE PREFERENTIAL TRANSFER RESULTS FROM THE FAILURE:

      (A) TO TIMELY RECORDED THE INSTRUMENT OF TRANSFER; OR

      (B) OF SUCH RECORDATION TO IMPART NOTICE TO A PURCHASER FOR VALUE OR A JUDGMENT OR LIEN CREDITOR.

(LIST OF PRINTED EXCEPTIONS AND EXCLUSIONS CONTINUED ON NEXT PAGE)

THE ABOVE POLICY FORMS MAY BE ISSUED TO AFFORD EITHER STANDARD COVERAGE OR EXTENDED COVERAGE. IN ADDITION TO THE ABOVE EXCLUSIONS FROM COVERAGE, THE EXCEPTIONS FROM COVERAGE IN A STANDARD COVERAGE POLICY WILL INCLUDE THE FOLLOWING GENERAL EXCEPTIONS:

EXCEPTIONS FROM COVERAGE

THIS POLICY DOES NOT INSURE AGAINST LOSS OR DAMAGE (AND THE COMPANY WILL NOT PAY COSTS, ATTORNEYS' FEES OR EXPENSES) WHICH ARISE BY REASON OF:

1. TAXES OR ASSESSMENTS WHICH ARE NOT SHOWN AS EXISTING LIENS BY THE RECORDS OF ANY TAXING AUTHORITY THAT LEVIES TAXES OR ASSESSMENTS ON REAL PROPERTY OR BY THE PUBLIC RECORDS. PROCEEDINGS BY A PUBLIC AGENCY WHICH MAY RESULT IN TAXES OR ASSESSMENTS, OR NOTICES OF SUCH PROCEEDINGS, WHETHER OR NOT SHOWN BY THE RECORDS OF SUCH AGENCY OR BY THE PUBLIC RECORDS.
2. ANY FACTS, RIGHTS, INTERESTS OR CALIMS WHICH ARE NOT SHOWN BY THE PUBLIC RECORDS BUT WHICH COULD BE ASCERTAINED BY AN INSPECTION OF THE LAND OR BY MAKING INQUIRY OF PERSONS IN POSSESSION THEREOF.
3. EASEMENTS, LIENS OR ENCUMMBRANCES, OR CLAIMS THEREOF, WHICH ARE NOT SHOWN BY THE PUBLIC RECORDS.
4. DISCREPANCIES, CONFLICTS IN BOUNDARY LINES, SHORTAGE IN AREA, ENCROACHMENTS, OR ANY OTHER FACTS WHICH A CORRECT SURVEY WOULD DISCLOSE, AND WHICH ARE NOT SHOWN BY THE PUBLIC RECORDS.
5. (A) UNPATENTED MINING CLAIMS; (B) RESERVATIONS OR EXCEPTIONS IN PATENTS OR IN ACTS AUTHORIZING THE ISSUANCE THEREOF; (C) WATER RIGHTS, CLAIMS OR TITLE TO WATER, WHETHER OR NOT THE MATTERS EXCEPTED UNDER (A), (B) OR (C) ARE SHOWN BY THE PUBLIC RECORDS.

4. AMERICAN LAND TITLE ASSOCIATION OWNER'S POLICY (10-17-92) AND AMERICAN LAND TITLE ASSOCIATION LEASEHOLD OWNER'S POLICY (10-17-92) EXCLUSIONS FROM COVERAGE

THE FOLLOWING MATTERS ARE EXPRESSLY EXCLUDED FROM THE COVERAGE OF THIS POLICY AND THE COMPANY WILL NOT PAY LOSS OR DAMAGE, COST, ATTORNEYS' FEES OR EXPENSES WHICH ARISE BY REASON OF:

1. (A) ANY LAW, ORDINANCE OR GOVERNMENTAL REGULATION (INCLUDING BUT NOT LIMITED TO BUILDING AND ZONING LAWS, ORDINANCES, OR REGULATIONS) RESTRICTING, REGULATING, PROHIBITING OR RELATING TO (I) THE OCCUPANCY, USE, OR ENJOYMENT OF THE LAND; (II) THE CHARACTER, DIMENSIONS OR LOCATION OF ANY IMPROVEMENT NOW OR HEREAFTER ERECTED ON THE LAND; (III) A SEPARATION IN OWNERSHIP OR A CHANGE IN THE DIMENSIONS OR AREA OF THE LAND OR ANY PARCEL OF WHICH THE LAND IS OR WAS A PART; OR (IV) ENVIRONMENTAL PROTECTION, OR THE EFFECT OF ANY VIOLATION OF THESE LAWS, ORDINANCES OR GOVERNMENTAL REGULATIONS, EXCEPT TO THE EXTENT THAT A NOTICE OF THE ENFORCEMENT THEREOF OR A NOTICE OF A DEFECT, LIEN OR ENCUMBRANCE RESULTING FROM A VIOLATION OR ALLEGED VIOLATION AFFECTING THE LAND HAS BEEN RECORDED IN THE PUBLIC RECORDS AT DATE OF POLICY.
   (B) ANY GOVERNMENTAL POLICE POWER NOT EXCLUDED BY (A) ABOVE, EXCEPT TO THE EXTENT THAT A NOTICE OF THE EXERCISE THEREOF OR A NOTICE OF A DEFECT, LIEN OR ENCUMBRANCE RESULTING FROM A VIOLATION OR ALLEGED VIOLATION AFFECTING THE LAND HAS BEEN RECORDED IN THE PUBLIC RECORDS AT DATE OF POLICY.
2. RIGHTS OF EMINENT DOMAIN UNLESS NOTICE OF THE EXERCISE THEREOF HAS BEEN RECORDED IN THE PUBLIC RECORDS AT DATE OF POLICY, BUT NOT EXCLUDING FROM COVERAGE ANY TAKING WHICH HAS OCCURRED PRIOR TO DATE OF POLICY WHICH WOULD BE BINDING ON THE RIGHTS OF A PURCHASER FOR VALUE WITHOUT KNOWLEDGE.
3. DEFECTS, LIENS, ENCUMBRANCES, ADVERSE CLAIMS OR OTHER MATTERS:
   (A) CREATED, SUFFERED, ASSUMED OR AGREED TO BY THE INSURED CLAIMANT;
   (B) NOT KNOWN TO THE COMPANY, NOT RECORDED IN THE PUBLIC RECORDS AT DATE OF POLICY, BUT KNOWN TO THE INSURED CLAIMANT AND NOT DISCLOSED IN WRITING TO THE COMPANY BY THE INSURED CLAIMANT PRIOR TO THE DATE THE INSURED CLAIMANT BECAME AN INSURED UNDER THIS POLICY;
   (C) RESULTING IN NO LOSS OR DAMAGE TO THE INSURED CLAIMANT;
   (D) ATTACHING OR CREATED SUBSEQUENT TO DATE OF POLICY; OR
   (E) RESULTING IN LOSS OR DAMAGE WHICH WOULD NOT HAVE BEEN SUSTAINED IF THE INSURED CLAIMANT HAD PAID VALUE FOR THE ESTATE OR INTEREST INSURED BY THIS POLICY.
4. ANY CLAIM, WHICH ARISES OUT OF THE TRANSACTION VESTING IN THE INSURED THE ESTATE OR INTEREST INSURED BY THIS POLICY, BY REASON OF THE OPERATION OF FEDERAL BANKRUPTCY, STATE INSOLVENCY, OR SIMILAR CREDITORS' RIGHTS LAWS, THAT IS BASED ON:

   (I) THE TRANSACTION CREATING THE ESTATE OR INTEREST INSURED BY THIS POLICY BEING DEEMED A FRAUDULENT CONVEYANCE OR FRAUDULENT TRANSFER; OR

   (II) THE TRANSACTION CREATING THE ESTATE OR INTEREST INSURED BY THIS POLICY BEING DEEMED A PREFERENTIAL TRANSFER EXCEPT WHERE THE PREFERENTIAL TRANSFER RESULTS FROM THE FAILURE:

      (A) TO TIMELY RECORD THE INSTRUMENT OF TRANSFER; OR

      (B) OF SUCH RECORDATION TO IMPART NOTICE TO A PURCHASER FOR VALUE OR A JUDGMENT OR LIEN CREDITOR.

(LIST OF PRINTED EXCEPTIONS AND EXCLUSIONS CONTINUED ON NEXT PAGE)

THE ABOVE POLICY FORMS MAY BE ISSUED TO AFFORD EITHER STANDARD COVERAGE OR EXTENDED COVERAGE. IN ADDITION TO THE ABOVE EXCLUSIONS FROM COVERAGE, THE EXCEPTIONS FROM COVERAGE IN A STANDARD COVERAGE POLICY WILL INCLUDE THE FOLLOWING GENERAL EXCEPTIONS:

EXCEPTIONS FROM COVERAGE

THIS POLICY DOES NOT INSURE AGAINST LOSS OR DAMAGE (AND THE COMPANY WILL NOT PAY COSTS, ATTORNEYS' FEES OR EXPENSES) WHICH ARISE BY REASON OF:

1. TAXES OR ASSESSMENTS WHICH ARE NOT SHOWN AS EXISTING LIENS BY THE RECORDS OF ANY TAXING AUTHORITY THAT LEVIES TAXES OR ASSESSMENTS ON REAL PROPERTY OR BY THE PUBLIC RECORDS. PROCEEDINGS BY A PUBLIC AGENCY WHICH MAY RESULT IN TAXES OR ASSESSMENTS, OR NOTICES OF SUCH PROCEEDINGS, WHETHER OR NOT SHOWN BY THE RECORDS OF SUCH AGENCY OR BY THE PUBLIC RECORDS.
2. ANY FACTS, RIGHTS, INTERESTS OR CLAIMS WHICH ARE NOT SHOWN BY THE PUBLIC RECORDS BUT WHICH COULD BE ASCERTAINED BY AN INSPECTION OF THE LAND OR BY MAKING INQUIRY OF PERSONS IN POSSESSION THEREOF.
3. EASEMENTS, LIENS OR ENCUMBRANCES, OR CLAIMS THEREOF, WHICH ARE NOT SHOWN BY THE PUBLIC RECORDS.
4. DISCREPANCIES, CONFLICTS IN BOUNDARY LINES, SHORTAGE IN AREA, ENCROACHMENTS, OR ANY OTHER FACTS WHICH A CORRECT SURVEY WOULD DISCLOSE, AND WHICH ARE NOT SHOWN BY THE PUBLIC RECORDS.
5. (A) UNPATENTED MINING CLAIMS; (B) RESERVATIONS OR EXCEPTIONS IN PATENTS OR IN ACTS AUTHORIZING THE ISSUANCE THEREOF; (C) WATER RIGHTS, CLAIMS OR TITLE TO WATER, WHETHER OR NOT THE MATTERS EXCEPTED UNDER (A), (B) OR (C) ARE SHOWN BY THE PUBLIC RECORDS.

5. CLTA HOMEOWNER'S POLICY OF TITLE INSURANCE (6-2-98) ALTA HOMEOWNER'S POLICY OF TITLE INSURANCE (10-17-98) EXCLUSIONS

IN ADDITION TO THE EXCEPTIONS IN SCHEDULE B, YOU ARE NOT INSURED AGAINST LOSS, COSTS, ATTORNEYS' FEES, AND EXPENSES RESULTING FROM:

1. GOVERNMENTAL POLICE POWER, AND THE EXISTENCE OR VIOLATION OF ANY LAW OR GOVERNMENT REGULATION. THIS INCLUDES ORDINANCES, LAWS AND REGULATIONS CONCERNING:

   A. BUILDING
   B. ZONING
   C. LAND USE
   D. IMPROVEMENTS ON LAND
   E. LAND DIVISION
   F. ENVIRONMENTAL PROTECTION

   THIS EXCLUSION DOES NOT APPLY TO VIOLATIONS OR THE ENFORCEMENT OF THESE MATTERS IF NOTICE OF THE VIOLATION OR ENFORCEMENT APPEARS IN THE PUBLIC RECORDS AT THE POLICY DATE.

   THIS EXCLUSION DOES NOT LIMIT THE COVERAGE DESCRIBED IN COVERED RISK 14, 15, 16, 17, OR 24.

2. THE FAILURE OF YOUR EXISTING STRUCTURES, OR ANY PART OF THEM, TO BE CONSTRUCTED IN ACCORDANCE WITH APPLICABLE BUILDING CODES. THIS EXCLUSION DOES NOT APPLY TO VIOLATIONS OF BUILDING CODES IF NOTICE OF THE VIOLATION APPEARS IN THE PUNLIC RECORDS AT THE POLICY DATE.

3. THE RIGHT TO TAKE THE LAND BY CONDEMNING IT, UNLESS:
   A. NOTICE OF EXERCISING THE RIGHT APPEARS IN THE PUNLIC RECORDS AT THE POLICY DATE; OR
   B. THE TAKING HAPPENED BEFORE THE POLICY DATE AND IS BINDING ON YOU IF YOU BOUGHT THE LAND WITHOUT KNOWING OF THE TAKING.
4. RISKS:
   A. THAT ARE CREATED, ALLOWED, OR AGREED TO BY YOU, WHETHER OR NOT THEY APPEAR IN THE PUBLIC RECORDS;
   B. THAT ARE KNOWN TO YOU AT THE POLICY DATE, BUT NOT TO US, UNLESS THEY APPEAR IN THE PUBLIC RECORDS AT THE POLICY DATE;
   C. THAT RESULT IN NO LOSS TO YOU; OR
   D. THAT FIRST OCCUR AFTER THE POLICY DATE - THIS DOES NOT LIMIT THE COVERAGE DESCRIBED IN COVERED RISK 7, 8.D, 22, 23, 24 OR 25.

5. FAILURE TO PAY VALUE FOR YOUR TITLE.

6. LACK OF A RIGHT:
   A. TO ANY LAND OUTSIDE THE AREA SPECIFICALLY DESCRIBED AND REFERRED TO IN PARAGRAPH 3 OF SCHEDULE A; AND
   B. IN STREETS; ALLEYS, OR WATERWAYS THAT TOUCH THE LAND.
   THIS EXCLUSION DOES NOT LIMIT THE COVERAGE DESCRIBED IN COVERED RISK 11 OR 18.

"GOLD" COMPREHENSIVE PROTECTIC
)AN POLICY OF TITLE INSURANCE
EXCLUSIONS FROM COVERAGE

THE FOLLOWING MATTERS ARE EXPRESSLY EXCLUDED FROM THE COVERAGE OF THIS POLICY AND THE COMPANY WILL NOT PAY LOSS OR DAMAGE, COST, ATTORNEYS' FEES OR EXPENSES WHICH ARISE BY REASON OF:

1. (A) ANY LAW, ORDINANCE OR GOVERNMENTAL REGULATION (INCLUDING BUT NOT LIMITED TO BUILDING AND ZONING LAWS, ORDINANCES, OR REGULATIONS) RESTRICTING, REGULATING, PROHIBITING OR RELATING TO (I) THE OCCUPANCY, USE, OR ENJOYMENT OF THE LAND; (II) THE CHARACTER, DIMENSIONS OR LOCATION OF ANY IMPROVEMENT NOW OR HEREAFTER ERECTED ON THE LAND; (III) A SEPARATION IN OWNERSHIP OR A CHANGE IN THE DIMENSIONS OR AREA OF THE LAND OR ANY PARCEL OF WHICH THE LAND IS OR WAS A PART; OR (IV) ENVIRONMENTAL PROTECTION, OR THE EFFECT OF ANY VIOLATION OF THESE LAWS, ORDINANCES OR GOVERNMENTAL REGULATIONS, EXCEPT TO THE EXTENT THAT A NOTICE OF THE ENFORCEMENT THEREOF OR A NOTICE OF A DEFECT, LIEN OR ENCUMBRANCE RESULTING FROM A VIOLATION OR ALLEGED VIOLATION AFFECTING THE LAND HAS BEEN RECORDED IN THE PUBLIC RECORDS AT DATE OF POLICY.
THIS EXCLUSION FROM COVERAGE 1(A) DOES NOT LIMIT THE COVERAGE PROVIDED IN INSURING PROVISIONS NUMBER 14, 15, 16, 17, 34, AND 41.
(B) ANY GOVERNMENTAL POLICE POWER NOT EXCLUDED BY (A) ABOVE, EXCEPT TO THE EXTENT THAT A NOTICE OF THE EXERCISE THEREOF OR A NOTICE OF A DEFECT, LIEN OR ENCUMBRANCE RESULTING FROM A VIOLATION OR ALLEGED VIOLATION AFFECTING THE LAND HAS BEEN RECORDED IN THE PUBLIC RECORDS AT DATE OF POLICY.
THIS EXCLUSION FROM COVERAGE 1(A) DOES NOT LIMIT THE COVERAGE PROVIDED IN INSURING PROVISIONS NUMBER 14, 15, 16, 17, 34, AND 41.

2. RIGHTS OF EMINENT DOMAIN UNLESS NOTICE OF THE EXERCISE THEREOF HAS BEEN RECORDED IN THE PUBLIC RECORDS AT DATE OF POLICY, BUT NOT EXCLUDING FROM COVERAGE ANY TAKING WHICH HAS OCCURRED PRIOR TO DATE OF POLICY WHICH WOULD BE BINDING ON THE RIGHTS OF A PURCHASER FOR VALUE WITHOUT KNOWLEDGE.

3. DEFECTS, LIENS, ENCUMBRANCES, ADVERSE CLAIMS OR OTHER MATTERS:
(A) CREATED, SUFFERED, ASSUMED OR AGREED TO BY THE INSURED CLAIMANT;
(B) NOT KNOWN TO THE COMPANY, NOT RECORDED IN THE PUBLIC RECORDS AT DATE OF POLICY, BUT KNOWN TO THE INSURED CLAIMANT AND NOT DISCLOSED IN WRITING TO THE COMPANY BY THE INSURED CLAIMANT PRIOR TO THE DATE THE INSURED CLAIMANT BECAME AN INSURED UNDER THIS POLICY;
(C) RESULTING IN NO LOSS OR DAMAGE TO THE INSURED CLAIMANT;
(D) ATTACHING OR CREATED SUBSEQUENT TO DATE OF POLICY (THIS EXCLUSION FROM COVERAGE 3 (D) DOES NOT LIMIT THE COVERAGE PROVIDED IN INSURING PROVISIONS NUMBER 7, 8, 15, 16, 18, 21, 22, 24, 25, 26, 28, 29, 30, 32, 33, 34, 35, 38, 39, AND 40);
(E) RESULTING IN LOSS OR DAMAGE WHICH WOULD NOT HAVE BEEN SUSTAINED IF THE INSURED CLAIMANT HAD PAID VALUE FOR THE INSURED MORTGAGE.

4. UNENFORCEABILITY OF THE LIEN OF THE INSURED MORTGAGE BECAUSE OF THE INABILITY OR FAILURE OF THE INSURED AT DATE OF POLICY, OR THE INABILITY OR FAILURE OF ANY SUBSEQUENT OWNER OF THE INDEBTEDNESS, TO COMPLY WITH APPLICABLE DOING BUSINESS LAWS OF THE STATE IN WHICH THE LAND IS SITUATED.

5. INVALIDITY OR UNENFORCEABILITY OF THE LIEN OF THE INSURED MORTGAGE, OR CLAIM THEREOF, WHICH ARISES OUT OF THE TRANSACTION EVIDENCED BY THE INSURED MORTGAGE AND IS BASED UPON ANY CONSUMER CREDIT PROTECTION OR TRUTH-IN-LENDING LAW.

6. ANY CLAIM, WHICH ARISES OUT OF THE TRANSACTION CREATING THE INTEREST OF THE MORTGAGEE INSURED BY THIS POLICY, BY REASON OF THE OPERATION OF FEDERAL BANKRUPTCY, STATE INSOLVENCY, OR SIMILAR CREDITORS' RIGHTS LAWS, THAT IS BASED ON:

   (A) THE TRANSACTION CREATING THE ESTATE OF THE INSURED MORTGAGEE BEING DEEMED A FRAUDULENT CONVEYANCE OR FRAUDULENT TRANSFER; OR
   (B) THE SUBORDINATION OF THE INTEREST OF THE INSURED MORTGAGEE AS A RESULT OF THE APPLICATION OF THE DOCTRINE OF EQUITABLE SUBORDINATION; OR
   (C) THE TRANSACTION CREATING THE INTEREST OF THE INSURED MORTGAGEE BEING DEEMED A PREFERENTIAL TRANSFER EXCEPT WHERE THE PREFERENTIAL TRANSFER RESULTS FROM THE FAILURE;
      (I) TO TIMELY RECORD THE INSTRUMENT OF TRANSFER; OR
      (II) OF SUCH RECORDATION TO IMPART NOTICE TO A PURCHASER FOR VALUE OR A JUDGMENT OR LIEN CREDITOR.

7. TAXES, ASSESSMENTS, COSTS, CHARGES, DAMAGES AND OTHER OBLIGATIONS TO THE GOVERNMENT SECURED BY STATUTORY LIENS THAT BECOME A LIEN ON THE LAND SUBSEQUENT TO DATE OF POLICY, BUT THIS EXCLUSION 7 DOES NOT LIMIT THE COVERAGE OF INSURING PROVISION 34.

STEWART TITLE GUARANTY COMPANY

Stewart Title Guaranty Company, Stewart Title Insurance Company, Stewart Title of California, Inc.

Privacy Policy Notice

PURPOSE OF THIS NOTICE

Title V of the Gramm-Leach-Bliley Act (GLBA) generally prohibits any financial institution, directly or through its affiliates, from sharing nonpublic personal information about you with nonaffiliated third party unless the institution provides you with a notice of its privacy policies and practices, such as the type of information that it collects about you and the catagories of persons or entities to whom it may be disclosed. In compliance with the GLBA, we are providing you with this document, which notifies you of the privacy policies and practices of Stewart Title Guaranty Company, Stewart Title Insurance Company, Stewart Title of California, Inc.

We may collect nonpublic personal information about you from the following sources:

* Information we receive from you, such as on applications or other forms.
* Information about your transactions we secure from our files, or from our affiliates or others.
* Information we receive from a consumer reporting agency.
* Information that we receive from others involved in your transaction, such as the real estate agent or lender.

Unless it is specifically stated otherwise in an amended Privacy Policy Notice, no additional nonpublic personal information will be collected about you.

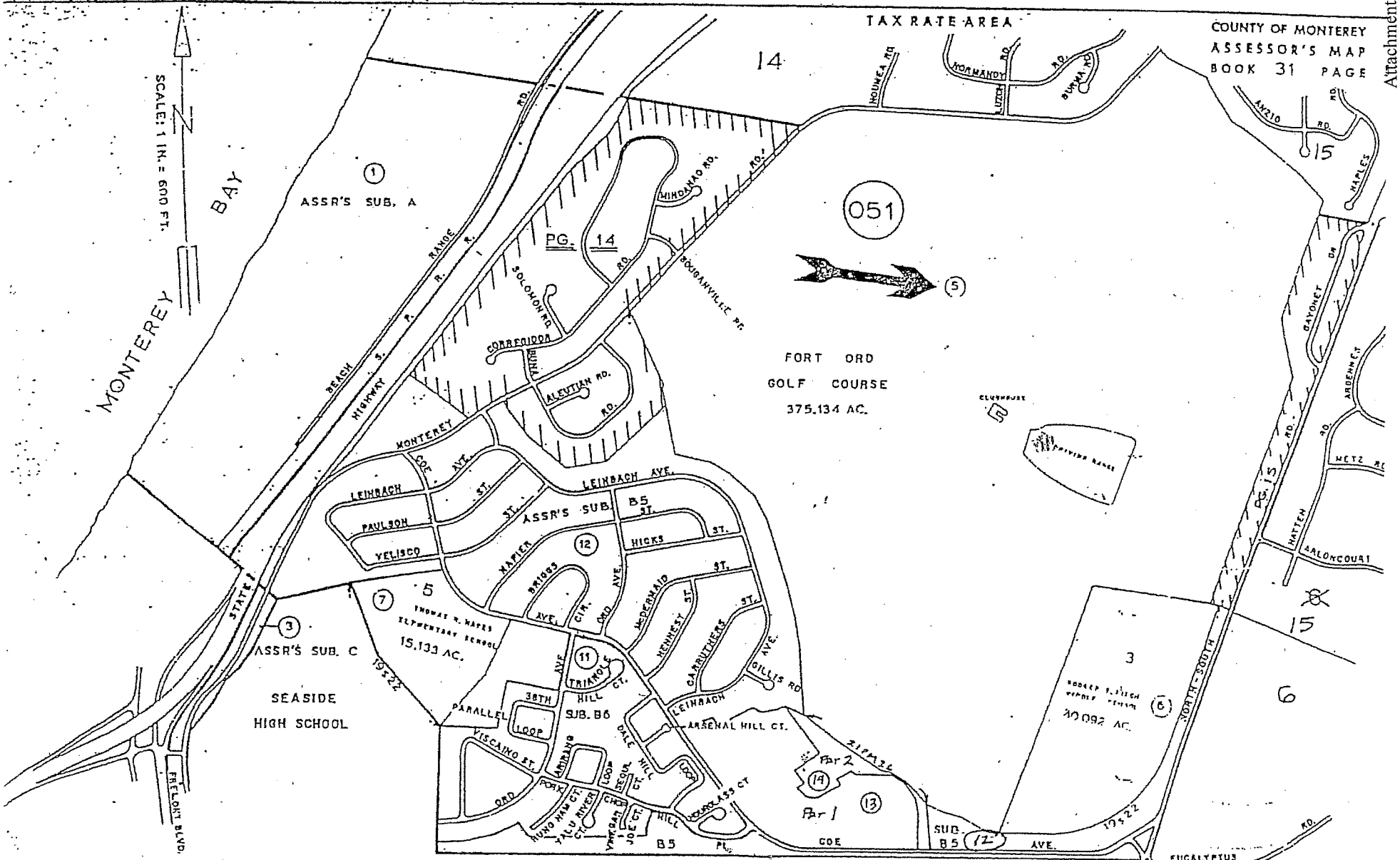
We may disclose any of the above information that we collect about our customers or former customers to our affiliates or to nonaffiliates third parties permitted by law.

We also may disclose this information about our customers or former customers to the following types of nonaffiliated companies that perform marketing services on our behalf or with whom we have joint marketing agreements:

* Financial service providers such as companies engaged in banking, consumer finance, securities and insurance.
* Non-financial companies such as envelope stuffers and fulfillment service providers.

WE DO NOT DISCLOSE ANY NONPUBLIC PERSONAL INFORMATION ABOUT YOU WITH ANYONE FOR ANY PURPOSE THAT IS NOT SPECIFICALLY PERMITTED BY LAW.

We restrict access to nonpublic personal information about you to those employees who need to know that information in order to provide products or services to you. We maintain physical, electronic, and procedural safeguards that comply with federal regulations to guard your nonpublic personal information.



This map is furnished as a matter of accommodation only, and no liability is assumed by its attachment to the policy of title insurance of Stewart Title Guaranty Company.

This map is furnished as a matter of accommodation only, and no liability is assumed by its attachment to the policy of title insurance of Stewart Title Guaranty Company.

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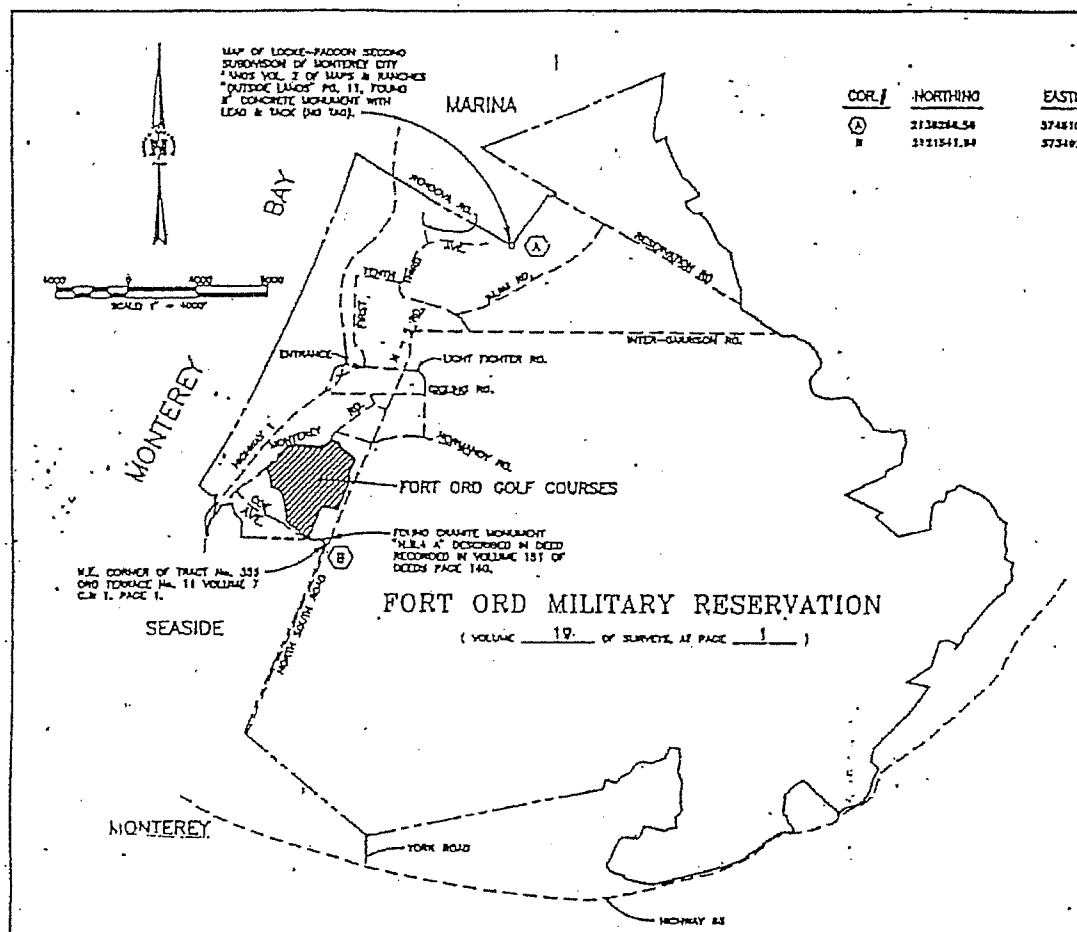


COR.	NORTHING	EASTING
A	2138254.58	5748102.99
B	2121541.84	5734059.34

BASIS OF BEARINGS:

THE BASIS OF BEARINGS FOR THIS SURVEY IS THE GRID BEARING OF N 37°05'40" E BETWEEN CALIFORNIA HIGH PRECISION GEODETIC NETWORK (HPGN) CONTROL POINTS "CA HPGN 03 13" AND "941 3450 M TIGA". THE HORIZONTAL DATUM IS THE NORTH AMERICAN DATUM OF 1983 (1992). THE GRID BEARING IS BASED ON THE LAMBERT PROJECTION FOR CALIFORNIA STATE PLANE ZONE 4. THE COORDINATES FOR THE HPGN CONTROL POINTS WERE ESTABLISHED BY THE CALIFORNIA DEPARTMENT OF TRANSPORTATION (CALTRANS) IN CONJUNCTION WITH THE NATIONAL GEODETIC SURVEY (NGS) IN 1992. ALL BEARINGS FOR THIS SURVEY WERE ESTABLISHED USING GLOBAL POSITIONING SYSTEM (GPS) "FAST-STATIC" SURVEYING TECHNIQUES.

LEGEND

- ● DENOTES SET 1 1/2" IRON PIPE WITH BRASS DISK "RCE 13310", UNLESS OTHERWISE NOTED.
- ○ DENOTES FOUND MONUMENT.
- ——|—— DENOTES NOTHING FOUND OR SET.
- ———— PROPERTY LINE
- – – – ROAD/STREET/AVENUE
- Ⓐ BOUNDARY CORNER

SURVEYOR'S STATEMENT

THIS MAP CORRECTLY REPRESENTS A SURVEY MADE BY ME OR UNDER MY DIRECTION IN CONFORMANCE WITH THE REQUIREMENTS OF THE LAND SURVEYOR'S ACT AT THE REQUEST OF FORT ORD MILITARY RESERVATION IN MARCH 1994.

JOHN M. VAN LANDER
R.C.E. 13310
STATE OF CALIFORNIA
EXPIRES 31 MARCH 1997

L.S. 13754
STATE OF CALIFORNIA
EXPIRES 30 JUNE 1998

REGISTERED PROFESSIONAL ENGINEER JOHN M. VAN LANDER No. 13310 STATE OF CALIFORNIA

RECORDER'S STATEMENT

FILED FOR RECORD AT THE REQUEST OF BESTOR ENGINEERS, INC. THIS 18 TH DAY OF NOVEMBER, 1994, AT 10:39 A.M. IN VOLUME 19 OF "SURVEYS" MAPS AT PAGE 21, RECORDS OF MONTEREY COUNTY, CALIFORNIA.

ERNEST A. HANSEN
COUNTY RECORDER

DEPUTY

SERIAL NO. 77873

FEE $ 9.00

COUNTY SURVEYOR'S STATEMENT

THIS MAP HAS BEEN EXAMINED IN ACCORDANCE WITH SECTION 8766 OF THE LAND SURVEYOR'S ACT THIS 16 DAY OF NOVEMBER 1994.

COUNTY SURVEYOR-ENGINEER

STATE OF CALIFORNIA
EXPIRES: 6-30-97

LICENSED LAND SURVEYOR EXP. 6-30-97 No. 5417 STATE OF CALIFORNIA

NOTE REGARDING DERIVATION OF COORDINATES:

STATE PLANE COORDINATES BASED ON THE NORTH AMERICAN DATUM OF 1983 (1992), ZONE 4 WERE DETERMINED FOR THE BOUNDARY CORNERS USING GLOBAL POSITIONING SYSTEM (GPS) "FAST STATIC" SURVEYING TECHNIQUES. THESE COORDINATES WERE THEN SCALED BY A UNIFORM PROJECT COMBINATION FACTOR OF .99983023 TO PRODUCE "GROUND" COORDINATES. THE COORDINATES LISTED ARE THEREFORE NOT STATE PLANE COORDINATES. TO OBTAIN GRID DISTANCES, MULTIPLY THE GROUND DISTANCES BY THE UNIFORM PROJECT COMBINATION FACTOR. NO ROTATION WAS APPLIED WHEN THE STATE PLANE COORDINATES WERE SCALED. THEREFORE, THE BEARINGS SHOWN ARE GRID BEARINGS BASED ON THE LAMBERT PROJECTION FOR CALIFORNIA STATE PLANE ZONE 4.

RECORD OF SURVEY

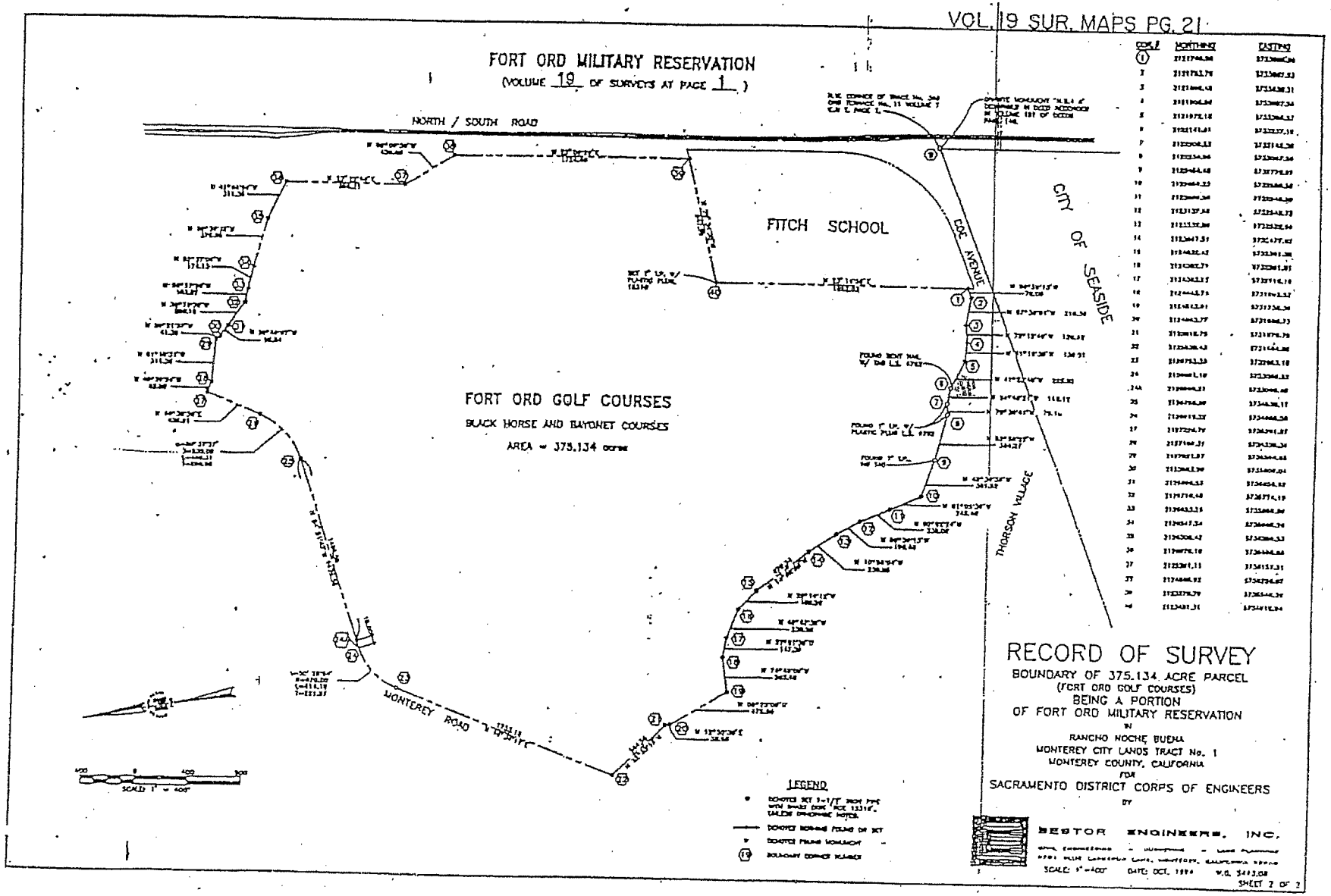
BOUNDARY OF 375.134 ACRE PARCEL
(FORT ORD GOLF COURSES)
BEING A PORTION
OF FORT ORD MILITARY RESERVATION
IN
RANCHO NOCHE BUENA
MONTEREY CITY LANDS TRACT No. 1
MONTEREY COUNTY, CALIFORNIA
FOR
SACRAMENTO DISTRICT CORPS OF ENGINEERS
BY

BESTOR ENGINEERS, INC.

SCALE: 1"=4000' DATE: OCT. 1994 W.O.: 541.08

SHEET 1 OF 2

VOL. 19 SUR. MAPS PG. 21



Bishop, McIntosh & McIntosh

Alternative Production Allocation
Place of Use
Legal Description

That certain real property Described as Parcel 1 and Parcel 2 as shown on Volume 15, Page 190 of Parcel Maps, filed in the Office of the County Recorder of Monterey, State of California described as follows:

Beginning at the southwesterly corner of Parcel 2 as shown on Volume 15, Page 190 of Parcel Maps, filed in the Office of the County Recorder of Monterey; thence

1) North, 132.00 feet to the beginning of a non-tangent curve, concave north, having a radius of 170.00 feet, and to which beginning a radial bears South 37°10'00" East; thence
2) Easterly, 110.28 feet along said curve, through a central angle of 37°10'00"; thence
3) North 52°50'00" East, 149.37 feet; thence
4) North 22°30'00" West, 165.88 feet; thence
5) North 80°00'00" East, 110.00 feet; thence
6) North 16°30'00" East, 415.00 feet; thence
7) North 16°30'00" West, 105.88 feet; thence
8) North 44°11'18" East, 110.00 feet; thence
9) North 83°26'18" East, 170.00 feet; thence
10) South 54°03'42" East, 160.00 feet; thence
11) North 83°31'18" East, 180.00 feet; thence
12) South 57°43'42" East, 225.00 feet; thence
13) South 88°48'42" East, 715.00 feet; thence
14) South 21°30'00" East, 85.00 feet; thence
15) South 21°30'00" East, 85.00 feet; thence
16) South 19°00'00" West, 135.00 feet; thence
17) South 30°00'00" East, 55.00 feet; thence
18) South 64°00'00" East, 100.00 feet; thence
19) North 56°30'50" East, 312.38 feet; thence
20) North 00°07'38" East, 1,246.18 feet; thence
21) North 67°00'00" West, 425.02 feet; thence
22) North 18°58'19" East, 205.18 feet; thence
23) North 45°03'05" West, 117.72 feet; thence

24) North 08°24'30" West, 223.00 feet; thence
25) North 82°30'34" West, 216.80 feet; thence
26) West, 99.47 feet; thence
27) South 17°01'49" West, 251.49 feet; thence
28) South 25°00'00" West, 38.98 feet; thence
29) Continue southwesterly along said line; 53.10 feet; thence
30) North 67°00'00" West, 60.04 feet; thence
31) North 25°00'00" East, 90.00 feet; thence
32) North 17°01'49" East, 239.00 feet; thence
33) South 76°00'00" West, 97.78 feet; thence
34) South 70°00'00" West, 98.07 feet; thence
35) South 78°00'00" West, 74.00 feet; thence
36) South 84°00'00" West, 203.00 feet; thence
37) North 80°00'00" West, 80.00 feet; thence
38) North 58°00'00" West, 69.00 feet; thence
39) North 34°00'00" West, 68.00 feet; thence
40) North 11°59'51" West, 249.61 feet; thence
41) South 78°00'09" West, 514.98 feet; thence
42) Continue westerly along said line, 61.69 feet to the beginning of a curve, concave southeast, having a radius of 220.00 feet; thence
43) Southwesterly 175.36 feet along said curve, through a central angle of 45°40'09"; thence
44) South 32°20'00" West, 68.61 feet; thence
45) North 57°40'00" West, 35.00 feet to the beginning of a curve, concave south, having a radius of 530.00 feet; thence
46) Westerly 410.07 feet along said curve, through a central angle of 44°19'51"; thence
47) North 78°00'09" East, 2,213.91 feet; thence
48) South 11°59'51" East, 60.01 feet; thence
49) South 81°30'00" East, 239.29 feet; thence
50) South 70°35'30" East, 123.50 feet; thence
51) North 81°11'18" East, 85.52 feet; thence
52) South 26°33'42" East, 99.82 feet; thence
53) North 86°06'18" East, 139.96 feet; thence
54) North 16°46'18" East, 375.61 feet; thence
55) North 78°00'09" East, 520.00 feet; thence

56) South 27°23'42" East, 280.00 feet; thence
57) South 89°28'42" East, 210.00 feet; thence
58) South 21°03'42" East, 270.00 feet; thence
59) South 57°11'18" West, 160.00 feet; thence
60) South 31°36'18" West, 250.00 feet; thence
61) South 31°03'42" East, 220.00 feet; thence
62) South 33°56'18" West, 390.00 feet; thence
63) North 71°43'42" West, 230.00 feet; thence
64) South 58°36'18" West, 190.00 feet; thence
65) South 03°43'42" East, 290.00 feet; thence
66) South 57°22'35" East, 373.62 feet; thence
67) North 80°34'59" East, 267.61 feet; thence
68) North 84°31'21" East, 153.29 feet; thence
69) South 74°52'13" East, 327.86 feet; thence
70) South 84°20'29" East, 224.52 feet; thence
71) South 42°36'32" East, 93.11 feet; thence
72) South 76°35'50" East, 293.61 feet; thence
73) South 26°19'19" East, 136.78 feet; thence
74) South 21°36'43" East, 115.18 feet; thence
75) South 68°10'09" West, 287.48 feet; thence
76) South 38°33'50" West, 317.27 feet; thence
77) South 08°51'22" East, 522.61 feet; thence
78) South 34°53'42" East, 190.00 feet; thence
79) Continue southeasterly along said line, 470.00 feet; thence
80) South 72°03'42" East, 360.00 feet; thence
81) North 61°56'18" East, 220.00 feet; thence
82) North 78°56'18" East, 466.00 feet; thence
83) South 14°13'42" East, 183.05 feet; thence
84) South 21°33'42" East, 250.00 feet; thence
85) South 07°39'48" West, 199.76 feet; thence
86) South 69°26'18" West, 60.00 feet; thence
87) South 71°01'18" West, 120.00 feet; thence
88) South 82°56'18" West, 230.00 feet; thence
89) South 88°36'18" West, 155.00 feet; thence
90) North 86°08'42" West, 155.00 feet; thence

91) North 82°13'42" West, 160.00 feet; thence
92) North 76°48'42" West, 150.00 feet; thence
93) North 75°03'42" West, 160.00 feet; thence
94) North 70°18'42" West, 160.00 feet; thence
95) North 61°13'31" West, 290.26 feet; thence
96) North 57°03'42" West, 395.74 feet; thence
97) North 42°53'42" West, 152.00 feet; thence
98) North 66°08'42" West, 494.00 feet; thence
99) North 76°03'42" West, 490.00 feet; thence
100) South 89°56'18" West, 488.00 feet; thence
101) South 75°36'18" West, 642.00 feet; thence
102) North 89°43'42" West, 278.00 feet; thence
103) South 86°31'18" West, 414.00 feet; thence
104) North 89°18'42" West, 338.00 feet; thence
105) North 85°13'42" West, 160.00 feet; thence
106) North 74°33'42" West, 230.99 feet to the **Point of Beginning.**

Containing 188.61 acres, more or less, as shown on the plat attached hereto and made a part of.

Bearings cited herein are referenced to Volume 15, Page 190 of Parcel Maps, filed in the office of the County Recorder of Monterey.

Dated: October 31, 2005

Bestor Engineers, Inc.

H. PATRICK WARD, PLS
LS 7866
Exp: 12/31/06

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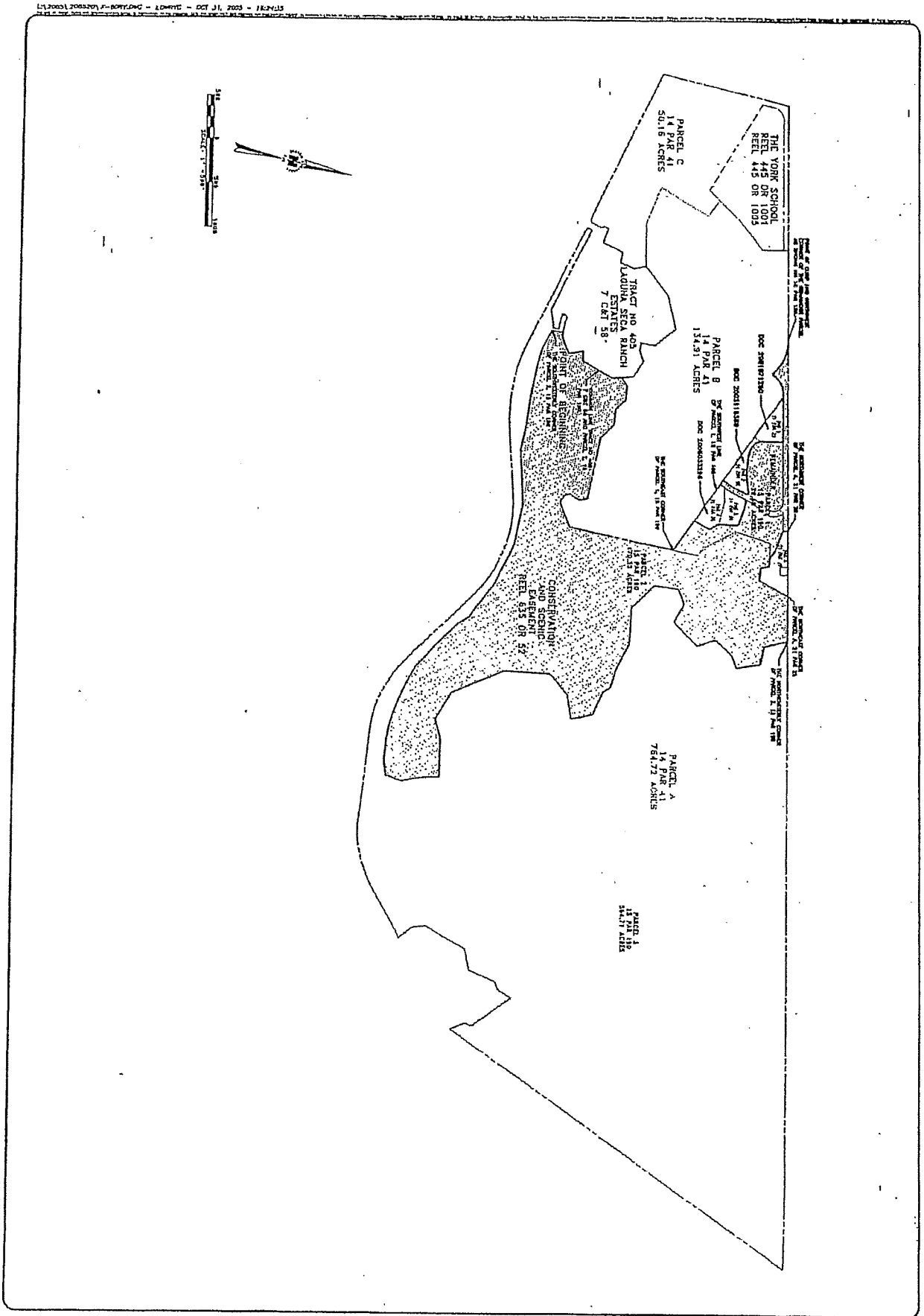


PREPARED FOR: Mahoney

EXHIBIT

LAGUNA SECA #3

COUNTY OF MONTEREY, CALIFORNIA

BESTOR ENGINEERS, INC.

PRELIMINARY

NOT FOR CONSTRUCTION

SCALE: 1" = 500'

DATE: 10/28/2008

SHEET: 1 of 1

JOB NO: 2015.30

EXHIBIT "A"
DESCRIPTION OF REAL PROPERTY

THE LAND REFERRED TO IS SITUATED IN THE STATE OF CALIFORNIA, COUNTY OF MONTEREY AND IS DESCRIBED AS FOLLOWS:

PARCEL A

Parcels I through P as shown on the Map entitled "Tract No. 1307, Rancho Monterey", which map was filed for record on November 4th, 1998 in Volume 20 of Cities and Towns, as Page 7 in the Office of the County Recorder of Monterey County, California

PARCEL B (LEASEHOLD)

Beginning at a large granite monument, marked L S 8, S 4 standing at the common corner for Monterey City Lands Tract No. 1 (Pueblo Tract) as patented and the Rancho Saucito and Laguna Seca, as patented from which a double live oak 14" in diameter bears N. 18° 15' W., 35.35 feet distant, and leaning live oak 14" in diameter bears N. 50° 40' E., 69.85 feet distant, both trees being marked B T L S 8; thence along the boundary between said Monterey City Lands Tract No 1 and the Rancho Laguna Seca

(1) N. 76° 05' E., 12587.36 feet to a hollow live oak 20 inches in diameter, marked LS9 from which a live oak 20 inches in diameter bears N. 89° 30' W., 66.17 feet distant and a double live oak 30 inches in diameter bears S. 44° 45' W., 63.50 feet distant both trees being marked B T L S 9; thence still along said dividing line

(2) N. 77° 36' E., 987.4 feet to a 4 x 4 inch post marked M A F, S J F, Station; thence leaving said line

(3) S. 22° 00 1/2' W., 5357.6 feet at 850.0 feet a 4 x 4 inch post marked M A F, S J F, On Line, at 4843.2 feet a 4 x 4 inch post marked M A F, S J F, standing in a fence corner near the Laguna Seca Ranch Building at 5310.3 feet a 4 x 4 inch post marked M A F, S J F, W P. Standing in the northern right of way line of the New Salinas-Monterey Road (width 80 feet) from which a live oak 30 inches in diameter marked B T bears N. 17° E., 78 feet distant; 5357.6 feet to a station 376.44 of the center line of the said new right of way of said road; thence

(4) S. 5° 35' W., 2855.1 feet at 41.1 feet a 4 x 4 inch post in fence on the southern side of said road, 1305.0 feet 4 x 4 inch post marked M A F, S J F, Line at 2293.8 feet a 4 x 4 inch post marked M A F, S J F, Line 2855.1 feet to a 8 x 8 inch post marked S J F, MAF, standing in the boundary between the Rancho Laguna Seca nd Monterey City lands Tract No. 2 (Pueblo Tract); thence

(5) N. 80 36' W., 1615.4 feet along fence and the boundary between Laguna Seca and Monterey City Lands Tract No. 2 to a live oak 2 1/2 feet in diameter, Corner L S 3 of the Patent survey of the Rancho Laguna Seca; thence

(6) N. 40° 39' W., 1779.8 feet at 1062.7 feet a 4 x 4 inch post marked L S R, Line at 1707.0 feet a 4 x 4 inch post marked L S R, 409+77.6 in south line of new road

right of way at 1711.6 feet a large granite witness monument near the south line of the new Salinas Monterey Road Right of Way from which Engineer Station 409+05.61 E.C., bears N. 57° 32' E., 82.16 feet distant 1779.8 feet to Station L S 4 in the road right of way; thence

(7) N. 76° 04' W., 2550.2 feet a 4 x 4 inch post marked L S R, Line at 995.6 feet to a 4 x 4 inch post marked L S R, S J F, Line 420+28.15 in fence on south line of road at 1615 feet a 4 x 4 inch post marked L S R, Line, on Summit of Spur at 2015.0 feet a 4 x 4 inch post marked L S R, Line 2550.2 feet to the original Patent Survey Corner Oak L S 5; thence

(8) N. 89° 56' W., at 100.5 feet a 4 x 4 inch post marked L S R, S J F, Line at 525.0 feet a 4 x 4 inch post marked L S R, S J F, Line at 1273.1 feet a 4 x 4 inch post marked L S R, S J F Line 450+62, at 2337.0 feet a 4" x 4" post marked L S R, 461+16.5 Line, in fence on south side of the new road right of way, at 2551.2 feet a 4 x 4 inch post marked L S R. T. 16, S R 1 E, T. 16 S R 2 E, 2676.6 feet to a 8 x 8 inch post marked L S 6 set in the roots of the original oak corner tree S L 6, from which a live oak 10 inches in diameter bears S. 52° 15' W., 21 feet distant, marked B T, LS 6, and live oak 12 inches in diameter bears S. 83° E., 38.8 feet distant, marked B T L S 6; thence

(9) N. 75° 13 1/2' W., 3032.4 feet a 418.7 feet to a 4 x 4 inch post L S R, S J F Line at 943.9 feet a 4 x 4 inch post marked L S R, S J F, Line at 1243.9 feet a 4 x 4 inch post marked L S R, S J F Line at 189.10 feet a 4 x 4 inch post marked L S R, S J F, Line at 2491.0 feet a 4 x 4 inch post marked L S R, S J F, Line 3032.4 feet a 8 x 8 inch post marked L S 7 in fence, from which a live oak 14 inches in diameter bears S. 27° 50' E., 47 feet distant; thence leave the line of the Monterey City Lands Tract No. 2, and along the easterly line of the Rancho Saucito

(10) N. 0° 15' W., 1571.5 feet at 83.3 feet a 4 x 4 inch post marked T J F in fence on the north line of the new road right of way (width 80 feet) at 234.3 feet a large live oak on line marked, with a cross 1571.5 feet to the place of beginning.

Excepting therefrom that portion of said land described in the deed to the County of Monterey, recorded April 30, 1929 in Book 190, Page 91, Official Records.

Also excepting therefrom all that portion of said land conveyed to Eula May Leidig, by deed recorded April 23, 1946 in Volume 919 Official Records, Page 426

Also excepting therefrom that portion of said land described in the deed to Constance H. Bishop, recorded June 30, 1952 in Book 1390, Page 299, Official Records.

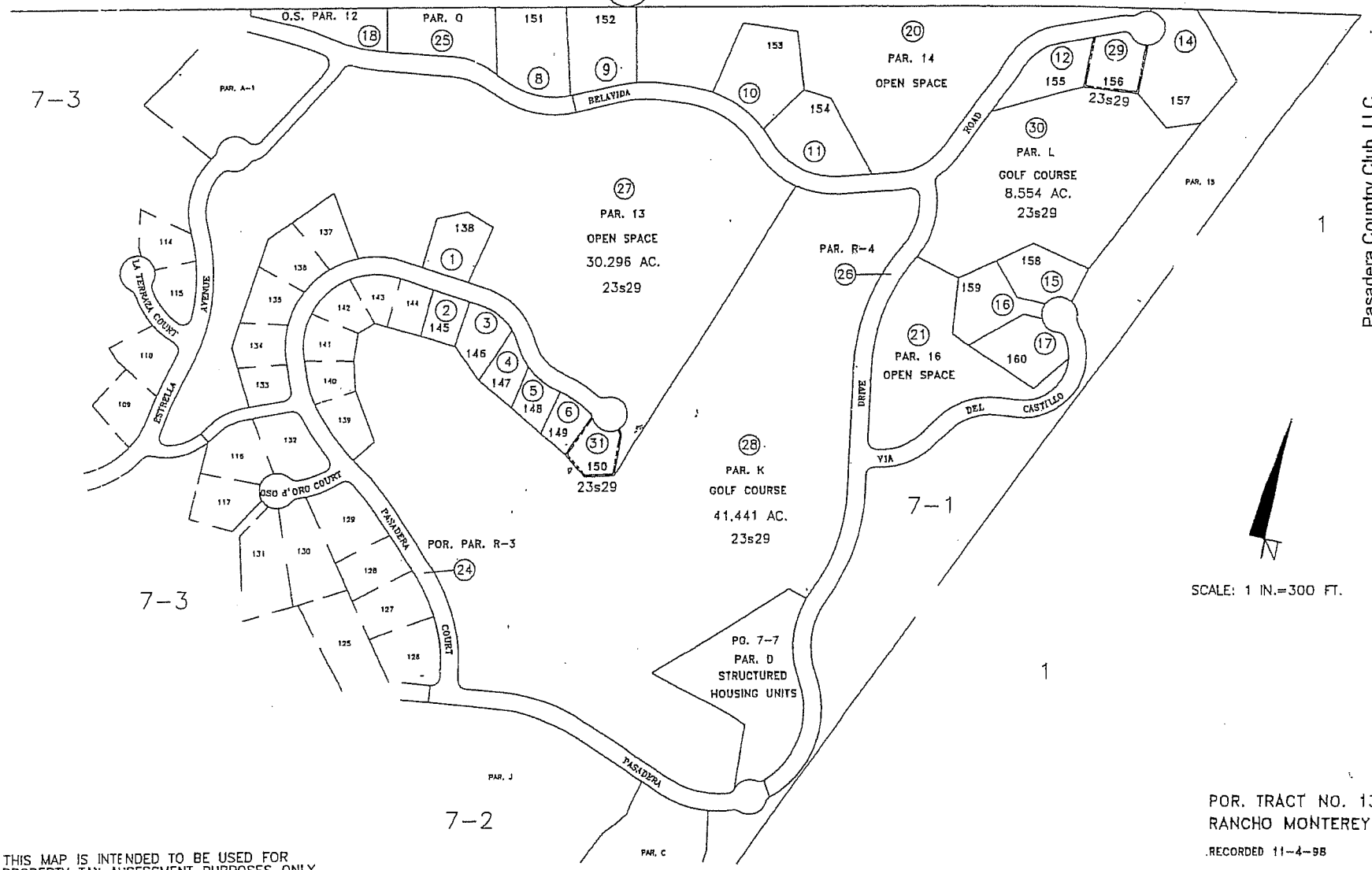
Also excepting therefrom that portion of said land described in the deed to James E. Elliott, et ux, recorded September 19, 1960 in Book 2083, Page 276, Official Records.

TAX CODE AREA 139-064

COUNTY OF MONTEREY
ASSESSOR'S MAP
BOOK 173 PAGE 2

075

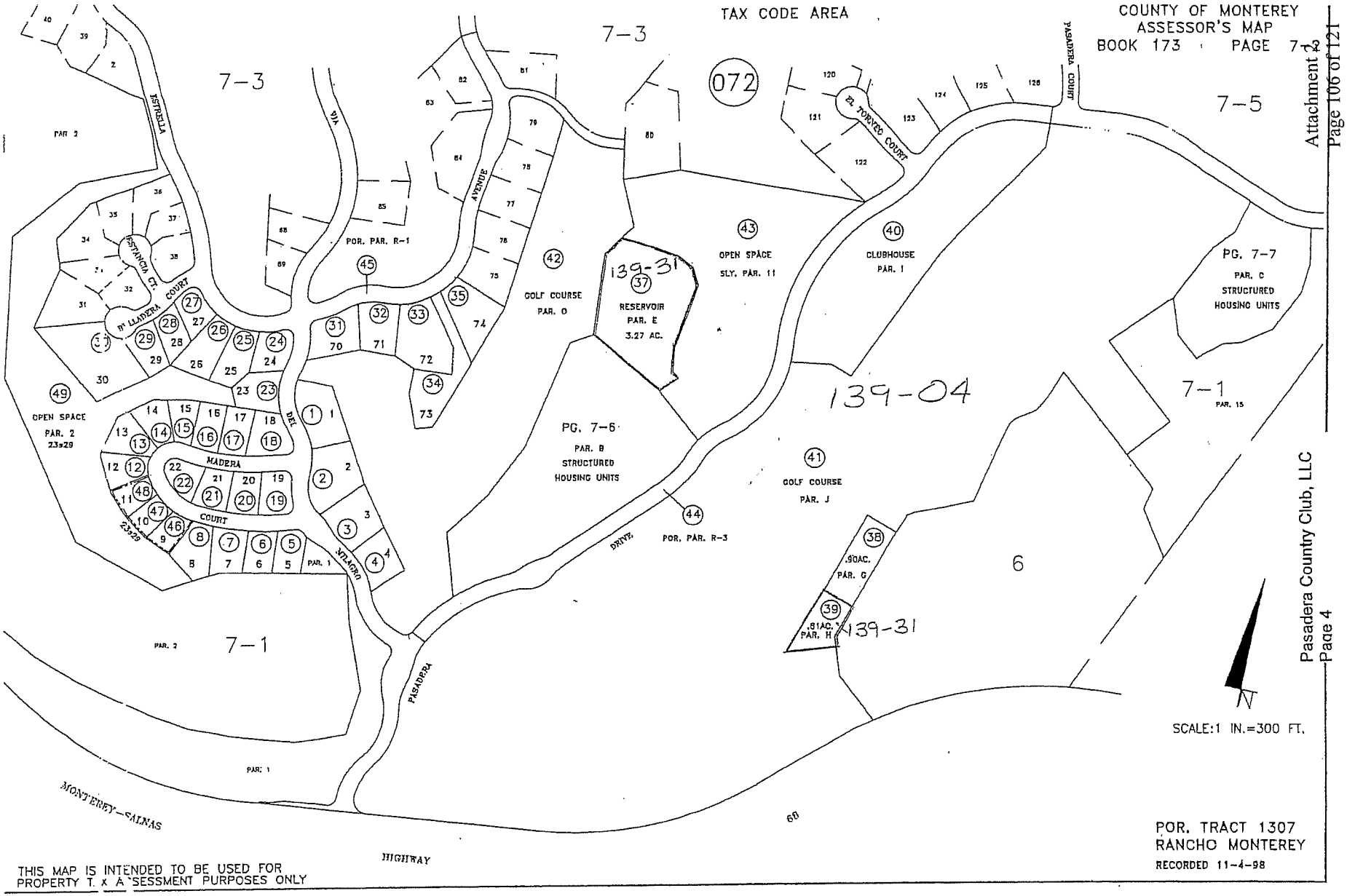
31/13



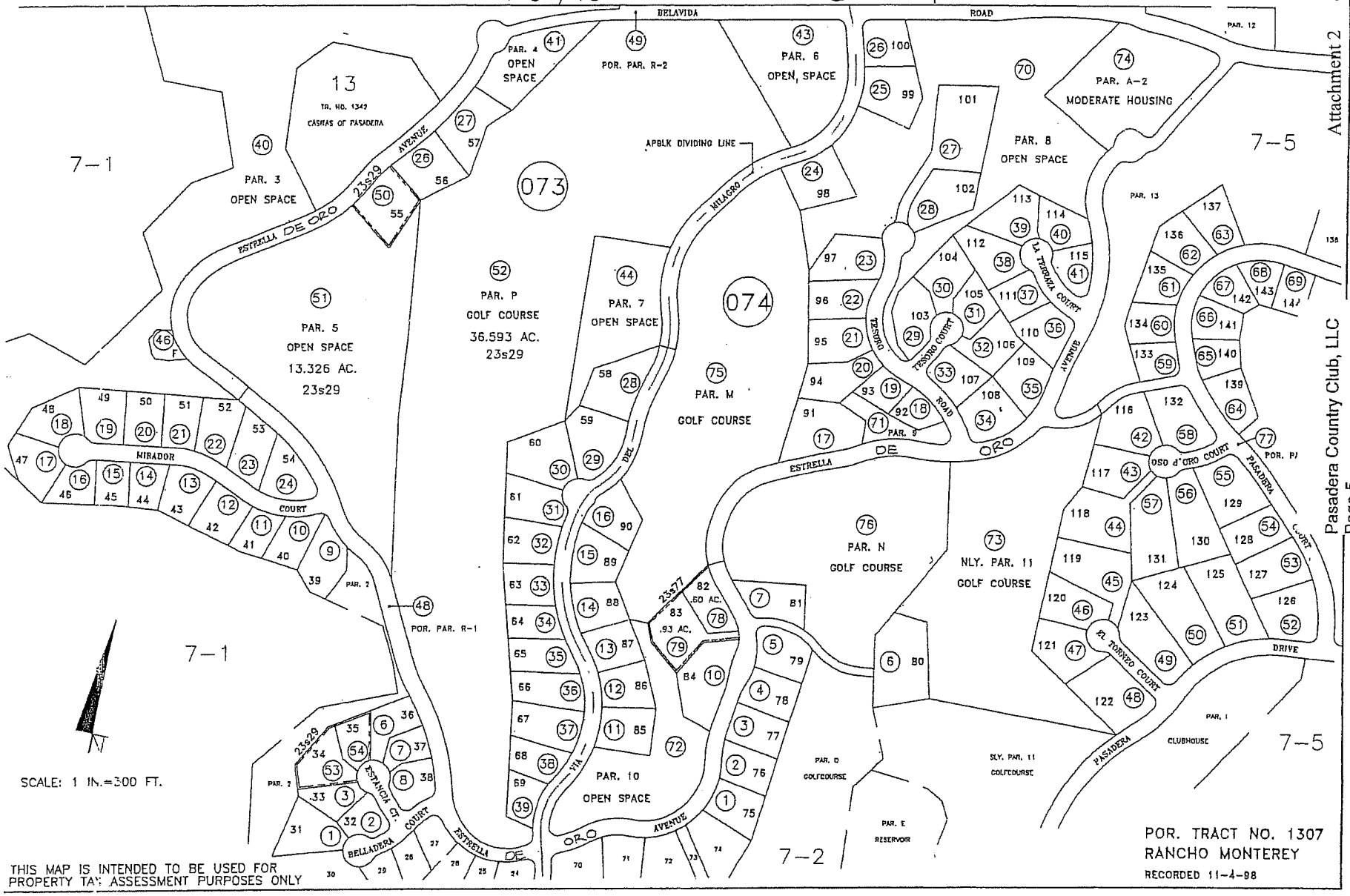
POR. TRACT NO. 1307
RANCHO MONTEREY
RECORDED 11-4-98

THIS MAP IS INTENDED TO BE USED FOR
PROPERTY TAX ASSESSMENT PURPOSES ONLY

Pasadera Country Club, LLC
Page 3



Attachment 2
Page 106 of 121
Pasadera Country Club, LLC
Page 4



Attachment 2
Page 107 of 121
Pasadera Country Club, LLC
Page 5

Mission Memorial Park
Legal Description and Map

Order No: 1743143 -MM

1

DESCRIPTION

PARCEL I:

Certain real propety situate, lying and being in the County of Monterey, State of California, being a portion of that certain 4.000 acres of land conveyed by Mission Memorial Park Inc., to John H. Moncivich and Walter Ehrlich by Deed dated August 10, 1955 in Volume 1647, Official Records of Monterey County, Page 261, particularly described as follows:

Beginning at the Southwesterly corner of said 4.00 acre parcel, being also a portion on the Westerly line of that certain 40 1/3 acre tract of land conveyed from Walter Ehrlich, et al, to Mission Memorial Park by Deed dated February 25, 1953 and recorded October 30, 1953 in Volume 1487, Official Records of Monterey County, at Page 420, from which point of beginning a concrete monument standing at the Northeasterly corner of Tract No. 303, Ord Terrace No. 9, as shown on that certain Map filed in Volume 6 of Maps, "Cities and Towns", at Page 104, Monterey County Records, bears N. 0° 42' 35" W., 830.75 feet (deed N. 1° 01' W., 831.9 feet); thence

(1) Along the Southerly line of said 4.000 acre parcel, S. 89° 48' E., 102.71 feet (deed S. 89° 48' E., 97.72 feet); thence

(2) 36.29 feet along the arc of a tangent curve to the left of radius 25.00 feet (long chord bears N. 48° 36' 40" E., 33.19 feet and central angle of 83° 10' 40"); thence

(3) 184.40 feet along the arc of a tangent reverse curve to the right of radius 255.00 feet (long chord bears N. 27° 44' 20" E., 180.41 feet and central angle of 41° 26'); thence

(4) Leaving the Easterly line of said 4.000 acre parcel N. 41° 32' 40" W., 125.00 feet; thence

(5) S. 89° 09' 50" W., 132.07 feet to a point on the Westerly line of said 4.000 acre parcel and the Easterly line of said Ord Terrace No. 9; thence

(6) Following said line, S. 0° 42' 35" E., 272.91 feet to the point of beginning.

A.P. NO.: 011-061-018

PARCEL II:

Beginning at a point on the Westerly line of that certain 40 1/3 acre tract of land conveyed from the City of Monterey to Walter Ehrlich, et al, by a Deed dated July 23, 1952 and recorded July 25, 1952 in Volume 1395, Official Records of Monterey County, at Page 187, from which point of beginning, a granite monument at the Northeasterly corner of Lot 1, Rancho Noche Buena bears N. 1° 01' W., 98.91 feet to a point on the Northerly line of said Lot 1, and thence along said Northerly line N. 89° 09' 50" E., 1307.36 feet (by said deed 1308.18 feet); thence from said point of beginning and following said Westerly line of said tract of land

DESCRIPTION

(1) S. 1° 01' E., 831.90 feet (in said deed said line is given a bearing of S. 0° 42' 35" E.); thence leaving said line

(2) S. 89° 48' E., 97.72 feet; thence

(3) 36.29 feet along the arc of a tangent curve of radius 25 feet (long chord bears N. 48° 36' 40" E., 33.19 feet); thence

(4) 184.40 feet along the arc of a tangent reverse curve of radius 255 feet (center of said curve bears S. 82° 58' 40" E., long chord bears N. 27° 44' 20" E., 180.41 feet); thence

(5) 164.72 feet along the arc of a tangent reverse curve of radius 125 feet (center of said curve bears N. 41° 32' 40" W., long chord bears N. 10° 42' 20" E., 153.05 feet); thence

(6) 109.11 feet along the arc of a tangent reverse curve of radius 235 feet (center of said curve bears N. 62° 57' 20" E., long chord bears N. 13° 44' 35" W., 108.13 feet); thence tangentially

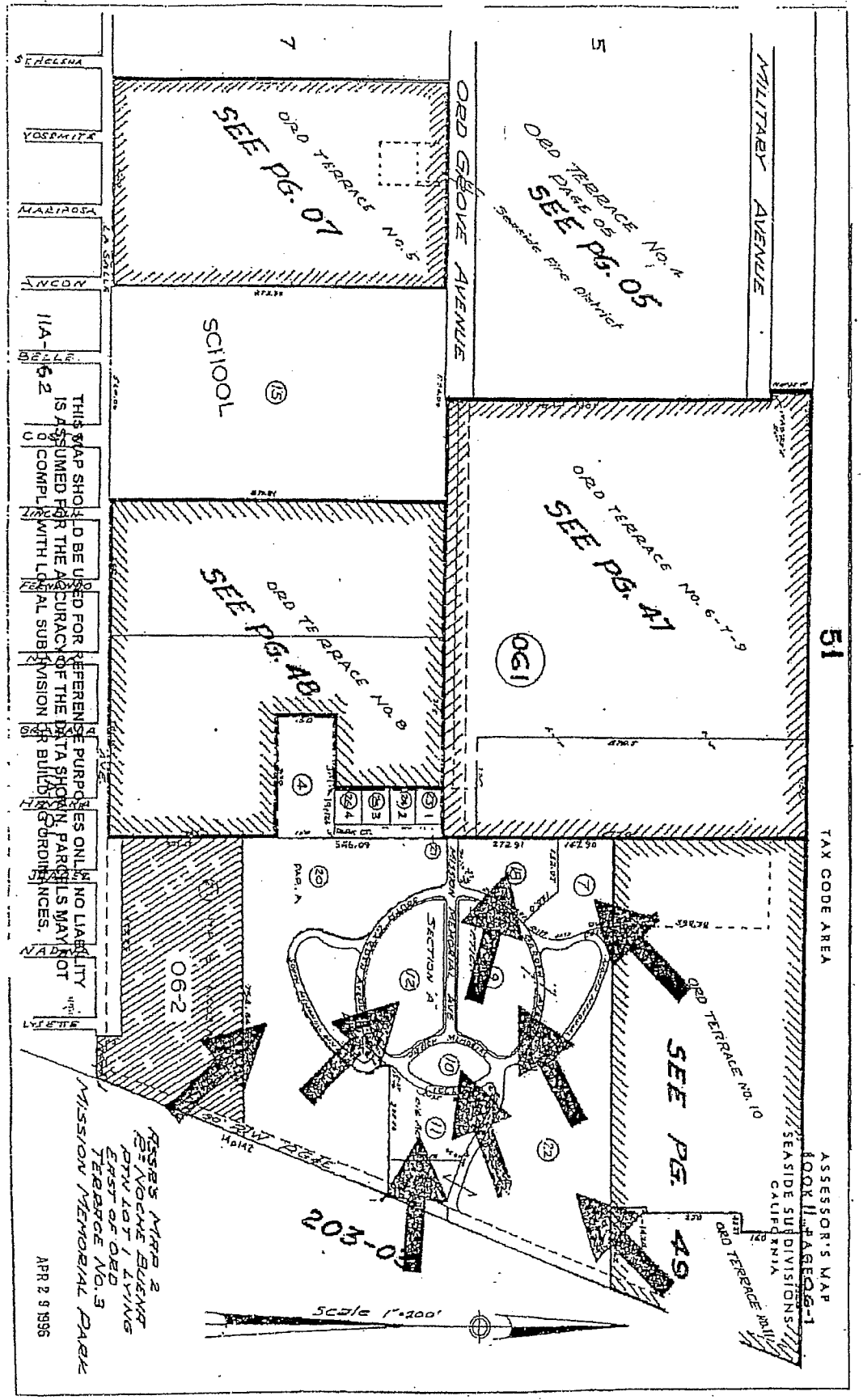
(7) N. 0° 26' 30" W., 398.30 feet; thence

(8) S. 89° 09' 50" W., 221.04 feet to the point of beginning and being a portion of said 40 1/3 acre tract of land.

EXCEPTING THEREFROM that certain real property described in the Deed from John H. Moncovich, et al, to Mission Memorial Park, a Corporation, dated August 22, 1958 and recorded October 28, 1958 in Volume 1905, Official Records of Monterey County, at Page 268.

ALSO EXCEPTING THEREFROM that certain real property described in the Deed from John H. Moncovich, et al, to R.I. Gorrell and A. Von Drachenfels, a Partnership, composed of R.I. Gorrell and A. Von Drachenfels, dated October 27, 1958 and recorded November 25, 1958 in Volume 1912, Official Records of Monterey County, at Page 150.

A.P. NO.: 011-061-007



THIS MAP SHOULD BE USED FOR REFERENCE PURPOSES ONLY. NO LIABILITY IS ASSUMED FOR THE ACCURACY OF THE DATA SHOWN. PARCELS MAY NOT COMPLY WITH LOCAL SUBDIVISION OR BUILDING ORDINANCES.

Description: Monterey,CA Assessor Map 11.6 Page 1 of 2 Only
Order: JCV Comment:

EXHIBIT "A"

EXHIBIT "A"

Calabrese Lands

PARCEL 1:

All that real property situated in the City of Sand, County of Monterey, State of California, described as follows:

Part of Lot 1 of Rancho Noche Buena in Monterey County, Calif., described as follows, to wit:

Commencing at the intersection of the westerly line of Ocean View Avenue with the Northerly line of Park Drive projected Westerly, as same are shown and designated on that certain map entitled, "Map No. 3, Hot Spring Tract, being a portion of Lot 1, Rancho Noche Buena, Monterey County, Calif., surveyed by C. H. Sanders, March 1912", filed for record April 1, 1912 in the office of the County Recorder of the County of Monterey, State of California, in Volume 2 of Maps, "Cities and Towns", at page 35; and running thence: S. 61° 15' E., 581.7 feet along the northerly line of said Park Drive; thence

S. 56° 43 ½' E., 374 feet along the said northerly line of Park Drive; thence

N. 33° 16 ½' E., 479.6 feet; thence

N. 61° 15' W., 972.6 feet to the westerly line of Lot 1 of Rancho Buena which is also the westerly line of Ocean Ave., projected northerly; thence

S. 31° 16' W., along said westerly line 450 feet to the point of beginning containing 10.00 acres of land, a little more or less;

Also any and all land adjacent and contiguous to the above described property lying westerly of the above parcel and projecting into the Bay of Monterey and between the northerly line and the southerly line of the above described parcel as said lines are projected westerly;

EXCEPTING THEREFROM any portion of the above property lying within the lines of State Freeway No. 1.

APN: 011-012-005 and 011-011-020 - Vacant Lots in Sand City, California

Parcel 2:

All that real property situate in the City of Sand, County of Monterey, described as follows:

Certain real property situate in the Rancho Noche Buena, in the County of Monterey, State of California, being a portion of that certain 86.75 acre parcel of land conveyed from T. A. Work, et ux, to Mrs. Edith A. Roberts by deed dated May 16, 1921 and recorded April 5, 1923 in Volume 13 of Official Records of Monterey County at Page 444, particularly described as

follows:

BEGINNING at a point in said 86.75 acre parcel, being the intersection of the southwesterly line of that certain 41.01 acre parcel of land described in lease from Jno. L. D. Roberts to Pacific Coast Agregates, Inc., dated October 18, 1946, with the northwesterly boundary of that certain 9.20 acre parcel of land described as Parcel 1A in Action No. 55706, Order for Possession, of the Superior Court of the State of California in and for the County of Monterey, dated October 6, 1965, said southwesterly lease boundary line being a line which bears S. 51° 10' E. from a point on the northwesterly boundary of said 86.75 acre parcel of land lying 1500.0 feet southwesterly along said northwesterly boundary from the most northerly corner of said 86.75 acre parcel, and said northwesterly boundary of said Parcel 1A being the northwesterly Right of Way Line of proposed State Highway, Road V-Non-56-I, Mon, Sea, Snd C, as delineated on the map filed in the State Highway Map Book at Pages 631 to 643, incl., records of said County; thence, along the boundary of said Parcel 1A, following Courses No. (12) and (11) as described in said court order

1. S. 59° 15' 51" W., 124.11 feet, to angle point of said boundary at southwesterly terminus of said course (12); thence

2. S. 73° 07' 28" W., 1.85 feet; thence, leaving said boundary

3. N. 51° 10' W., parallel with said southeasterly line of said lease parcel (in said lease N. 53° 06' W.) a distance of 68.20 feet; thence

4. Westerly, 128.88 feet, along the arc of a tangent curve to the left with radius of 100 feet (long chord bears N. 83° 05' 17" W., 120.14 feet); thence, non-tangentially

5. N. 51° 10' W., parallel with said southeasterly line of said lease parcel, a distance of 103.90 feet; thence

6. N. 38° 50' E., 190.0 feet, to intersection with said lease line; thence

7. S. 51° 10' E., along said lease line (in said lease S. 53° 06' E.), 312.52 feet, to the point of beginning. Basis of bearings for the above stated courses being identical with and derived from survey for said State Highway as shown on said highway map sheet.

TOGETHER WITH a non-exclusive easement for road and utilities purposes over the following described parcel of land;

BEGINNING at the westerly terminus of course numbered 2 of the boundary of the above described parcel of land, said course being stated "S. 73° 07' 28" W., 1.85 feet", thence

1. S. 73° 07' 28" W., along the boundary of said Parcel 1A as described in said court order, 121.03 feet, to angle point of said boundary; thence, leaving said boundary

2. N. 35° 00' 35" W., 100.00 feet, to the westerly terminus of course numbered 4 of the boundary of the above described parcel of land, said course being a curve of radius 100 feet; thence, following the boundary of said parcel as above described

3. Easterly 128.88 feet along the arc of said curve to the right having a radius of 100 feet (center of said curve bears S. 35° 00' 35" E., 100.00 feet distant from the terminus of the preceding course), to a point from which said center bears S. 38° 50' W.; thence tangentially

4. S. 51° 10' E., 68.20 feet, to the point of beginning.

APN: 011-501-010

EXHIBIT 19-A
MONTHLY ALLOCATION REPORT
Reported in Acre-Feet
September 30, 2005

Jurisdiction	Parcel Allocation	Changes	Remaining	ERR Parcel Credits	Changes	Remaining	Public Credits	Changes	Remaining	Total Available
Airport District	8.100	0.000	5.782	0.000	0.000	0.000	0.000	0.000	0.000	5.782
Carmel-by-the-Sea	19.410	0.000	1.630	1.081	0.000	1.081	0.560	0.000	0.560	3.271
Del Rey Oaks	8.100	0.000	0.000	0.440	0.000	0.000	0.000	0.000	0.000	0.000
Monterey	76.320	0.000	0.015	50.659	0.000	9.702	38.792	0.020 Cr	8.282	17.999
Monterey County	87.710	0.000	17.406	13.080	0.000	0.065	7.827	0.000	2.501	19.972
Pacific Grove	25.770	0.000	1.620	1.410	0.000	1.091	11.473	0.000	2.329	5.040
Sand City	51.860	0.000	1.490	0.838	0.000	0.838	24.717	0.000	24.717	27.045
Seaside	65.450	0.000	25.863	34.438	0.000	34.438	4.534	0.000	3.541	63.842
TOTALS	342.72	0.000	53.806	101.946	0.000	47.215	87.343	0.020 Cr	41.930	142.951

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CERTIFICATE OF MAILING
C.C.P. SEC. 1013a

I do hereby certify that I am not a party to the within stated cause and that on 1-12-06

I deposited true and correct copies of the following document:

TENTATIVE DECISION FILED JANUARY 12, 2006

in sealed envelopes with postage thereon fully prepaid, in the mail at Salinas, California 93901,

directed to each of the following named persons at their respective addresses, as hereinafter set forth:

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Dated: 1-12-06

LISA M. GALDOS, Clerk of the
Superior Court, for the County of Monterey

By _____
Erika D. Dunn, Deputy

Attachment 3

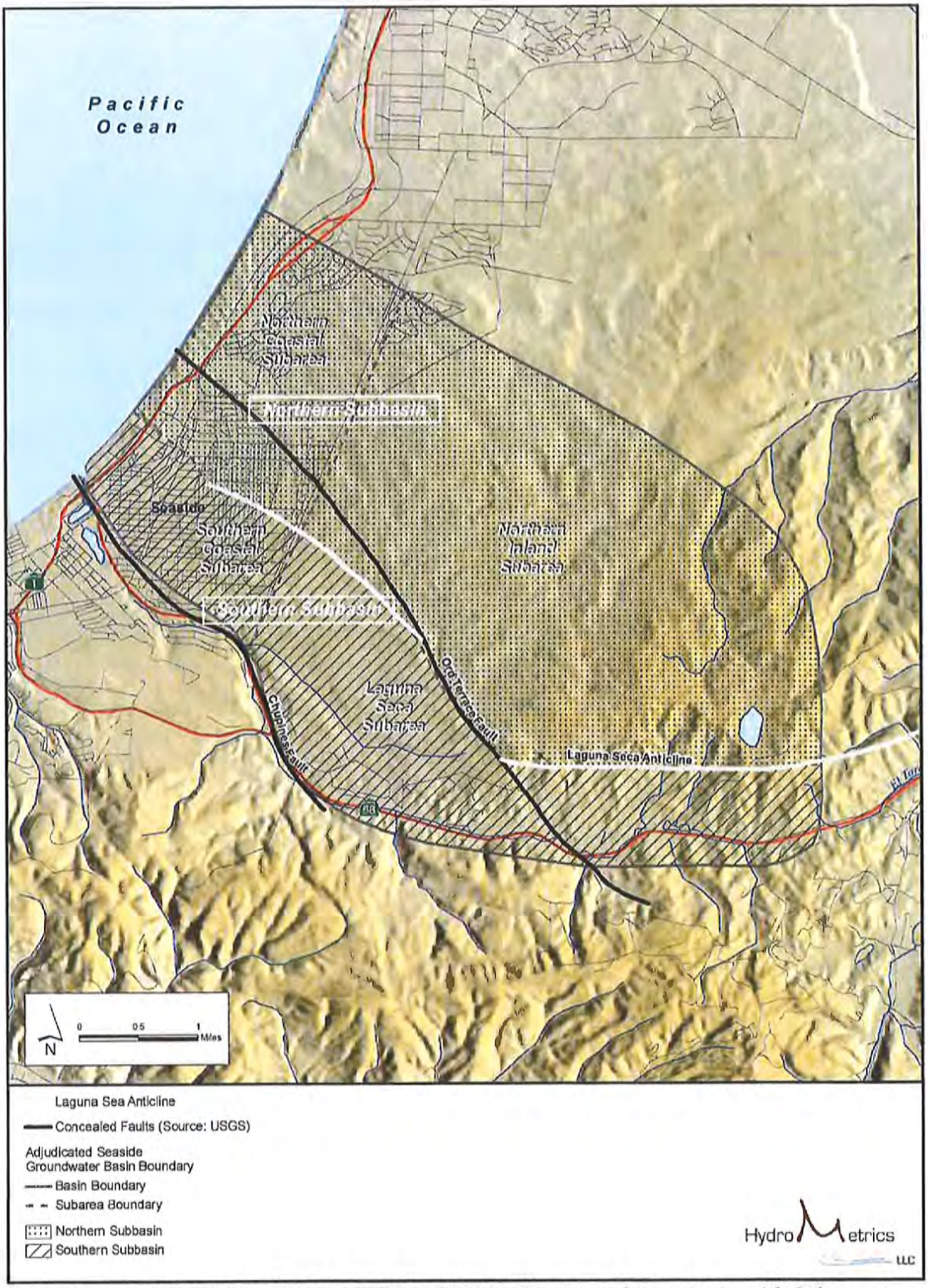


Figure 4: Amended Decision Boundary of the Seaside Groundwater Basin with Subareas

Attachment 4

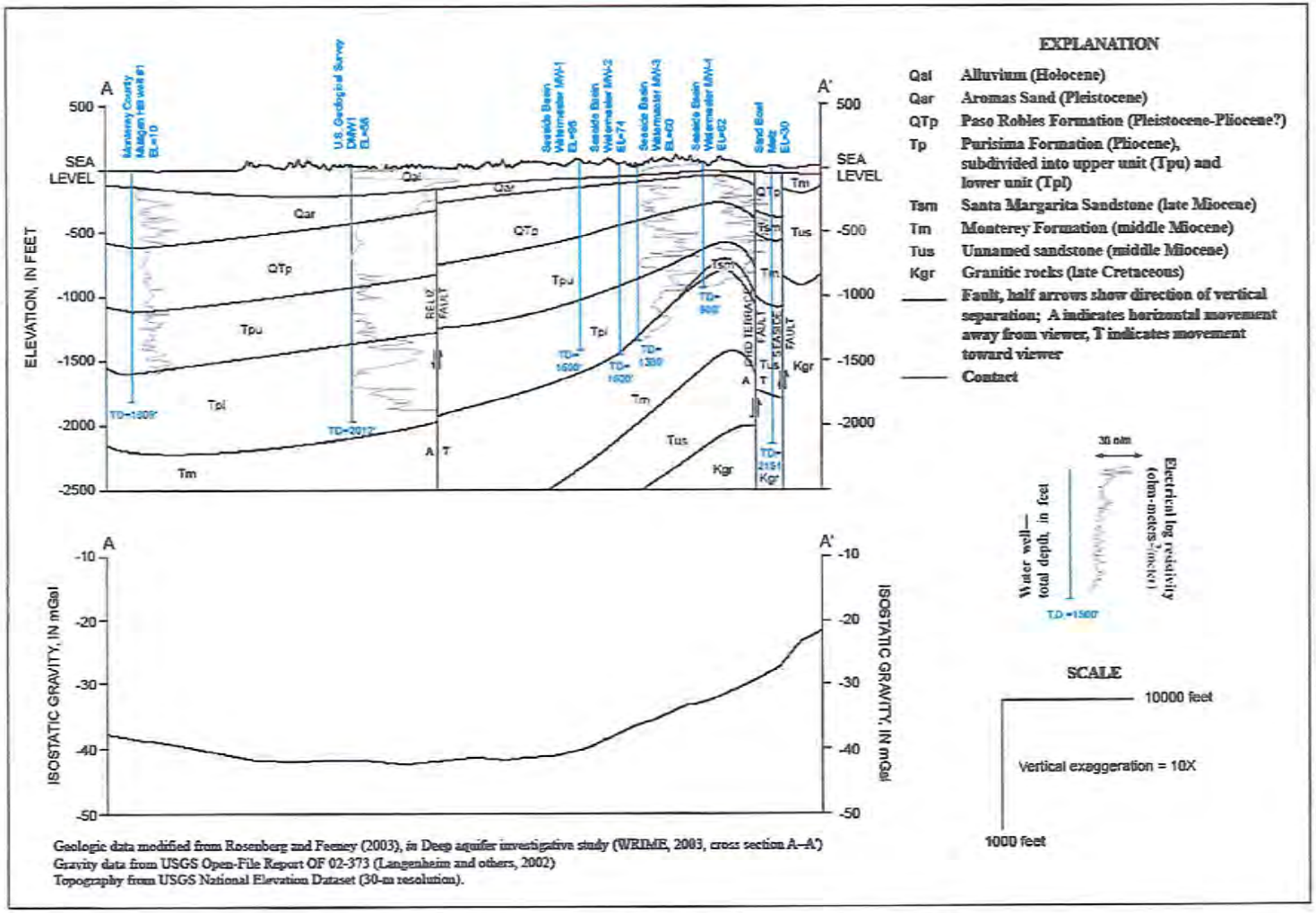


Figure 3: Geologic Cross Section A-A' (from Feeny, 2007)

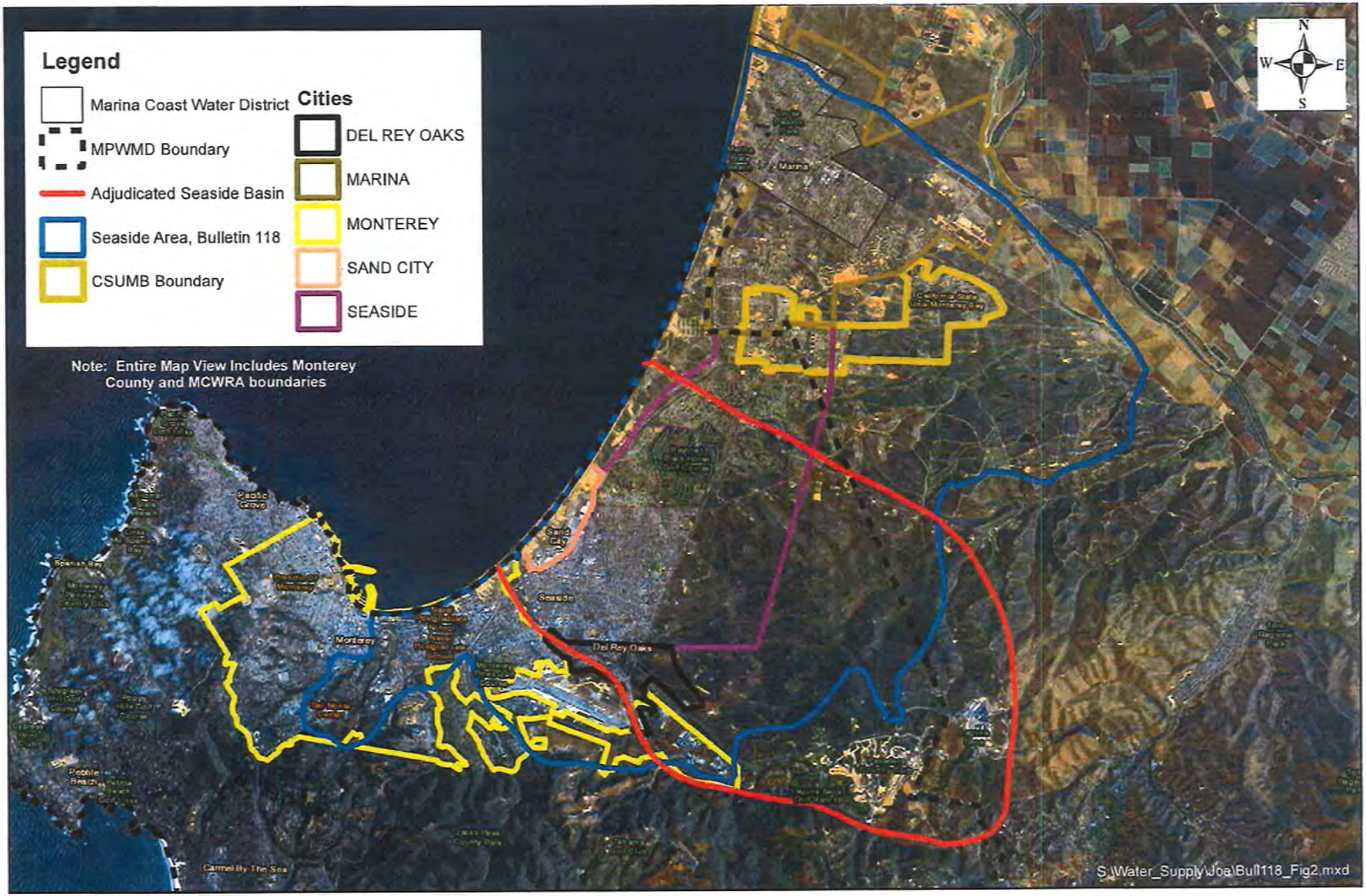
Attachment 4
Page 1 of 1

Attachment 5

Alluvial Groundwater Basins and Subbasins within the Central Coast Hydrologic Region

Source: Department of Water Resources, CWP 2013

Attachment 6



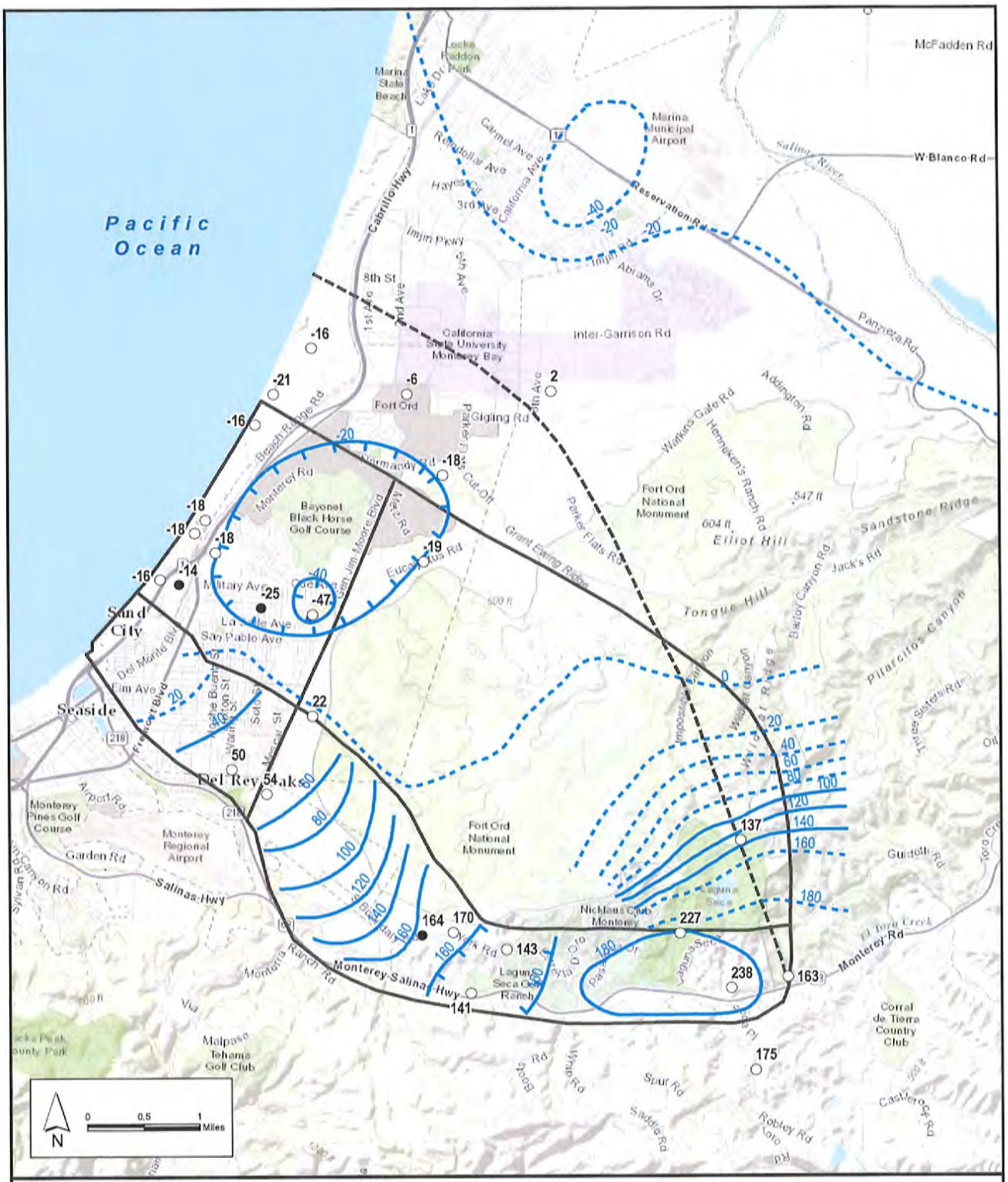
Attachment 6
Page 1 of 1

1.5 0.75 0 1.5 Miles

Figure 2: Proposed Modified Basin Boundary with Local Agencies

Monterey Peninsula Water Management District

Attachment 7



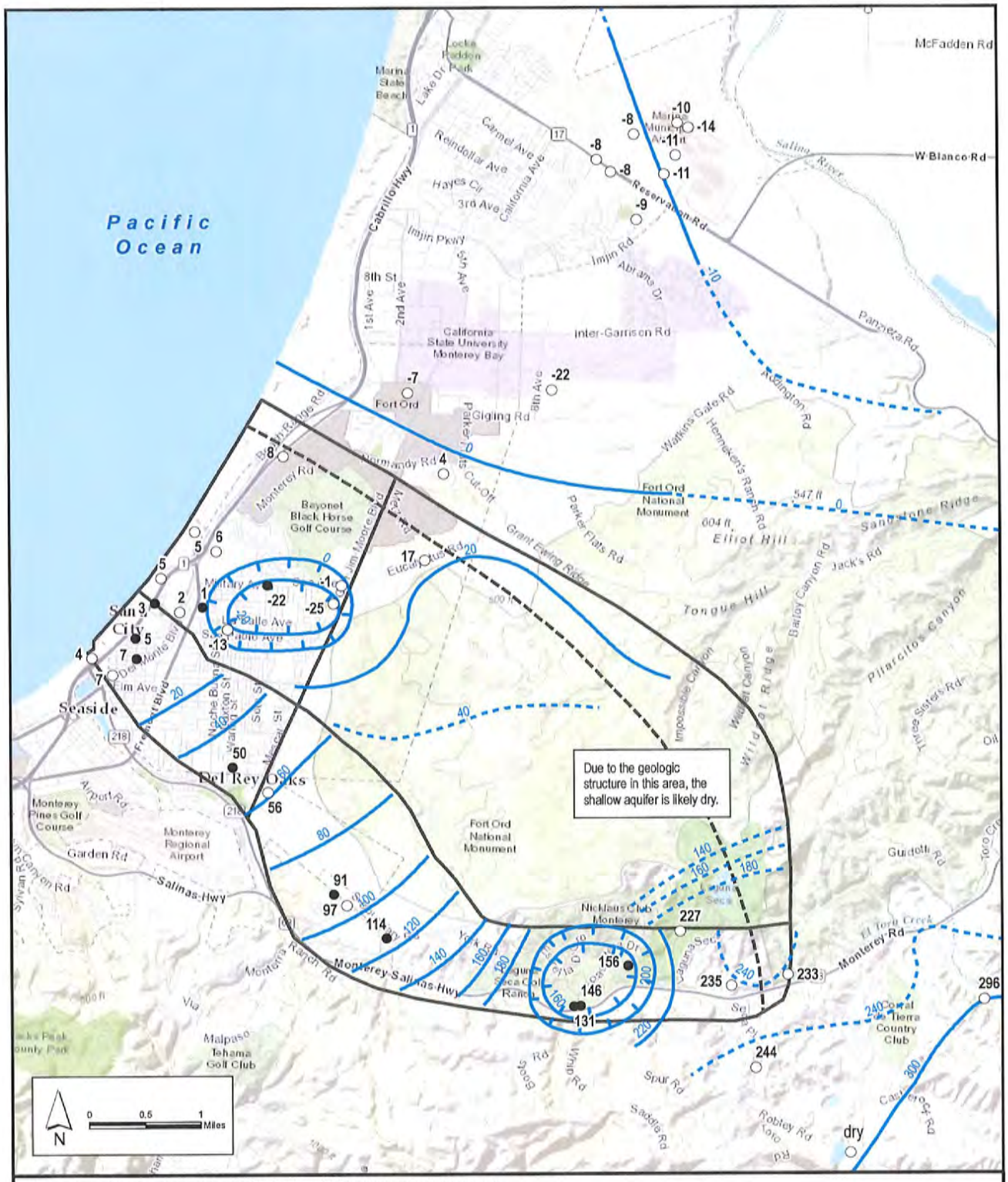
Wells with Water-Level Data (2nd Quarter WY 2015, Deep Zone)

- ○ Monitoring Well
- ● Production Well

Deep Zone Groundwater Elevation (feet MSL)

- Groundwater Elevation
- Pumping Depression
- Dashed where uncertain (no well data)
- Deep Aquifer Northern Boundary
- Adjudicated Seaside Basin Boundary

Deep Zone Water Level Map - 2nd Quarter WY 2015 (January-March 2015)



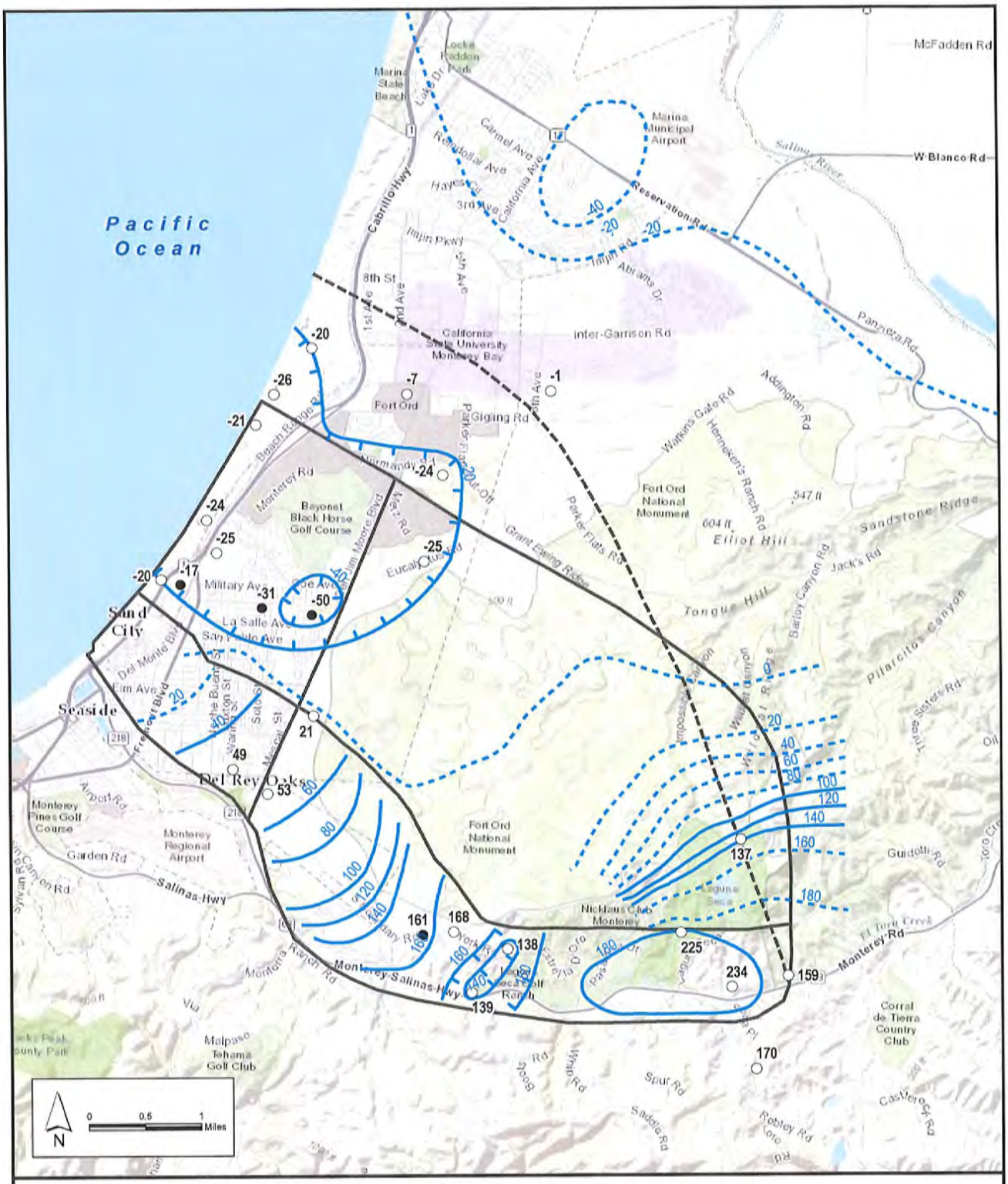
Wells with Water-Level Data (2nd Quarter WY 2015, Shallow Zone)

- ○ Monitoring Well
- ● Production Well

Shallow Zone Groundwater Elevation (feet MSL)

- Groundwater Elevation
- Pumping Depression
- Dashed where uncertain (no well data)
- Shallow Aquifer Northern Boundary
- Adjudicated Seaside Basin Boundary

Shallow Zone Water Level Map - 2nd Quarter WY 2015 (January-March 2015)



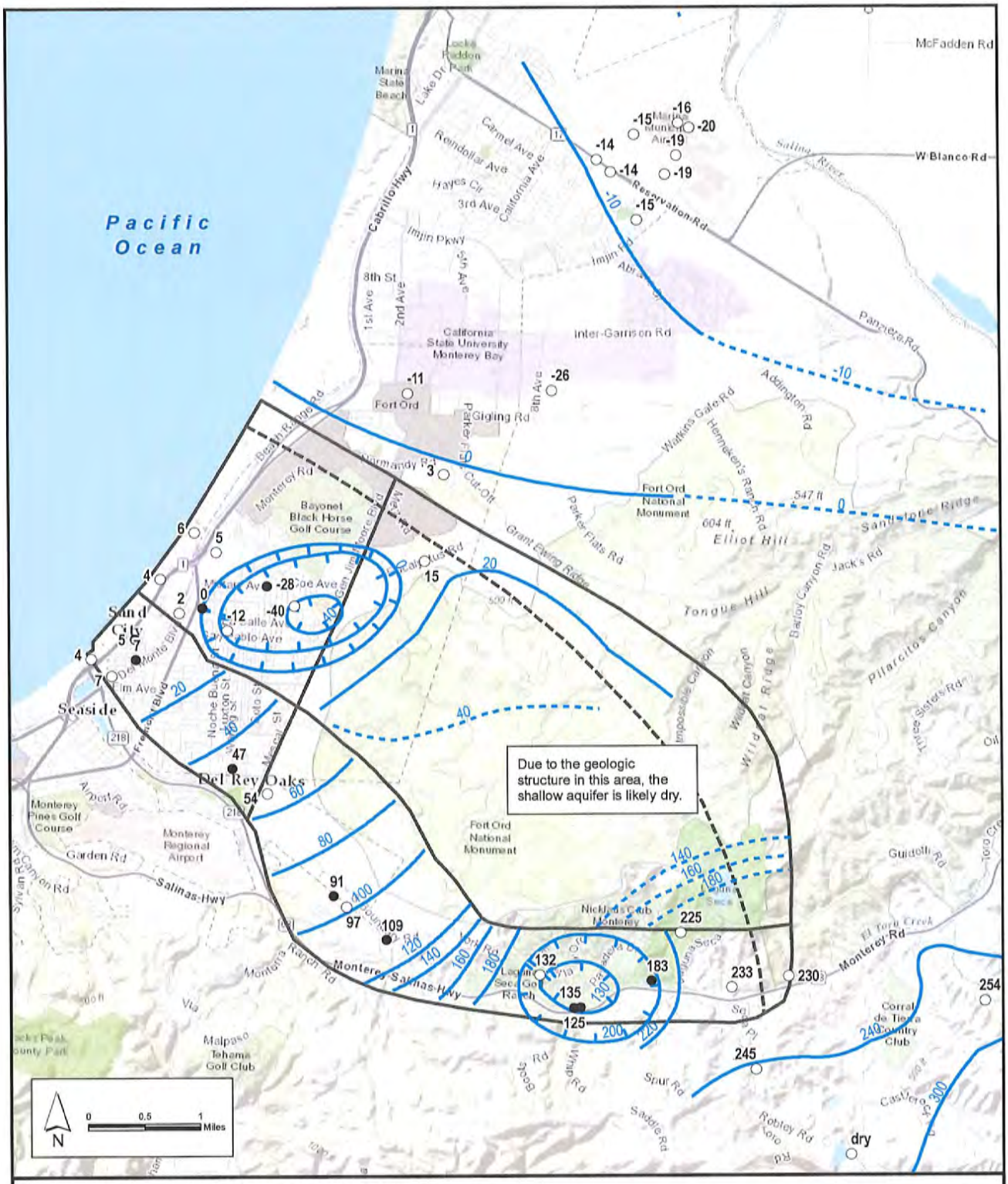
Wells with Water-Level Data (4th Quarter WY 2015, Deep Zone)

- ○ Monitoring Well
- ● Production Well

Deep Zone Groundwater Elevation (feet MSL)

- Groundwater Elevation
- Pumping Depression
- Dashed where uncertain (no well data)
- Deep Aquifer Northern Boundary
- Adjudicated Seaside Basin Boundary

Deep Zone Water Level Map - 4th Quarter WY 2015 (July-August 2015)



Wells with Water-Level Data (4th Quarter WY 2015, Shallow Zone)

- ○ Monitoring Well
- ● Production Well

Shallow Zone Groundwater Elevation (feet MSL)

- Groundwater Elevation
- Pumping Depression
- Dashed where uncertain (no well data)
- Shallow Aquifer Northern Boundary
- Adjudicated Seaside Basin Boundary

Shallow Zone Water Level Map - 4th Quarter WY 2015 (July-August 2015)

PROOF OF SERVICE

STATE OF CALIFORNIA)
)
COUNTY OF SANTA BARBARA)

I am employed by Brownstein Hyatt Farber Schreck in the County of Santa Barbara, State of California. I am over the age of 18 and not a party to the within action; my business address is: 1020 State Street, Santa Barbara, California 93101. On May 23, 2016, I served the within documents:

- REQUEST FOR STATUS CONFERENCE, AND ADJUDICATION BACKGROUND REPORT AND UPDATE
- [PROPOSED] ORDER GRANTING STATUS CONFERENCE HEARING

☐ **BY OVERNIGHT DELIVERY.** By placing with an overnight mail company for delivery a true copy thereof, enclosed in a sealed package, delivery fees prepaid addressed as shown on the Service List below.

☒ **BY MAIL.** By placing each envelope (with postage affixed thereto) in the U.S. Mail addressed as shown below.

☐ By personally sending a true copy via e-mail to the parties at the e-mail addresses listed on the attached Service List, on the date below.

☐ By sending a true copy of the above document to the parties as set forth on the service list at the fax numbers indicated. The facsimile machine used complied with CRC Rule 2003(3), and the transmission was reported as complete and without error. Pursuant to CRC Rule 2005(i), a transmission confirmation report was properly issued by the transmitting facsimile machine, stating the time and date of such transmission.

SEE ATTACHED SERVICE LIST

I am readily familiar with the firm's practice of collection and processing correspondence for mailing. Under that practice it would be deposited with the U.S. Postal Service on that same day with postage thereon fully prepaid in the ordinary course of business. I am aware that on motion of the party served, service is presumed invalid if postal cancellation date or postage meter date is more than on day after the date of deposit for mailing in affidavit.

I declare under penalty of perjury under the laws of the State of California that the above is true and correct. Executed on May 23, 2016, at Santa Barbara, California.

Gina Lane

GINA LANE

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TECHNICAL MEMORANDUM

To: Bob Jaques, Seaside Watermaster Program Manager

From: Georgina King and Derrik Williams

Date: February 21, 2017

Subject: Seaside Groundwater Basin Analysis of Wells Sampled in December 2016

1. Executive Summary

Three Sentinel Wells and one monitoring well were sampled in December 2016. Each Sentinel Well was sampled at two depths and the Ord Terrace Well was sampled at only one depth. Three of these wells (Sentinel Well #2 (SBWM-2) at the 1,470 foot depth, Sentinel Well #4 (SBWM-4) at the 900 foot depth, and Ord Terrace Shallow well) were being resampled to verify anomalous results from samples collected in July 2016. Sentinel Well #1 was included in the sampling event to complete the suite of wells that are normally sampled in January. The December sampling event effectively replaced the normal January event.

Of the seven groundwater quality samples analyzed, SBWM-1 (1,140 ft), SBWM-2 (1,000 ft), and SBWM-4 (715 ft) results were within the range of normal historical values. Results from samples with observed anomalies in either the July 2016 or December 2016 samples are summarized below.

- Well SBWM-1 (1,390 ft): Based on the well's piper diagram, and shape of its stiff diagram, the increased chloride concentration in December 2016 is not indicative of incipient seawater intrusion This well has experienced fluctuating chloride concentrations since 2014 with higher chloride concentrations being observed in winter samples and lower concentrations in summer samples. Prior to 2014, its chloride concentrations were fairly stable. The induction log at the deeper depths of well SBWM-1 show no clear evidence of increased salinity over time.

- Well SBWM-2 (1,470 ft): The chloride concentration in December 2016 returned to within the range of historical concentrations. The well's piper and stiff diagrams both indicate that the anions and cations from the December 2016

sample returned to within their pre-July 2016 range. The high chlorides and anomalous sodium/chloride ratios observed in the July, 2016 sample may have been due to seasonal fluctuations, similar to what is observed in well SBWM-1 (1,390 ft). The induction logs for this well shows increased conductivity in the July 2016 log at the 1,470 foot depth which corroborates the higher chloride concentration on that date and rules out sampling/laboratory error for this sample.

- Well SBWM-4 (900 ft): The chloride concentration in December 2016 is higher than historical concentrations, with the exception of the July 2016 sample. The well's piper and stiff diagrams show that its anions and cations have returned to within the range of pre-July 2016 conditions. The anomalous anion and cation distribution observed in July 2016 may have been due to seasonal fluctuations, similar to what is observed in well SBWM-1 (1,390 ft). This well has the highest chloride elevations of all the coastal monitoring wells and appears to have an increasing chloride trend. The electrical conductivity logs for this well are very similar over time, indicating there has been no major increase in salinity in the aquifer at the 900 foot depth

- Ord Terrace Shallow well chloride concentrations have declined to within the range of historical concentrations. Its piper and stiff diagrams, and inland location do not suggest a seawater source.

None of the samples definitively indicate incipient seawater intrusion. However, variations in groundwater quality from samples collected over the last year from wells SBWM-1 and SBWM-4 warrant increased vigilance regarding potential changes to the Basin's groundwater quality in the vicinity of the Sentinel Wells. There may be some seasonal changes in groundwater quality in the deepest portions of the aquifer that could be related to seasonal groundwater elevation changes. If this is true and groundwater elevations continue to decline, larger fluctuations might be seen in the fall when groundwater levels are at their lowest.

The sources of increasing and fluctuating chlorides in wells SBWM-1 and SBWM-4 are unclear. Potential sources may include natural groundwater quality variations, upwelling or upconing of saline water in wells in response to declining groundwater levels, seawater intrusion, or downward leakage of shallow, poor quality groundwater. Regardless of the source, the coincidence of record low groundwater elevations in the basin with increasing and fluctuating chlorides may indicate that the chronically low groundwater elevations have triggered the fluctuations being observed.

Recommendations on future work and monitoring include:

1. Continue to sample SBWM-1 and SBWM-4 twice a year.
2. SBWM-2 should be resampled at the end of summer in 2017 and based on those results a decision should be made as to whether it should be sampled twice a year on an ongoing basis.
3. To determine if groundwater quality samples reflect the influence of fluctuating groundwater elevations, it is recommended that samples in the future be collected in the last week of September for the 4th quarter samples and in the first week of March for the 2nd quarter samples.
4. Prepare a work plan that will direct an effort towards identifying the source of fluctuating chloride concentrations. The work plan should outline the types of analyses and data to be used in identifying the chloride source. If the source of fluctuating chlorides is understood, it will help in developing management actions to prevent the higher concentrations increasing to the point that they cause groundwater degradation.
5. Conduct downhole conductivity and temperature profiles within each of the Sentinel Wells during the next sampling event. This tool measures the conductivity within the well, as opposed to induction logging which measures conductivity within the adjacent sediments. This technique may help identify if upwelling is occurring.
6. Continue the process that has recently been implemented to review water quality results as soon as they are received, rather than waiting until they are used to prepare the annual Seawater Intrusion Analysis Report. This will enable action to be taken, including reanalysis of samples, if appropriate, immediately instead of at the end of the year when the data have historically been analyzed.
7. Continue conducting all groundwater quality sampling and analysis conducted in accordance with standard quality assurance and quality control procedures. This includes submitting field blanks and duplicates samples to the laboratory once every couple of years.

2. BACKGROUND

The 2016 Seawater Intrusion Analysis Report (SIAR) reported on groundwater samples obtained during July 2016 that contained several anomalous chloride concentrations and other anion and cations concentrations. These anomalous results triggered resampling of those wells with the anomalies. The wells with the increased chlorides were:

- Sentinel Well #2 (SBWM-2) at the 1,470 ft depth,
- Sentinel Well #4 (SBWM-4) at the 900 ft depth, and
- Ord Terrace Shallow well.

The Technical Advisory Committee (TAC) approved the SIAR recommendation to resample those wells as soon as possible to verify the water quality. The Ord Terrace Shallow well was resampled on December 5, 2016 by Monterey Peninsula Water Management District; and the sentinel wells were resampled by Martin Feeney on December 14, 2016.

The December samples effectively replace the samples that were scheduled to be collected in January 2017. Samples were analyzed by Monterey Bay Analytical Services (MBAS), which is the laboratory that has historically analyzed the Seaside Basin groundwater samples. Duplicate samples of the sentinel wells were sent to the Monterey County laboratory for general minerals analysis. Samples were not collected for Sentinel Well 3 (SBWM-3) which is only sampled in July of each year. No duplicate samples for the Ord Terrace Shallow well were analyzed.

3. LABORATORY RESULTS

Table 1 summarizes the results obtained from both MBAS and Monterey County laboratories. The analyses in the following section of this memorandum are based on the MBAS results to maintain consistency with previous years' reports.

With one exception, the results from duplicate samples analyzed by Monterey County were close to those results from MBAS; and there were no results that would indicate MBAS laboratory error. Some differences in the cations and anions are to be expected, but overall the results were similar. The exception is the SBWM-1 (1,390 ft) duplicate sample from the Monterey County laboratory which has higher chloride, sodium, specific conductivity than the MBAS sample. The concentrations of these constituents collected at the well's 1,140 foot depth did not have as great a difference.

Table 1: Summary of Laboratory Results

Well	Constituent	MBAS Result	Monterey County Result	Units
SBWM 1 at 1,140 ft Sampled 12/14/2016	Calcium	12	9.1	mg/L
	Chloride	74	72	mg/L
	Fluoride	0.2	-	mg/L
	Hardness (as CaCO3)	34	-	mg/L
	Bicarbonate (as HCO3-)	89	-	mg/L
	Potassium	3.3	2.5	mg/L
	Langlier Index, 60°C	0.56	-	
	Magnesium	1.0	0.3	mg/L
	Manganese, Total	21	-	µg/L
	Sodium	73	80	mg/L
	Nitrate as NO3	ND	ND	mg/L
	pH (Laboratory)	8.5	7.9	pH (H)
	Specific Conductance (E.C)	457	443	µmhos/cm
	Total Diss. Solids	254	-	mg/L
	Sulfate	22	25	mg/L
	QC Anion-Cation Balance	-1	-	%
	QC Ratio TDS/SEC	0.56	-	
	o-Phosphate-P, Dissolved	ND	-	mg/L
	Langlier Index, 15°C	-0.04	-	
	Alkalinity, Total (as CaCO3)	73	75	mg/L
	Iron	1359	-	µg/L
	Nitrite as NO2-N	0.1	-	mg/L
	QC Anion Sum x 100	88%	-	%
	QC Cation Sum x 100	86%	-	%
	Hydroxide	ND	-	mg/L
	Carbonate as CaCO3	ND	-	mg/L
	Bromide	0.2	-	mg/L
	Barium, Total	26	-	µg/L
	Iron, Dissolved	ND	-	µg/L
	Manganese, Dissolved	ND	-	µg/L
	Boron	0.09	-	mg/L
	Iodide	28	-	µg/L

ND = Not Detected

Well	Constituent	MBAS Result	Monterey County Result	Units
SBWM 1 at 1,390 ft Sampled 12/14/2016	Calcium	29	27	mg/L
	Chloride	152	201	mg/L
	Fluoride	0.2	-	mg/L
	Hardness (as CaCO3)	81	-	mg/L
	Bicarbonate (as HCO3-)	83	-	mg/L
	Potassium	5.3	4.2	mg/L
	Langlier Index, 60°C	0.97	-	
	Magnesium	2.0	0.3	mg/L
	Manganese, Total	58		µg/L
	Sodium	109	149	mg/L
	Nitrate as NO3	ND	ND	mg/L
	pH (Laboratory)	8.6	7.6	pH (H)
	Specific Conductance (E.C)	706	889	µmhos/cm
	Total Diss. Solids	383	-	mg/L
	Sulfate	29	35	mg/L
	QC Anion-Cation Balance	2	-	%
	QC Ratio TDS/SEC	0.54	-	
	o-Phosphate-P, Dissolved	ND	-	mg/L
	Langlier Index, 15°C	0.38	-	
	Alkalinity, Total (as CaCO3)	68	74	mg/L
	Iron	6400	-	µg/L
	Nitrite as NO2-N	ND	-	mg/L
	QC Anion Sum x 100	89%	-	%
	QC Cation Sum x 100	92%	-	%
	Hydroxide	ND	-	mg/L
	Carbonate as CaCO3	ND	-	mg/L
	Bromide	0.4	-	mg/L
	Barium, Total	72	-	µg/L
	Iron, Dissolved	40	-	µg/L
	Manganese, Dissolved	ND	-	µg/L
	Boron	0.09	-	mg/L
	Iodide	30	-	µg/L

ND = Not Detected

Well	Constituent	MBAS Result	Monterey County Result	Units
SBWM 2 at 1,000 ft Sampled 12/14/2016	Calcium	16	14	mg/L
	Chloride	67	66	mg/L
	Fluoride	0.2	-	mg/L
	Hardness (as CaCO3)	48	-	mg/L
	Bicarbonate (as HCO3-)	99	-	mg/L
	Potassium	3.3	2.8	mg/L
	Langlier Index, 60°C	0.64	-	
	Magnesium	2.0	0.7	mg/L
	Manganese, Total	36	-	µg/L
	Sodium	61	69	mg/L
	Nitrate as NO3	ND	ND	mg/L
	pH (Laboratory)	8.4	8.2	pH (H)
	Specific Conductance (E.C)	432	417	µmhos/cm
	Total Diss. Solids	234	-	mg/L
	Sulfate	17	19	mg/L
	QC Anion-Cation Balance	-2	-2	%
	QC Ratio TDS/SEC	0.54	-	
	o-Phosphate-P, Dissolved	ND	-	mg/L
	Langlier Index, 15°C	0.04	-	
	Alkalinity, Total (as CaCO3)	81	86	mg/L
	Iron	6585	-	µg/L
	Nitrite as NO2-N	0.2	-	mg/L
	QC Anion Sum x 100	89%	-	%
	QC Cation Sum x 100	86%	-	%
	Hydroxide	ND	-	mg/L
	Carbonate as CaCO3	ND	-	mg/L
	Bromide	0.2	-	mg/L
	Barium, Total	40	-	µg/L
	Iron, Dissolved	34	-	µg/L
	Manganese, Dissolved	ND	-	µg/L
	Boron	0.08	-	mg/L
	Iodide	32	-	µg/L

ND = Not Detected

Well	Constituent	MBAS Result	Monterey County Result	Units
SBWM 2 at 1,470 ft Sampled 12/14/2016	Calcium	18	18	mg/L
	Chloride	66	65	mg/L
	Fluoride	0.2	-	mg/L
	Hardness (as CaCO3)	53	-	mg/L
	Bicarbonate (as HCO3-)	100	-	mg/L
	Potassium	3.4	3.0	mg/L
	Langlier Index, 60°C	0.69	-	
	Magnesium	2.0	1.0	mg/L
	Manganese, Total	47	-	µg/L
	Sodium	60	69	mg/L
	Nitrate as NO3	ND	ND	mg/L
	pH (Laboratory)	8.4	7.9	pH (H)
	Specific Conductance (E.C)	431	419	µmhos/cm
	Total Diss. Solids	234	-	mg/L
	Sulfate	18	18	mg/L
	QC Anion-Cation Balance	-2	1	%
	QC Ratio TDS/SEC	0.54	-	
	o-Phosphate-P, Dissolved	ND	-	mg/L
	Langlier Index, 15°C	0.10	-	
	Alkalinity, Total (as CaCO3)	82	89	mg/L
	Iron	5448	-	µg/L
	Nitrite as NO2-N	0.2	-	mg/L
	QC Anion Sum x 100	90%	-	%
	QC Cation Sum x 100	87%	-	%
	Hydroxide	ND	-	mg/L
	Carbonate as CaCO3	ND	-	mg/L
	Bromide	0.2	-	mg/L
	Barium, Total	50	-	µg/L
	Iron, Dissolved	77	-	µg/L
	Manganese, Dissolved	ND	-	µg/L
	Boron	0.08	-	mg/L
	Iodide	34	-	µg/L

ND = Not Detected

Well	Constituent	MBAS Result	Monterey County Result	Units
SBWM 4 at 715 ft Sampled 12/14/2016	Calcium	78	69	mg/L
	Chloride	139	135	mg/L
	Fluoride	0.2	-	mg/L
	Hardness (as CaCO3)	232	-	mg/L
	Bicarbonate (as HCO3-)	224	-	mg/L
	Potassium	8.5	7.5	mg/L
	Langlier Index, 60°C	0.62	-	
	Magnesium	9.0	9.4	mg/L
	Manganese, Total	133	-	µg/L
	Sodium	91	103	mg/L
	Nitrate as NO3	ND	ND	mg/L
	pH (Laboratory)	7.4	7.5	pH (H)
	Specific Conductance (E.C)	866	866	µmhos/cm
	Total Diss. Solids	503	-	mg/L
	Sulfate	37	36	mg/L
	QC Anion-Cation Balance	3	2	%
	QC Ratio TDS/SEC	0.58	-	
	o-Phosphate-P, Dissolved	ND	-	mg/L
	Langlier Index, 15°C	0.02	-	
	Alkalinity, Total (as CaCO3)	184	195	mg/L
	Iron	12,985	-	µg/L
	Nitrite as NO2-N	0.2	-	mg/L
	QC Anion Sum x 100	97%	-	%
	QC Cation Sum x 100	102%	-	%
	Hydroxide	ND	-	mg/L
	Carbonate as CaCO3	ND	-	mg/L
	Bromide	0.4	-	mg/L
	Barium, Total	133	-	µg/L
	Iron, Dissolved	29	-	µg/L
	Manganese, Dissolved	27	-	µg/L
	Boron	0.10	-	mg/L
	Iodide	50	-	µg/L

ND = Not Detected

Well	Constituent	MBAS Result	Monterey County Result	Units
SBWM 4 at 900 ft Sampled 12/14/2016	Calcium	86	83	mg/L
	Chloride	274	259	mg/L
	Fluoride	0.2	-	mg/L
	Hardness (as CaCO3)	297	-	mg/L
	Bicarbonate (as HCO3-)	340	-	mg/L
	Potassium	8.6	8.1	mg/L
	Langlier Index, 60°C	0.79	-	
	Magnesium	20	18	mg/L
	Manganese, Total	140	-	µg/L
	Sodium	172	189	mg/L
	Nitrate as NO3	ND	ND	mg/L
	pH (Laboratory)	7.4	7.6	pH (H)
	Specific Conductance (E.C)	1,427	1,430	µmhos/cm
	Total Diss. Solids	806	-	mg/L
	Sulfate	40	50	mg/L
	QC Anion-Cation Balance	-2	0	%
	QC Ratio TDS/SEC	0.56	-	
	o-Phosphate-P, Dissolved	ND	-	mg/L
	Langlier Index, 15°C	0.20	-	
	Alkalinity, Total (as CaCO3)	279	284	mg/L
	Iron	4215	-	µg/L
	Nitrite as NO2-N	0.2	-	mg/L
	QC Anion Sum x 100	99%	-	%
	QC Cation Sum x 100	96%	-	%
	Hydroxide	ND	-	mg/L
	Carbonate as CaCO3	ND	-	mg/L
	Bromide	0.8	-	mg/L
	Barium, Total	347	-	µg/L
	Iron, Dissolved	37	-	µg/L
	Manganese, Dissolved	72	-	µg/L
	Boron	0.31	-	mg/L
	Iodide	65	-	µg/L

ND = Not Detected

Well	Constituent	MBAS Result	Units
Ord Terrace Shallow	Calcium	64	mg/L
	Chloride	114	mg/L
	Fluoride	0.2	mg/L
Sampled 12/14/2016	Hardness (as CaCO3)	217	mg/L
	Bicarbonate (as HCO3-)	249	mg/L
	Potassium	3.7	mg/L
	Langlier Index, 60°C	--	
	Magnesium	14	mg/L
	Manganese, Total	87	µg/L
	Sodium	66	mg/L
	Nitrate as NO3	6	mg/L
	pH (Laboratory)	7.6	pH (H)
	Specific Conductance (E.C)	868	µmhos/cm
	Total Diss. Solids	506	mg/L
	Sulfate	43	mg/L
	QC Anion-Cation Balance	-6	%
	QC Ratio TDS/SEC	0.58	
	o-Phosphate-P, Dissolved	ND	mg/L
	Langlier Index, 15°C	--	
	Alkalinity, Total (as CaCO3)	204	mg/L
	Iron	106	µg/L
	Nitrite as NO2-N	0.2	mg/L
	QC Anion Sum x 100	95%	%
	QC Cation Sum x 100	84%	%
	Hydroxide	--	mg/L
	Carbonate as CaCO3	ND	mg/L
	Bromide	0.3	mg/L
	Barium, Total	51	µg/L
	Iron, Dissolved	ND	µg/L
	Manganese, Dissolved	ND	µg/L
	Boron	0.07	mg/L

ND = Not Detected

4. WATER QUALITY ANALYSIS

The analyses used to examine the water quality data collected in December 2016 are the same as those used in the SIAR: chloride concentrations over time, sodium/chloride ratios, and piper and stiff diagrams.

Groundwater quality results for the following wells were within the range of normal historical values, and are therefore not discussed further in this memorandum:

- Well SBWM-1 (1,140 ft),
- Well SBWM-2 (1,000 ft), and
- Well SBWM-4 (715 ft).

The analysis in this memorandum focuses on those wells with observed anomalies in either the July 2016 or December 2016 samples:

- Well SBWM-1 (1,390 ft),
- Well SBWM-2 (1,470 ft),
- Well SBWM-4 (900 ft), and
- Ord Terrace Shallow.

4.1. Chloride Concentrations and Sodium/Chloride Ratios

Figures 1 through 4 update the chloride concentration and sodium/chloride ratio charts from the 2016 SIAR with the December 2016 sample results, and include chloride trend lines. In summary, the charts show:

- Well SBWM-1 (1,390 ft) had a 85 mg/L chloride increase since July 2016 and its overall chloride concentrations are increasing. The increasing chloride trend (grey trend line) observed in this well is more pronounced because of seasonal fluctuations where the winter concentrations tend to be higher than summer concentrations. There is a slight, but inconsequential, increasing trend if the high winter concentrations are excluded (> 70 mg/L, black trend line). The sodium/chloride ratio is well above the ratio of 0.86, below which other investigators have proposed as an indicator of seawater intrusion.
- Well SBWM-2 (1,470 ft) chloride concentrations declined in December to less than 70 mg/L, back to within the range of historical concentrations. The overall chloride trend is virtually flat if the July 2016 sample is excluded. The

sodium/chloride ratio is well above the ratio of 0.86, below which other investigators have proposed as an indicator of seawater intrusion.

- Well SBWM-4 (900 ft) chloride concentrations are slightly less than in July 2016 but still higher than historical values. The overall chloride trend at this depth in the well is increasing over the period of record and increasing at a higher rate since January 2012. The sodium/chloride ratio has increased from less than 0.86 in July 2016 to above 1 in December 2016.
- Ord Terrace Shallow well chloride concentrations have declined to 114 mg/L, which is within the range of historical concentrations. There is a very slight increasing chloride trend over the period of record. The sodium/chloride ratio is between 0.86 and 0.9.

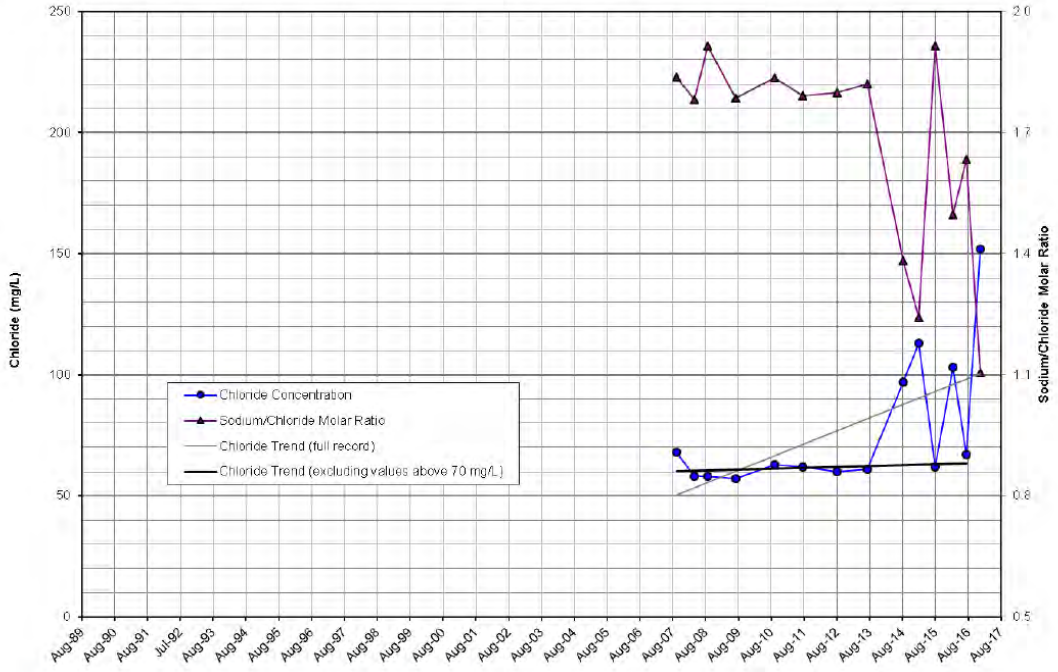


Figure 1: SBWM-1 (1,390 ft) Chloride Concentrations and Sodium/Chloride Ratios

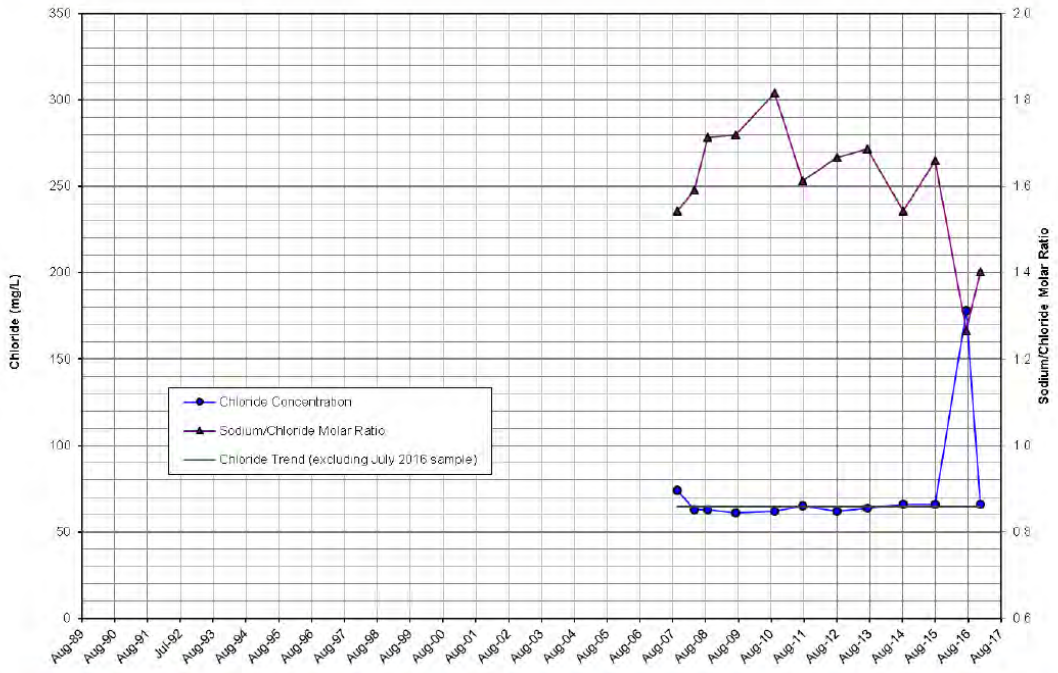


Figure 2: SBWM-2 (1,470 ft) Chloride Concentrations and Sodium/Chloride Ratios

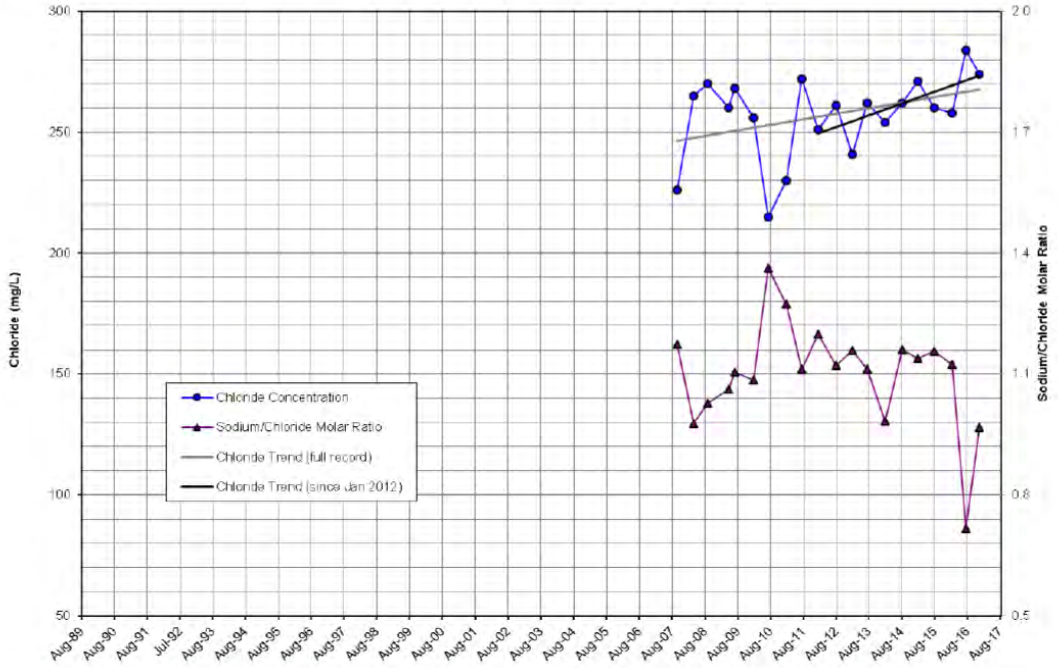


Figure 3: SBWM-4 (900 ft) Chloride Concentrations and Sodium/Chloride Ratios

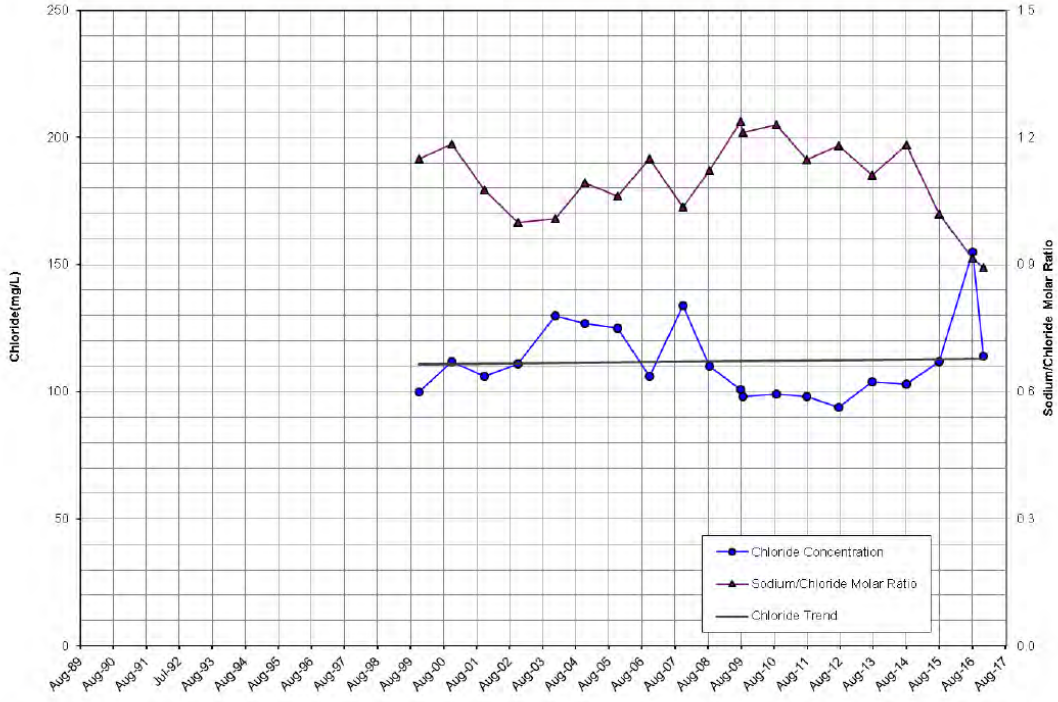


Figure 4: Ord Terrace Shallow Chloride Concentrations and Sodium/Chloride Ratios

4.2. Anion and Cation Analyses

4.2.1. Piper Diagrams

Piper diagrams for the four wells with anomalous data are shown on Figures 5 through 8. In summary the Piper diagrams show:

- Well SBWM-1 (1,390 ft)'s groundwater quality is generally of a sodium-chloride-bicarbonate type (Figure 5). The sample for December 2016, shown with the green solid triangle, has slightly increased calcium cations compared to the majority of the data points. Chloride anions increased such that the water type can be classified as more strongly sodium-chloride in character. The data points on the piper diagram show no consistent trend over time but rather appear to exhibit fluctuations.

- Well SBWM-2 (1,470 ft)'s groundwater quality is generally of a sodium-chloride-bicarbonate type (Figure 6). The sample for December 2016, shown with the green open triangle, plots within its historical cluster of data points. This is in contrast with the July 2016 sample, shown with the open circle, which had no apparent change in cations compared to historical values but a large increase in chloride anions with correspond decrease in bicarbonate anions. The data points on the piper diagram show no consistent trend over time but rather appear to exhibit fluctuations.

- Well SBWM-4 (900 ft)'s groundwater quality is generally of a sodium-chloride type (Figure 7). The sample for December 2016, shown with the green solid star, plots within its historical cluster of data points. This is in contrast with the July 2016 sample, shown with the open star symbol, which exhibits a more strongly sodium-chloride character than usual. The data points on the piper diagram show no consistent trend over time but rather appear to exhibit fluctuations.

- Ord Terrace Shallow well's groundwater quality is generally of a calcium-bicarbonate type (Figure 8). The sample for December 2016, shown with the green open triangle, plots within its historical cluster of data points. The data points on the piper diagram show no trend over time.

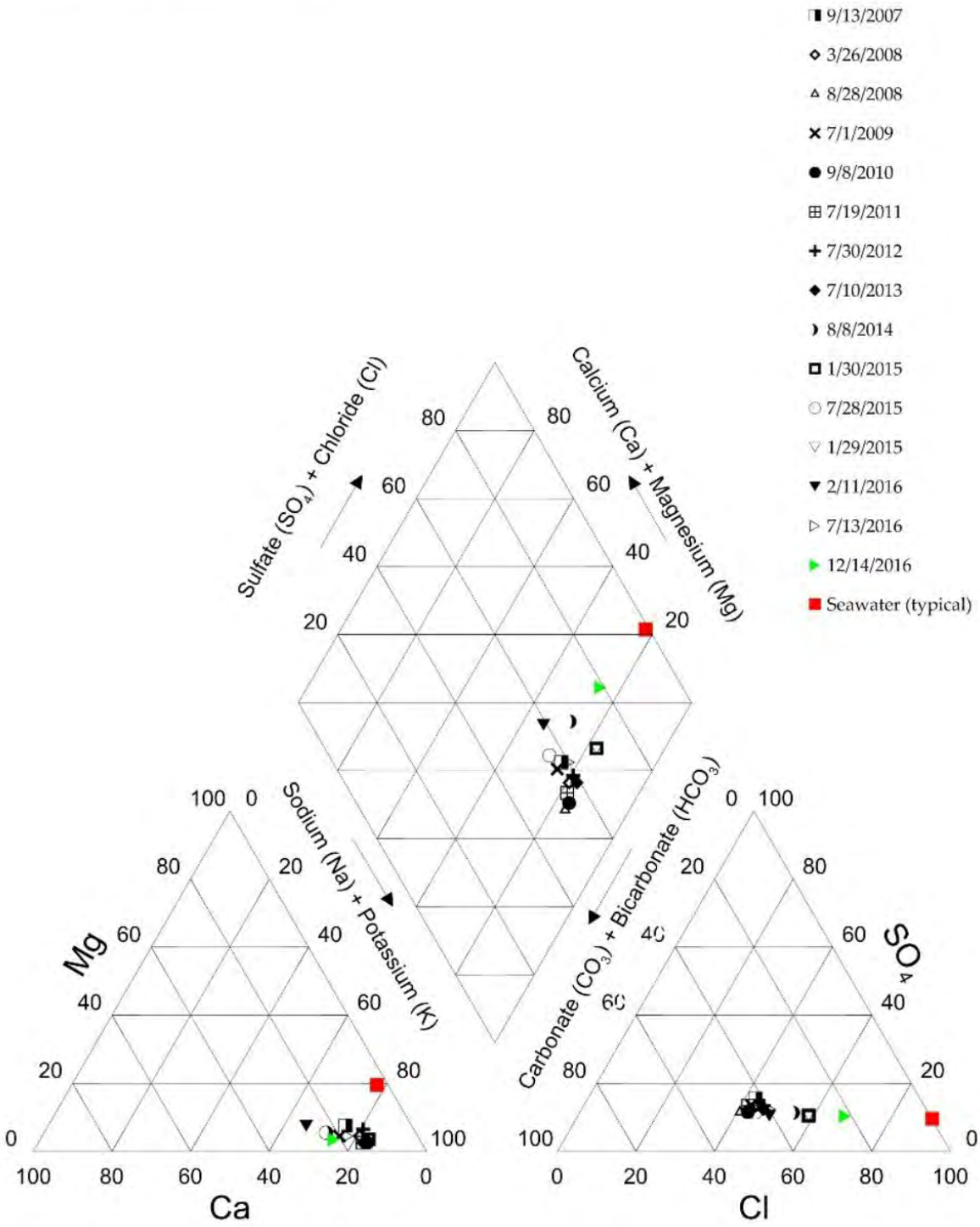


Figure 5: Piper Diagram for SBWM-1 (1,390 ft)

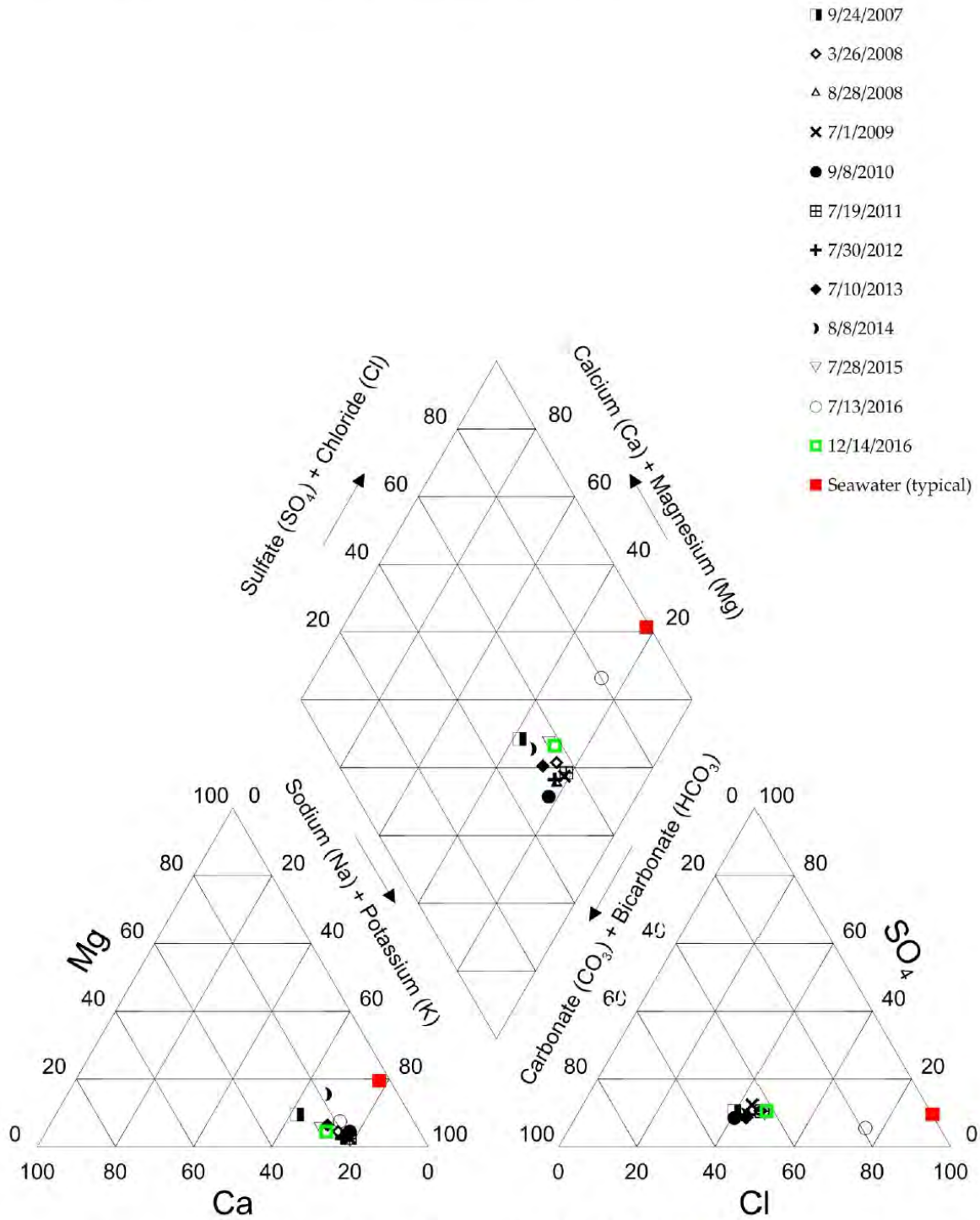


Figure 6: Piper Diagram for SBWM-2 (1,470 ft)

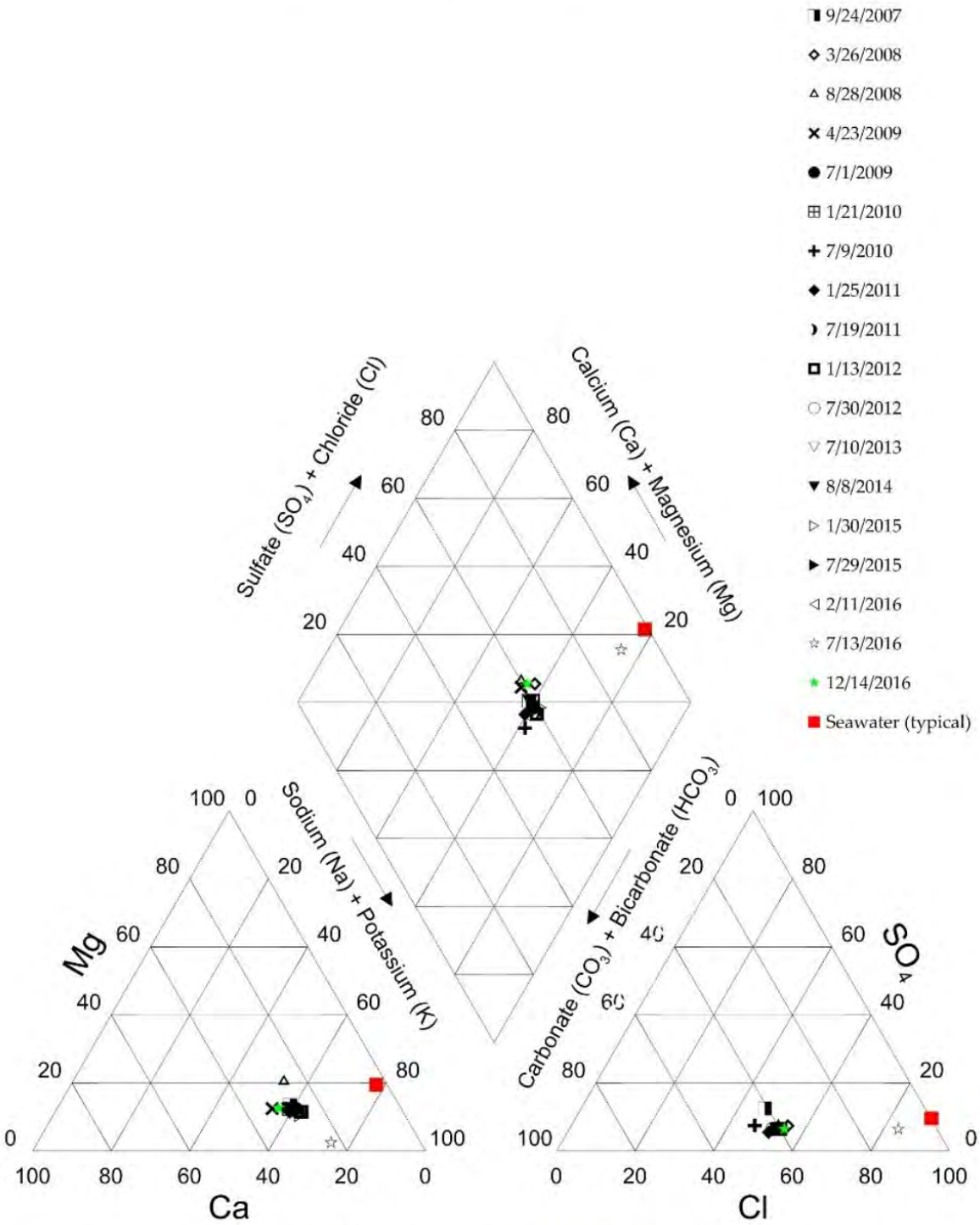


Figure 7: Piper Diagram for SBWM-4 (900 ft)

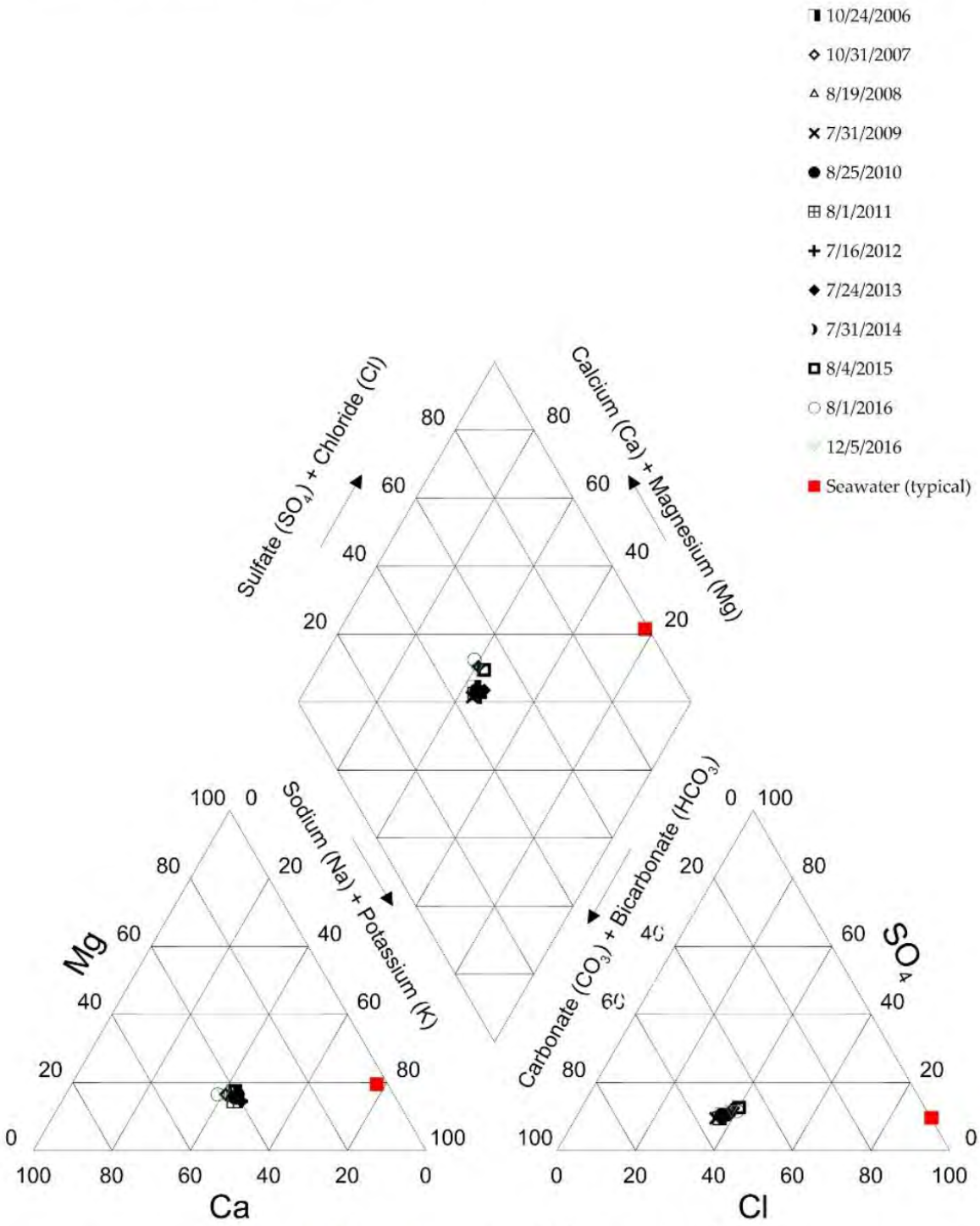


Figure 8: Piper Diagram for Ord Terrace Shallow

In the Pajaro Valley to the north, the evolution of groundwater quality from fresh to seawater intruded followed the paths indicated with red arrows on the piper diagram shown on Figure 9. In the Pajaro Valley, unintruded groundwater was of a calcium-bicarbonate type. During the initial phase of seawater intrusion in the Pajaro Valley, the dominant chemical change in groundwater was an increase in chloride concentrations, as evidenced by the plotted samples moving up towards the peak of the diamond in Figure 9. The expected increase in sodium concentrations only occurs later, as evidenced by the later samples moving down and to the right of the diamond in Figure 9. Groundwater samples from the Pajaro Valley did not exhibit an immediate sodium increase during the initial phase of seawater intrusion because of an ion exchange reaction in which sodium in the groundwater replaces the calcium on the clays; effectively taking sodium out of the groundwater and replacing it with calcium.

The groundwater quality evolution shown in Figure 9 is what we expect to see for any groundwater that is initially of a calcium-bicarbonate type. For wells starting off as a sodium-bicarbonate or sodium-chloride-bicarbonate water type, including wells SBWM-1, SBWM-2 and SBWM-4, it is unclear what the expected chemical evolution of groundwater will look like as seawater advances. To date, we have found no other examples of clearly documented seawater intrusion in these types of groundwater from which to examine whether calcium enrichment occurs or not in sodium-rich waters.

Sentinel Wells SBWM 1, 2 and 3 are completed in the Purisima Formation and have chloride concentrations that are typical of groundwater from that formation (Feeney, 2007). They also share a similar sodium-chloride-bicarbonate chemical character. Sentinel Well SBWM-4 is completed in the Santa Margarita Sandstone and has a different groundwater quality than the three sentinel wells completed in the Purisima Formation. Well SBWM4 has higher chloride concentrations and a stronger sodium-chloride character, which is consistent with wells completed in the Santa Margarita Sandstone (Feeney, 2007).

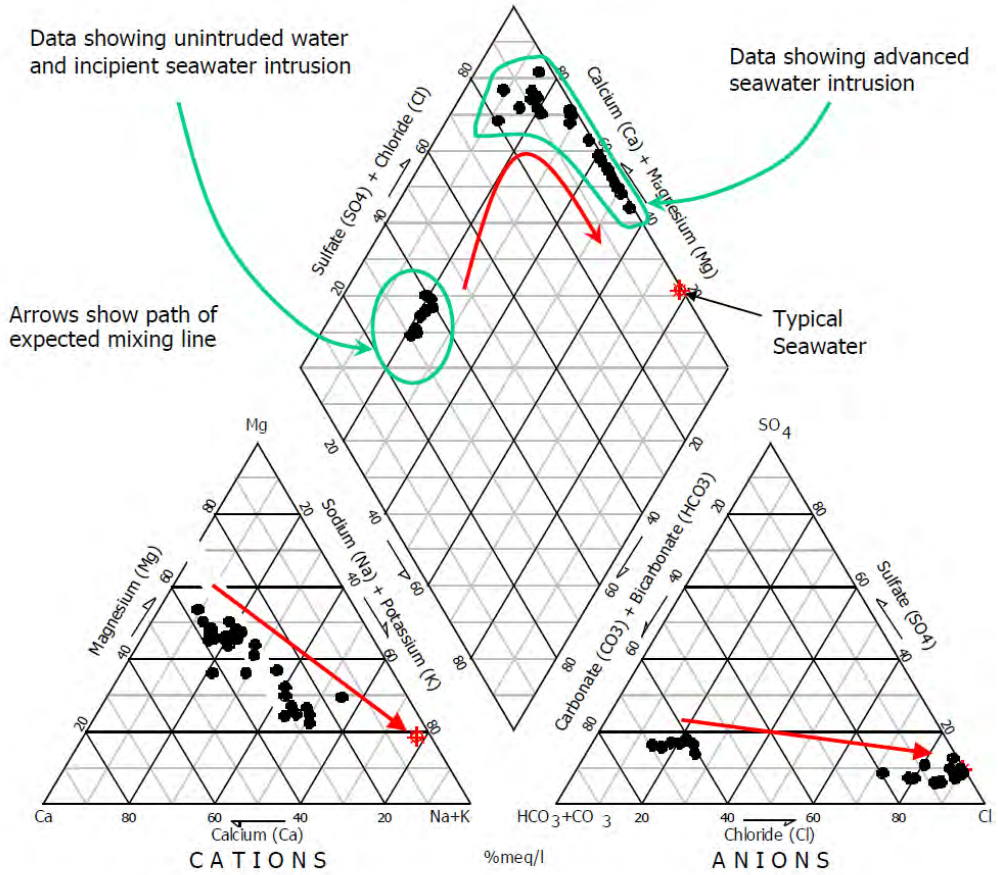


Figure 9: Piper Diagram for Groundwater in Pajaro Valley (Data source: PVWMA)

4.2.2. Stiff Diagrams

Stiff diagrams for SBWM-1 (1,470ft), SBWM-2 (1,390 ft), SBWM-4 (900 ft), and Ord Terrace Shallow are shown on Figures 10 and 11. Stiff diagrams for 2015 and 2016 are included to provide context, and show change over a two year period. All of the well's stiff diagrams for the December 2016 sample, except well SBWM-1 (1,390 ft)'s, are similar to historical diagrams before July 2016. Sentinel well SBWM-1 (1,390 ft)'s stiff diagram has a slightly different shape from previous years, but the shape of the stiff diagrams have varied over time for this well.

The stiff diagrams demonstrating what a seawater intruded sample might look like are provided on Figure 12. Comparing the stiff diagrams on Figure 10 and Figure 11 with Figure 12 reveals that none of the December sample's stiff diagrams are indicative of seawater intrusion, which is characterized on the stiff diagram as having calcium enrichment and a chloride spike. The stiff diagrams in Figure 12 came from locations where the native, unintruded groundwater was a calcium-bicarbonate type. It is unclear what the stiff diagrams of incipient seawater intrusion look like for areas where the native groundwater is of sodium-chloride or sodium-chloride-bicarbonate types.

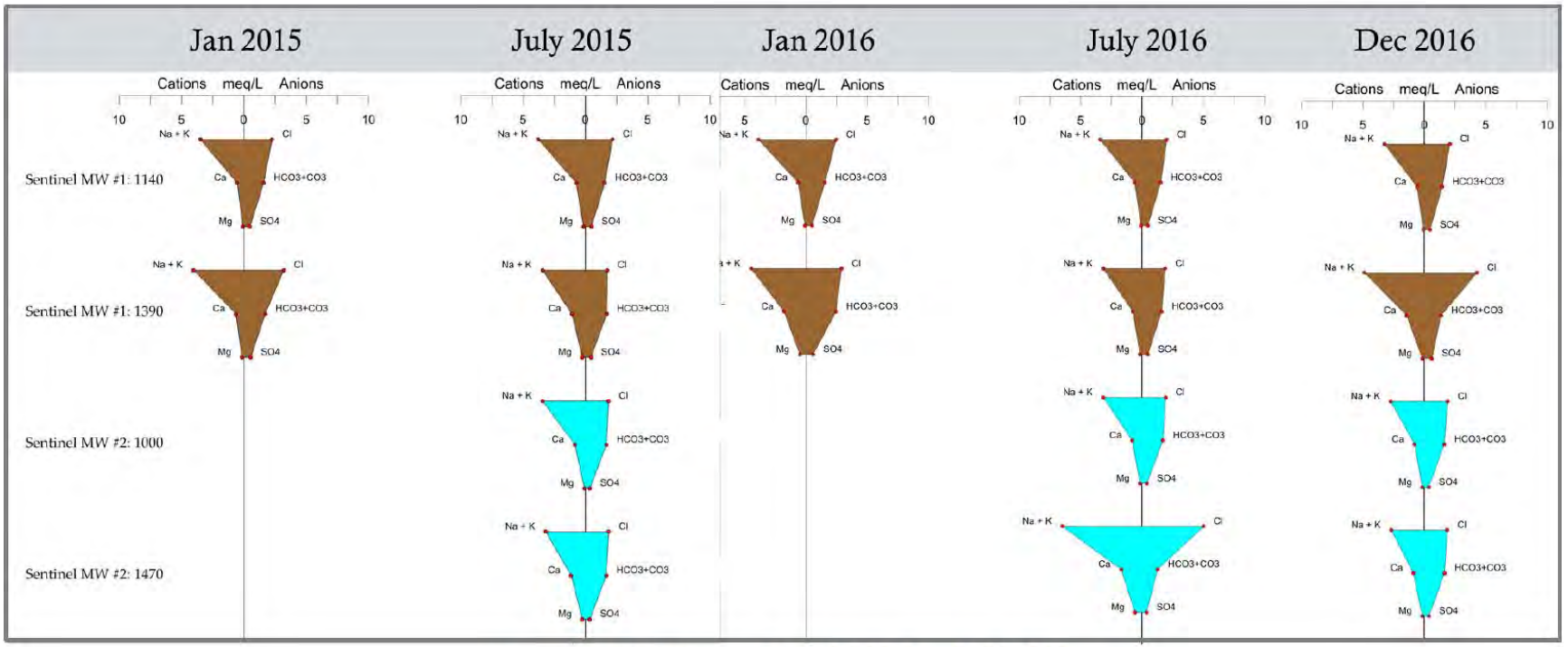


Figure 10: Stiff Diagram for SBWM-1 and SBWM-2

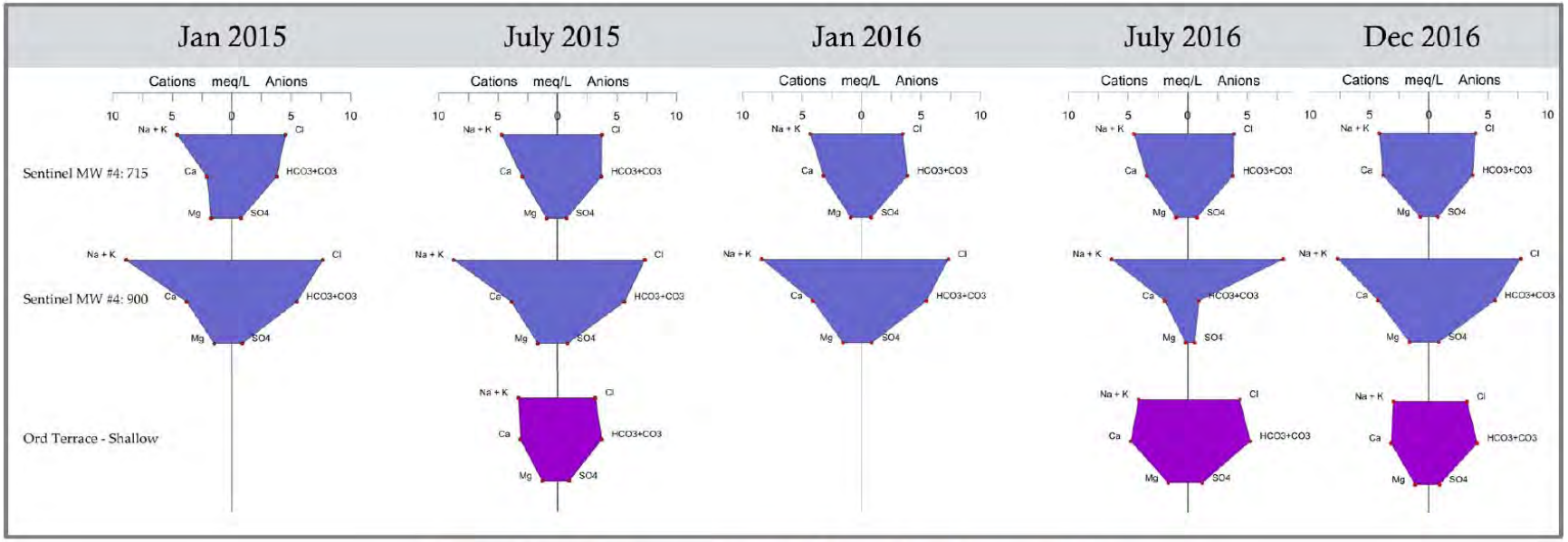


Figure 11: Stiff Diagram for SBWM-4 and Ord Terrace Shallow

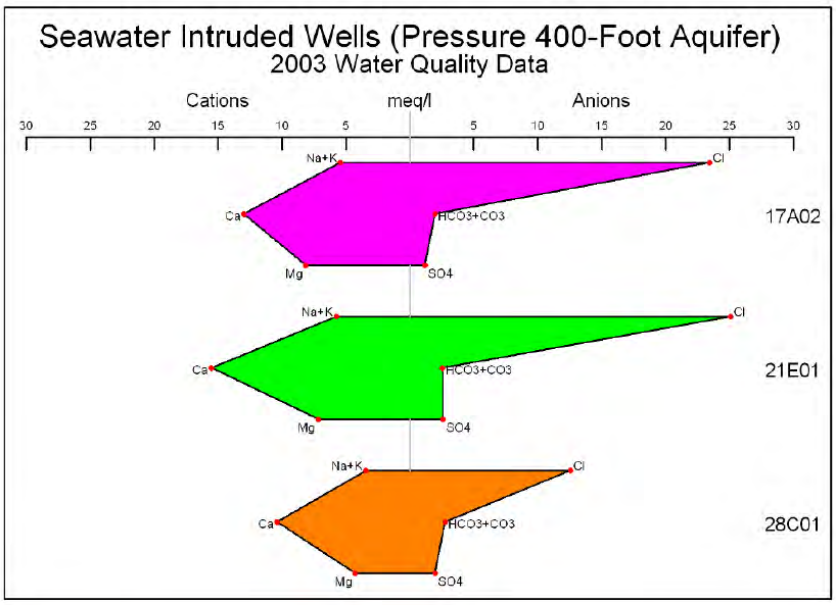


Figure 12: Stiff Diagrams from Salinas Valley Wells with Seawater Intrusion (Source: MWCRA)

5. Discussion of Results

5.1. Well SBWM-1 (1,390 ft)

Based on the piper diagram (Figure 6), and shape of the stiff diagram (Figure 10), the increased chloride concentration in the December 2016 sample is not clearly indicative of incipient seawater intrusion This well has experienced fluctuating chloride concentrations since 2014 (Figure 1) with higher chloride concentrations being observed in winter and lower concentrations in summer. Prior to 2014, its chloride concentrations were fairly stable. It is possible the observed chloride fluctuations are being controlled by seasonal groundwater elevation fluctuations, and that may or may not be attributable to seawater intrusion. This is discussed in more detail in Section 5.5. However, the increasing trend of chloride and significant drop in sodium/chloride ratios that indicated seawater intrusion was occurring in the nearby Salinas and Pajaro valley are not apparent.

5.2. Well SBWM-2 (1,470 ft)

The December 2016 sample, the chloride concentration in SBWM-2 (1,470 ft) returned to within the range of historical concentrations of less than 70 mg/L, following a reading of over 150 mg/L in the July 2016 sample. The piper (Figure 6) and stiff diagrams (Figure

10) both indicate that the anions and cations from the December 2016 sample returned to within their pre-July 2016 range. The high chlorides and anomalous sodium/chloride ratios observed in the July, 2016 sample may have been due to seasonal fluctuations, similar to what is observed in SBWM-1; or may have been the result of sampling/laboratory error. Continued monitoring of this well will determine whether seasonal fluctuations are responsible for the elevated chloride concentration observed in July 2016.

5.3. Well SBWM-4 (900 ft)

The 274 mg/L chloride concentration in SBWM-4 (900 ft) from December 2016 is above historical concentrations prior to July 2016 concentrations, but slightly lower than the July 2016 concentration of 284 mg/L (Figure 3). The piper (Figure 7) and stiff (Figure 11) diagrams for this well show that the anions and cations have returned to within the range of pre-July 2016 conditions. The anomalous anion and cation distribution observed in the July 2016 sample may have been due to seasonal fluctuations, similar to what is observed in well SBWM-1. This well has the highest chloride elevations of all the coastal monitoring wells and appears to have an increasing chloride trend (Figure 3).

5.4. Ord Terrace Shallow Well

The chloride concentration measured in the Ord Terrace Shallow well in December, 2016, returned to within its historical range of concentrations of less than 120 mg/L. In the 2016 SIAR, this well was ruled out as being potentially impacted by seawater because of its inland location, and because its piper and stiff diagrams did not indicate a seawater source of its anions and cations. The piper and stiff diagrams on Figure 7 and Figure 11, respectively, support this observation.

5.5. Trends and Fluctuations

The Seaside Basin Watermaster Seawater Intrusion Response Plan (SIRP) (HydroMetrics WRI, 2009) points out that:

> *Unusually high or steadily increasing chloride concentrations are one of the most commonly used indicators of seawater intrusion. At low chloride concentrations, trends are often as important as absolute concentrations because of natural variations in groundwater chemistry. While chloride concentrations are strongly indicative of seawater intrusion, it often takes time for the increasing chloride trend to be recognizable due to the long-term and relatively slow increase in chlorides during seawater intrusion.*

Most of the coastal wells have low chloride concentrations and trends are difficult to identify at those low concentrations because the trends can be masked by natural variations in groundwater quality. However, we are starting to see an increasing trend in the well with the highest coastal chloride concentrations: SBWM-4.

The chloride fluctuations observed more recently in well SBWM-1 (1,390 ft) appear to be seasonal, with samples collected in January/February having higher concentrations than samples collected in July/August. It is apparent from groundwater level hydrographs of the coastal monitoring wells (Figure 13) that the current sampling periods do not correspond with seasonal low and high groundwater levels. Both sampling periods occur midway between the seasonal fluctuation in groundwater levels that occurs in response to groundwater pumping. It may be possible to identify the relationship between chloride concentrations and seasonal changes in groundwater elevations if samples were collected when the extreme low and high groundwater levels were occurring. However, this relationship likely results from a complex interplay of hydrogeologic structure and stratigraphy, pumping location, and seawater interface location.

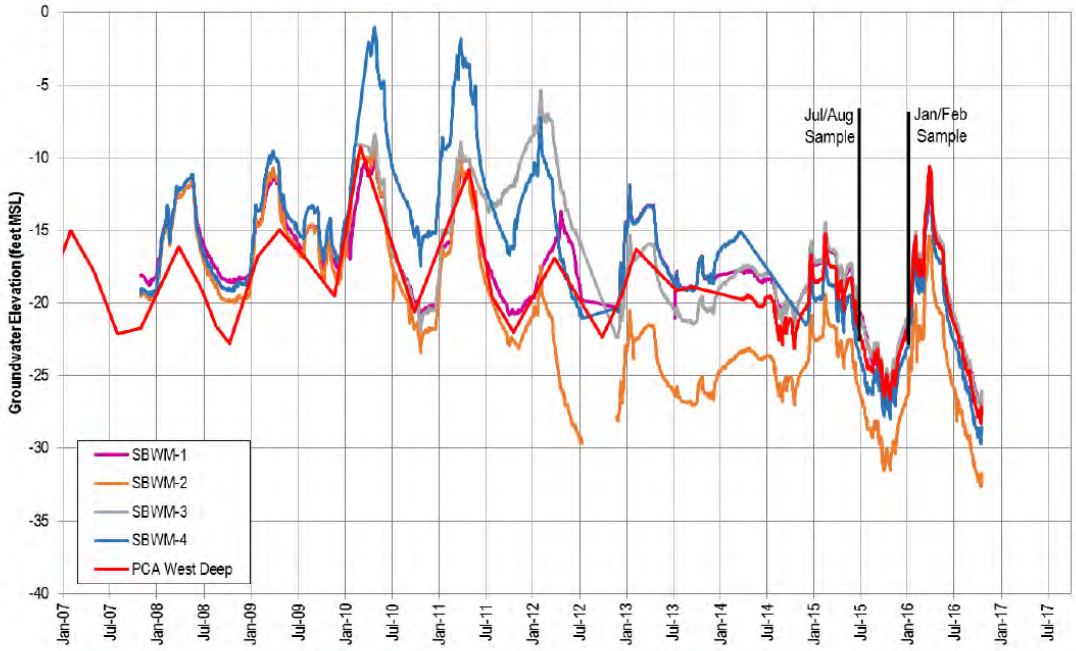


Figure 13: Hydrograph for Sentinel Wells and Monitoring Well PCA West Deep

An increasing chloride trend may underlie the seasonal fluctuations as evidenced by the slight increasing chloride trend even when the seasonal high concentrations are excluded from the trend line (Figure 1). If water quality is changing in response to seasonal groundwater elevation fluctuations, larger groundwater quality impacts may be seen in future fall months as groundwater levels continue to decline in the basin.

The types of analyses for the annual SIAR and this memorandum do not identify the source of the increased salinity or fluctuations. Potential sources of salinity may include natural groundwater quality variations, upwelling or upconing of saline water in wells in response to declining groundwater levels, seawater intrusion, or downward leakage of shallow, poor quality groundwater.

In the Seaside Basin, declining groundwater levels may be causing upwelling of saline water from the Monterey Formation which underlies the Santa Margarita Formation. This saline water, known as connate water, was trapped in the sediment pore spaces at the time of deposition and is known to cause increased salinity. For example, groundwater in the Laguna Seca subarea is more saline than the rest of the Seaside Basin due to the Monterey Formation.

Poorer quality water from shallow depths, migrating down the outside of the well casing is not likely a source of higher chloride concentrations in the sentinel wells because they are constructed with concrete/bentonite seals in the annular space between the formation and well casing that extend from the surface to at least 620 feet down. Mixing of poorer quality water within the well is also not considered a source of higher chlorides. Each sentinel well is sampled at two different depths. The samples taken from shallower depths do not have the same high chloride concentrations as those taken from deeper depths; so there is no apparent water mixing within the well.

The source of fluctuating chloride concentrations at the deeper depths of the sentinel wells should be investigated so that management options to protect the basin can be appropriately developed. For example, managing salinity from upwelling may require lower protective groundwater elevations than incipient seawater intrusion will require.

6. Electric Induction Logging

Induction logging measures the fluid conductivity up to a distance of three feet away from the well, within the formation adjacent to the well being logged. If conductivity increases relative to a baseline value over time, it indicates increased salinity. A limitation of this method is that it does not provide concentrations of chloride or other

ions that contribute to salinity. Therefore, the use of electric induction logs can only be used qualitatively.

Induction logs are run in the sentinel wells because they are deep wells screened at select depths. The induction logs provide qualitative salinity information throughout the entire well depth, including unscreened areas of the well. The groundwater grab samples taken within the screened intervals only provide groundwater quality at that particular screened depth.

Figure 14 through Figure 16 shows the initial induction logs for the entire length of wells SBWM-1, SBWM-2 and SBWM-4 when they were installed (blue), and for all induction logs run by Pacific Surveys since 2014. Welenco performed the logging between 2007 and 2013 but due to a different tool used by Pacific Survey, a new baseline was established in August 2014. To improve readability of the lower portion of the wells, Figure 17 and Figure 18 provide a zoomed in view with the logs overlain on one another.

The induction logs for well SBWM-1 shows there has been an increase in the shallow seawater intrusion zone above 450 feet depth since the well was constructed in 2007 (Figure 14). This intrusion was evident at the time SBWM-1 was constructed (HydroMetrics WRI, 2016). The deeper depths of well SBWM-1 show no clear evidence of increased salinity over time, although seasonal fluctuations are observed in the clays (zones with lower resistivity); summer conductivites (July 2015 and July 2016) plot close together and the conductivites in winter are more varied (Figure 17).

The induction logs for well SBWM-2 shows that there has been an increase in the shallow seawater intrusion zone above 300 feet depth since the well was constructed in 2007 (Figure 15). The logs show seasonal fluctuations in the clays (zones with lower resistivity), with similar conductivites in January 2015 and February 2016, and increased conductivites in summer (August 2014, July 2015 and July 2016) (Figure 17). At a depth of 1,470 feet within the screened sandy part of the aquifer (higher resistivity), the July 2016 conductivity is higher than all previous conductivities, except the initial log in 2007 (Figure 17). This might corroborate the higher chloride concentration observed in the July 2016 sample and rule out sampling/laboratory error for this sample.

At the 900 foot depth in well SBWM-4, it is difficult to see changes in conductivity because most of the logs plot too close together (Figure 18). These similar conductivities indicate that there has been no major increase in salinity at this depth. The seasonal fluctuations observed in SBWM-1 and SBWM-2 are not obvious in this well.

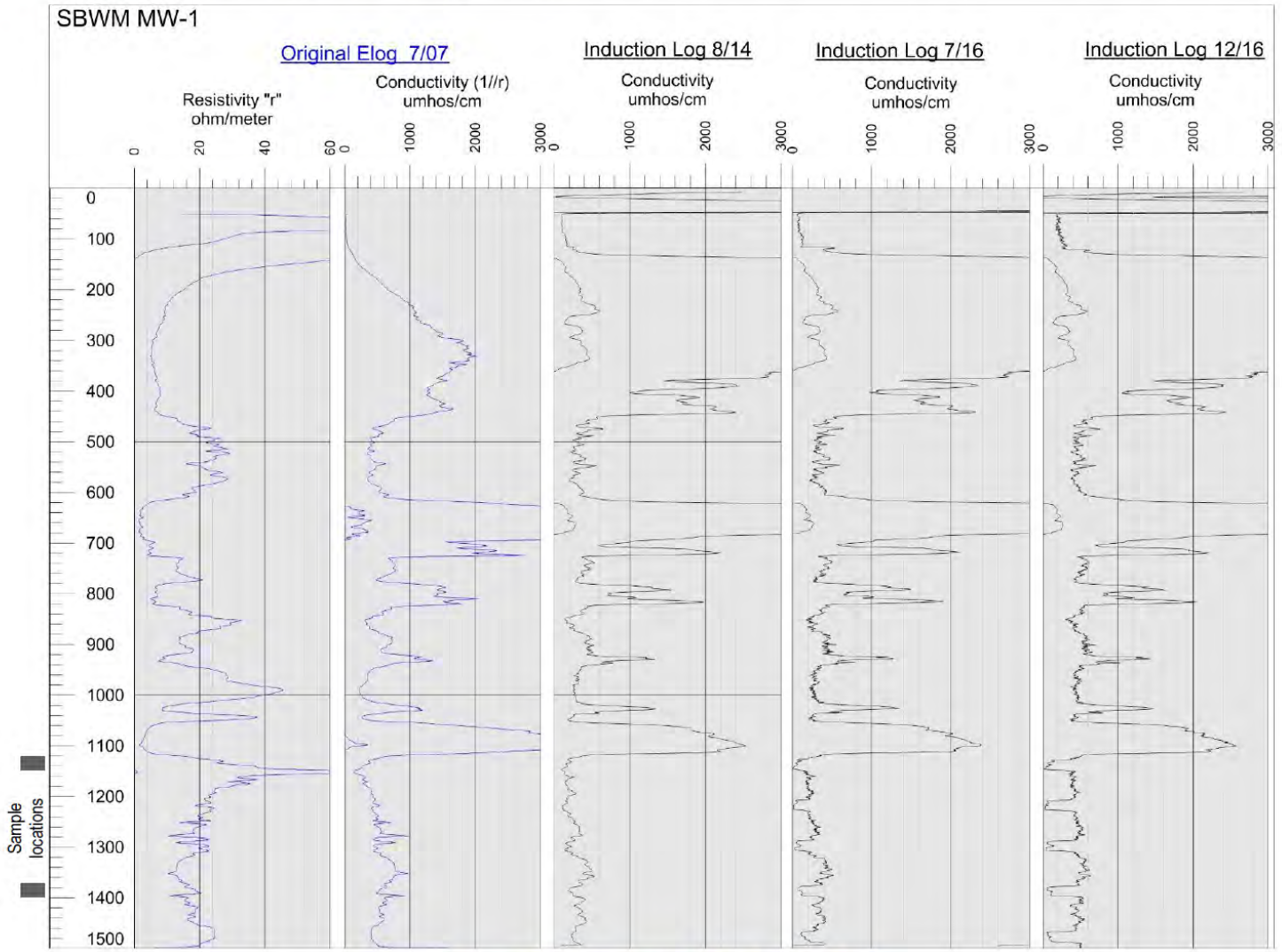


Figure 14: Sentinel Well 1 Induction Logs

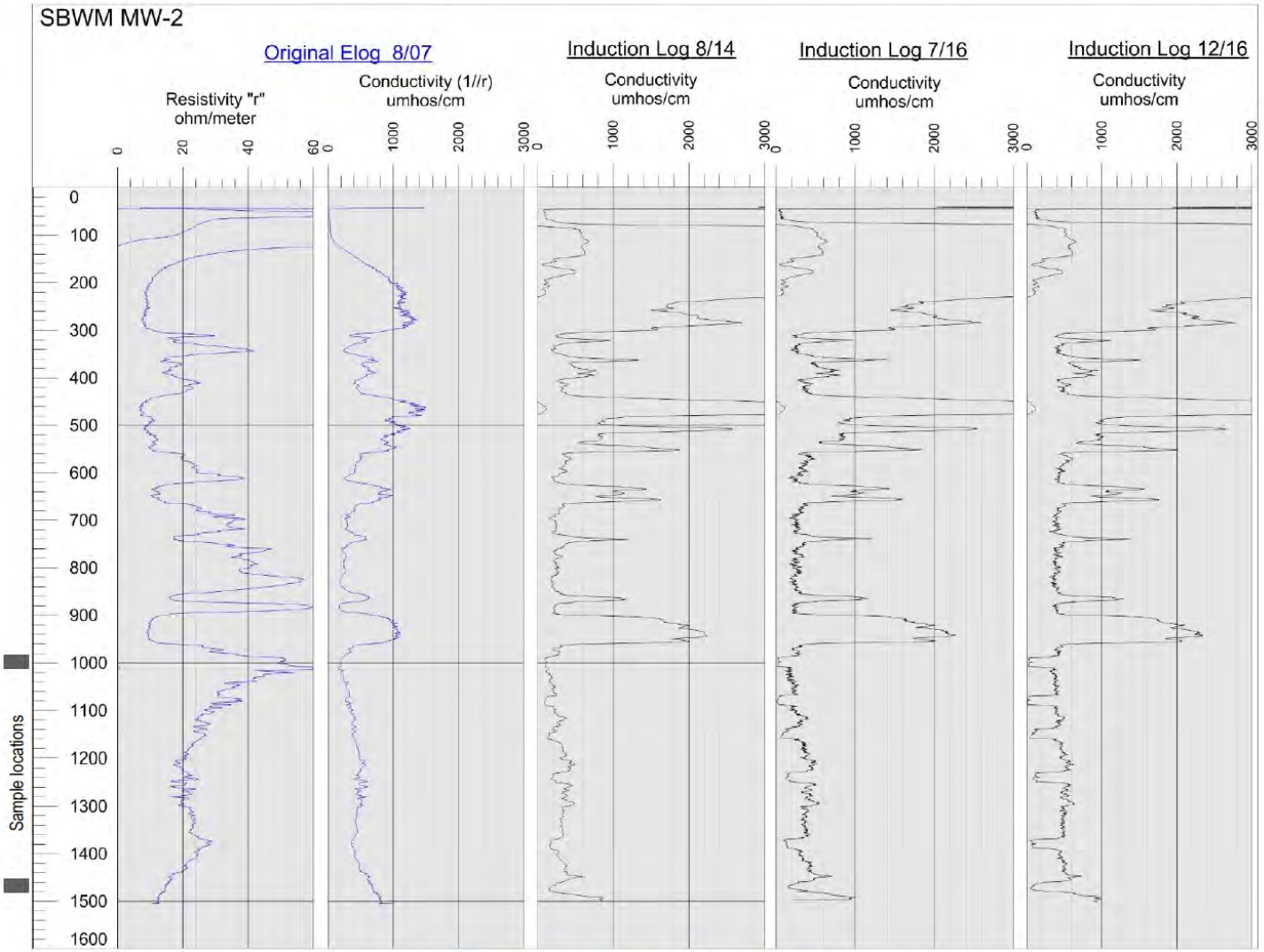


Figure 15: Sentinel Well 2 Induction Logs

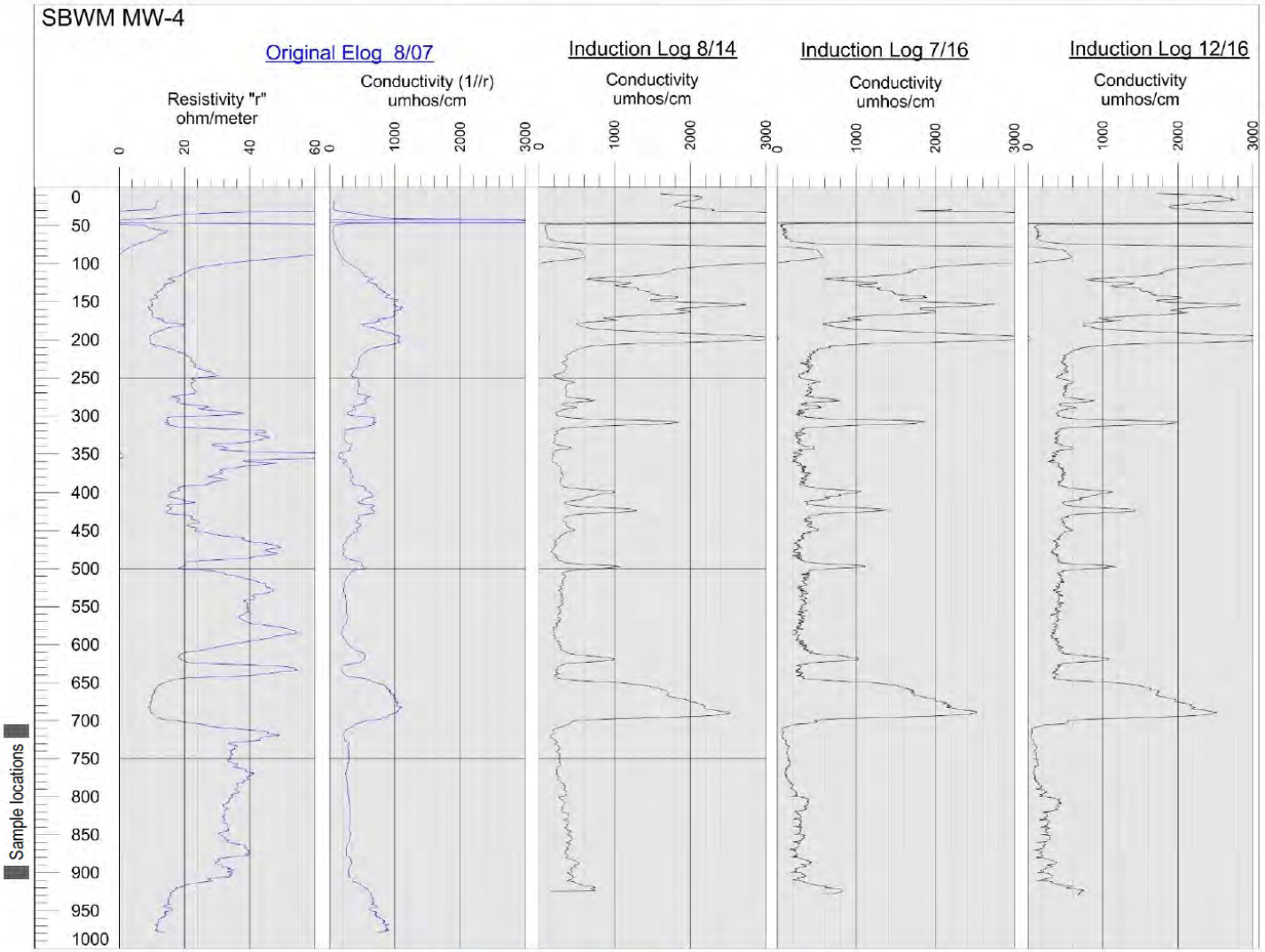


Figure 16: Sentinel Well 4 Induction Logs

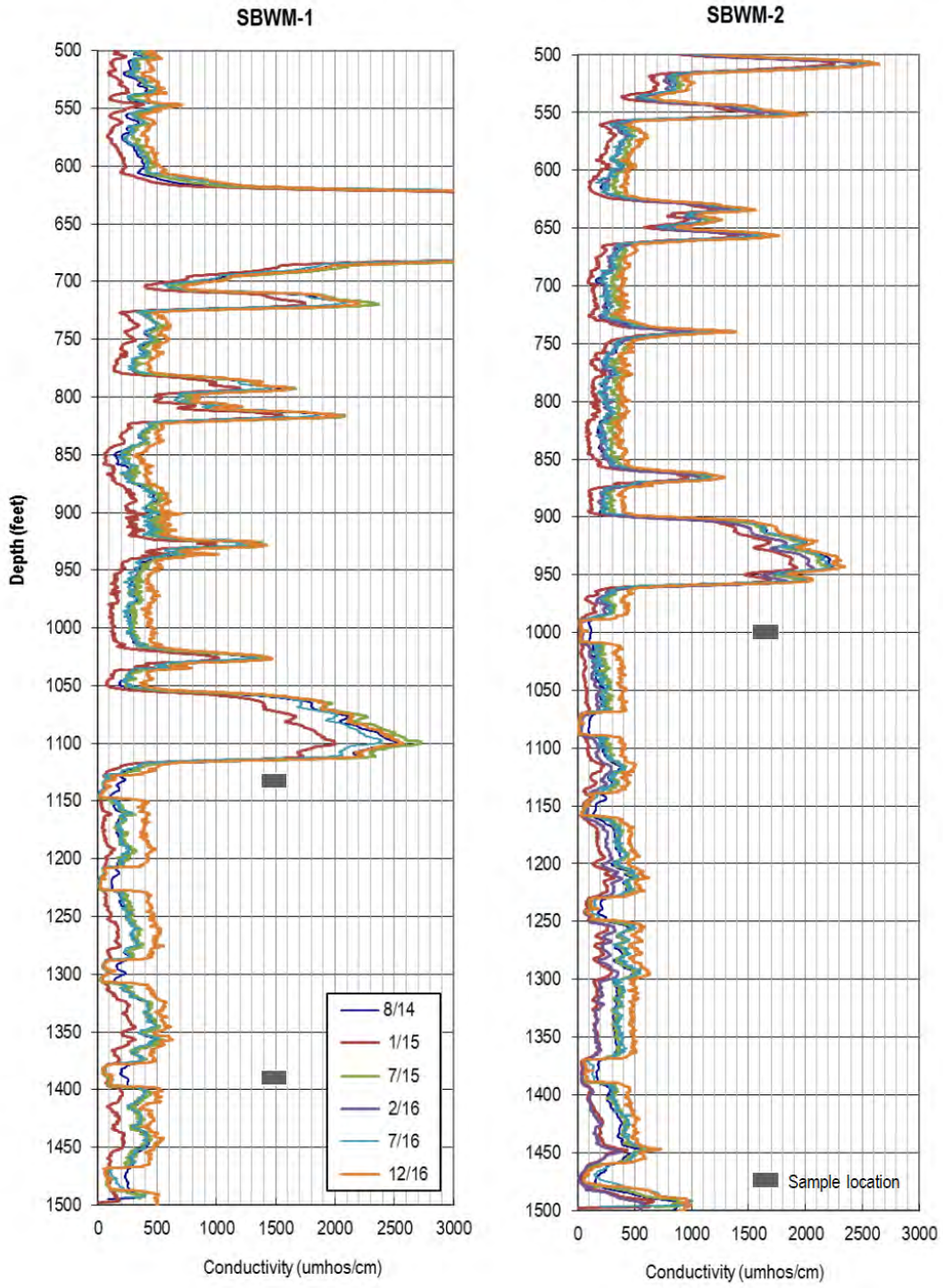


Figure 17: Induction Logs of Lowest 500 feet of Sentinel Wells 1 and 2

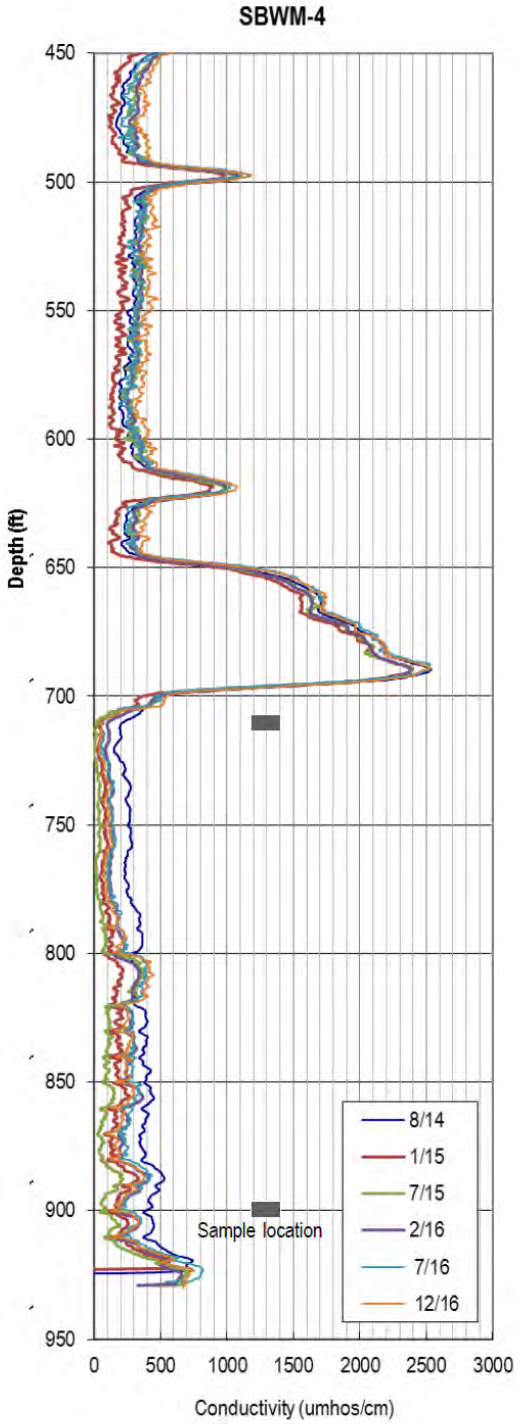


Figure 18: Induction Logs of Lowest 500 feet of Sentinel Well 4

7. CONCLUSIONS

1. None of the samples definitively indicate incipient seawater intrusion. However, variations in groundwater quality from samples collected over the last year from wells SBWM-1 and SBWM-4 necessitate continued vigilance and caution regarding potential changes to the Basin's groundwater quality.
2. Chloride concentrations at well SBWM-1 (1,390 ft) increased in December 2016 but the stiff diagram does not indicate that the anions and cations are much different from previous years. There is a very slight increasing chloride trend in this well.
3. Water quality at both well SBWM-2 (1,470 ft) and well SBWM-4 (900 ft) returned to within the range of historical groundwater quality observed in previous years.
4. Sentinel well SBWM- 4 (900 ft) has the highest coastal chloride concentrations and does appear to show an increasing chloride trend of approximately 5 mg/L per year since 2012. Although, this rate of increase is not significant, any increasing trend should continue to be monitored.
5. Monitoring well Ord Terrance Shallow chloride concentrations returned to the historic range. Its anions and cations both currently and historically do not indicate seawater chemistry.
6. There could possibly be some seasonal effects on groundwater quality in the deepest portions of the aquifer that may be related to seasonal groundwater elevation changes. If this is true and groundwater elevations continue to decline, larger impacts might be seen in the fall when groundwater levels are at their lowest.
7. The sources of increasing and fluctuating chlorides in wells SBWM-1 and SBWM-4 are unclear. Further investigation may provide evidence for the chloride source. Regardless of the source, the increasing and fluctuating chlorides likely result from chronically low groundwater levels.
8. Poorer quality water from shallow depths, migrating down the outside of the well casing is not likely a source of higher chloride concentrations in the sentinel wells because they are constructed with deep concrete/bentonite seals. Mixing of poorer quality water within the well is also not considered a source of higher chlorides at the deeper sample depths of the sentinel wells because the samples taken above the deepest samples do not have the same higher chloride concentrations.
9. While there is no evidence that errors occurred in the July 2016 sampling event, errors in collection, labeling, handling, and/or laboratory analyses of water

quality samples is always a possibility in complex sampling events such as these. Consequently, the possibly of such errors cannot be ruled out. Reanalysis of samples, and resampling as soon as possible when anomalous results are obtained will verify such concentrations.

8. RECOMMENDATIONS

1. Continue to sample SBWM-1 and SBWM-4 twice a year.
2. SBWM-2 should be resampled at the end of summer in 2017 and based on those results a decision should be made as to whether it should be sampled twice a year on an ongoing basis.
3. To determine if groundwater quality samples reflect the influence of fluctuating groundwater elevations, it is recommended that samples in the future be collected in the last week of September for the 4th quarter samples and in the first week of March for the 2nd quarter samples.
4. Prepare a work plan that will direct an effort towards identifying the source of fluctuating chloride concentrations. The work plan should outline the types of analyses and data to be used in identifying the chloride source. If the source of fluctuating chlorides is understood, it will help in developing management actions to prevent the higher concentrations increasing to the point that they cause groundwater degradation.
5. Conduct downhole conductivity and temperature profiles within each of the Sentinel Wells during the next sampling event. This tool measures the conductivity within the well, as opposed to induction logging which measures conductivity within the adjacent sediments. This technique may help identify if upwelling is occurring.
6. Continue the process that has recently been implemented to review water quality results as soon as they are received, rather than waiting until they are used to prepare the annual Seawater Intrusion Analysis Report. This will enable action to be taken, including reanalysis of samples, if appropriate, immediately instead of at the end of the year when the data have historically been analyzed.
7. Continue conducting all groundwater quality sampling and analysis conducted in accordance with standard quality assurance and quality control procedures. This includes submitting field blanks and duplicates samples to the laboratory once every couple of years.

9. REFERENCES

Feeney, M.B., 2007. *Seaside Groundwater Basin Watermaster - Seawater sentinel wells project, summary of operations*, prepared for the Seaside Groundwater Basin Watermaster, October 2007.

HydroMetrics LLC, 2009. *Seawater intrusion response plan, Seaside basin, Monterey County, California*, prepared for the Seaside Groundwater Basin Watermaster, February 2009.

HydroMetrics Water Resources Inc., 2014. *Water year 2016 seawater intrusion analysis report*, prepared for the Seaside Groundwater Basin Watermaster, December 2016.

NOTICE OF PUBLIC MEETING Revised 2/17/17 11:00 a.m.

THURSDAY, MARCH 9, 2017, 9:00 A.M. – 5:00 P.M.

WATSONVILLE CITY COUNCIL CHAMBERS

275 MAIN STREET - 4TH FLOOR (NEW BUILDING)

WATSONVILLE

Thursday, March 9, 2017, 9:00 a.m.

BOARD BUSINESS

9. Roll Call
   [Tammie Olson, Clerk to the Board, 805/549-3140, Tammie.Olson@Waterboards.ca.gov]

10. Introductions
    [John Robertson, Executive Officer, 805/549-3140, John.Robertson@waterboards.ca.gov]

11. Approval of January 26-27, 2017 Board Meeting minutes

12. Report by Regional Board Members

13. Report by State Water Resources Control Board Liaison [Steven Moore 916/341-5624]

Public Forum

14. Any person may address the Board regarding a matter within the Board's jurisdiction that is not related to an item on this meeting agenda. Comments will generally be limited to three minutes, unless otherwise directed by the Chair. Any person wishing to make a longer presentation should contact the Executive Officer at least one week prior to the meeting. Comments regarding pending adjudicatory matters will not be permitted.

15.

Waste Discharge Requirements

16. Consideration of Waste Discharge and Water Recycling Requirements for the Pure Water Monterey Advanced Water Purification Project, Monterey County, Order No. R3-2017-0003 *(Written comments were due by January 20, 2017).*
    [Jon Rokke, 805/549-3892, Jon.Rokke@waterboards.ca.gov]

Administrative Items

17. Executive Officer's Report
    [John Robertson, Executive Officer 805/549-3140, John.Robertson@waterboards.ca.gov]

18. Blank

19.

Closed Session

20. Discussion of Cases in Litigation [Assistant Chief Counsel Lori Okun]

The Board will meet in closed session to discuss pending litigation, as authorized by Government Code (GC) Section 11126[e][2][A], in the cases of:

1. *Monterey Coastkeeper, et al. v. California Regional Water Quality Control Board, Central Coast Region (Monterey County Superior Court Case No. M111983)(Extension of 2004 Ag Order)*
2. *Petition of Monterey Coastkeeper, Santa Barbara Channelkeeper and San Luis Obispo Coastkeeper (Resolution No. R3-2011-0208, Executive Officer Extension of the 2004 Agricultural Order No. R3-2004-0117)*
3. *Petition of William Elliott (Resolution No. R3-2011-0208, Executive Officer Extension of the 2004 Agricultural Order No. R3-2004-0117*
4. *Casmalia Hazardous Waste Site Litigation: U.S. v. State of California and Related Matters*
5. *Petition of Levon Investments, LLC; Rose Marie Towle (trustee); John L. DeMourkas (trustee); John Ridell (trustee); Stephanie Marie Redding (trustee); Elisa Anna Redding (trustee); and Wells Fargo Bank (trustee) for Renco Encoders, 26 Coromar Drive, Goleta (Water Code Section 13267 Order dated May 13, 2011, Revising Monitoring and Reporting Program No. R3-2005-0143), SWRCB/OCC File No. A-2168*
6. *Carmen Zamora and Environmental Law Foundation vs. Regional Water Quality Control Board, Central Coast Region (San Luis Obispo County Superior Court, Case No. 15CV-0247) (Central Coast Groundwater Coalition cooperative monitoring program)*
7. *Pyrethroid Working Group v. California Regional Water Quality Control Board, Central Coast Region, State Water Resources Control Board (Sacramento County Superior Court, Case No. 34-2015-80002177)(Santa Maria Watershed TMDL for Toxicity and Pesticides)*
8. *U.S. et al. v. HVI Cat Canyon, Inc., f/k/a Greka Oil & Gas, Inc*. (U.S. District Court, Central District of California Case No. CV 11-05097 FMO (PLAx))
9. *Plains Pipeline, LP, Refugio Oil Spill, Gaviota, Santa Barbara County. Resolution Order No. R3-2015-0026.*
10. Petition of Grower Shipper Association of Central California et al. for review of Revised MRP Order Nos. R3-2012-0011-01, R3-2012-0011-02, and R3-2012-0011-03, SWRCB/OCC File A-2503.

The Board may discuss significant exposure to litigation as authorized by GC Section 11126[e][2][B]. The Board may also decide whether to initiate litigation as authorized by GC Section 11126[e][2][C]. The Board is not required to allow public comment on closed session items. (See GC Section 11125.7(d).)

Deliberation on Decision after Hearing

The Board may meet in closed session to deliberate on a decision to be reached based upon evidence introduced in a hearing, as authorized by GC Section 11126(c) (3).

Personnel Issues

The Board may meet in closed session to discuss the appointment, evaluation of performance, or dismissal of a public employee or to hear complaints or charges brought against that employee by another employee unless the employee requests a public hearing. (This closed session is authorized under Government Code section 11126, subd. (a)(1).)

The next scheduled Board meeting is May 11-12, 2017, in San Luis Obispo.

ATTACHMENT 1

Draft Order No. R3-2017-0003

Pure Water Monterey - Advanced Water Purification Facility
and
Groundwater Replenishment Project

STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION
DRAFT ORDER NO. R3-2017-0003

WASTE DISCHARGE REQUIREMENTS AND WATER RECYCLING REQUIREMENTS

FOR THE

PURE WATER MONTEREY ADVANCED WATER PURIFICATION FACILITY AND GROUNDWATER REPLENISHMENT PROJECT

ISSUED TO

MONTEREY REGIONAL WATER POLLUTION CONTROL AGENCY

The California Regional Water Quality Control Board, Central Coast Region (Central Coast Water Board) finds that:

I. BACKGROUND

1. The Monterey Regional Water Pollution Control Agency (MRWPCA) in partnership with the Monterey Peninsula Water Management District (MPWMD) has developed the "Pure Water Monterey Groundwater Replenishment Project" (Project) to deliver 3,500 acre-feet per year (AFY) of purified recycled water to replenish the Seaside Groundwater Basin (Seaside Basin), in Monterey County.

2. The MRWPCA is a joint powers authority (JPA) operating in the Monterey Bay area, with 11 members including Monterey County, City of Salinas, Boronda County Sanitation District, Castroville Community Services District, City of Del Rey Oaks, City of Monterey, City of Pacific Grove, City of Sand City, City of Seaside, Marina Coast Water District, and Moss Landing County Sanitation District.

3. The MRWPCA is the facility owner and is responsible for complying with all requirements of this Order and the Monitoring and Reporting Program.

4. Each JPA member has had sewage conveyance or treatment responsibilities in the past for its respective area of jurisdiction and is currently responsible for maintaining and operating its own collection system. The collection systems of the 11 member agencies all connect to MRWPCA's Regional Treatment Plant (RTP).

5. The MRWPCA currently serves a population of approximately 250,000 people and treats approximately 18.5 million gallons per day (MGD) of municipal wastewater at its RTP located two miles north of the City of Marina.

6. The RTP currently has a design capacity of 29.6 MGD.

7. California American Water Company (CalAm) is under a State Water Resources Control Board (SWRCB) cease and desist order (SWRCB Order No. 2009-0060) to secure replacement water supplies and cease over-pumping of the Carmel River. The Project will help CalAm to comply with the cease and desist order by allowing it to reduce diversions from the Carmel River system by 3,500 AFY by injecting the same amount of purified recycled product water into the Seaside Basin.

8. The Project will also include a drought reserve component by providing for an additional 200 AFY of product water that will be injected in the Seaside Basin in wet and normal years up to a total of 1,000 acre-feet (AF). Thus, the Project will inject up to 3,700 AF of product water into the Seaside Basin in some years, rather than the 3,500 AF needed for CalAm supplies. This will result in a "banked" drought reserve.

9. The Advanced Water Treatment Facility (AWPF) will be located adjacent to the RTP and will consist of ozone pre-treatment, low-pressure membrane filtration, reverse osmosis treatment, advanced oxidation, and product water stabilization.

10. Purified recycled water from the AWPF will be conveyed by pipeline to the Seaside Basin for groundwater recharge using both deep injection and vadose zone wells. The injected water will then mix with existing groundwater and be stored for future urban use, including use as a potable water source.

11. Additional recycled water from the RTP's tertiary treatment system will augment the existing Castroville Seawater Intrusion Project's agricultural irrigation supply.

12. The Project will supplement sewage flows to the RTP in order to increase the quantity of secondary effluent available as feed water. The sewage flows will be supplemented with:

    - agricultural wash water from the City of Salinas;
    - storm water flows from the southern part of Salinas;
    - storm water and urban agricultural runoff from the Reclamation Ditch; and
    - surface and agricultural tile drain waters from the Blanco Drain.

13. AWPF treated water will be conveyed by pipeline to the Seaside Basin for groundwater recharge using injection and vadose zone wells owned by MRWPCA. The injection wells will be arrayed just east of General Jim Moore Blvd. and south of Eucalyptus Road (see Figure 1).

II. PURPOSE OF ORDER

14. This Order authorizes the treatment of recycled water at the AWPF and injection of the treated water into the Seaside Basin aquifer.

15. On February 25, 2016, the MRWPCA submitted a Report of Waste Discharge requesting new waste discharge requirements and water recycling requirements (WDRs/WRRs) to reflect a proposal to operate the AWT facility and inject recycled water into the Seaside Basin.

16. On November 29, 2016, the Water Board sent a letter to MRWPCA notifying it that the Report of Waste Discharge letter was complete.

17. On August 22, 2016, the MRWPCA held a public hearing on the draft Title 22 Engineering Report for this project and on October 21, 2016, submitted a final version the Title 22 Engineering Report (Pure Water Monterey Groundwater Replenishment Title 22 Engineering Report) for operation of the Facility to the Central Coast Water Board and the State Water Resources Control Board Division of Drinking Water (DDW). The final Engineering Report was accepted by DDW on November 7, 2016.

18. MRWQCA has made changes to the project since the final Engineering Report was accepted by DDW.

19. DDW submitted a letter to the Central Coast Water Board with recommendations for conditions to properly regulate the Project on November 10, 2016.

20. The DDW conditions are incorporated into the provisions of this Order.

III. PURE WATER MONTEREY ADVANCED WATER PURIFICATION PROJECT

21. The Monterey Regional Water Pollution Control Agency (hereafter “MRWPCA” or “Discharger”) owns and operates the Advanced Water Purification Facility located at 14811 Del Monte Boulevard, located north east of Marina in Monterey County (see Figure 1). The facility is located just south of the Salinas River.

22. **Primary Project Components**:

    1. The following source waters will be treated to secondary standards at the RTP:
        - Sewage from the MRWPCA member entities
        - Agricultural wash water from the City of Salinas
        - Storm water flows from the southern part of Salinas
        - Storm water and urban and agricultural runoff from the Reclamation Ditch
        - Surface and agricultural tile drain waters from the Blanco Drain
    2. The Advanced Water Purification Facility (AWPFAWPF) has the following major components:
        - Supply water pump station
        - Ozonation (membrane filtration pretreatment)
        - Membrane filtration feed water pump station
        - Low Pressure Membrane Filtration (MF)
        - Reverse osmosis (RO) feed water pump station
        - RO system
        - Ultraviolet light (UV) with hydrogen peroxide advanced oxidation Process (AOP)
        - Post treatment stabilization
        - Product water pump station
    3. Aquifer recharge by injection of purified recycled water into the Seaside

Basin.

Figure 1 - shows the approximate locations of the AWPF and the injection wells site.

Figure 2 - shows a simplified process flow diagram of the existing RTP and the AWPF.

Figure 3 - is a map of wells associated with and in the vicinity of the Project.

23. **AWPF Design Flows and Waste Streams** - The proposed AWPF will have a design capacity to produce 4.0 MGD of advanced treated recycled water. The facility will also produce seven waste streams: ozone injection strainer waste, MF backwash waste, neutralized MF enhanced flux maintenance waste, neutralized MF clean-in-place waste, neutralized RO clean-in-place waste, analytical instrument waste, and RO concentrate. The RO concentrate will be piped to MRWPCA's existing ocean outfall along with secondary wastewater effluent, and trucked brine. The other AWPF waste streams will be diverted to the RTP headworks or the RTP sludge thickening process for treatment.

24. **Ocean Discharge** - The RO concentrate will be sent to the existing ocean outfall regulated by Water Board Order No. R3-2014-0013, NPDES No. CA0048551 for disposal.

    Because there will be new waste streams entering the RTP, and these waste streams will have seasonal variations in water quality, the Central Coast Water Board must modify MRWPCA's existing NPDES permit for discharge to the Pacific Ocean prior to project operation.

IV. RECYCLED WATER INJECTION SYSTEM

25. **Injection Facilities** – Injection facilities will be constructed along a strip of land on the eastern boundary of the City of Seaside, about 1.5 miles inland from Monterey Bay, in an area is located within the Northern Inland Subarea of the Seaside Basin. Each vadose zone well will be paired with a deep injection well (i.e. a well cluster) at each of the four proposed injection well locations. (Figure 3)

26. **Vadose Zone Wells** - Up to four vadose zone injection wells are planned (VZW-1 through VZW-4) in the Paso Robles aquifer. These wells are targeted to receive 10 percent of the advanced treated recycled water.

27. **Deep Injection Wells** - Up to four deep water injection wells (DIW-1 through DIW-4) are planned in the Santa Margarita aquifer. These wells are targeted to receive 90 percent of the advanced treated recycled water**.**

28. **Water Supply Wells Near the Injection Area** - Most supply wells near the injection facilities are located in the adjacent Northern Coastal Subarea. The closest water supply wells include Seaside No. 4 (operated by the City of Seaside) and two aquifer storage and recovery (ASR) wells, ASR-1 and ASR-2 (operated by the Monterey Peninsula Water Management District for CalAm). Each of these wells is located about 1,000 feet downgradient from a Project injection well (Figure 3).

29. **Monitoring Wells** - MRWPCA will construct two monitoring wells downgradient of each injection well cluster. One monitoring well must be located between two weeks to six months travel time and at least 30 days upgradient of the nearest drinking water well, and one monitoring well must be located between each well cluster and the nearest downgradient drinking water well. The monitoring wells will allow for samples to be obtained independently from each aquifer and validated as receiving recharge water from the Project.

30. **Recycled Water Retention Time** - The SWRCB Division of Drinking Water (DDW - formerly the California Department of Public Health) has adopted groundwater replenishment regulations (June 2014) for the recharge of recycled water. The DDW regulations contain requirements for underground retention time of recycled water that could also potentially affect well spacing. Recycled water must be retained underground for a sufficient period of time to identify and respond to any treatment failure so that inadequately treated recycled water does not enter a potable water system (referred to as the response retention time). The response retention time must be at least two months. The 1,000-ft distance between proposed project wells and the closest downgradient production wells is expected to result in a travel time of approximately one year. MRWPCA will propose a tracer study to DDW and the Central Coast Water Board and when approved, will conduct the study to confirm the underground retention time.

V. SEASIDE GROUNDWATER SUBBASIN

31. **Seaside Groundwater Basin** - Groundwater Bulletin 118 defines the Salinas Valley Groundwater Basin - Seaside Area Subbasin 3-4.08 as having a surface area of 25,900 acres, or approximately 40 square miles. The subbasin underlies the coastal communities of Seaside and Marina as well as the western portion of the former Fort Ord. The main water-bearing units of the subbasin are the Santa Margarita Formation and the Paso Robles Formation. The Santa Margarita Formation is poorly consolidated marine sandstone, has a maximum thickness of 225 feet, and underlies the Paso Robles Formation. The Paso Robles Formation is the major water-bearing unit in the Seaside area and consists of sand, gravel, and clay interbedded with some minor calcareous beds. The storage capacity of the subbasin is estimated to be 1,000,000 acre-feet.

32. **Seaside Groundwater Basin Salt & Nutrient Management Plan -** A salt and nutrient management plan (SNMP) was prepared for the Monterey Peninsula Management District, pursuant to the State Water Board's Recycled Water Policy in June of 2014. The SNMP has not been adopted by the Central Coast Water Board and will not be brought before the Board in its current form.

VII. REGULATION OF RECYCLED WATER

33. Legislation was adopted, effective July 1, 2014, that transferred personnel in the California Department of Public Health Drinking Water Program, which includes those working on permitting of recycled water projects, to the State Water Board as the new Division of Drinking Water (DDW). The regional water quality control boards are responsible for issuing water reclamation requirements for the beneficial use of recycled water. The State Water Board and regional water quality control boards are responsible for issuing waste discharge requirements for the production

of recycled water.

34. State authority to oversee production and reuse of recycled water use is shared by the State Water Board Division of Drinking Water and the Regional Water Boards. DDW is the division with the primary responsibility for establishing water recycling criteria under Title 22 of the Code of Regulations to protect the health of the public using the groundwater basins as a source of potable water.

35. The State Water Board adopted Resolution No. 77-1, Policy with Respect to Water Reclamation in California, which includes principles that encourage and recommend funding for water recycling and its use in water-short areas of the state. On September 26, 1988, the Central Coast Water Board adopted Resolution No. 88-012, which encourages the beneficial use of recycled water and supports water recycling projects.

36. The State Water Board adopted the Recycled Water Policy (State Water Board Resolution No. 2009-0011) on February 3, 2009, and amended the Policy on January 22, 2013. The purpose of the Recycled Water Policy is to protect groundwater resources and to increase the beneficial reuse of recycled water from municipal wastewater sources in a manner consistent with state and federal water quality laws and regulations. The Recycled Water Policy describes the respective authorities of DDW and the regional water quality control boards as follows:

> *Regional Water Boards shall appropriately rely on the expertise of DDW for the establishment of permit conditions needed to protect human health.* (section 5.b)
>
> *Nothing in this paragraph shall be construed to limit the authority of a Regional Water Board to protect designated beneficial uses, provided that any proposed limitations for the protection of public health may only be imposed following regular consultation by the Regional Water Board with DDW, consistent with State Water Board Orders WQ 2005-0007 and 2006-0001.* (section 8.c)
>
> *Nothing in this Policy shall be construed to prevent a Regional Water Board from imposing additional requirements for a proposed recharge project that has a substantial adverse effect on the fate and transport of a contaminant plume or changes the geochemistry of an aquifer thereby causing dissolution of constituents, such as arsenic, from the geologic formation into groundwater.* (section 8.d)

In addition, the Policy notes the continuing obligation of the Regional Water Boards to comply with the state's anti-degradation policy, Resolution No. 68-16:

> *The State Water Board adopted Resolution No. 68-16 as a policy statement to implement the legislature's intent that waters of the state shall be regulated to achieve the highest water quality consistent with the maximum benefit to the people of the state.* (section 9.a)

37. Section 13523(a) of the Water Code provides that a regional water quality control board, after consulting with and receiving recommendations from DDW, and after any necessary hearing, shall, if it determines such action to be necessary to protect the health, safety, or welfare of the public, prescribe water recycling requirements for water that is used or proposed to be used as recycled water. Pursuant to Water Code section 13523, the Central Coast Water Board has consulted with DDW and received its recommendations. On August 22, 2016, DDW participated in a public hearing to consider the proposed Pure Water Monterey Groundwater Replenishment Project. On October 21, 2016, DDW transmitted to the Central Coast Water Board its conditions concerning the Pure Water Monterey Project. DDW's recommendations are included in this order as requirements.

38. Section 13540 of the Water Code requires that recycled water may only be injected into an aquifer used as a source of domestic water supply if DDW finds the recharge will not degradethe quality of the receiving aquifer as a source of water supply for domestic purposes. DDW determined that as long as the water reclamation requirements meet all of its conditions, the Pure Water Monterey Groundwater Replenishment Project can provide injection recharge water that will not degrade groundwater basins as a source of water supply for domestic purposes. This Order requires that the Discharger comply with all of the recommended DDW conditions.

39. Section 13523(b) of the Water Code provides that reclamation requirements shall be established in conformance with the uniform statewide recycling criteria established pursuant to Water Code section 13521. Section 60320 of Title 22 currently includes requirements for groundwater recharge projects.

40. The State Water Resources Control Board adopted uniform water recycling criteria for groundwater recharge on July 15, 2014. This Order is consistent with those criteria.

VIII. OTHER APPLICABLE PLANS, POLICIES AND REGULATIONS

A. Regional Board Water Quality Control Plan (Basin Plan)

41. The Central Coast Water Board has adopted the *Water Quality Control Plan for the Central Coastal Basin* (Basin Plan). The Basin Plan designates beneficial uses for surface water and groundwater; establishes narrative and numeric water quality objectives that must be attained or maintained to protect the designated (existing and potential) beneficial uses and to conform with the state's anti-degradation policy; and includes implementation provisions, programs, and policies to protect all waters in the region. In addition, the Basin Plan incorporates applicable State Water Board and Central Coast Water Board plans and policies and other pertinent water quality policies and regulations.

42. The Basin Plan incorporates the California Code of Regulations (CCR) Title 22 primary Maximum Contaminant Levels (MCLs) by reference. This incorporation is prospective, including future changes to the incorporated provisions as the changes take effect. The Basin Plan states that groundwater designated for use as domestic or municipal supply shall not contain concentrations of chemical

constituents and radionuclides in excess of the MCLs. The Basin Plan also specifies concentrations that cause nuisance or adversely affect beneficial uses.

43. For the Seaside Basin, the Basin Plan includes general narrative groundwater objectives for taste and odor and radioactivity and numeric objectives for:

- Bacteria - the median concentration of coliform organisms (i.e., total coliform) over any seven-day period must be less than 2.2/100 mL; and
- Chemical constituents - groundwater shall not contain chemical concentrations in excess of primary and secondary MCLs.:

Table 1 – Water Quality Goals

	Receiving Water		Beneficial Uses			
	Seaside Aquifer		**Municipal and Domestic Water Supply (MUN) Industrial Service Supply (IND) Agricultural Supply (AGR)**			
			Water Quality Goals - Sources			
	WQG	**Units**	**CA Primary MCL**	**CA Secondary MCL**	**CA Public Health Goal for Drinking Water**	**Water Quality for Agriculture (Basin Plan)**
Aluminum	1,000	µg/L	X			
Arsenic	10	µg/L	X			
Barium	1,000	µg/L	X			
Boron	750	µg/L				X
Cadmium	10	µg/L				X
Chloride	250	mg/L		X		
Chromium (total)	0.02	µg/L			X	
Iron	300	µg/L		X		
Lead	0.2	µg/L			X	
Manganese	50	µg/L		X		
Nitrate - N	10	mg/L	X			
pH	6.5-8.4	pH Units				X
Sodium	69	mg/L	*WQ Goals – Marshak, WQ for Ag (Ayers & Wescot)*			
Sulfate	250	mg/L		X		
TDS	500	mg/L		X		
Zinc	**2.0**	**mg/L**				X

44. Four wells were used to establish existing groundwater water quality and assimilative capacity of the aquifer and sub-aquifers. The most recent five years of data (2011-2016) were analyzed for each well and the data are presented in Table 2. Two of the wells draw their water from both the Paso Robles and Santa Margarita aquifers (Ord Grove No. 2 and Paralta). One well draws water exclusively from the Paso Robles aquifer (City of Seaside No. 4) and one well draws exclusively from the Santa Margarita aquifer (ASR-1).

Table 2 - Existing Groundwater Quality in the Seaside Basin

Constituent	City of Seaside No.4	ASR-1	Ord Grove No. 2	Paralta	Basin-Wide Averages
Aluminum	50	50	26	50	42
Arsenic	1.2	1.8	2.0	2.5	2.1
Barium	28	100	100	100	94
Boron	46	95	132	96	108
Chloride	72	63	129	94	103
Chromium-total	3.6	9.3	10	10	9.1
Chromium VI	-	1.0	0.8	2.3	1.4
Lead	5	3.7	5.0	5.0	4.5
Nitrate as N	1.9	0.1	1.7	0.5	1.1
Sodium	50	60	94	79	79.7
Sulfate	13	77	63	58	54.9
TDS	237	406	524	435	449
TOC	0.5	1.0	0.6	0.6	0.7

**Source: averages of well water quality data submitted by MRPCA on November 9, 2016*

**Concentrations are in μg/L except chloride, nitrate, sodium, sulfate, TDS, and TOC, which are mg/L*

45. MRWPCA completed a focused groundwater quality evaluation, utilizing the available groundwater quality data for the four water supply wells named in Table 2, and constructed a three-dimensional solute transport model to predict localized and basin-wide groundwater quality changes resulting from the mixing of injected recycled water and ambient groundwater. The model analyzed the percentage of assimilative capacity consumed by the Project after 25 years. The results of the evaluation are presented in Table 3. MRWPCA also demonstrated that when effluent limits are equal to the applicable water quality objective for each constituent, the percentage of recycled water present in the aquifer equals the percentage of assimilative capacity consumed. This analysis confirms that less than 10% of the basin's assimilative capacity will be utilized by this project and that beneficial uses will be protected.

Table 3. Volume-Weighted Average = % Assimilative Capacity Consumed

Modeled Layer	Volume–Weighted Average Recycled Water Percentage				
	Northern Coastal	Northern Inland	Southern Coastal	Laguna Seca	All Subareas
1	0.1%	0.0%	0.0%	0.0%	0.0%
2	0.5%	2.2%	0.0%	0.0%	1.0%
3	4.0%	2.1%	0.0%	0.0%	1.7%
4	2.1%	0.6%	0.0%	0.0%	0.8%
5	5.3%	7.2%	0.0%	0.0%	3.8%
Paso Robles Aquifer	1.8%	1.7%	0.0%	0.0%	1.1%
Santa Margarita Aquifer	5.3%	7.2%	0.0%	0.0%	3.8%
All Model Layers	3.3%	4.2%	0.0%	0.0%	2.4%

46. Any constituent that currently exceeds its applicable water quality objective in the groundwater basin will see its water quality improved by discharges of recycled water below the water quality objective concentration.

47. The Basin Plan contains the following specific water quality objectives for groundwater:

MUNICIPAL AND DOMESTIC SUPPLY (MUN)

- Bacteria - The median concentration of coliform organisms over any seven-day period shall be less than 2.2/100 mL.
- Organic Chemicals - Ground waters shall not contain concentrations of organic chemicals in excess of the limiting concentrations set forth in California Code of Regulations, Title 22, Chapter 15, Article 5.5, Section 64444.5 Table 5, and listed in Basin Plan Table 3-1.
- Chemical Constituents - Ground waters shall not contain concentrations of chemical constituents in excess of the limits specified in California Code of Regulations, Title 22, Chapter 15, Article 4, Section 64435, Tables 2 and 3. Radioactivity - Ground waters shall not contain concentrations of radionuclides in excess of the limits specified in California Code of Regulations, Title 22, Chapter 15, Article 5, Section 64443, Basin Plan Table 4.

AGRICULTURAL SUPPLY (AGR)

- Ground waters shall not contain concentrations of chemical constituents in amounts that adversely affect such beneficial use. Interpretation of adverse effect shall be as derived from the University of California Agricultural Extension Service guidelines provided in Basin Plan Table 3-3.
- In addition, water used for irrigation and livestock watering shall not exceed the concentrations for those chemicals listed in Basin Plan Table 3-4. No controllable water quality factor shall degrade the quality of any ground water resource or adversely affect long-term soil productivity. The salinity control aspects of ground water management will account for effects from all sources.

This Order protects Seaside Basin groundwater water quality objectives and is therefore consistent with the Basin Plan.

B. State Water Resources Control Board Policies

48. The Sources of Drinking Water Policy (Resolution No. 88-63) provides that all waters of the state, with certain exceptions, are to be protected as existing or potential sources of municipal and domestic supply. Exceptions include waters with existing high dissolved solids (i.e., greater than 3,000 mg/L), low sustainable yield (less than 200 gallons per day for a single well), waters with contamination that cannot be treated for domestic use using best management practices or best economically achievable treatment practices, waters within particular municipal, industrial and agricultural wastewater conveyance and holding facilities, and regulated geothermal ground waters. This Order protects existing or potential sources of drinking water and is therefore consistent with Resolution No. 68-63.

49. On October 28, 1968, the State Water Board adopted Resolution No. 68-16,

Statement of Policy with Respect to Maintaining High Quality of Waters in California (Resolution 68-16), establishing an anti-degradation policy for the State Water Board and Regional Water Boards. Resolution No. 68-16 requires that existing high quality of waters be maintained unless a change is demonstrated to be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial uses of waters, and will not result in water quality less than that prescribed in applicable policies. Resolution No. 68-16 also requires that waste discharge requirements be prescribed for discharges to high quality waters that will result in the best practicable treatment or control of the discharge necessary to ensure that a pollution or nuisance will not occur and the highest water quality consistent with maximum benefit to the people of the State will be maintained. The Central Coast Water Board's Basin Plan implements, and incorporates by reference, the state anti-degradation policy.

50. This order is consistent with Resolution No. 68-16 (anti-degradation policy). Groundwater recharge with recycled water for later extraction and use in accordance with the Recycled Water Policy and state and federal water quality laws is to the benefit of the people of the State of California.

    Compliance with this Order will protect present and anticipated beneficial uses of groundwater, ensure attainment of water quality prescribed in applicable policies, and avoid any conditions of pollution or nuisance. Although this Order may allow some degradation to water quality, the Order does not authorize the Project to cause exceedances of applicable water quality goals or objectives for the basin.

51. A goal of the Recycled Water Policy, Resolution No. 2013-0003, is to increase the beneficial use of recycled water from municipal wastewater sources in a manner consistent with state and federal water quality laws and regulations. The Policy directs the Regional Water Boards to collaborate with generators of municipal wastewater and interested parties in the development of salt and nutrient management plans (SNMPs) to manage the loading of salts and nutrients to groundwater basins in a manner that is protective of beneficial uses, thereby supporting the sustainable use of local waters. No SNMP has been adopted by the Central Coast Water Board for the Seaside Basin.

    The Recycled Water Policy also states that until such time as a salt and nutrient management plan has been approved by the Water Board and is in effect, compliance with Resolution No. 68-16 for projects that consume less than 10 percent of the available assimilative capacity in a basin/sub-basin may be demonstrated by conducting an antidegradation analysis verifying the use of assimilative capacity. This Order supports the sustainable use of local waters and ensures that the Project will consume less that 10 percent of available assimilative capacity, which is consistent with the Recycled Water Policy

52. DDW has established a notification level of 10 nanograms per liter (ng/L) for N-nitrosodimethylamine (NDMA). NDMA can be produced by reactions that occur during chlorination and has been determined to be a potent carcinogen. The notification level is the concentration of a contaminant in drinking water delivered for human consumption that DDW has determined, based on available scientific information, does not pose a significant health risk but warrants notification. Notification levels are established as precautionary measures for contaminants that

may be considered candidates for establishment of maximum contaminant levels, but have not yet undergone or completed the regulatory standard setting process prescribed for the development of maximum contaminant levels and are not drinking water standards. DDW has established a response level of 300 ng/L for NDMA. The response level is the concentration of a contaminant in drinking water delivered for human consumption at which DDW recommends that additional steps, beyond notification, be taken to reduce public exposure to the contaminant.

C. California Water Code

53. Pursuant to California Water Code (Water Code) section 106.3, it is the policy of the State of California that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking and sanitary purposes.

54. Pursuant to Water Code section 13263(g), discharges of waste into waters of the state are privileges, not rights. Nothing in this order creates a vested right to continue the discharge. Water Code section 13263 authorizes the Central Coast Water Board to issue waste discharge requirements that implement any relevant water quality control plan.

55. Section 13267(b) of the Water Code states, in part:

> *In conducting an investigation specified in subdivision (a), the regional board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging or who proposes to discharge within its region, or any citizen or domiciliary, or political agency or entity of this state who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste outside of its region shall furnish under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs of these reports shall bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports.*

Section 13267(d) of the Water Code states, in part:

> *[A] regional board may require any person, including a person subject to waste discharge requirements under section 13263, who is discharging, or who proposes to discharge, wastes or fluid into an injection well, to furnish the state board or regional board with a complete report on the condition and operation of the facility or injection well, or any other information that may be reasonably required to determine whether the injection well could affect the quality of the waters of the state.*

56. The need for the technical and monitoring reports required by this order, including the Monitoring and Reporting Program, is based on the Report of Waste Discharge (ROWD), the DDW's recommended conditions, the California Environmental Quality Act (CEQA) environmental impact report, the Title 22 Engineering Report, and other information in the Central Coast Water Board's files for the facility. The technical and

monitoring reports are necessary to ensure compliance with these waste discharge requirements and water recycling requirements. The burden, including costs, of providing the technical reports required by this Order bears a reasonable relationship to the need for the reports and the benefits to be obtained from the reports.

57. This order includes limits on quantities and concentrations of chemical, physical, biological, and other pollutants in the advanced treated recycled water that is injected into groundwater.

58. This order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code, §§ 2050 to 2097) or the federal Endangered Species Act (16 U.S.C.A. §§ 1531 to 1544). This Order requires compliance with requirements to protect the beneficial uses of waters of the state. The Discharger is responsible for meeting all applicable requirements of the endangered species acts.

IX. CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) AND NOTIFICATION

59. An environmental impact report (EIR) was prepared for the proposed Pure Water Monterey Groundwater Replenishment Project with MRWPCA serving as the lead agency. (State Clearinghouse # 2013051094)

    a. Notices regarding the April 2015 draft EIR were emailed to 700 agencies, interested organizations, and individuals; placed as newspaper advertisements; distributed to state agencies through the State Clearinghouse; placed in public locations such as libraries, MRWPCA's and Monterey Peninsula Water Management District's (MPWMD's) websites and offices and key project sites; and posted with the Monterey County Clerk.

    b. Public meetings to provide information on the Project and CEQA process were held on May 20 and 21, 2015.

    c. The public was provided a 45-day comment period for the draft EIR.

    d. Notices about the availability of the final EIR were distributed in September 2015 to all entities that received the draft EIR, commented on the Draft EIR, or requested a copy or copies.

    e. The MRWPCA adopted Resolution No. 2015-24 on October 8, 2015, after a public hearing, which certified the final EIR, adopted the CEQA findings, approved mitigation measures and a mitigation monitoring and reporting program, adopted a statement of overriding considerations, and approved the project as modified. This Order, at General Requirement IV.10, requires that the Discharger comply with the mitigation measures and mitigation monitoring program identified in the final EIR.

    f. The final EIR contains oral and written comments received on the draft EIR and presents responses to environmental issues raised in the comments. In addition to the responses to comments, the final EIR contains revisions, updates, and clarifications in response to public comment on the draft EIR.

g. A notice of determination (NOD) was filed with the State Clearinghouse and the Monterey County Clerk's office on October 8, 2015. The Project has completed the notification and review process required by CEQA. The Central Coast Water Board is a responsible agency for purposes of CEQA. The Central Coast Water Board, as a responsible agency under CEQA, has considered the EIR and associated documents and concurs with MRWPCA's approval of the relevant CEQA documents. The Central Coast Water Board finds that all environmental effects have been identified for project activities that it is required to approve and that the Project will not have significant adverse impacts on the environment provided that the mitigation presented in the EIR for components of the Project being approved by this Order and the required Operation Optimization Plan are carried out as conditioned in this Order (see General Requirement IV.10 in this Order). In adopting this Order, the Central Coast Water Board has eliminated or substantially lessened the less-than-significant effects on water quality, and therefore approves the project.

60. Any person aggrieved by this action may petition the State Water Resources Control Board (State Water Board) to review the action in accordance with Water Code section 13320 and California Code of Regulations, Title 23, section 2050 and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the internet at:

    http://www.waterboards.ca.gov/public_notices/petitions/water_quality/

61. The Central Coast Water Board has notified the MRWPCA and interested agencies and persons of its intent to issue this Order for the production and use of recycled water and has provided them with an opportunity to submit written comments. The Central Coast Water Board, in a public meeting, heard and considered all comments pertaining to these WDRs/WRRs.

THEREFORE, IT IS HEREBY ORDERED that Order No. R3-2017-0003, with MRP No. R3-2017-0003, is effective as of the date of this order, and, in order to meet the provisions contained in division 7 of the Water Code (commencing with section 13000) and regulations and guidelines adopted thereunder, and California Code of Regulations Title 22, division 4, chapter 3, the MRWPCA shall comply with the requirements in this Order.

I. INFLUENT SPECIFICATIONS

The influent to the MRWPCA Advanced Water Treatment Facility shall consist of secondary treated wastewater discharged from the RTP. The wastewater coming into the RTP will be augmented with agricultural wash water from the City of Salinas, storm water flows from the southern part of Salinas, and surface and agricultural tile drain waters from the Reclamation Ditch and Blanco Drain as described in the approved 2016 Title 22 Engineering Report.

II. RECYCLED WATER TREATMENT SPECIFICATION

Treatment of the recycled water is as described in the findings of this Order and the recommended conditions issued by DDW.

III. RECYCLED WATER DISCHARGE LIMITS

1. The advanced treated recycled water injected into any well at the injection facility shall not contain pollutants in excess of the following limits:

Table 4 – Recycled Water Reinjection Discharge Limits

Constituents	Units	Concentration	Monitoring Frequency	Compliance Interval
***Arsenic**	mg/L	0.01	Monthly	Running Annual Average
***Boron**	µg/L	750	Monthly	Running Annual Average
***Chloride**	mg/L	250	Monthly	Running Annual Average
***Nitrate as N**	mg/L	10	Weekly	Sample Result: no averaging
****Nitrogen - Total**	mg/L	10	Twice per Week	Average of Last 4 Results
***Sodium**	mg/L	69	Monthly	Running Annual Average
***Sulfate**	mg/L	250	Monthly	Running Annual Average
***TDS**	mg/L	500	Monthly	Running Annual Average
****Total Organic Carbon (TOC)**	mg/L	0.5	Weekly	20-week running average and average of last 4 results
****Total Coliform**	MPN/ 100mL	<2.2	Daily	7-day Median

**Limits equal to Water Quality Objectives, except **TOC, Total Nitrogen, and Total Coliform, which are Title 22 limits*

IV. GENERAL REQUIREMENTS

1. Recycled water shall not be used for direct human consumption or for the processing of food or drink intended for human consumption.

2. Bypass, discharge, or delivery to the use area of inadequately treated recycled water, at any time, are prohibited.

3. The AWPF and all injection wells shall be adequately protected from inundation and damage by storm flows.

4. Recycled water use or disposal shall not result in earth movement in

geologically unstable areas.

5. Odors of sewage origin shall not be perceivable at any time outside the boundary of the Facility.

6. The MRWPCA shall at all times properly operate and maintain all treatment facilities and control systems (and related appurtenances) that are installed or used by the MRWPCA to achieve compliance with the conditions of this order. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls (including appropriate quality assurance procedures).

7. A copy of these requirements shall be maintained at the Facility and available at all times to operating personnel.

8. For any material change or proposed change in character, location, or volume of recycled water or its uses, the MRWPCA shall submit at least 120 days prior to the proposed change an engineering report or addendum to the existing engineering report to the Central Coast Water Board and DDW (pursuant to Water Code Division 7, Chapter 7, Article 4, section 13522.5 and CCR Title 22, Division 4, Chapter 3, Article 7, section 60323) for approval. The engineering report shall be prepared by a qualified engineer registered in California.

9. MRWPCA shall revise the Title 22 Engineering Report to reflect operational choices made and to correct no longer applicable and incorrect information discovered during the permitting process. MRWPCA shall have the revised report approved by DDW and the Water Board prior to commencing groundwater injection discharges to the Seaside Basin.

10. MRWPCA shall comply with the mitigation measures and mitigation monitoring and reporting program described in the final EIR for this project, as described in the findings of this Order. Mitigation measures of concern to and within the jurisdiction of the Central Coast Water Board include BT-1a, BF-1a, BF-1b, BF-1c, BF-2a, alternate BF-2a, and HS-4.

V. PROVISIONS

1. Injection of the advanced treated recycled water shall not cause or contribute to an exceedance of water quality objectives in Seaside Basin groundwater.

2. The MRWPCA shall submit to the Central Coast Water Board, under penalty of perjury and signed by a designated responsible party, self-monitoring reports according to the specifications contained in the MRP, as directed by the Executive Officer.

3. The MRWPCA shall notify the Central Coast Water Board, DDW and all water purveyors drawing potable water from the Seaside Basin (immediately following notification to the Water Board and DDW) by telephone or electronic means as soon as MRWPCA becomes aware, but no later than 24 hours after obtaining knowledge of any violations of this order, or any adverse conditions as a result of the use of recycled water from this facility; written confirmation shall

follow to the Central Coast Water Board and DDW within five working days from date of notification. The report shall include, but not be limited to, the following information, as appropriate:

a. The nature and extent of the violation;

b. The date and time when the violation started, when compliance was achieved, and when injection was suspended and restored, as applicable;

c. The duration of the violation;

d. The cause(s) of the violation;

e. Any corrective and/or remedial actions that have been taken and/or will be taken with a time schedule for implementation to prevent future violations; and,

f. Any impact of the violation.

4. This Order does not exempt the MRWPCA from compliance with any other laws, regulations, or ordinances which may be applicable, it does not legalize the recycling and use facilities, and it leaves unaffected any further constraint on the use of recycled water at certain sites that may be contained in other statutes or required by other agencies.

5. This Order does not alleviate the responsibility of the MRWPCA to obtain other necessary local, state, and federal permits to construct facilities necessary for compliance with this Order, nor does this Order prevent imposition of additional standards, requirements, or conditions by any other regulatory agency.

6. This Order may be modified, revoked and reissued, or terminated for cause, including but not limited to, failure to comply with any condition in this Order; endangerment of human health or environment resulting from the permitted activities in this Order; obtaining this Order by misrepresentation or failure to disclose all relevant facts; or acquisition of new information that could have justified the application of different conditions if known at the time of Order adoption. The filing of a request by the MRWPCA for modification, revocation and reissuance, or termination of the Order or a notification of planned changes or anticipated noncompliance does not stay any condition of this Order.

7. The MRWPCA shall furnish, within a reasonable time, any information the Central Coast Water Board or DDW may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Order. The MRWPCA shall also furnish the Central Coast Water Board, upon request, with copies of records required to be kept under this Order for at least three years.

8. In an enforcement action, it shall not be a defense for the MRWPCA that it would have been necessary to halt or to reduce the permitted activity in order to maintain compliance with this Order. Upon reduction, loss, or failure of the treatment facility, the MRWPCA shall, to the extent necessary to maintain

compliance with this Order, control production of all discharges until the facility is restored or an alternative method of treatment is provided. This provision applies, for example, when the primary source of power of the treatment facility fails, is reduced, or is lost.

9. This Order includes the attached *Standard Provisions and Reporting Requirements for Waste Discharge Requirements*. If there is any conflict between the provisions stated in this Order and the Standard Provisions, the provisions stated in this Order shall prevail.

10. This Order includes the attached MRP No. R3-2017-0003. If there is any conflict between provisions stated in the MRP and the Standard Provisions, those provisions stated in the MRP prevail. The MRP may be modified by the Central Coast Water Board's Executive Officer; however, any such modified requirements must still achieve the MRP's primary purpose, which is to detect violations, confirm effective treatment, and to ensure that neither excessive degradation in the aquifer nor adverse impacts to beneficial uses occurs. Excessive degradation is defined as the discharge consuming 10 percent or more of available assimilative capacity.

11. The DDW conditions that are not explicitly included in this Order are incorporated herein by this reference, and are enforceable requirements of this Order. Any violation of a term in this Order that is identical to a DDW condition will constitute a single violation.

VI. STATE WATER RESOURCES CONTROL BOARD DIVISION OF DRINKING WATER (DDW) REQUIREMENTS

1. The Pure Water Monterey Groundwater Replenishment Project (Project) shall comply with Article 5.2 - Indirect Potable Reuse: Groundwater Replenishment-Subsurface Application, sections 60320.200 through 60320.228 of Title 22, California Code of Regulations.
2. The Project's advanced water treatment facility (AWPF) shall conduct startup and commissioning testing that meets the requirement in Title 22 section 60320.201. Advanced Treatment Criteria. A test protocol must be submitted to DDW for approval prior to commencement of testing.
3. The Project AWPF shall be operated to meet the requirements in section 60320.222. Operation Optimization and Plan.
4. As required by Title 22 section 60320.222. (Operation Optimization Plan), prior to operation, MRWPCA shall submit an Operation Optimization Plan for review and approval to DDW and the Central Coast Water Board. At a minimum, the Operation Optimization Plan shall identify and describe the operations, maintenance, analytical methods, monitoring (grab and online) necessary for the Project to meet the requirements and the reporting of monitoring results. MRWPCA must submit a draft of the Operation Optimization Plan prior to the construction and commissioning. The draft Operation Optimization Plan can be amended and finalized after the completion of full-scale commissioning and startup testing. A final Operation Optimization Plan must be submitted to DDW 90 days after completion of startup operations.

5. AWPF commissioning shall validate and confirm the actual setpoints for hydrogen peroxide and UV parameters, demonstrating that the advanced oxidation process (AOP) will provide no less than 0.5-log (69 percent) reduction of 1,4-dioxane.
6. MRWPCA shall follow what is described in the approved Operation Optimization Plan.
7. The Project's Operation Optimization Plan shall, at all times, be representative of the current operations, maintenance, and monitoring.
8. The Project's AWPF shall provide continuous real-time monitoring and reporting of UV dose, UV Transmittance, and power used in the AOP.
9. The Project must have alarms as stated in the approved Title 22 Engineering Report. Commissioning shall validate and confirm the actual setpoints and they shall be specified in the Operation Optimization Plan.
10. For reporting, MRWPCA shall submit to DDW a summary of monthly operational parameters for UV dose and hydrogen peroxide for the AWPF.
11. MRWPCA shall verify that the recycled municipal wastewater used for the Project meets the requirements in Title 22 section 60320.206. Wastewater Source Control.
12. Pursuant to Title 22 section 60320.208 (a) Pathogenic Microorganism Control (a), MRWPCA shall operate the Project such that the recycled municipal wastewater used as recharge water receives treatment that achieves at least 12-log enteric virus reduction, 10-log Giardia cyst reduction, and 10-log Cryptosporidium oocyst reduction.
13. If a pathogen reduction in Title 22 section 60320.208 (a) is not met based on the on-going monitoring required pursuant to subsection (c), within 24 hours of being aware, MRWPCA shall immediately investigate the cause and initiate corrective actions. MRWPCA shall immediately notify the DDW and the Central Coast Water Board if the Project fails to meet the pathogen reduction criteria longer than 4 consecutive hours, or more than a total of 8 hours during any 7-day period. Failures of shorter duration shall be reported to the Central Coast Water Board by MRWPCA no later than 10 days after the month in which the failure occurred.
14. Per the approved Title 22 Engineering Report, the initial maximum Recycled Water Contribution (RWC) shall be 1.0, meaning that the Project is approved to use 100% recycled water for recharging the aquifer at the beginning. As long as the Project can demonstrate that it can reliably meet Total Organic Carbon (TOC) requirements, they will be allowed to maintain the RWC of 1.0.
15. The Project contains a multi-barrier treatment facility in order to comply with the Groundwater Replenishment Regulations. The following monitoring (grab and online) and reporting requirements will need to be included in the Operation Optimization Plan and reported to DDW and the Central Coast Water Board monthly.
    a. Membrane integrity testing (MIT) shall be performed on each of the MF membrane units, a minimum of once every 24 hours of operation.

i. The log removal value (LRV) for Cryptosporidium shall be calculated and the value reported after the completion of each MIT.

ii. The MIT shall have a resolution that is responsive to an integrity breach on the order of 3 µm or less.

iii. Calculations of the LRV shall be based on a pressure decay rate (PDR) value with an ending pressure that provides a resolution of 3 µm or less.

iv. The MIT shall have a sensitivity to verify a LRV equal to or greater than 4.0.

b. The Reverse Osmosis (RO) system shall be credited pathogen reduction at this facility in accordance with the amount demonstrated via online monitoring to ensure the integrity of the RO system. MRWPCA must monitor the effluent of each RO train (including each stage) continuously for conductivity at the AWPF. The daily average and maximum conductivity reading, and the percent of time that the reduction of conductivity is less than 1.0 log removal must be reported. The MRWPCA shall calculate the minimum removal achieved at the AWPF. An alternative surrogate may be utilized if approved by the Division of Drinking Water and the Central Coast Water Board.

c. The RO effluent will be monitored for TOC via grab sample weekly and reported in the monthly report. The RO influent and effluent will be monitored for TOC online and reported in the monthly report. The daily average and maximum TOC reading and the percent of time that the TOC is greater than 0.5 mg/L must be reported.

d. In accordance with the Recycled Water Policy, NDMA and sucralose are performance surrogates for RO and shall be analyzed quarterly both prior to the RO and after RO prior to the AOP.

e. The UV/peroxide system shall be operated, as has been designed, to meet the Groundwater Replenishment Regulations, providing a minimum 0.5-log reduction of 1,4- dioxane. AOP commissioning will validate and confirm the actual setpoints for peroxide and UV parameters

f. The UV system must be operated with online monitoring and built-in automatic reliability features that must trigger automatic diversion of effluent to waste by the following critical alarm setpoints.

i. UV dose less than 900 mJ/cm^2, or a new setpoint approved by DDW after the AOP commissioning.

ii. UV transmittance less than 95%

iii. Complete UV reactor failure

iv. Peroxide residual less than 3.0 mg/L, or a new setpoint approved by DDW after the AOP commissioning.

g. On-line monitoring of UV dose, UV intensity, flow, and UV transmittance must be provided at all times. Flow meters, UV intensity sensors, and UV transmittance monitors must be properly calibrated.

h. At least monthly, all duty UV intensity sensors must be checked for calibration against a reference UV intensity sensor.

i. The UV transmittance meter must be inspected and checked against a reference bench-top unit weekly to document accuracy.

j. The monitoring and reliability features, including automatic shutdown capability, shall be demonstrated to DDW during a plant inspection prior to final approval.

k. Based on the calculation of log reduction achieved daily by the entire treatment facility, from the WWTP to the public water supply wells, the MRWPCA will report a "Yes" or "No" for each day as to whether the necessary log reductions (12-logs virus, 10-logs for Giardia and Cryptosporidium) have been achieved. An overall log reduction calculation will be provided only for those days when a portion of the treatment facility does not achieve the necessary log reductions.

16. MRWPCA shall submit the required annual and five-year reports per Title 22, section §60320.228 (Reporting).

17. MRWPCA must submit for approval a draft AOP commissioning and testing protocol, to demonstrate the AOP will provide no less than 0.5-log (69 percent) reduction of 1,4-dioxane.

18. MRWPCA must submit a draft of the Operation Optimization Plan prior to the construction and commissioning. This draft Operation Optimization Plan can be amended and finalized after the completion of full-scale commissioning and startup testing. A final Operation Optimization Plan must be submitted to DDW 90 days after completion of startup operations.

19. MRWPCA must submit an addendum to the Title 22 Engineering Report to include information on final well configurations and locations (injection wells, vadose zone wells, and monitoring wells). MRWPCA must conduct a Water Board-approved tracer test, and submit a completed tracer study report to DDW and the Central Coast Water Board.

VII. REOPENER

1. This Order may be reopened to include the most scientifically relevant and appropriate limitations for this discharge, including a revised Basin Plan limit based on monitoring results, anti-degradation studies, or other Central Coast Water Board or State Water Board policy, or the application of an attenuation factor based upon an approved site-specific attenuation study.

2. This Order may be reopened to modify limitations for pollutants to protect beneficial uses, based on new information not available at the time this Order was adopted, including additional monitoring, reporting and trend analysis documenting aquifer conditions.

3. After additional monitoring, reporting, and trend analysis documenting aquifer conditions, this Order may be reopened to ensure the groundwater is protected in a manner consistent with state and federal water quality laws, policies and regulations.

4. This Order may be reopened to incorporate any new regulatory requirements for sources of drinking water or injection of recycled water for groundwater recharge to aquifers that are used as a source of drinking water, that are adopted after the effective date of this Order.

5. This Order may be reopened upon a determination by DDW that treatment and disinfection of the Monterey Regional Water Pollution Control Agency advanced treated product water is not sufficient to protect human health.

VIII. ENFORCEMENT

The requirements of this Order are subject to enforcement under Water Code sections 13261, 13265, 13268, 13350, and enforcement provisions in Water Code, Division 7, Chapter 7 (Water Reclamation).

IX. EFFECTIVE DATE OF THE ORDER

This Order takes effect on March 9, 2017.

I, John M. Robertson, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an order adopted by the Regional Water Quality Control Board, Central Coast Region on March 9, 2017.

John M. Robertson
Executive Officer

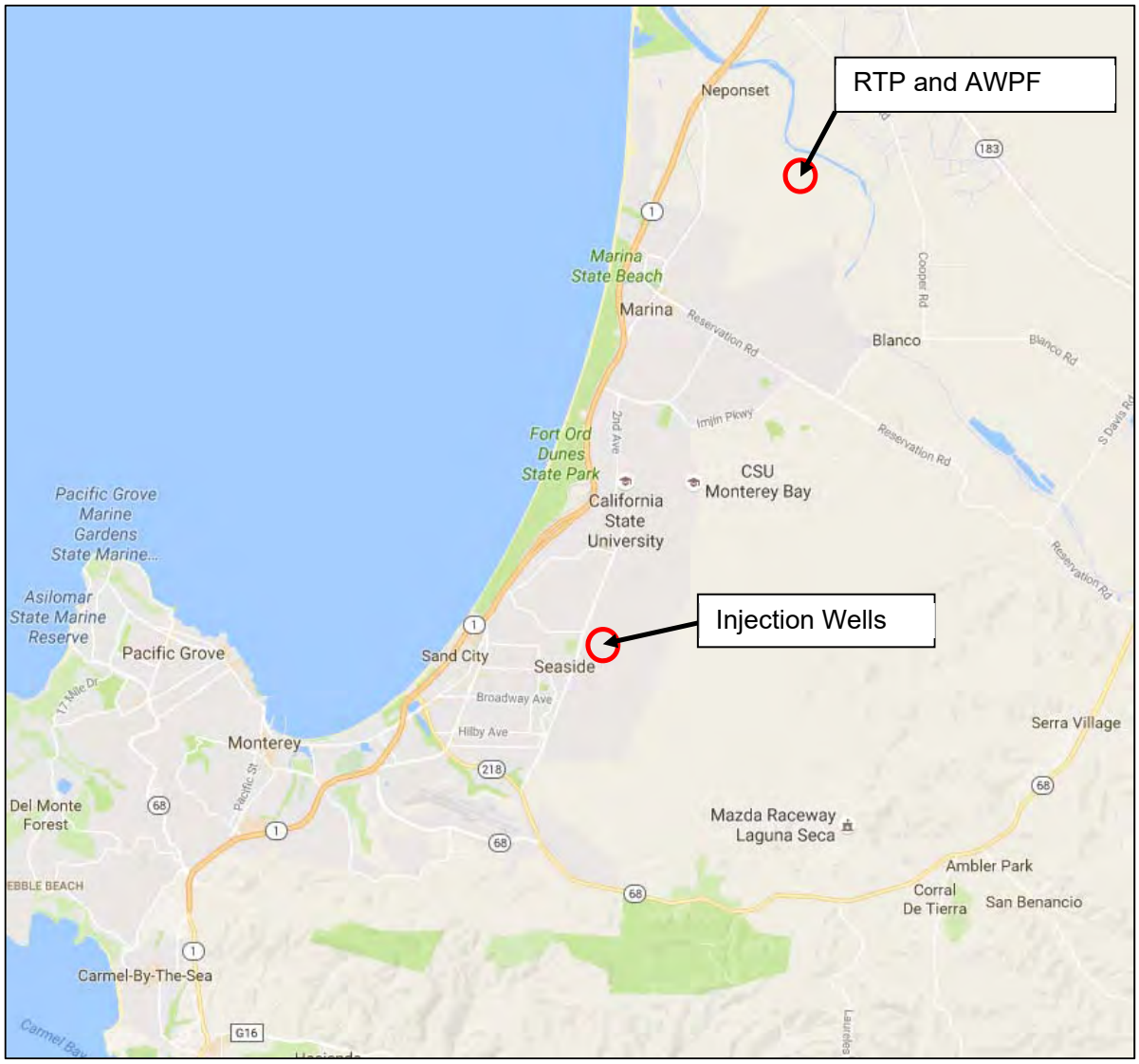


Figure 1 - Location of MRWPCA's RTP, AWPF and Injection Wells

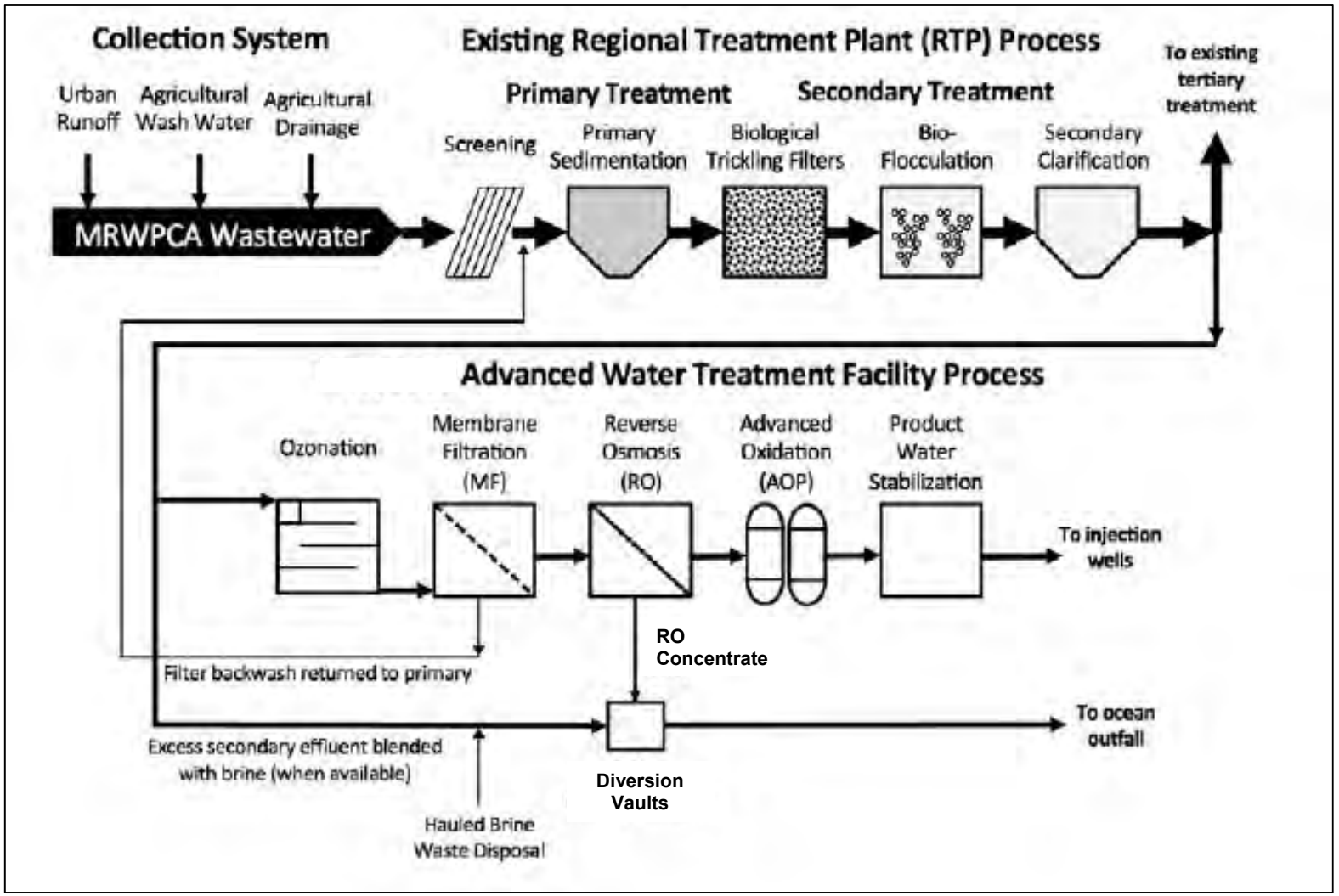


Figure 2 – Simplified Process Flow Diagram of MRWPCA RTP and AWPF

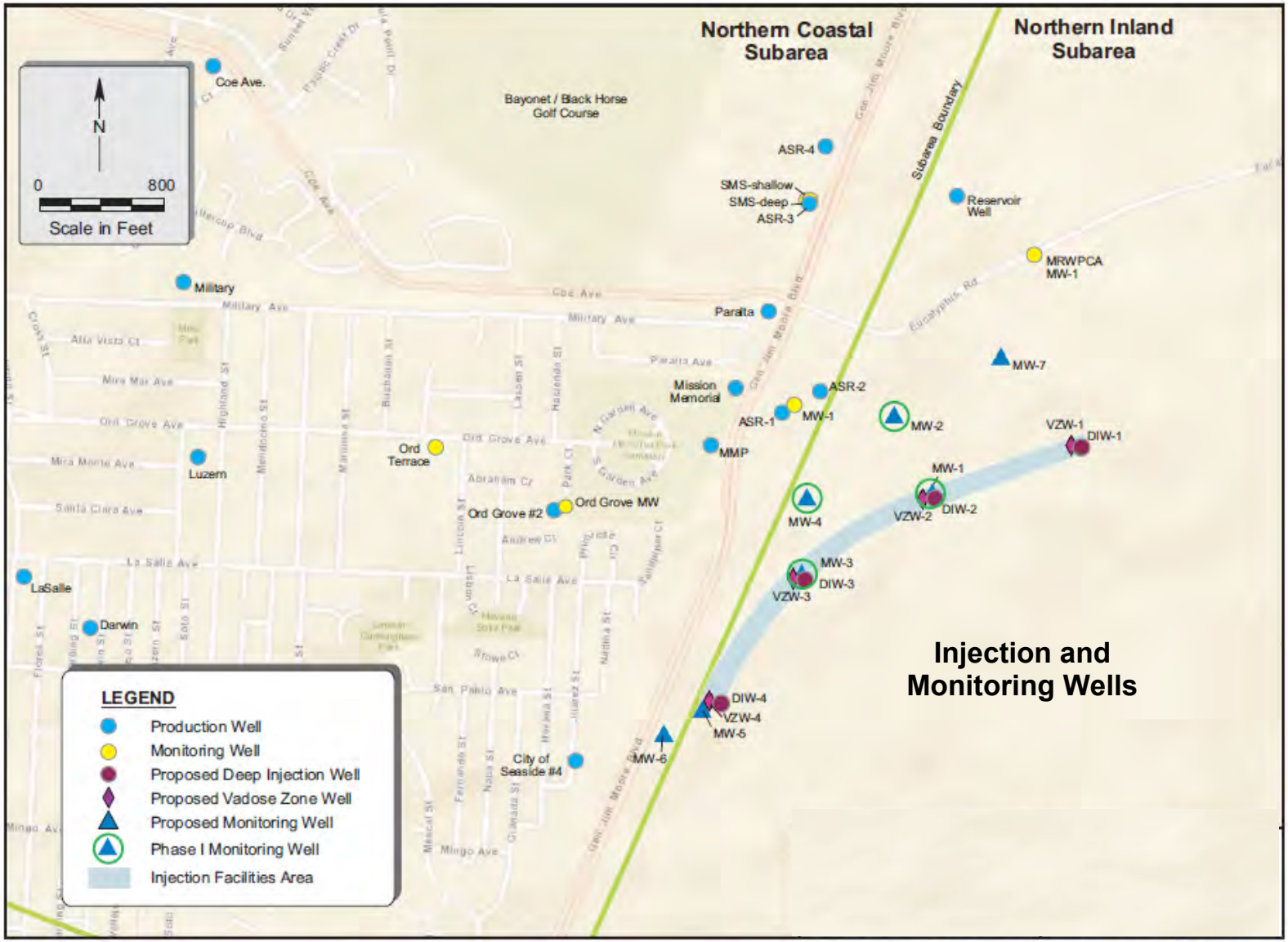


Figure 3- Proposed Injection Wells, Monitoring Wells and Production Wells

STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION
DRAFT MONITORING AND REPORTING PROGRAM
NO. R3-2017-0003

FOR THE

PURE WATER MONTEREY
ADVANCED WATER PURIFICATION FACILITY
AND
GROUNDWATER REPLENISHMENT PROJECT

ISSUED TO

MONTEREY REGIONAL WATER POLLUTION CONTROL AGENCY

Table of Contents

The Monterey Regional Water Pollution Control Agency (MRWPCA) shall implement this Monitoring and Reporting Program (MRP) on the effective date of Order No. R3-2017-0003.

I. SUBMITTAL OF REPORTS

1. The MRWPCA shall submit the required reports outlined in the following paragraphs in the appropriate electronic format to the State Water Resources Control Board (State Water Board)'s California Integrated Water Quality System (CIWQS[1]) program for all monitoring data. Groundwater monitoring data shall also be submitted to the Geotracker database (in Electronic Data Format[2]) and to the Division of Drinking Water (DDW), Drinking Water Field Operations, by the dates indicated.

AWPFAWPF

b. Monthly Reports:

Consistent with section III.REPORTING REQUIREMENTS, monthly reports for monitoring and reporting requirements included in the Operations Optimization Plan shall be received by the 15th day after the end of the month in which monitoring occurred.

c. Quarterly Monitoring:

Quarterly Monitoring Reports shall be received by the 15th day of the second month following the end of each quarterly monitoring period according to Table M-1.

Table M-1: Quarterly Report Periods and Due Dates

Reporting Period	Report Due
January – March	May 15
April – June	August 15
July – September	November 15
October – December	February 15

[1] For help with CIWQS go to: http://www.waterboards.ca.gov/water_issues/programs/ciwqs/chc_npdes.shtml
[2] For help with EDF go to: http://www.waterboards.ca.gov/ust/electronic_submittal/

The contents of the CIWQS and Geotracker Quarterly Monitoring Reports shall include a one-page summary of operational concerns that addresses changes in reporting conditions, including influent, recycled water, and groundwater monitoring results, since the last report.

d. Annual Summary:

The Annual Summary Report shall be received by April 15th of each year. This Annual Summary Report shall contain a discussion of the previous calendar year's analytical results, as well as graphical and tabular summaries of the monitoring analytical data.

Public water systems and owners of small water systems and other active production wells having downgradient sources potentially affected by the MRWPCA groundwater injection project or within 10 years groundwater travel time from the MRWPCA groundwater injection project shall be notified by direct mail and/or electronic mail of the availability of the annual report.

e. Operations Optimization Plan:
Prior to startup of the AWPF, the MRWPCA shall submit an Operations Optimization Plan (OOP) to DDW and the Central Coast Water Board for approval. After six months of operation of the Plant, the OOP shall be updated as necessary and submitted to the Central Coast Water Board and the DDW for review and approval.

i. The OOP covers critical operational parameters to include routine testing procedures for the ozone pre-treatment, microfiltration (MF), reverse osmosis (RO), and ultraviolet (UV)/advanced oxidation process (AOP) systems, optimization of the UV dose for disinfection and AOP for reduction of light-sensitive contaminants, and all treatment processes, maintenance and calibration schedules for all monitoring equipment, process alarm set points, and response procedures for all alarms in each treatment process of the AWPF, including responses if water quality requirements are not met, start-up, emergency response and contingency plans. During the first year of operation of the AWPF, all treatment processes shall be operated in a manner to provide optimal reduction of microbial, regulated and nonregulated contaminants. Based on this experience and anytime operational changes are made, the OOP shall be updated.

ii. The OOP includes staffing levels with applicable certification levels for Facility operations personnel. Significant changes in the operation of any of the treatment processes shall be reported to the DDW and Central Coast Water Board. Significant changes in the approved OOP must be approved by the DDW and the Central Coast Water Board prior to instituting changes. The MRWPCA is responsible for ensuring that the OOP is, at all times, representative of the current operations, maintenance, and monitoring of the AWPF.

f. Well Installation Reports: No later than two weeks of the completion of a new injection or monitoring well, MRWPCA shall submit a well completion report to both the Central Coast Water Board and DDW detailing the following:

i. well location;
ii. well purpose (injection or monitoring);
iii. well designation (MW-1 etc.);
iv. well depth;
v. screened intervals;
vi. depth to groundwater (below ground surface)

2. Five-Year Engineering Report: MRWPCA shall update the 2016 Title 22 Engineering Report and submit the updated report to the State Water Board's CIWQS and Geotracker databases and to DDW five years from the date of the initial approval of the engineering report, and every five years thereafter.

3. All reports to the State Water Board's Geotracker shall reference Order No. R3-2017-0003. Compliance monitoring reports shall be submitted separately from other technical reports.

4. All reports shall be submitted as a portable data format file and uploaded electronically to the State Water Board's CIWQS and Geotracker databases and provided via email to the DDW (if the file exceeds 10 MB, either a CD containing the file shall be mailed to DDW, or a link for downloading an electronic copy of the file shall be provided). Upon request the data shall be provided in excel format

5. By the reporting due dates specified in Table M-1, groundwater data shall be uploaded electronically to the State Water Board's Geotracker in an electronic deliverable format specified by the State Water Board. All data shall be uploaded electronically to the CIWQS database. Upon request the data shall be provided in excel format.

II. MONITORING REQUIREMENTS

1. MRWPCA shall monitor the flow and quality of the following according to the manner and frequency specified in this MRP:

    a. Influent to the AWPF;

    b. Recycled water from AWPF after all treatment and chemical injection and before injection into the Seaside Basin;

    c. If potable water is used, blend of recycled water and diluent water;

    d. Receiving groundwater (monitoring wells associated with each injection well will be installed prior to recharge from associated injection wells); and,

2. Monitoring reports shall include, but not limited to, the following:

    a. Analytical results;

    b. Location of each sampling station where representative samples are obtained, including a map, at a scale of 1 inch equals 1,200 feet or less, that clearly identifies the locations of all injection wells, monitoring wells, and production wells;

    c. Analytical test methods used and the corresponding minimum reporting levels (MRLs);

    d. Name(s) of the laboratory, which conducted the analyses;

    e. Copy of laboratory certifications by the DDW's Environmental Laboratory Accreditation Program (ELAP);

f. Quality assurance and control information, including documentation of chain of custody; and,

g. Maximum contaminant level (MCL), notification level, response level, DDW Condition or Recycled Water Discharge Limit.

3. Though not required to be submitted in the monitoring reports unless specifically requested by the Central Coast Water Board Executive Officer or the DDW, the MRWPCA shall have in place written sampling protocols. For groundwater monitoring, the sampling protocols shall outline the methods and procedures used for measuring water levels; purging wells; collecting samples; decontaminating equipment; containing, preserving, and shipping samples, and maintaining appropriate documentation. Also, the sampling protocols shall include the procedures for handling, storing, testing, and disposing of purge and decontamination waters generated from the sampling events.

4. Where multiple EPA-approved methods are available, drinking water (500 series) or wastewater (600 series) may be used as appropriate.

5. The samples shall be analyzed using analytical methods described in 40 Code of Federal Regulations (CFR) Part 141, or where no methods are specified for a given pollutant, by methods approved by the DDW, Central Coast Water Board and/or State Water Board. The MRWPCA shall select the analytical methods that provide Minimum Reporting Levels (MRLs) lower than the limits prescribed in this Order or as low as possible that will provide reliable data.

6. The MRWPCA shall instruct its laboratories to establish calibration standards so that the MRLs (or its equivalent if there is a different treatment of samples relative to calibration standards) are the lowest calibration standard. At no time shall analytical data derived from extrapolation beyond the lowest point of the calibration curve be used.

7. Upon request by the MRWPCA, the Central Coast Water Board, in consultation with the DDW and the State Water Board Quality Assurance Program, may establish MRLs, in any of the following situations:

   a. When the pollutant has no established method under 40 CFR 141;

   b. When the method under 40 CFR 141 for the pollutant has an MRL higher than the limit specified in this Order; or,

   c. When the MRWPCA agrees to use a test method that is more sensitive than those specified in 40 CFR Part 141.

8. For regulated constituents, the laboratory conducting the analyses shall be certified by ELAP or approved by the DDW, Central Coast Water Board, or State Water Board, for a particular pollutant or parameter.

9. Samples shall be analyzed within allowable holding time limits as specified in 40 CFR Part 141. All Quality Assurance/Quality Control (QA/QC) analyses shall be run on the same dates that samples are actually analyzed. The MRWPCA shall retain the QA/QC documentation in its files for three years and make available for inspection and/or submit them when requested by the Central Coast Water

Board or the DDW. Proper chain of custody procedures shall be followed, and a copy of this documentation shall be submitted with the quarterly report.

10. For all bacterial analyses, sample dilutions shall be performed so the range of values extends from 1 to 800. The detection methods used for each analysis shall be reported with the results of the analyses.

11. Quarterly monitoring for recycled water and groundwater shall be performed during the months of February, May, August, and November. Semiannual monitoring for recycled water shall be performed during the months of February and August. Semiannual monitoring for groundwater shall be performed during the months of May and November. Should there be instances when monitoring cannot be done during these specified months, the MRWPCA shall conduct the monitoring as soon as it can and state in the monitoring report the reason monitoring could not be conducted during the specified month. Results of quarterly analyses shall be reported in the quarterly monitoring report following the analysis.

12. For unregulated chemical analyses, the MRWPCA shall select methods according to the following approach:

    a. Use the drinking water methods or waste water method sufficient to evaluate all water quality objectives and protect all beneficial uses;

    b. Use DDW-recommended methods for unregulated chemicals, if available;

    c. If there is no DDW-recommended drinking water method for a chemical, and more than a single United States Environmental Protection Agency (USEPA)- approved method is available, use the most sensitive of the USEPA-approved methods;

    d. If there is no USEPA-approved method for a chemical, and more than one method is available from the scientific literature and commercial laboratory, after consultation with DDW, use the most sensitive method;

    e. If no approved method is available for a specific chemical, the Project Sponsors' laboratory may develop or use its own methods and should provide the analytical methods to DDW for review. Those methods may be used until DDW-recommended or USEPA-approved methods are available.

    f. For constituents of emerging concern (CECs) subject to the State Water Board Recycled Water Policy as amended January 22, 2013, analytical methods for laboratory analysis of CECs shall be selected to achieve the reporting limits (RLs) presented in Table 1 of Attachment A of the Recycled Water Policy. The analytical methods shall be based on methods published by the USEPA, methods certified by the DDW, or peer review reviewed and published methods that have been reviewed by DDW, including those published by voluntary consensus standards bodies such as the Standards Methods Committee and the American Society for Testing and Materials International. Any modifications to the published or certified methods shall be reviewed by DDW and subsequently submitted to the Central Coast Water Board Executive Officer in an updated quality assurance project plan.

III. REPORTING REQUIREMENTS

1. **Monthly Reports**: The following monitoring and reporting requirements must be included in the OOP and reported to the DDW and the Central Coast Water Board monthly.

    a. Membrane Filtration Effluent Monitoring - The MRWPCA will monitor the Membrane Filtration Effluent for turbidity continuously. The turbidity shall not exceed 0.2 nepholometric turbidity units (NTU) more than 5 percent of the time within a 24-hour period and 0.5 NTU at any time. Turbidity measurements shall be recorded every 15 minutes. The daily average, and daily maximum, and whether the 0.2 NTU was exceeded more than 5 percent of the time in any 24-Hour period shall be reported monthly.

    b. The membrane filtration (MF) integrity - Daily pressure decay tests (PDTs) shall be performed on each MF membrane unit a minimum of once every 24 hours of operation based on the criteria described in the Order. Submit the results of the daily Membrane Integrity Testing (MIT) conducted during the month..

        - The PDT will be conducted to confirm no broken fibers or other breach of membrane integrity, based on product-specific minimum test pressure and maximum allowable pressure decay.

    c. The Reverse Osmosis (RO) system will be credited for virus, Giardia cysts and Cryptosporidium oocysts based upon reduction demonstrated via an approved surrogate, such as conductivity. MRWPCA shall monitor conductivity continuously in both the RO feed and RO permeate of each RO train, in order to demonstrate membrane integrity and a conductivity. The daily average and maximum conductivity reading and percent of time that the reduction of conductivity is less than 1.0 log removal must be reported. The report shall include calculation of minimum removal achieved at the AWPF. An alternative surrogate may be utilized (e.g., TOC) if approved by the Division of Drinking Water and the Central Coast Water Board. The proposal to change surrogates may also include different monitoring locations (e.g., combined RO permeate instead of train RO permeate), if approved by DDW and the Central Coast Water Board.

    d. On-line continuous monitoring of UV dose, UV intensity, flow, UV transmittance (UVT), and power must be provided at all times. Flow meters UV intensity sensors, and UVT monitors must be properly calibrated to ensure proper disinfection. At least monthly, all duty UV intensity sensors must be checked for calibration against a reference UV intensity sensor. The UVT meter must be inspected and checked against a reference bench-top unit weekly to document accuracy.

        i. For AOP (UV and hydrogen peroxide at the AWPF), MRWPCA shall report the calculated daily hydrogen peroxide dose (based on the pump speed and bulk feed concentration)
        ii. For UV, MRWPCA shall report the UVT (daily minimum, maximum, and average), UV dose for each reactor (daily minimum, maximum, and average), and the total flow (daily minimum, maximum, and average).

    e. Based on the calculation of log reduction achieved daily by the entire

treatment facility, from the AWPF to the public water supply wells, the MRWPCA will report a "Yes" or "No" for each day as to whether the necessary log reductions (12-logs virus, 10-logs for Giardia and Cryptosporidium) have been achieved. An overall log reduction calculation will be provided only for those days when a portion of the treatment facility does not achieve the credits listed in Table 5-4 of the ER.

f. MRWPCA shall sample the monitoring wells for general mineral/physicals, inorganics, radioactivity (gross alpha and uranium) and volatile organic chemicals. MRWPCA shall take these samples monthly for the first year of operation. MRWPCA may request, from the Division of Drinking Water, a reduction in this monitoring after the first year.

g. MRWPCA shall monitor the RO effluent for TOC via grab sample weekly and report in the monthly report. MRWPCA shall also monitor RO influent and effluent for TOC online and report monthly. The daily average and maximum TOC reading and the percent of time that the TOC is greater than 0.5 mg/L must be reported.

h. MRWPCA shall monitor final effluent daily (7 days per week) for total coliform concentrations. The effluent 7-day median of the analyses for total coliform shall be reported monthly

2. **Quarterly Reports:** These reports shall include, at a minimum, the following information:

a. The volume of:

- AWPF Influent – Secondary effluent from the RTP.
- Waste EQ effluent discharged into the RTP.
- Fully treated recycled water injected into the Seaside Basin.
- RO concentrate sent to the ocean outfall.
- If no water was pumped, the report shall so state.

i. The date and time of sampling and analyses.

ii. All analytical results of samples collected during the monitoring period of the:

- AWPF Influent,
- RO feed water,
-
- RO recycled water, and
- Groundwater.

iii. Records of any operational problems, plant upset and equipment breakdowns or malfunctions, and any diversion(s) of off-specification recycled water and the location(s) of final disposal.

iv. Discussion of compliance, noncompliance, or violation of requirements.

v. All corrective or preventive action(s) taken or planned with schedule of implementation, if any.

vi. Certification by the MRWPCA that no groundwater for drinking purposes has been pumped from wells within the boundary representing the greatest of the horizontal and vertical distances reflecting two months.

vii. A summary of operational concerns describing changes in reporting conditions, including influent, MF filtrate, RO permeate, UV/AOP water, and groundwater monitoring results, since the last report.

b. Monitoring results associated with the evaluation of pathogenic microorganism removal as described in the Order.

c. For the purpose of reporting compliance with numerical limitations, analytical data shall be reported using the following reporting protocols:

i. Sample results greater than or equal to the MRL must be reported "as measured" by the laboratory (i.e., the measured chemical concentration in the sample); or

ii. Sample results less than the MRL, but greater than or equal to the laboratory's Minimum Detection Limit (MDL), shall be reported as "Detected, but Not Quantified", "DNQ". The laboratory shall write the estimated chemical concentration of the sample next to "DNQ"; or

iii. Sample results less than the laboratory's MDL shall be reported as "Not-Detected", or ND.

d. If the MRWPCA samples and performs analysis on any sample more frequently than required in this MRP using approved analytical methods, the results of those analyses shall be included in the report. These results shall be reflected in the calculation of the average used in demonstrating compliance with average recycled water, receiving water, etc., limitations.

e. The Central Coast Water Board or DDW may request supporting documentation, such as daily logs of operations.

3. **Annual Summary Reports:** shall include, at a minimum, the following information:

a. Tabular and graphical summaries of the monitoring data obtained during the previous calendar year;

b. A summary of compliance status with all monitoring requirements during the previous calendar year;

c. For any non-compliance during the previous calendar year, a description of:

i. the date, duration, and nature of the violation;

ii. a summary of any corrective actions and/or suspensions of subsurface application of recycled water resulting from a violation; and

iii. if uncorrected, a schedule for and summary of all pending and completed remedial actions;

d. Any detections of monitored chemicals or contaminants, and any observed trends in the monitoring wells;

e. Information pertaining to the vertical and horizontal migration of the recharge water plume;

f. Title 22 drinking water quality data for the nearest drinking water supply well;

g. A description of any changes in the operation of any unit processes or facilities;

h. The estimated quantity and quality of the recycled water to be utilized for the next calendar year;

i. A list of the analytical methods used for each test and associated laboratory quality assurance/quality control procedures shall be included. The report shall identify the laboratories used by the MRWPCA to monitor compliance with this Order, their status of certification, and provide a summary of proficiency test;

j. A list of current operating personnel, their responsibilities, and their corresponding grade of certification.

k. The Annual Report shall be prepared by a properly qualified engineer registered and licensed in California and experienced in the field of wastewater or water treatment; and

l. A summary of monitoring reports, reporting and trend analysis, to describe the changes in water quality and contrast them to background measurements for all constituents exceeding MCLs or where concentration trends increase after the addition of recycled water. Specifically describe studies or investigations made to identify the source, fate and transport path of constituents which exceed the MCL at the monitoring wells.

4. The existing OOP shall be updated to accurately reflect the operations of the AWPF, the date the plan was last reviewed, and whether the plan is valid and current.

5. **Five-Year Engineering Report**: Five years from the date of the initial approval of the engineering report and every five years thereafter, the MRWPCA shall update the engineering report to address any project changes and submit the report to the Central Coast Water Board and the DDW. The Five-Year Engineering Report Update shall include, but not be limited to:

a. A description of any inconsistencies between previous groundwater model predictions and the observed and/or measured values. For this requirement, the MRWPCA shall summarize the groundwater flow and

transport including the injection and extraction operations for the MRWPCA groundwater injection project during the previous five calendar years. This summary shall also use the most current data for the evaluation of the transport of recycled water; such evaluations shall include, at a minimum, the following information:

i. Total quantity of advanced treated recycled water injected into Seaside Basin, and quantities of water injected into each individual injection well;

ii. Estimates of the rate and path of flow of the injected water within the aquifer;

iii. Projections of the arrival time of the recycled water at all monitoring and extraction wells and the percent of recycled water at each location.

iv. Clear presentation on any assumptions and/or calculations used for determining the rates of flow and for projecting arrival times and dilution levels;

v. A discussion of the underground retention time of recycled water, a numerical model, or other methods used to determine the recycled water contribution to each aquifer;

vi. A revised flow and transport model to match actual flow patterns observed within the aquifer if the flow paths have significantly changed; and,

vii. Revised estimates, if applicable, on hydrogeologic conditions including the retention time and the amount of the recycled water in the aquifers and at the production well field at the end of that calendar year. The revised estimates shall be based upon actual data collected during that year on recharge rates (including recycled water and native water), hydrostatic head values, groundwater production rates, basin storage changes, and any other data needed to revise the estimates of the retention time and the amount of the recycled water in the aquifers and at the production well field. Significant differences, and the reasons for such differences, between the estimates presented in the 2016 Engineering Report and subsequently revised estimates, shall be clearly presented. Additionally, the MRWPCA shall use the most recently available data to predict the retention time of recycled water in the subsurface.

b. Evaluation of the ability of MRWPCA to comply with all regulations and provisions over the following five years.

c. The Five-Year Engineering Report shall be prepared by a properly qualified engineer registered and licensed in California and experienced in the field of wastewater or water treatment.

IV. MONITORING PROGRAMS

1. AWPF Influent Monitoring

a. Monitoring is required to determine compliance with water quality conditions and standards and assess AWPF performance.
b. The influent sampling station is located before clarified secondary effluent from the RTP enters the ozone pre-treatment system of the AWPF. Influent samples

shall be obtained on the same day that stabilized RO recycled water samples are obtained. The date and time of sampling shall be reported with the analytical values determined. Table M-2 constitutes the influent monitoring program.

Table M-2: Influent Monitoring

Constituents	Units	Type of Sample	Minimum Frequency of Analysis
Ammonia-N	mg/L	grab	Weekly
$CBOD_5$	mg/L	24-hour composite	Weekly
Boron	mg/L	grab	Weekly
Chloride	mg/L	24-hour composite	Weekly
Nitrate-N	mg/L	24-hour composite	Weekly
Nitrite-N	mg/L	24-hour composite	Weekly
Nitrogen - Total	mg/L	grab	Weekly
pH	pH units	Metered	Continuous
Sodium	mg/L	24-hour composite	Weekly
Sulfate	mg/L	grab	Weekly
Total Suspended Solids	mg/L	24-hour composite	Weekly
Total coliform	MPN/100	grab	Weekly
Total Dissolve Solids	mg/L	24-hour composite	Weekly
Total flow	mgd	Metered	Continuous[3]
Total Kjeldahl nitrogen-N	mg/L	grab	Weekly
Total nitrogen[4]	mg/L	grab	Weekly
Total Organic Carbon (TOC)	mg/L	24-hour composite[5]	Weekly
Turbidity	NTU	Metered	Continuous[5]
UV transmittance	%	grab	Continuous

[3] For those pollutants that are continuously monitored, the MRWPCA shall report the monthly minimum and maximum, and daily average values.
[4] Total Nitrogen includes nitrate-N, nitrite-N, ammonia-N, and organic-N.
[5] May change to grab after MRWPCA demonstrates that grab sampling is adequate.

2. Recycled Water (AWPF Product Water) Discharge Limit Monitoring.

   a. Advanced treated recycled water monitoring is required to:

      i. Determine compliance with the Permit conditions;

      ii. Identify operational problems and aid in improving facility performance; and,

      iii. Provide information on recycled water characteristics and flows for use in interpreting water quality and biological data.

   Samples shall be collected downstream of the last chemical injection point, with the exception of constituents specified in Tables M-12 and M-13. Should the need for a change in the sampling station(s) arise in the future, the MRWPCA shall seek approval of the proposed station by the Executive Officer

prior to use.

Table M-3 shall constitute the recycled water monitoring program. After the first full year of monitoring, MRWPCA shall compile results and submit a revised monitoring program to DDW and the Central Coast Water Board for review and approval.

Table M-3: Recycled Water Discharge Limits Monitoring

Constituent/Parameters	Units	Type of Sample	Minimum Frequency of Analysis	Reference Table Number
Conductivity	mmho/c	Metered	Continuous[5]	M-3
Total chlorine residual	mg/L	Metered	Continuous	M-3
Total recycled water flow	mgd	Metered	Continuous	M-3
UV dose for each reactor	mJ/cm^2	Metered	Continuous	-
UV Transmittance	%	Metered	Continuous	-
pH	pH units	Metered	Continuous	M-3
Arsenic	µg/L	Grab	Monthly	M-3
Boron	µg/L	Grab	Monthly	M-3
Chloride	mg/L	Grab	Monthly	M-3
Chromium - Total	µg/L	Grab	Monthly	M-3
Total nitrogen[6]	mg/L	grab	At least two samples per week at least 3 days apart	M-3
Nitrate-N	mg/L	grab	Weekly	M-3
Total Kjeldahl nitrogen-N	mg/L	Grab	Weekly	M-3
Sodium	mg/L	Grab	Monthly	M-3
Sulfate	mg/L	Grab	Monthly	M-3
Total Dissolved Solids - TDS	mg/L	Grab	Monthly	M-3
Total coliform	MPN/ 100 ml	Grab	Daily	M-3
Total Organic Carbon (TOC)	mg/L	24-hour composite[7]	Weekly	M-3
Turbidity	NTU	Metered	Continuous	M-3
Inorganics with Primary MCLs	µg/L	Grab	Monthly	M-4

Table M-3: Recycled Water Discharge Limits Monitoring				
Constituents/parameters with Secondary MCLs	*various*	*Grab*	*Monthly*	**M-5**
Radioactivity	pCi/L	Grab	Monthly	M-6
Regulated organic chemicals	µg/L	grab	Monthly	M-7
Disinfection byproducts	µg/L	grab	Monthly	M-8
General physical	various	Grab	Quarterly	M-9
General minerals	µg/L	Grab	Quarterly	M-9
Constituents with Notification Levels	µg/L	Grab	Monthly	M-10
Remaining priority pollutants	µg/L	Grab	Annually	M-11
Constituents of Emerging Concern (CECs)	ng/L	Grab	Varies	M-12
Surrogates	Varies	Varies	Varies	M-13
Lead and Copper	mg/L	Grab	Quarterly	M-3

For those constituents that are continuously monitored, the Project Sponsors shall report the daily minimum, maximum, and average values.

[6] If no problem is detected, analysis of nitrogen can be reduced to weekly after 12 months of data collection.

[7] May change to grab after MRWPCA demonstrates that grab sampling is adequate.

Table M-4: Inorganics with Primary MCLs		
Constituent		
Aluminum	Chromium (Total)	Nitrite (as nitrogen)
Antimony		Nitrate + Nitrite
Arsenic	Cyanide	Perchlorate
Asbestos	Fluoride	Selenium
Barium	Mercury	Thallium
Beryllium	Nickel	
Cadmium	Nitrate (as nitrogen)	

Table M-5: Constituents/parameters with Secondary MCLs		
Constituents		
Aluminum	Manganese	Thiobencarb
Chloride	Methyl-tert-butyl-ether (MTBE)	Total Dissolved Solids
Color	Odor – Threshold	Turbidity
Copper	Silver	Zinc
Foam Agents (MBAS)	Specific Conductance	
Iron	Sulfate	

Table M-6: Radioactivity		
Constituent		
Gross Alpha Particle Activity (Including Radium-226 but Excluding Radon and Uranium)	Combined Radium-226 and Radium-228	Tritium
Gross Beta Particle Activity	Strontium-90	Uranium

Table M-7: Regulated Organics		
Constituents		
(a) Volatile Organic Chemicals	1,1,1-Trichloroethane	Endothal
Benzene	1,1,2-Trichloroethane	Endrin
Carbon Tetrachloride (CTC)	Trichloroethylene (TCE)	Ethylene Dibromide (EDB)
1,2-Dichlorobenzene	Trichlorofluoromethane	Glyphosate
1,4-Dichlorobenzene	1,1,2-Trichloro-1,2,2-	Heptachlor
1,1-Dichloroethane	Vinyl Chloride	Heptachlor Epoxide
1,2-Dichloroethane (1,2- DCA)	Xylenes (m,p)	Hexachlorobenzene
1,1-Dichloroethene (1,1- DCE)	(b) Non-Volatile synthetic Organic Constituents	Hexachlorocyclopentadiene
Cis-1,2-Dichloroethylene	Alachlor	Lindane
Trans-1,2-Dichloroethylene	Atrazine	Methoxychlor
Dichloromethane	Bentazon	Molinate
1,2-Dichloropropane	Benzo(a)pyrene	Oxamyl
1,3-Dichloropropene	Carbofuran	Pentachlorophenol
Ethylbenzene	Chlordane	Picloram
Methyl-tert-butyl-ether (MTBE)	Dalapon	Polychlorinated Biphenyls
Monochlorobenzene	1,2-Dibromo-3-chloropropane (DBCP)	Simazine
Styrene	2,4-Dichlorophenoxyacetic acid	Thiobencarb
1,1,2,2-Tetrachloroethane	Di(2-ethylhexyl)adipate	Toxaphene
Tetrachloroethylene (PCE)	Di(2-ethylhexyl)phthalate	2,3,7,8-TCDD (Dioxin)
Toluene	Dinoseb	2,4,5-TP (Silvex)
1,2,4-Trichlorobenzene	Diquat	

Table M-8: Disinfection Byproducts		
Constituent		
Total Trihalomethanes (TTHM)	Haloacetic Acid (five) (HAA5)	Bromate
Bromodichloromethane	Monochloroacetic acid	Chlorite
Bromoform	Dichloroacetic acid	
Chloroform	Trichloroacetic acid	
Dibromochloromethane	Monobromoacetic acid Dibromoacetic acid	

Table M-9: General Physical and General Minerals		
Constituent		
Asbestos	Potassium	Foaming Agents
Calcium	Sodium	Odor
Chloride	Sulfate	Specific Conductance
Copper	Zinc	Total Dissolved Solids
Iron	Color	Total Hardness
Manganese	Corrosivity	

Table M-10: Constituents with Notification Levels			
Constituents	**Units**	**Type of Sample**	**Minimum Frequency of Analysis**
Boron	µg/L	Grab	Quarterly
n-Butylbenzene	µg/L	Grab	Annually
sec-Butylbenzene	µg/L	Grab	Annually
tert-Butylbenzene	µg/L	Grab	Annually
Carbon disulfide	µg/L	Grab	Quarterly
Chlorate	µg/L	Grab	Quarterly
2-Chlorotoluene	µg/L	Grab	Annually
4-Chlorotoluene	µg/L	Grab	Annually
Diazinon	µg/L	Grab	Annually
Dichlorodifluoromethane (Freon 12)	µg/L	Grab	Annually
1,4-Dioxane	µg/L	Grab	Quarterly
Ethylene glycol	µg/L	Grab	Annually
Formaldehyde	µg/L	Grab	Annually
HMX	µg/L	Grab	Annually
Isopropylbenzene	µg/L	Grab	Annually
Manganese	µg/L	Grab	Quarterly

Table M-10: Constituents with Notification Levels			
Constituents	**Units**	**Type of Sample**	**Minimum Frequency of Analysis**
Methyl isobutyl ketone (MIBK)	µg/L	Grab	Annually
Naphthalene	µg/L	Grab	Annually
n-Nitrosodiethyamine (NDEA)	µg/L	Grab	Annually
n-Nitrosodimethylamine (NDMA)	µg/L	Grab	Quarterly
n-Nitrosodi-n-propylamine (NDPA)	µg/L	Grab	Annually
Propachlor	µg/L	Grab	Annually
n-Propylbenzene	µg/L	Grab	Annually
RDX	µg/L	Grab	Annually
Tertiary butyl alcohol (TBA)	µg/L	Grab	Quarterly
1,2,3-Trichloropropane (1,2,3-TCP)	µg/L	Grab	Annually
1,2,4-Trimethylbenzene	µg/L	Grab	Annually
1,3,5-Trimethylbenzene	µg/L	Grab	Annually
2,4,6-Trinitrotoluene (TNT)	µg/L	Grab	Annually
Vanadium	µg/L	Grab	Annually

Table M-11: Remaining Priority Pollutants		
Constituent		
Pesticides	Metals	Di-n-butyl phthalate
Aldrin	Chromium III	Di-n-octyl phthalate
Dieldrin		Diethyl phthalate
4,4'-DDT	Base/Neutral Extractables	Dimethyl phthalate
4,4'-DDE	Acenaphthene	Benzo(a)anthracene
4,4'-DDD	Benzidine	Benzo(a)fluoranthene
Alpha-endosulfan	Hexachloroethane	Benzo(k)fluoranthene
Beta-endosulfan	Bis(2-chloroethyl)ether	Chrysene
Endosulfan sulfate	2-chloronaphthalene	Acenaphthylene
Endrin aldehyde	1,3-dichlorobenzene	Anthracene
Alpha-BHC	3,3'-dichlorobenzidine	1,12-benzoperylene
Beta-BHC	2,4-dinitrotoluene	Fluorene
Delta-BHC	2,6-dinitrotoluene	Phenanthrene
Acid Extractables	1,2-diphenylhydrazine	1,2,5,6-dibenzanthracene
2,4,6-trichlorophenol	Fluoranthene	Indeno(1,2,3-cd)pyrene
P-chloro-m-cresol	4-chlorophenyl phenyl ether	Pyrene
2-chlorophenol	4-bromophenyl phenyl ether	Volatile Organics
2,4-dichlorophenol	Bis(2- chloroisopropyl) ether	Acrolein

Table M-11: Remaining Priority Pollutants		
Constituent		
2,4-dimethylphenol	Bis(2- chloroethoxyl)methane	Acrylonitrile
2-nitrophenol	Hexachlorobutadiene	Chlorobenzene
4-nitrophenol	Isophorone	Chloroethane
2,4-dinitrophenol	Nitrobenzene	1,1-dichloroethylene
4,6-dinitro-o-cresol	N-nitrosodiphenylamine	Methyl chloride
Phenol	Bis(2- ethylhexyl)phthalate	Methyl bromide
Chlorodibromomethane	Butyl benzyl phthalate	2-chloroethyl vinyl ether
2,4-Diphenylhydrazine		

Table M-12: Constituents of Emerging Concern						
Constituent	**Relevance/ Indicator Type**	**Type of Sample**	**Minimum Frequency of Analysis**	**Reporting Limit (µg/L)**	**Monitoring Locations[7]**	
					Prior to RO	**Following treatment prior to well injection**
17β-estradiol	Health	grab	Annually	0.001		X
Caffeine	Health & Performance	grab	Annually	0.05	X	X
NDMA	Health & Performance	grab	Quarterly	0.002	X	X
Triclosan	Health	grab	Annually	0.05		X
DEET	Performance	grab	Annually	0.05	X	X
Sucralose	Performance	grab	Quarterly	0.1	X	X

Table M-13: Surrogates				
Constituent	**Type of Sample**	**Minimum Frequency**	**Monitoring Locations**	
			Prior to RO Treatment	**Following Treatment prior to Well Injection**
Electrical Conductivity	Online	Continuous	X	X

[7] The January 22, 2013 Recycled Water Policy Attachment A makes a distinction between health-based and performance-based CEC indicators for purposes of monitoring locations. For subsurface applications, the health-based CECs are 17β-estradiol, caffeine, NDMA, and triclosan, with monitoring required for final recycled water only. The health-based and performance-based CECs are caffeine, NDMA, DEET, and sucralose, with monitoring required prior to reverse osmosis and post treatment prior to release to the aquifer. Caffeine and NDMA serve both as health-based and performance based indicators.

Table M-13: Surrogates				
Constituent	**Type of Sample**	**Minimum Frequency**	**Monitoring Locations**	
			Prior to RO Treatment	**Following Treatment prior to Well Injection**
Total Organic Carbon (TOC)	24-hour composite	Weekly	X	X

c. Consistent with the January 22, 2013 amended Recycled Water Policy, the MRWPCA may request the removal of specific CECs from the monitoring program if supported by the data.

i. Analytical methods for CECs shall be selected to achieve the reporting limits presented in Table M-12 in accordance with the Recycled Water Policy. The analytical methods shall be based on methods published by the USEPA, methods certified by DDW, or peer reviewed and published methods that have been reviewed by DDW. Any modifications to the published or certified methods shall be reviewed and approved by the Central Coast Water Board and DDW.

ii. For performance indicator CECs and surrogates, removal percentages shall be reported in addition to the measured concentrations.

[1] The removal percentage shall be calculated based on the following formula:

Removal Percentage = $([X_{in} – X_{out}]/X_{in})*100$
X_{in} = Concentration in recycled water prior to a treatment process
X_{out} = Concentration in recycled water after a treatment process

[2] The removal percentages for the surrogates shall be determined based on the daily averages for electrical conductivity and weekly values for TOC and included in the quarterly compliance monitoring reports.

[3] The removal percentages for the performance indicator CECs shall be included in the Annual Summary Report.

d. Evaluation of Pathogenic Microorganism Removal

For the purposes of evaluating the performance of the following treatment facilities/units with regards to pathogenic microorganism removal, the MRWPCA shall include the results of the monitoring specified below in its monthly compliance monitoring reports:

i. For the purpose of demonstrating that the necessary log reductions are achieved at the AWPF, MRWPCA shall report the daily average and maximum turbidity, percent of time more than 5 nephelometric turbidity units (NTU), and daily coliform results measured in the recycled water (as

specified in Table M-3);

ii. Advanced Oxidation Process (AOP) - (UV and hydrogen peroxide at the AWPF): For each day of operation, MRWPCA shall report the calculated daily peroxide dose (based on the peroxide pump speed and bulk feed concentration), percent reduction based on daily average of chloramine (via total residual chlorine) measured upstream and downstream of AOP, and the applied UV power shall be reported. For UV, MRWPCA shall report the UV system dose (expressed as greater than a certain threshold such as 300 milli-joules/cm^2), UV transmittance (daily minimum, maximum, and average), UV intensity for each reactor (daily minimum, maximum, and average) and the total UV power applied; and

iii. Based on the calculation of log reduction achieved each day by the entire treatment system, MRWPCA shall report the value and "Yes" or "No" for each day as to whether the necessary log reductions (i.e. 10-logs for *Giardia*, 10-logs for *Cryptosporidium*, and 12-logs for virus) have been attained. An overall log reduction calculation shall be provided only for those days when a portion of the treatment system does not achieve the credits proposed in Table 5-4 of the engineering report.

3. Treatment Conditions

If a sample of the advanced- treated recycled water is greater than 10 ng/L for NDMA, within 72 hours of knowledge of the result, the MRWPCA shall collect another sample as confirmation. The MRWPCA shall notify DDW and the Central Coast Water Board within 48 hours of knowledge of the exceedance and, if directed by DDW or the Central Coast Water Board, suspend injection of the advanced treated recycled water.

4. Groundwater Monitoring

a. As required by Title 22, Section 60320.226, prior to operating any injection well, a MRWPCA shall site and construct at least two monitoring wells downgradient of the injection well, such that:
(1) at least one monitoring well is located;

(A) no less than two weeks but no more than six months of travel time from the injection wells, and

(B) at least 30 days upgradient of the nearest drinking water well;

(3) samples from the monitoring wells in paragraphs (1) and (2) can be;

(A) obtained independently from each aquifer, initially receiving the water used as a source of drinking water supply, that will receive the injection wells recharge water, and

(B) validated as receiving recharge water from the injection well.

(b) In addition to the monitoring required pursuant to section 60320.120, from each monitoring well in subsection (a)(1), and each monitoring well in subsection (a)(2) that has recharge water located within one year travel time

of the well(s), a project

New monitoring wells will be installed to ensure ongoing project performance and to comply with the Title 22 Criteria. The objectives of the groundwater monitoring well program are to demonstrate compliance with the Title 22 and Basin Plan groundwater criteria and applicable state policies regarding protection of groundwater by:

- Siting one downgradient well with groundwater travel times (underground retention time) no less than two weeks and no more than six months from the injection wells (well also has to be greater than 30 days travel time from the nearest drinking water source).
- Siting an additional downgradient well between the Injection Facilities and the nearest downgradient potable water supply (in addition to the downgradient monitoring well used to demonstrate retention time as described in the bullet point above).
- Monitoring groundwater levels and water quality; the well design will allow for sample collection from each aquifer receiving recycled water.
- Collecting baseline water quality samples prior to startup of the Project operation.

Monitoring well installation will be phased to coincide with the phasing of the deep injection wells and vadose zone wells. Initially, two monitoring well clusters will be installed at the site of the first two deep injection wells, DIW-2 and DIW-3 and vadose zone wells, VZW-2 and VZW-3. These Phase I monitoring wells are labeled MW-1, MW-2, MW-3, and MW-4 on Figure 3 of Waste Discharge Requirements Order No. R3-2017-0003. Phase II monitoring wells will be proposed based on the location of additional injection wells and project operation information. For planning purposes, current locations of the additional Phase II monitoring wells MW-5, MW-6, and MW-7, are also included on Figure 3.

At each monitoring well location, two adjacent, but separate boreholes will be drilled in close proximity (within about 20 feet) of each other at the same location – one for the Paso Robles Aquifer and one for the Santa Margarita Aquifer (referred to as a monitoring well cluster).

For the injection well cluster at DIW-1, no adjacent monitoring well is proposed. Travel times from this well are very long and one monitoring well is presumed sufficient to document performance of this eastern-most injection well cluster. A tracer test will confirm whether or not one monitoring well is sufficient associated with the DIW-1 injection well cluster.

Representative samples of groundwater shall be collected from all monitoring wells installed for this project. Table M-15 sets forth the minimum constituents and parameters for monitoring groundwater quality in MRWPCA monitoring wells.

The MRWPCA shall implement the following groundwater monitoring program as described in Tables M-14, M-15, and M-16. Some constituents may be eligible for reduced monitoring due to the consistent historic lack of detection, upon approval by the Executive Officer.

If any of the monitoring results indicate that an MCL has been exceeded or

coliforms are present in the monitoring wells at the MRWPCA groundwater injection project as a result of the use of the recycled water, the MRWPCA shall notify the DDW and Central Coast Water Board within 72 hours of receiving the results and make note of any positive finding in the next monitoring report submitted to the Central Coast Water Board.

Upon an exceedance of 10 ng/L for NDMA in monitoring samples in groundwater wells and within 30 days, the MRWPCA shall notify DDW and the Central Coast Water Board and begin monthly sampling of groundwater for NDMA from the well with the exceedance. Groundwater sampling may return to the frequency stated in this MRP if the average of three consecutive monthly samples is 10 ng/L or below.

Table M-14: Groundwater Monitoring

Constituents/Parameters	Units	Type of Sample	Minimum Frequency of Analysis	Reference Table Number
Water level elevation[8]	Feet	---	Quarterly	M-**14**
Chlorine residual	mg/L	Grab	Quarterly	M-14
Chloride	mg/L	Grab	Quarterly	M-14
Nitrate-N	mg/L	Grab	Quarterly	M-14
Nitrite-N	mg/L	Grab	Quarterly	M-14
Nitrate plus Nitrite	mg/L	Grab	Quarterly	M-14
pH	pH units	Grab	Quarterly	M-14
Sodium	mg/L	Grab	Quarterly	M-14
Sulfate	mg/L	Grab	Quarterly	M-14
TOC	mg/L	Grab	Quarterly	M-14
Total coliform	MPN/100ml	Grab	Quarterly	M-14
BOD_5 20°C	mg/L	Grab	Semi-annually	M-14
Oil and grease	mg/L	Grab	Quarterly	M-14
Total nitrogen	mg/L	Grab	Quarterly	M-14
Total Suspended Solids	mg/L	Grab	Semi-annually	M-14
Turbidity	NTU	Grab	Quarterly	M-14
Inorganics with primary MCLs	µg/L	Grab	Monthly	M-4

[8] Water level elevations shall be measured to the nearest 0.01 feet, and referenced to mean sea level.

Table M-14: Groundwater Monitoring				
Constituents/parameters with secondary MCLs				
Fluoride	µg/L	Grab	Quarterly	M-4
Radioactivity	pci/L	Grab	Monthly	M-15
Regulated organics	µg/L	Grab	Monthly or Quarterly	M-15
Disinfection byproducts (DBPs)	µg/L	Grab	Quarterly	M-15
General physical		Grab	Monthly	M-16
General minerals	µg/L	Grab	Monthly	M-16
Chemicals with NLs	µg/L	Grab	Quarterly or Annually	M-15
N-Nitrosopyrrolidine	µg/L	Grab	Annually	M-14
Remaining priority pollutants	µg/L	Grab	Quarterly	M-15
Silver	mg/L	Grab	Quarterly	M-14

Table M-15: Groundwater Monitoring Frequency	
Constituent	**Frequency**
Total Suspended Solids (TSS)	Quarterly
Turbidity	Quarterly
Radioactivity	
Gross Alpha Particle Activity (including Radium-226 but excluding radon and uranium)	Monthly
Gross Beta Particle Activity	Monthly
Radium-226	Monthly
Radium-226 & Radium-228 (Combined)	Monthly
Radium-228	Monthly
Strontium-90	Monthly
Tritium	Monthly
Uranium	Monthly

Table M-15: Groundwater Monitoring Frequency	
Organic Chemicals	
(a) Volatile Organic Chemicals	
1,1,1-Trichloroethane	Monthly
1,1,2,2-Tetrachloroethane	Monthly
1,1,2-Trichloro-	Monthly
1,2,2- Trifluoroethane	Monthly
1,1,2-Trichloroethane	Monthly
1,1-Dichloroethane	Monthly
1,1-Dichloroethene (1,1 DCE)	Monthly
1,2,4-Trichlorobenzene	Monthly
1,2-Dichlorobenzene	Monthly
1,2-Dichloroethane (1,2 DCA)	Monthly
1,2-Dichloropropane	Monthly
1,3-Dichloropropene	Monthly
1,4-Dichlorobenzene	Monthly
Benzene	Monthly
Carbon Tetrachloride (CTC)	Monthly
cis-1,2-Dichloroethylene	Monthly
Dichloromethane	Monthly
Ethylbenzene	Monthly
Methyl-tert-butyl-ether (MTBE)	Monthly
Monochlorobenzene	Monthly
Styrene	Monthly
Tetrachloroethylene (PCE)	Monthly
Toluene	Monthly
trans-1,2-Dichloroethylene	Monthly
Trichloroethylene (TCE)	Monthly
Trichlorofluoro-methane	Monthly
Vinyl Chloride	Monthly
Xylenes (m, p)	Monthly
(b) non-volatile synthetic organic chemical	
1,2-Dibromo-3-Chloropropane (DBCP)	Quarterly
2,3,7,8-TCDD (Dioxin)	Quarterly
2,4,5-TP (Silvex)	Quarterly
2,4-Dichlorophenoxyacetic acid (2,4-D)	Quarterly

Table M-15: Groundwater Monitoring Frequency	
Alachlor	Quarterly
Atrazine	Quarterly
Bentazon	Quarterly
Benzo (a) pyrene	Quarterly
Carbofuran	Quarterly
Chlordane	Quarterly
Dalapon	Quarterly
Di (2-ethylhexyl) adipate	Quarterly
Di (2-ethylhexyl) phthalate	Quarterly
Dinoseb	Quarterly
Diquat	Quarterly
Endothal	Quarterly
Endrin	Quarterly
Ethylene Dibromide (EDB)	Quarterly
Glyphosate	Quarterly
Heptachlor	Quarterly
Heptachlor Epoxide	Quarterly
Hexachlorobenzene	Quarterly
Hexachlorocyclo-pentadiene	Quarterly
Lindane (Gamma BHC)	Quarterly
Methoxychlor	Quarterly
Molinate	Quarterly
Oxamyl	Quarterly

Table M-15: Groundwater Monitoring Frequency	
PCB 1016	Quarterly
PCB 1221	Quarterly
PCB 1232	Quarterly
PCB 1242	Quarterly
PCB 1248	Quarterly
PCB 1254	Quarterly
PCB 1260	Quarterly
Pentachlorophenol	Quarterly
Picloram	Quarterly
Simazine	Quarterly
Thiobencarb	Quarterly
Toxaphene	Quarterly
Disinfection Byproducts	
Bromate	Quarterly
Bromodichloro-methane	Quarterly
Bromoform	Quarterly
Chlorite	Quarterly
Chloroform	Quarterly
Dibromoacetic Acid	Quarterly
Dibromochloro-methane	Quarterly
Dichloroacetic Acid	Quarterly
Haloacetic Acid (Five) (HAA5)	Quarterly
Monobromoacetic Acid	Quarterly
Monochloroacetic Acid	Quarterly
Total Trihalomethanes	Quarterly
Trichloroacetic Acid	Quarterly

Table M-15: GroundwaterMonitoring Frequency	
Chemicals with Notification Levels	
1,2,3-Trichloropropane (1,2,3 TCP)	Quarterly
1,2,4-Trimethylbenzene	Annual
1,3,5-Trimethylbenzene	Annual
1,4-Dioxane	Annual
2-Chlorotoluene	Annual
2,4,6-Trinitrotoluene (TNT)	Annual
4-Chlorotoluene	Annual
Boron	Quarterly
Carbon Disulfide	Annual
Chlorate	Annual
Diazinon	Annual
Dichlorodifluoro-methane (Freon 12)	Annual
Ethylene Glycol	Annual
Formaldehyde	Annual
HMX	Annual
Isopropylbenzene	Annual
Manganese	Annual
Methyl-isobutyl-keytone (MIBK)	Annual
Naphthalene	Quarterly
n-Butylbenzene	Annual
n-Nitrosodiethyl-amine (NDEA)	Annual
n-Nitrosodimethylamine (NDMA)	Quarterly
n-Nitrosodi-n-propylamine (NDPA)	Quarterly
n-Propylbenzene	Annual
Propachlor	Annual
RDX	Annual
sec-Butlybenzene	Annual
tert-Butylbenzene	Annual
Tertiary-butyl-alcohol (TBA)	Annual
Vanadium	Annual

Table M-15: Groundwater Monitoring Frequency	
Remaining Priority Pollutants	
Pesticides	
4,4,4'-DDD	Annual
4,4,4'-DDE	Annual
4,4,4-DDT	Annual
Aldrin	Quarterly
Alpha BHC	Quarterly
Alpha Endosulfan	Quarterly
Beta BHC	Quarterly
Beta Endosulfan	Quarterly
Chromium III	Quarterly
Chromium VI	Quarterly
Delta BHC	Quarterly
Dieldrin	Quarterly
Endosulfan Sulfate	Quarterly
Endrin Aldehyde	Quarterly
Acid Extractables	
2,4,6-Trichlorophenol	Quarterly
2,4-Dichlorophenol	Quarterly
2,4-Dimethylphenol	Quarterly
2,4-Dinitrophenol	Quarterly
2-Chlorophenol	Quarterly
2-Nitrophenol	Quarterly
4,6-Dinitro-o-Cresol (2-Methly-4,6-Dinitrophenol)	Quarterly
4-Nitrophenol	Quarterly
p-Chloro-m-Cresol (3-Methyl-4-Chlorophenol)	Quarterly
Phenol	Quarterly
Base/Neutral Extractables	
1,12-Benzoperylene ((Benzo(g,h,i)-perylene))	Quarterly
1,2,5,6-Dibenzanthracene ((Dibenzo(a,h) anthracene))	Quarterly
1,2-Diphenylhydrazine	Quarterly
1,3-Dichlorobenzene	Quarterly
2,4-Dinitrotoluene	Quarterly
2,6-Dinitrotoluene	Quarterly
2-Chloronaphthalene	Quarterly
3,3'-Dichlorobenzidine	Quarterly
4-Bromophenyl phenyl ether	Quarterly

Table M-15: Groundwater Monitoring Frequency	
4-Chlorophenyl phenyl ether	Quarterly
Acenaphthene	Quarterly
Acenaphthylene	Quarterly
Anthracene	Quarterly
Benzidine	Quarterly
Benzo(a)anthracene	Quarterly
Benzo(b)fluoranthene	Quarterly
Benzo(k)fluoranthene	Quarterly
Bis(2-chloroethoxyl)-methane	Quarterly
Bis(2-chloroethyl)ether	Quarterly
Bis(2-chloroisopropyl)ether	Quarterly
Butyl benzyl phthalate	Quarterly
Chrysene	Quarterly
Di(2-ethylhexyl) phthlate	Quarterly
Dimethyl phthalate	Quarterly
Di-n-butyl phthalate	Quarterly
Di-n-octyl phthalate	Quarterly
Fluoranthene	Quarterly
Fluorene	Quarterly
Hexachlorobutadiene	Quarterly
Hexachloroethane	Quarterly
Indeno(1,2,3-cd) pyrene	Quarterly
Isophorone	Quarterly
Nitrobenzene	Quarterly
n-Nitrosodi-n-propylamine	Quarterly
n-Nitrosodiphenylamine	Quarterly
Phenanthrene	Quarterly
Pyrene	Quarterly
1,1-Dichloroethylene	Quarterly
2-Chloroethyl vinyl ether	Quarterly
Acrolein	Quarterly
Acrylonitrile	Quarterly
Chlorobenzene	Quarterly
Chloroethane	Quarterly
Methyl bromide	Quarterly
Methyl chloride	Quarterly

Table M-16: General Physical and General Minerals		
Constituent		
Asbestos	Potassium	Foaming Agents
Calcium	Sodium	Odor
Chloride	Sulfate	Specific Conductance
Copper	Zinc	Total Dissolved Solids
Iron	Color	Total Hardness
Manganese	Corrosivity	

V. CERTIFICATION STATEMENT

Each report shall contain the following declaration[9]:

"I certify under penalty of law that this document, including all attachments and supplemental information, was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a find and imprisonment.

Executed on the _____day of _____at _____

_____(Signature)

_____(Title)"

VI. OTHER MONITORING REQUIREMENTS

The MRWPCA shall submit written documentation identifying the responsible party who certifies the perjury document.

The list of parameters and monitoring frequencies may be adjusted by the Executive Officer if the MRWPCA makes a request and the Executive Officer determines that the modification is adequately supported by statistical trends of monitoring data submitted.

VII. CERTIFICATION

Ordered by _____
Executive Officer

Date March 9, 2017

STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL
BOARD CENTRAL COAST REGION

STAFF REPORT FOR REGULAR MEETING OF MARCH 7-9, 2017
Prepared on January 30, 2016

ITEM NUMBER: **16**

SUBJECT: Waste Discharge Requirements and Water Reclamation Requirements for the Pure Water Monterey Advanced Water Purification Project, Monterey Regional Water Pollution Control Agency, Monterey County

STAFF CONTACT: **Jon Rokke, 805/549-3892 or Jon.rokke@waterboards.ca.gov**

KEY INFORMATION

Facility Name:	Pure Water Monterey Advanced Water Purification Project
Facility Owner:	Monterey Regional Water Pollution Control Agency
Location:	Two miles north of the city of Marina, Monterey County
Discharge Type:	Advanced treatment of secondary treated sewage, agricultural wash waters, storm water, urban agricultural runoff, and surface and tile drain waters will be injected into the Seaside Basin for groundwater recharge.
Design Flow:	4.0 MGD
Current Flow:	None
Treatment Type:	Advanced treatment technologies including ozone pretreatment, membrane filtration, reverse osmosis, advanced oxidation, and water product stabilization.
Disposal:	Brine will flow to the MRWPCA's existing ocean outfall.
Existing Orders:	None

This Action: **Adopt Order No. R3-2017-0003**

SUMMARY

The Monterey Regional Water Pollution Control Agency (MRWPCA), in partnership with the Monterey Peninsula Water Management District (MPWMD), has developed the "Pure Water Monterey Advanced Water Purification Project" (Project) to deliver an average of 3,500 acre-feet per year (AFY) of purified recycled water to the Seaside Groundwater Basin, in Monterey County.

The Central Coast Water Board will consider prescribing water reclamation requirements for this project. The Central Coast Water Board has consulted with and received recommendations from the State Water Board's Division of Drinking Water regarding the project, as required by law. This staff report describes the project and the proposed water reclamation requirements and monitoring requirements.

This Project will help the California American Water Company (CalAm) to reduce diversions

from the Carmel River. CalAm is under a State Water Resources Control Board (SWRCB) cease and desist order (SWRCB Order No. 2009-0060) to cease over-pumping of the Carmel River. If the Water Board approves this draft Order to allow recycling and groundwater recharge, CalAm will then be able to withdraw 3,500 AFY from groundwater, reducing its dependence upon the Carmel River once the project is completed.

The draft Order sets effluent limits at maximum contaminant limits (MCLs) on a constituent-by-constituent basis and includes an extensive monitoring and reporting program (MRP) to ensure that public health and beneficial uses are protected.

Staff recommends that the Water Board adopt Order No. R3-2017-0003 as proposed.

DISCUSSION

Background

MRWPCA was created in 1972, and currently serves a population of approximately 250,000. MRWPCA provides regional wastewater treatment, disposal, and reclamation facilities for its member entities: Monterey, Pacific Grove, Del Rey Oaks, Sand City, Marina, Salinas, the Seaside County Sanitation District, the Castroville, Moss Landing, and Boronda community services districts, and Fort Ord lands. Each member entity retains ownership and operating and maintenance responsibility for their respective wastewater collection and transport systems.

MRWPCA's proposed Advanced Water Purification Facility (AWPF) will take secondary treated water from its regional treatment plant (RTP) and use advanced treatment technologies to further treat the water to meet Title 22 standards for indirect potable reuse. This highly treated water will then be reinjected into the Seaside Basin's shallow and deep aquifers. Currently wastewater from the RTP consists of undisinfected secondary clarifier effluent that is (1) discharged to the ocean pursuant to National Pollutant Discharge Elimination System (NPDES) Permit (Order No. R3-2014-0013) or (2) used as influent for the co-located Salinas Valley Reclamation Project for production of tertiary recycled water regulated under Order No. 94-82. This proposed Order only addresses water that will be treated at the AWPF and then reinjected into the Seaside Basin.

The goal of the Project is to enable CalAm to reduce its diversions from the Carmel River system by up to 3,500 AFY by injecting the same amount of water produced by the AWPF into the Seaside Basin.

The Project will include a drought reserve component by providing for an additional 200 AFY of product water that will be injected in the Seaside Basin in wet and normal years, up to a total of 1,000 AF. Thus, the Project will inject up to 3,700 AF of product water into the Seaside Basin in some years, rather than the 3,500 AF needed for CalAm supplies. This will result in a "banked" drought reserve. During dry years, less than 3,500 AF of product water will be delivered to the Seaside Basin. CalAm will be able to extract the banked water to make up the difference to its supplies, with the intent that its extractions and deliveries will not fall below 3,500 AFY.

<u>Groundwater Pumping</u>
In this basin, groundwater extractions occur for both domestic and agricultural supply uses. The Seaside Basin was adjudicated in 2008 due to overdraft and sea water intrusion conditions. The Seaside Groundwater Basin Watermaster reported that for wells within its jurisdiction in 2016, 4,565 AF of water was produced.

This Project will help the California American Water Company (CalAm) to reduce diversions

from the Carmel River. CalAm is under a State Water Resources Control Board (SWRCB) cease and desist order (SWRCB Order No. 2009-0060) to cease over-pumping of the Carmel River. CalAm will be able to withdraw 3,500 AFY from groundwater, reducing its dependence upon the Carmel River once the project is completed.

Recycled Water

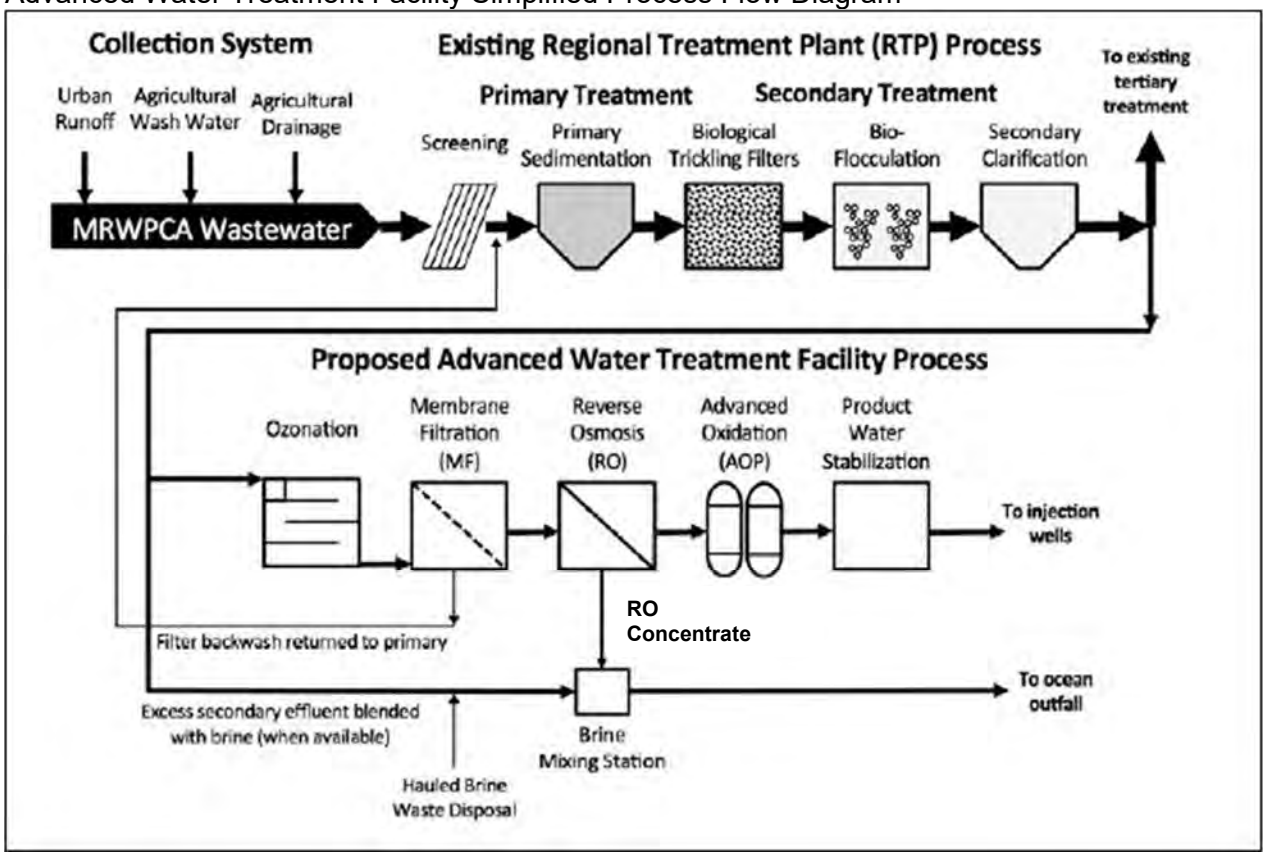
The Project will also result in additional recycled water becoming available for irrigation in the northern Salinas Valley. An existing tertiary recycled water facility at the Regional Treatment Plant (RTP) that is part of the Salinas Valley Reclamation Project (SVRP) will be provided additional source waters (treated first at the RTP) in order to provide supplementary tertiary recycled water for use in agricultural irrigation. It is anticipated that in normal and wet years approximately 4,500 to 4,750 AFY of additional recycled water supply could be created for agricultural irrigation purposes. In drought conditions, the Project could provide up to 5,900 AFY for crop irrigation. This irrigation water is not regulated via this Order.

Project Description

The AWPF will be located adjacent to the existing RTP and will consist of:

- Supply water pump station
- Ozone pre-treatment
- Low-pressure membrane filtration
- Reverse osmosis treatment
- UV disinfection with advanced oxidation
- Product water stabilization
- Product water pump station

Advanced Water Treatment Facility Simplified Process Flow Diagram



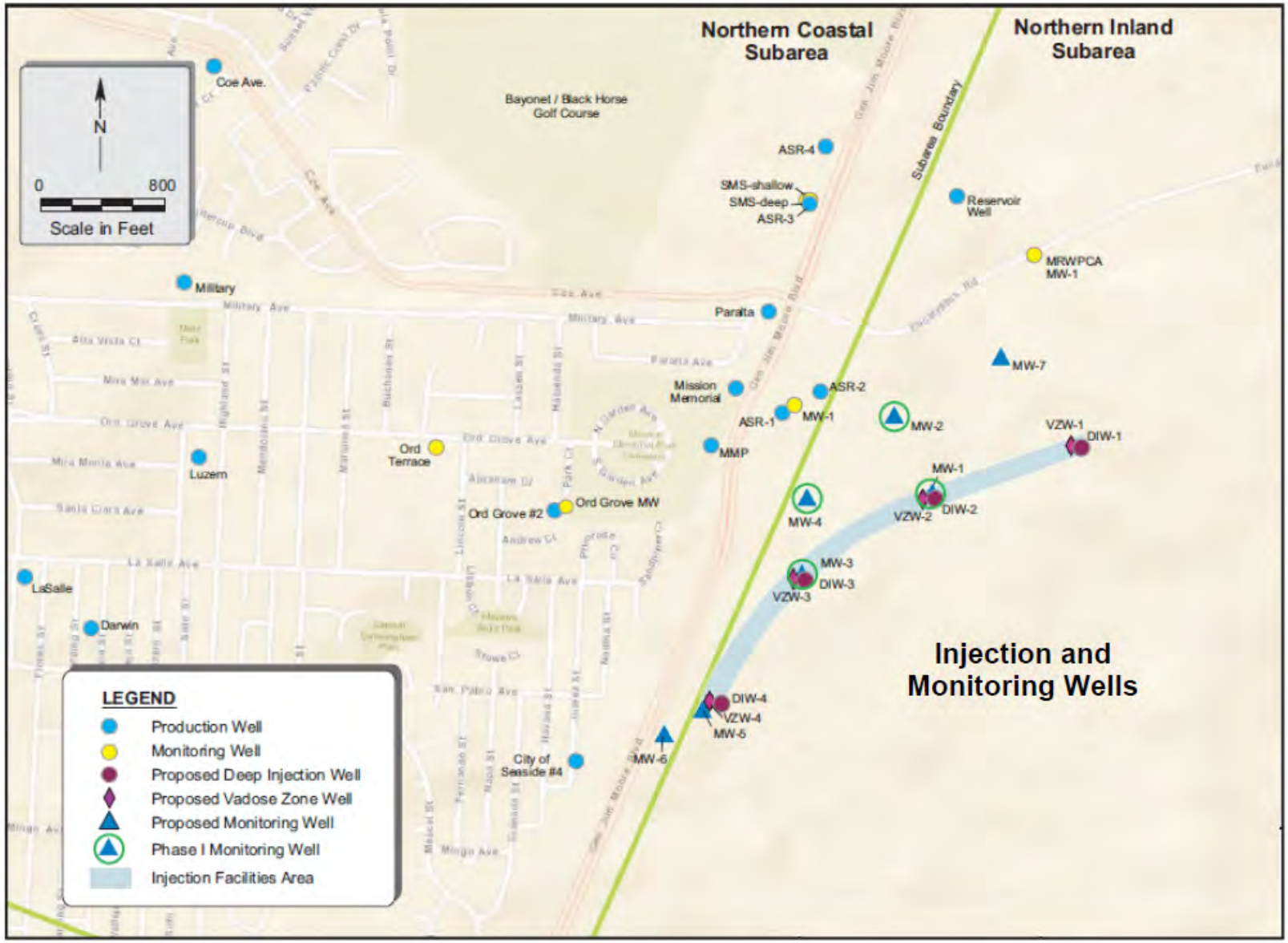
The RTP will treat secondary treated municipal sewage, agricultural wash water from the Salinas Industrial Waste Treatment Facility, storm water flows from the southern part of Salinas, storm water and agricultural runoff from the Reclamation Ditch, and surface and agricultural tile drain waters from the Blanco Drain. The treated water (feed water) is influent to the AWPF.

The reverse osmosis concentrate from the AWPF will be sent to MRWPCA's existing ocean outfall for disposal, which is regulated by Central Coast Water Board Order No. R3-2014-0013, NPDES No. CA0048551. Chemical cleaning waste and analytical instrument waste will be routed back to the RTP headworks or trickling filters for treatment. The Central Coast Water Board will update the NPDES permit in the future prior to any wastes from the AWPF being discharged to the ocean to ensure protection of beneficial uses.

Advanced treated water from the AWPF will be conveyed by pipeline to the Seaside Basin for groundwater recharge using both deep injection and vadose zone wells. The injected water will then mix with existing groundwater and be stored for future urban uses, including use as a potable water source.

Facilities Location Map

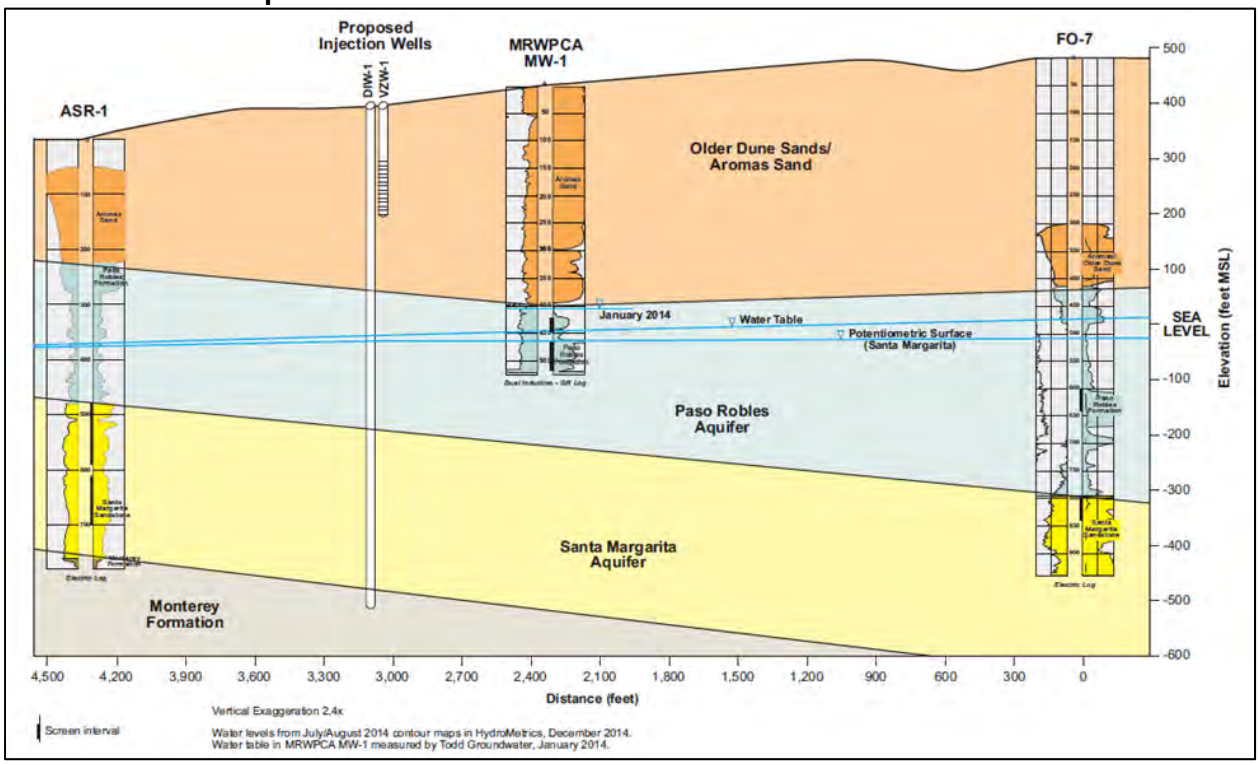
Proposed Injection Wells, Monitoring Wells, and Production Wells



Proposed Injection Wells, Monitoring Wells, and Production Wells

MRWPCA intends to install four deep injection wells and four in the vadose zone arrayed in pairs, with one deep and one vadose zone (shallow) well in each cluster. Approximately 10% of the highly treated water will be injected into the vadose zone wells and 90% will be injected into the deep wells (Santa Margarita aquifer). A cross-sectional diagram of the aquifers including existing and proposed wells is shown below.

Seaside Basin Aquifer Cross-Section



Monitoring Wells - MRWPCA will construct two monitoring wells down gradient of each injection well cluster. One monitoring well must be located between two weeks and six months travel time and at least 30 days upgradient of the nearest drinking water well, and one monitoring well must be located between each well cluster and the nearest down gradient drinking water well. The monitoring wells will allow samples to be obtained independently from each aquifer and validated as receiving recharge water from the Project.

Water Supply Wells Near the Injection Area - Most supply wells near the injection facilities are located in the Northern Coastal Subarea. The closest water supply wells include Seaside No. 4 (operated by the City of Seaside) and two aquifer storage and recovery (ASR) wells, ASR-1 and ASR-2 (operated by the Monterey Peninsula Water Management District for CalAm). Each of these wells is located about 1,000 feet down gradient from a Project injection well.

Recycled Water Retention Time - The SWRCB Division of Drinking Water (DDW) has adopted groundwater replenishment regulations for the recharge of recycled water. The DDW regulations contain requirements for underground retention time of recycled water that could also potentially affect well spacing. Recycled water must be retained underground for a

sufficient period of time to identify and respond to any treatment failure so that inadequately treated recycled water does not enter a potable water system (referred to as the response retention time). The response retention time must be at least two months. The 1,000-ft distance between proposed project wells and the closest down gradient production wells is expected to result in a travel time of approximately one year. The Order requires that MRWPCA propose a tracer study to DDW and the Central Coast Water Board and, after the study is approved, to conduct the study to confirm the response retention time.

Background Water Quality

MRWPCA conducted studies of background water quality and available assimilative capacity in the Seaside Basin as required by the Recycled Water Policy (State Water Resources Control Board Resolution No. 2013-0003). Where there is no salt and nutrient management plan in place, the Recycled Water Policy requires a calculation of the baseline assimilative capacity and then a determination of whether the impacts of the project will exceed that capacity over at least a ten year time frame. Compliance with antidegradation is demonstrated by utilizing less than 10 percent of the available assimilative capacity in a basin/sub-basin.

The four production wells nearest to the proposed injection well array were used to establish existing groundwater water quality and assimilative capacity of the aquifer and sub-aquifers. The most recent five years of data (2011-2016) were analyzed for each production well. Two of the wells draw their water from both the Paso Robles and Santa Margarita aquifers (Ord Grove No. 2 and Paralta). One well draws water exclusively from the Paso Robles aquifer (City of Seaside No. 4), and one well draws exclusively from the Santa Margarita aquifer (ASR-1). See the "Seaside Basin Aquifer Cross-Section" diagram (below). Average five-year constituent concentrations by production well and basin-wide averages are presented in the table below.

Existing Water Quality in Nearby Production Wells

Constituent	City of Seaside No.4	ASR-1	Ord Grove No. 2	Paralta	Basin-Wide Averages	Maximum Contaminant Limit (MCL)
Aluminum	50	50	26	50	42	1,000
Arsenic	1.2	1.8	2.0	2.5	2.1	10
Barium	28	100	100	100	94	1,000
Boron	46	95	132	96	108	750
Chloride	72	63	129	94	103	250
Chromium-total	3.6	9.3	10	10	9.1	50
Chromium VI	-	1.0	0.8	2.3	1.4	10
Lead	5	3.7	5.0	5.0	4.5	15
Nitrate as N	1.9	0.1	1.7	0.5	1.1	10
Sodium	50	60	94	79	79.7	69
Sulfate	13	77	63	58	54.9	250
TDS	237	406	524	435	449	500
TOC	0.5	1.0	0.6	0.6	0.7	-

**Source: averages of well water quality data submitted by MRPCA on November 9, 2016*

**Concentrations are in μg/L except chloride, nitrate, sodium, sulfate, TDS, and TOC, which are mg/L*

In addition to the groundwater quality evaluation, MRWPCA constructed a three-dimensional

solute transport model to predict localized and basin-wide groundwater quality changes resulting from the mixing of injected recycled water and ambient groundwater after 25 years. The model analyzed the percentage of assimilative capacity consumed by the Project. The results of the evaluation are presented in the table below.

Percentage of Assimilative Capacity Consumed after 25 Years

Modeled Layer	Volume–Weighted Average Recycled Water Percentage				
	Northern Coastal	Northern Inland	Southern Coastal	Laguna Seca	All Subareas
1	0.1%	0.0%	0.0%	0.0%	0.0%
2	0.5%	2.2%	0.0%	0.0%	1.0%
3	4.0%	2.1%	0.0%	0.0%	1.7%
4	2.1%	0.6%	0.0%	0.0%	0.8%
5	5.3%	7.2%	0.0%	0.0%	3.8%
Paso Robles	1.8%	1.7%	0.0%	0.0%	1.1%
Santa Margarita	5.3%	7.2%	0.0%	0.0%	3.8%
All Model Layers	3.3%	4.2%	0.0%	0.0%	2.4%

The assimilative capacity in an aquifer is the difference between existing “baseline” water quality concentrations and the respective maximum contaminant limits (MCLs) which if exceeded, would adversely impact the beneficial use(s) of the resource. Assimilative capacity is assessed on a constituent-by-constituent basis. MRWPCA algebraically demonstrated in a technical memorandum dated November 18, 2016, that when effluent limits are equal to the applicable water quality objective for each constituent, the percentage of recycled water present in the aquifer equals the percentage of assimilative capacity consumed. This analysis confirmed that less than 10% of the basin’s assimilative capacity will be utilized by this project and that beneficial uses will be protected. The percentages presented in the table above equal the percentages of assimilative capacity consumed by this project in the Seaside Basin and sub-basins.

State Board Division of Drinking Water

State authority to oversee production and reuse of recycled water use is shared by the State Water Board Division of Drinking Water (DDW) and the Regional Water Boards. DDW is the division with the primary responsibility for establishing water recycling criteria under Title 22 of the Code of Regulations to protect the health of the public using the groundwater basins as a source of potable water. One of DDW’s functions is to review and approve Title 22 engineering reports for recycled water projects, including indirect potable reuse projects such as this Project. On October 21, 2016, MRWPCA submitted its final Title 22 engineering report to DDW and the Central Coast Water Board. The final engineering report was accepted by DDW on November 7, 2016, and DDW submitted a letter to the Central Coast Water Board with a list of recommended conditions to properly regulate the Project on November 10, 2016. The proposed Order requires that the Discharger comply with all of DDW’s recommended conditions.

Proposed Order

The draft Order sets effluent limits at maximum contaminant limits (MCLs) on a constituent-by-constituent basis and includes an extensive monitoring and reporting program (MRP) to ensure that public health and beneficial uses are protected. A pilot plant and demonstration project (reported in the Project's Title 22 approved engineering report) demonstrated that a high level of treatment, resulting in water quality considerably better than MCLs, is possible with the unit processes proposed. MRWPCA argued, however, that more operational flexibility was needed than would have been afforded if effluent limits were set according to the pilot plant's operational results. MRWPCA stated that such flexibility was needed due to the varying nature of the different feed waters entering the RTP and the various operational and equipment choices that were anticipated (e.g., RO membrane selection). MRWPCA demonstrated, in a technical memorandum dated November 18, 2016, that beneficial uses will be protected by setting effluent limits at the MCLs for the individual constituents and ensuring that less than 10 percent of the Seaside Basin's available assimilative capacity will be consumed by the project. Staff agreed and has proposed effluent limitations for the AWTF as follows:

Reinjected Recycled Water Discharge Limits

Constituents	Units	Concentration	Monitoring Frequency	Compliance Interval
***Arsenic**	mg/L	0.01	Monthly	Running Annual Average
***Boron**	µg/L	750	Monthly	Running Annual Average
***Chloride**	mg/L	250	Monthly	Running Annual Average
***Nitrate as N**	mg/L	10	Weekly	Sample Result: no averaging
****Nitrogen - Total**	mg/L	10	Twice per Week	Average of Last 4 Results
***Sodium**	mg/L	69	Monthly	Running Annual Average
***Sulfate**	mg/L	250	Monthly	Running Annual Average
***TDS**	mg/L	500	Monthly	Running Annual Average
****Total Organic Carbon (TOC)**	mg/L	0.5	Weekly	20-week running average and average of last 4 results
****Total Coliform**	MPN/ 100mL	<2.2	Daily	7-day Median

**Limits equal to water quality objectives, except **TOC, total nitrogen, and total coliform, which are Title 22 limits*

With concurrence from DDW, Water Board staff has drafted the proposed Order to reflect a project description that differs in some minor ways from that which was in the Title 22 engineering report approved by DDW on November 10, 2016. MRWPCA will need to update the engineering report for this project to reflect the changes as required in General Requirements #9 of the Order.

State Water Resources Control Board Policies

The **Sources of Drinking Water Policy** (Resolution No. 88-63) provides that all waters of the state, with certain exceptions, are to be protected as existing or potential sources of municipal and domestic supply. Exceptions include waters with existing high total dissolved solids (i.e., greater than 3,000 mg/L), low sustainable yield (less than 200 gallons per day for a single well), waters with contamination that cannot be treated for domestic use using best management practices or best economically achievable treatment practices, waters within particular municipal, industrial, and agricultural wastewater conveyance and holding facilities, and regulated geothermal ground waters. This proposed Order protects existing or potential sources of drinking water and is therefore consistent with Resolution No. 68-63.

Resolution No. 68-16 established an **antidegradation policy** for the State Water Board and Regional Water Boards. Resolution No. 68-16 requires that existing high quality of waters be maintained unless a change is demonstrated to be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial uses of waters, and will not result in water quality less than that prescribed in applicable policies. Resolution No. 68-16 also requires that waste discharge requirements be prescribed for discharges to high-quality waters that will result in the best practicable treatment or control of the discharge necessary to ensure that a pollution or nuisance will not occur and the highest water quality consistent with maximum benefit to the people of the State will be maintained. The proposed Order is consistent with Resolution No. 68-16 because it conforms to the more recent Recycled Water Policy antidegradation requirements for recycled water projects.

A goal of the **Recycled Water Policy** (Resolution No. 2013-0003) is to increase the beneficial use of recycled water from municipal wastewater sources in a manner consistent with state and federal water quality laws and regulations. The Policy directs the Regional Water Boards to collaborate with generators of municipal wastewater and interested parties in the development of salt and nutrient management plans (SNMPs) to manage the loading of salts and nutrients to groundwater basins in a manner that is protective of beneficial uses, thereby supporting the sustainable use of local waters. No SNMP has been adopted by the Central Coast Water Board for the Seaside Basin to date, and it is not anticipated that an SNMP will be adopted for the Seaside Basin in the foreseeable future.

The Recycled Water Policy states that until such time as a SNMP has been approved by the Water Board and is in effect, compliance with Resolution No. 68-16 for projects that consume less than 10 percent of the available assimilative capacity in a basin/sub-basin may be demonstrated by conducting an antidegradation analysis verifying the use of assimilative capacity.

The proposed Order supports the sustainable use of local waters and confirms that the Project will consume less that 10 percent of available assimilative capacity and is therefore consistent with the Sources of Drinking Water, Recycled Water, and antidegradation policies.

ENVIRONMENTAL SUMMARY

An environmental impact report (EIR) was prepared for the proposed Pure Water Monterey Advanced Water Purification Project with MRWPCA serving as the lead agency. Public meetings to provide information about the Project and CEQA process were held on May 20 and 21, 2015.

MRWPCA adopted Resolution No. 2015-24 on October 8, 2015, after a public hearing, which certified the final EIR, adopted the CEQA findings, approved mitigation measures and a mitigation monitoring and reporting program, adopted a statement of overriding considerations, and approved the project as modified.

The Central Coast Water Board is a responsible agency pursuant to CEQA (CEQA Guidelines section 15096). The Central Coast Water Board has considered the EIR and makes its own conclusions in this Order on whether and how to approve the water reclamation requirements for the project. The EIR identified three potentially significant environmental effects within the Central Coast Water Board's jurisdiction that can be mitigated to less than significant levels. The three impacts and their associated mitigation measures follow below. The proposed order requires MRWPCA to comply with the mitigation measures specified in the EIR.

BF-1: Habitat Modification Due to Construction of Diversion Facilities. Construction of the proposed Reclamation Ditch and Tembladero Slough diversions could indirectly result in habitat modifications for endangered or threatened fish species as a result of construction activities and dewatering the constructions.

Mitigation Measure BT-1a (see below under Biological Resources: Terrestrial, Impact BT-1) Mitigation Measure BF-1a: Construction during Low Flow Season. (Applies to Blanco Drain Reclamation Ditch and Tembladero Slough Diversions) Implement Mitigation Measure BT- 1a. Conduct construction of diversion facilities, including the directional drilling under the Salinas River, during periods of low flow outside of the SCCC steelhead migration periods, i.e. between June and November, which would be outside of the adult migration period from December through April and outside of the smolt migration period from March through May.

Mitigation Measure BF-1b: Relocation of Aquatic Species during Construction. (Applies to Reclamation Ditch and Tembladero Slough Diversions). Conduct pre-construction surveys to determine whether tidewater gobies or other fish species are present, and if so, implement appropriate measures in consultation with applicable regulatory agencies, which may include a program for capture and relocation of tidewater gobies to suitable habitat outside of work area during construction. Pre-construction surveys shall be consistent with requirements and approved protocols of applicable resource agencies and performed by a qualified fisheries biologist.

Mitigation Measure BF-1c: Tidewater Goby and Steelhead Impact Avoidance and Minimization. (Applies to Reclamation Ditch and Tembladero Slough Diversions) To ensure compliance with the federal Endangered Species Act (FESA) and the California Endangered Species Act (CESA), consultation with NFMS/NOAA, USFWS, and CDFW shall be conducted as required, and any necessary take permits or authorizations would be obtained. If suitable habitat for tidewater goby (Tembladero Slough) and steelhead cannot be avoided, any in-stream portions of each project component (where the Proposed Project improvements require in-stream work) shall be dewatered/ diverted. A dewatering/diversion plan shall be prepared and submitted to NMFS, USFWS, and CDFW for review and approval. Specific plan elements are noted below and will be refined through consultation with USFWS, NMFS and CDFW:

- Required Pre-Construction surveys identified in Mitigation Measure BF-1b shall be consistent with requirements and approved protocol of applicable resource agencies and performed by a qualified fisheries biologist.

- All dewatering/diversion activities shall be monitored by a qualified fisheries biologist. The fisheries biologist shall be responsible for capture and relocation of fish species out of the work area during dewatering/diversion installation.
- The project proponents shall designate a qualified representative to monitor on-site compliance of all avoidance and minimization measures. The fisheries biologist shall have the authority to halt any action which may result in the take of listed species.
- Only USFWS/NMFS/CDFW-approved biologists shall participate in the capture and handling of listed species subject to the conditions in the Incidental Take Permits as noted above.
- No equipment shall be permitted to enter wetted portions of any affected drainage channel. All equipment operating within streams shall be in good conditions and free of leaks.
- Spill containment shall be installed under all equipment staged within stream areas and extra spill containment and clean up materials shall be located in close proximity for easy access.
- Work within and adjacent to streams shall not occur between November 1 and June 1 unless otherwise approved by NMFS and the CDFW.
- If project activities could degrade water quality, water quality sampling shall be implemented to identify the pre-project baseline, and to monitor during construction for comparison to the baseline. If water is to be pumped around work sites, intakes shall be completely screen with wire mesh not larger than five millimeters to prevent animals from entering the pump system.
- If any tidewater goby or steelhead are harmed during implementation of the project, the project biologist shall document the circumstances that led to harm and shall determine if project activities should cease or be altered in an effort to avoid further harm to the species.
- Water turbidity shall be monitored by a qualified biologist or water quality specialist during all instream work. Water turbidity shall be tested daily at both an upstream location for baseline measurement and downstream to determine if project activities are altering water turbidity.
- Turbidity measures shall be taken within 50 feet of construction activities to rule out other outside influences. Additional turbidity testing shall occur if visual monitoring indicates an increased in turbidity downstream of the work area. If turbidity levels immediately downstream of the project rise to more than 20 NTUs (Nephelometric Turbidity Units) above the upstream (baseline) turbidity levels, all construction shall be halted and all erosion and sediment control devices shall be thoroughly inspected for proper function, or shall be replaced with new devices to prevent additional sediment discharge into streams. The above mitigation is subject to review and approval for CESA and FESA requirements by approving agencies as identified above and may be modified to further reduce, avoid or minimize impacts to species.

BF-2: Interference with Fish Migration. Operation of the Proposed Project would result in changes in stream flows that may interfere with fish migration in the Salinas River and Reclamation Ditch.

Mitigation Measure BF-2a: Maintain Migration Flows. (Applies to the Reclamation Ditch Diversion) Implement BF-1a, BF-1b, and BF-1c. Operate diversions to maintain steelhead migration flows in the Reclamation Ditch based on two criteria – one for upstream adult passage in Jan-Feb-Mar and one for downstream juvenile passage in Apr- May. For juvenile passage, the downstream passage shall have a flow trigger in both Gabilan Creek and at

the Reclamation Ditch, so that if there is flow in Gabilan Creek that would allow outmigration, then the bypass flow requirements, as measured at the San Jon Gage of the Reclamation Ditch, shall be applied (see Hagar Environmental Science, Estimation of Minimum Flows for Migration of Steelhead in the Reclamation Ditch, February 27, 2015, in Appendix G-2, of this Draft EIR and Schaaf & Wheeler, Fish Passage Analysis: Reclamation Ditch at San Jon Rd. and Galiban Creek at Laurel *Rd .* July 15, 2015 in Appendix CC of this Final EIR). If there is no flow in Gabilan Creek, then only the low flow (minimum bypass flow requirement as proposed in the project description) shall be applied, and these flows for the dry season at Reclamation Ditch as measured at the San Jon USGS gage shall be met. Note: If there is no flow gage in Gabilan Creek, then downstream passage flow trigger shall be managed based on San Jon Road gage and flows. Alternately, as the San Jon weir located at the USGS gage is considered a barrier to steelhead migration and the bypass flow requirements have been developed to allow adult and smolt steelhead migration to have adequate flow to travel past this obstacle, if the weir were to be modified to allow steelhead passage, the mitigation above would not have to be met. Therefore, alternate Mitigation Measure BF-2a has been developed, as follows:

Mitigation Measure Alternate BF-2a: Modify San Jon Weir. (Applies to the Reclamation Ditch Diversion) Construct modifications to the existing San Jon weir to provide for steelhead passage. Modifications could include downstream pool, modifications to the structural configuration of the weir to allow passage or other construction, and improvements to remove the impediment to steelhead passage defined above. The above mitigation is subject to compliance with CESA and FESA and appropriate approving agencies may modify the above mitigation to further reduce, avoid, or minimize impacts to species.

HS-4: Operational Surface Water Quality Impacts due to Source Water Diversions. Proposed Project diversions would result in water quality benefits due to diversion and treatment of polluted waters; however, rapid water fluctuation from diversions at the Reclamation Ditch could induce erosion and sedimentation in downstream waters.

Mitigation Measure HS-4: Management of Surface Water Diversion Operations (Applies to Reclamation Ditch Diversion, only) Rapid, imposed water-level fluctuations shall be avoided when operating the Reclamation Ditch Diversion pumps to minimize erosion and failure of exposed (or unvegetated), susceptible banks. This can be accomplished by operating the pumps at an appropriate flow rate, in conjunction with commencing operation of the pumps only when suitable water levels or flow rates are measured in the water body. Proper control shall be implemented to ensure that mobilized sediment would not impair downstream habitat values and to prevent adverse impacts due to water/soil interface adjacent to the Reclamation Ditch and Tembladero Slough. During planned routine maintenance at the Reclamation Ditch Diversion, maintenance personnel shall inspect the diversion structures within the channel for evidence of any adverse fluvial geomorphological processes (for example, undercutting, erosion, scour, or changes in channel cross-section). If evidence of any substantial adverse changes are noted, the diversion structure shall be redesigned and the project proponents shall modify it in accordance with the new design.

COMPLIANCE HISTORY

This is a proposed, new facility and therefore has no compliance history. However, the RTP generally has a very good compliance record. Staff identified six violations of its total coliform limit since 2009.

COMMENTS

On December 15, 2016, staff distributed the draft waste discharge requirements to the Discharger and an interested parties list consisting of over 1,200 email addresses and over 30 physical addresses. Staff requested that all interested parties submit written comments no later than 5:00 PM on January 20, 2017.

Two comment letters were received within the comment period. Staff has excerpted the comments below and provided a response to each one. Suggested changes to the draft order that staff agrees with are reflected in redline in the draft order.

Letter #1 from Monterey Regional Water Pollution Control Agency *(dated January 19, 2017)*

Comment #1: MRWPCA has selected "Advanced Water Purification Facility" as the final name for the PWM advanced water treatment facility. This name is being used in the construction bid documents, public outreach materials, and facility signage. For consistency with the Draft Order and future regulatory correspondence, please change all facility references from the "Advanced Water Treatment Facility (AWTF)" to the "Advanced Water Purification Facility (AWPF)."
Response #1: The Central Coast Regional Water Quality Control Board (Water Board) and the Division of Drinking Water (DDW) have no objections to the proposed name change. The project name will be changed throughout the draft Order, in the Monitoring and Reporting Program, and in this staff report.

Comment #2: The Draft Order identifies recycled water produced at the AWPF as "product water," "recycled water," and "advanced treated recycled water." For clarity, MRWPCA requests consistent identification as "purified recycled water."
Response #2: “Purified recycled water” is not defined in Title 22 water recycling criteria. Recharge Water and Recycled Municipal Wastewater are defined, however. The requested change, to use the term “purified recycled water,” is denied.

Comment #3: The list of AWPF major components should include the supply water and product water pump stations. These pump stations will be used to collect samples of AWPF influent and purified recycled water. The following changes are requested for completeness.

111.21. Primary Project Components (Page 3)

2. The Advanced Water Treatment Facility (AWTF) has the following major components:
   - Supply water pump station
   - Ozonation (membrane filtration pretreatment)
   - Membrane filtration feed water pump station
   - Low Pressure Membrane Filtration (MF)
   - Reverse osmosis (RO) feed water pump station
   - RO system
   - Ultraviolet light (UV) with hydrogen peroxide advanced oxidation process (AOP)
   - Post treatment stabilization
   - Product water pump station

Response #3: Water Board and DDW staff have no objections to including the “Supply water pump station” and the “Product water pump station” to the list of major components. The Draft Order will be revised accordingly.

Comment #4: The APWF will produce seven waste streams and the waste solids will be sent to the RTP headworks and/or the RTP thickening process for treatment. The following changes are requested to accurately describe the waste stream production and processing.

111.22. AWTF Design Flows and Waste Streams (Page 4)

The proposed AWTF will have a design capacity to produce 4.0 MGD of purified ~~advanced treated~~ recycled water. The facility will also produce ~~six~~ seven waste streams: ozone injection strainer waste, MF backwash waste. neutralized MF enhanced flux maintenance waste, neutralized MF clean-in place waste, neutralized RO clean-in-place waste, analytical instrument waste, and RO concentrate. The RO concentrate will be piped to MRWPCA's existing ocean outfall along with secondary wastewater effluent. ~~And~~ and trucked brine. The other AWTF waste streams will be diverted ~~back~~ to the RTP ~~or the~~ headworks ~~or the trickling filters~~ or the RTP sludge thickening process for treatment.

Response #4: Water Board and DDW staff have no objections regarding this proposed change, except for the terminology change (see response to comment #2 above). This description is contrary to what is in Title 22 Appendix, page 65 under "AWTF Design Flows and System Waste Streams," which states there are only two waste streams, and MF backwash will go to either the headworks or to the trickling filters. MRWPCA will need to update the Title 22 Appendix with the changes per General Requirement #9 of the Order..

Comment #5: The list of constituents presented in Table 1 (page 8) is incomplete and includes numerous mistakes with regards to units, identified goals/objectives, and sources. MRWPCA suggests removal of Table 1 and expanding the narrative description (as needed) to describe the Basin Plan water quality goals and objectives in VIII.A.40. andVIII.A.41.
Response #5: The Seaside Groundwater Basin is not specifically addressed in Table 3-8. "Median Ground Water Objectives" in the Basin Plan and therefore many of the water quality goals displayed in Table 1 were taken from the State Boards water quality goals database.

http://www.waterboards.ca.gov/water_issues/programs/water_quality_goals/

The list of constituents will be revised to only include only those with an effluent limit or those that are constituents of concern in the Seaside Basin. The units in Table 1 are correct.

Table 1 will also be revised to correct the typo for lead (should read 0.2 not 0.02) and to make the origin of the sodium water quality goal clear.

Comment #6: The Basin Plan includes general objectives, Municipal and Domestic Supply (MUN) objectives, and Agricultural Supply (AGR) objectives that apply to Seaside Basin groundwater. To correctly identify applicable receiving water requirements in the Draft Order, the following changes are suggested.

VIII.A. Regional Board Water Quality Control Plan (Basin Plan) (Page 10)

46. The Basin Plan contains the following specific water quality objectives for Seaside Basin groundwater:

This Order protects Seaside Basin groundwater water quality objectives and is therefore consistent with the Basin Plan.

V. Provisions (Page 16)

1. Injection of the purified advanced treated recycled water shall not cause or contribute to an exceedance of water quality objectives in Seaside Basin

groundwater.

Response #6: The Basin Plan calls out water quality objectives for specific beneficial uses in groundwaters, not necessarily specific to the Seaside Basin. Therefore the first requested insertion of “Seaside Basin” will not be made. Water Board and DDW staff have no objections to the other proposed changes, except for the terminology change proposed for page 16 (see response to comment #2 above).

Comment #7: The recycled water monitoring requirements in the MRP (Table M-3, Footnote 6) allows weekly analysis of total nitrogen if no problem is detected after 12 months of data collection. The following change is recommended to provide consistency between Table 4 and Table M-3.

III. Recycled Water Discharge Limits (Page 15)

Constituents	Units	Concentration	Monitoring Frequency	Compliance Interval
**Nitrogen – Total	mg/L	10	Twice per week (or Weekly[1])	Average of Last 4 Results

[1]MRP (Table 3) allows weekly monitoring if no problem is detected after 12 months of data collection.

Response #7: The last sentence in the MRP states: “The list of parameters and monitoring frequencies may be adjusted by the Executive Officer if the MRWPCA makes a request and the Executive Officer determines that the modification is adequately supported by statistical trends of monitoring data submitted." No further changes to the MRP to reflect this statement are necessary at this time.

Comment #8: The following changes are needed to correctly reference the CCR Title 22 requirements for groundwater replenishment utilizing subsurface application.

VI. State Water Resources Control Board Division of Drinking Water (DDW) Requirements (Pages 18 to 19)

3. The Project AWTF shall be operated to meet the requirements in section 60320.122.60320.222 Operation Optimization and Plan.

4. As required by Title 22 section 60320.122. 60320.222 (Operation Optimization Plan), prior to operation, MRWPCA shall submit an Operation Optimization Plan for review and approval to DDW and the Central Coast Water Board.

11. MRWPCA shall verify that the recycled municipal wastewater used for the Project meets the requirements in Title 22 section 60320.106 60320.206. Wastewater Source Control.

12. Pursuant to Title 22 section 60320.108 60320.208 (a) Pathogenic Microorganism Control (a), MRWPCA shall operate the Project such that the recycled municipal wastewater used as recharge water receives...

13. If a pathogen reduction in Title 22 section 60320.108 60320.208 (a) is not met based on the on-going monitoring required pursuant to subsection (c}, within 24 hours of being aware, MRWPCA. ..

Response #8: Water Board and DDW staff have no objections to the proposed citation revisions. Appropriate changes will be made to the draft Order.

Comment #9: MRWPCA is planning to measure total organic carbon (TOC) removal through reverse osmosis (RO) during commissioning and operation of the AWPF in order to determine if it can be used as a surrogate for pathogen removal instead of electrical conductivity. MRWPCA is planning to submit a report to DDW and the Central Coast Water Board after sufficient comparative data have been collected. If the results suggest that TOC can be used instead of conductivity, then MRWPCA is planning to ask for a revision to the permit to allow for TOC monitoring of the RO feed and RO combined permeate instead of conductivity. Accordingly, the following change is requested for the Draft Order.

VI.15. State Water Resources Control Board Division of Drinking Water (DDW) Requirements (Page 19)

b. The Reverse Osmosis (RO) system shall be credited pathogen reduction at this facility in accordance with the amount demonstrated via online monitoring to ensure the integrity of the RO system. MRWPCA must monitor the effluent of each RO train (including each stage) continuously for conductivity at the AWTF. The daily average and maximum conductivity reading, and the percent of time that the reduction of conductivity is less than 1.0 log removal must be reported. The MRWPCA shall calculate the minimum removal achieved at the AWTF. <u>An alternative surrogate may be utilized if approved by the Division of Drinking Water and the Central Coast Water Board.</u>

111.1. Reporting Requirements (Page MRP-8)

c. The Reverse Osmosis (RO) system will be credited for virus, Giardia cysts and Cryptosporidium oocysts based upon reduction demonstrated via an approved surrogate, such as conductivity. MRWPCA shall monitor conductivity continuously in both the RO feed and RO permeate of each RO train, in order to demonstrate membrane integrity and a conductivity. The daily average and maximum conductivity reading and percent of time that the reduction of conductivity is less than 1.0 log removal must be reported. The report shall include calculation of minimum removal achieved at the AWTF. <u>An alternative surrogate may be utilized (e.g., TOC) if approved by the Division of Drinking Water and the Central Coast Water Board. The proposal to change surrogates may also include different monitoring locations (e.g., combined RO permeate instead of train RO permeate), if approved by DDW and the Central Coast Water Board.</u>

Response #9: Water Board and DDW staff have no objections to the proposed revisions. Appropriate changes will be made to the draft Order. Revisions to the MRP may be approved by the Central Coast Water Boards Executive Officer.

Comment #10: AWPF commissioning may demonstrate that the 1,4-dioxane removal requirement is achieved at an ultraviolet light transmittance (UVT) other than 95o/o minimum. To allow for this possibility, and to be consistent with the other advanced oxidation process (AOP) requirements, MRWPCA requests the following change.

VI.15.f. State Water Resources Control Board Division of Drinking Water (DDW) Requirements (Page 20)

ii. UV transmittance less than <u>95%, or a new setpoint approved by DDW after the AOP commissioning.</u>

Response #10: DDW does not accept this proposed change. An RO system that is operating properly should have a UVT 97%-98%. UVT less than 95% is not acceptable. In addition, MRWPCA's Title 22 Engineering Report was approved based on the proposed criteria of a minimum UVT of 95% for advanced oxidation feed water quality, UV AOP system design criteria, and full scale commissioning (Section 3.2.6.5 – 3.2.6.7). The proposed change is denied.

Comment #11: A startup 30-day report has not been required for other all other groundwater replenishment projects except for the Cambria Community Services District Emergency Water Treatment Facility Recycle Water Re-injection Project. Given that the PWM project is not an emergency project and production of this report is an unnecessary burden, MRWPCA requests the requirements for a startup 30-day report be removed from the Draft Order.

1.1. Submittal of Reports (Page MRP-3)

~~a. Startup 30 day report:~~

~~The Discharger must evaluate and field validate any operating assumptions for the AWTF (quality of water supplies, membrane filter backwash discharge, membrane filtrate discharge, and stabilized reverse osmosis product •.water re injection) and compare the pre project assumptions to documented operating data. The Discharger must submit a report detailing differences between documented operating values and assumed concentrations/conditions. The report must be submitted 'within 10 days following the first 30 days of AWTF operation.~~

Response #11: Water Board and DDW staff have no objections to the proposed revisions. The requested changes will be made to the draft Order.

Comment #12: Chloramine removal has had inconsistent results as a surrogate for UV/AOP performance when hydroxyl radicals are present, such as in the AWPF UV/AOP system. MRWPCA requests the following changes until the industry has more clearly demonstrated the benefit of measuring chloramine removal through UV/AOP. The UV/AOP performance will be assessed through the measurements of flowrate, UV intensity, UVT, and hydrogen peroxide.

111.1.d. Monthly Reports (Page MRP-9)

i. For AOP (UV and hydrogen peroxide at the AWTF), MRWPCA shall report the calculated daily hydrogen peroxide dose (based on the pump speed and bulk feed concentration). ~~and percent reduction based on daily average of chloramine (via total residual chlorine) measured upstream and downstream of the AOP.~~

Response #12: Water Board and DDW staff have no objections to the proposed revisions. The requested changes will be made to the draft Order.

Comment #13: The combined effluent from the waste equalization (EQ) basins is metered, which includes drainage from the chemical area, RO clean-in-place (CIP) waste, RO flush waste, MF strainer backwash, MF CIP/enhanced flux maintenance (EFM) waste, overflow from the MF filtrate tank, and MF backwash waste. Accordingly, MRWPCA requests the following changes to the flow volume reporting requirements:

111.2. Quarterly Reports (Page MRP-10)

a. The volume of:

- AWTF Influent- Secondary effluent from the RTP.
- ~~Membrane filter (MF) backwash~~ <u>Waste EQ effluent</u> discharged into the RTP.
- <u>Purified</u> ~~Fully treated~~ recycled water injected into the Seaside Basin.
- RO concentrate sent to the ocean outfall.
- If no water was pumped, the report shall so state.

Response #13: Water Board and DDW staff have no objections to the proposed changes, except for the terminology change (see response to comment #2 above). The proposed changes to the draft Order will be made with the exception of the proposed change to “Purified” in the second bullet point.

Comment #14: The following changes are needed to correctly describe the monitoring locations required for quarterly reporting. The constituents to be monitored are details in Tables M-2 and M-3 of the Draft Order.

111.2.a. Quarterly Reports (Page MRP-10)

ii. All analytical results of samples collected during the monitoring period .at ~~of~~ the following locations:

- AWTF Influent,
- MF feed water conductivity,
- MF Pressure Decay Tests,
- RO feed product water conductivity,
- Chlorine concentrations at the injection 'Nell heads,
- Purified recycled water RO recycled water injected to the Seaside Basin,
- Groundwater.

Response #14: Water Board and DDW staff have no objections to the proposed changes, except for the terminology change (see response to comment #2 above). The proposed changes to the draft Order will be made with the exception of the proposed substitution of “Purified” in the sixth bullet point for "RO."

Comment # 15: There are no known domestic wells in the vicinity of the injection wells. The nearest downgradient wells are municipal and irrigation supply wells. CCR Title 22 data should be collected and reported for the public drinking water supply well that is closest to the injection wells and the following language is suggested to clarify the requirement.

111.3. Annual Summary Report (Page MRP-11)

f. Title 22 drinking water quality data for the nearest drinking ~~domestic~~ water supply well;

Response # 15: Water Board and DDW staff have no objections to the proposed revisions. The requested changes will be made to the draft Order.

Comment # 16: The source waters will be blended with RTP influent prior to treatment at the RTP. Clarified secondary effluent from the RTP will be sampled as AWPF influent. Accordingly, MRWPCA requests the following changes to correctly describe the AWPF influent monitoring location.

IV.1. AWTF Influent Monitoring (Page MRP-13)

b. The influent sampling station is located before ~~water from any of the various sources~~ clarified secondary effluent from the RTP enters the ozone pretreatment system of the AWTF. Influent samples shall be obtained on the same day that stabilized purified ~~RO~~ recycled water samples are obtained...

Response # 16: Water Board and DDW staff have no objections to the proposed changes, except for the terminology change (see response to comment #2 above). The proposed changes to the draft Order will be made with the exception of the proposed insertion of the term “Purified.”

Comment # 17: The Draft Order establishes several new monitoring locations and significantly expands the frequency and list of monitored constituents for MRWPCA. Considerable investments will be undertaken to obtain/install sampling equipment, collect representative samples, and analyze/report sample results as prescribed by the Draft Order provisions. In

2013, the State Water Resources Control Board adopted a resolution to "identify and implement measures to reduce costs of compliance while maintaining water quality protection and improving regulatory program outcomes" (Resolution No. 2013-0029). In accordance with this resolution, MRWPCA requests review and consolidation of monitoring requirements as MRWPCA's other permits are modified to include the AWPF treatment train and/or changed influent or effluent quality.

Response # 17: Water Board and DDW staff have no objection regarding this proposed change as long as all Title 22 related monitoring requirements for this project are met, and all required reports for this project are submitted. Review and consolidation or monitoring requirements will be evaluated as other permits are modified.

Comment # 18: MRWPCA requests the following changes to the AWPF influent monitoring requirements (Table M-2, Page MRP-14). These constituent concentrations are not required to assess compliance with CCR Title 22 and are not required to evaluate AWPF performance. To demonstrate compliance with the CCR Title 22 requirement for oxidized wastewater (Section 60301.650), MRWPCA proposes to use TSS and either TOC or CBOD5 . If ultraviolet light transmittance (UVT) must be monitored, then MRWPCA requests the type of sample be changed from metered to grab sample as a UVT meter is not included in the project design. The shortened list of influent monitoring requirements is consistent with permits issued recently for other groundwater replenishment subsurface application projects (e.g., Dominguez Gap Barrier Project, Order No. R4-2016-0334).

- Delete Ammonia
- Change BOD_5 to $CBOD_5$ (for consistency with NPDES permit requirements)
- Delete Boron
- Delete Chloride
- Delete Nitrate
- Delete Nitrite
- Delete Total Nitrogen
- Delete Sodium
- Delete Sulfate
- Delete Total coliform
- Delete Total dissolved solids (TDS)
- Delete Total Kjeldahl nitrogen (TKN)
- Delete Ultraviolet light transmittance (UVT)
- Change the TOG sample type from 24-hour composite to grab (if demonstrate grab sampling is representative)
- Allow use of Non-Purgeable Organic Carbon (NPOC) for TOG measurement and reporting (based on comparison monitoring currently underway by MRWPCA)

Response # 18: Water Board staff notes that the Dominguez Gap Barrier Project has been in operation since 2003 and has an established data-driven track record. The Barrier project is composed of 94 injection wells and 257 observation wells, substantially larger than the Pure Water project, and the monitoring program for that project has been revised multiple times, after data was acquired and the project's track record established. Accordingly, we agree to change the UVT type of sample from metered to grab, to change the BOD_5 requirement to $CBOD_5$, to change the TOC sample type from 24-hour composite to grab (if MRWPCA demonstrates grab sampling is representative), and to allow use of Non-Purgeable Organic Carbon (NPOC) for TOC measurement and reporting (based on comparison monitoring currently). The request to shorten the list of influent monitoring requirements is denied at this time. However, the draft order allows he Executive Officer to change the influent monitoring requirements after a good plant-performance data set is acquired.

Comment # 19: MRWPCA notes that all other approved subsurface application groundwater replenishment projects in California are required to monitor less frequently for inorganics with primary MCLs, constituents/parameters with secondary MCLs, radioactivity, regulated organic chemicals, disinfection byproducts, and constituents with notification levels. The monthly monitoring requirements specified in the Draft Order will add significant costs to the project. For constituents without recycled water discharge limits, MRWPCA will propose a reduction in monitored constituents and frequencies after the first full year of data collection. The following language is suggested to outline a process for compiling/reviewing data, proposing new monitoring frequencies, and receiving approval from DDW and the Central Coast Water Board.

IV.2. Recycled Water (AWTF) Discharge Limit Monitoring (Page MRP-14)

a. Advanced treated recycled water monitoring is required to:

i. Determine compliance with the Permit conditions;

ii. Identify operational problems and aid in improving facility performance; and,

iii. Provide information on recycled water characteristics and flows for use in interpreting water quality and biological data.

Samples shall be collected downstream of the last chemical injection point, with the exception of constituents specified in Tables M-12 and M- 13. Should the need for a change in the sampling station(s) arise in the future, the MRWPCA shall seek approval of the proposed station by the Executive Officer prior to use.

Table M-3 shall constitute the recycled water monitoring program. <u>After the first full year of monitoring, MRWPCA shall compile results and submit a revised monitoring program to DDW and Central Coast Water Board for review and approval.</u>

Response # 19: Water Board and DDW staff have no objections to the proposed changes.

Comment # 20: MRWPCA requests the following changes to the recycled water monitoring requirements (Tables M-3 and M-4, Pages MRP-15 to MRP-16). Chlorine residual is not utilized for pathogen removal credit. However, if chlorine monitoring is required, MRWPCA suggests changing the constituent to total chlorine instead of free chlorine, as the chlorine species will be present as chloramines. UV dose and UVT will be monitored and reported based on requirements specified in the approved Operation Optimization Plan (OOP). MRWPCA is switching to a new analytical method for total nitrogen (ASTM D8083, pending publication) that does not require use of the TKN digestion process. As a result, TKN monitoring will become unnecessary and the results will no longer be relevant for total nitrogen calculations. The list of regulated organic chemicals contain volatile compounds that are better represented by collecting grab samples rather than 24-hour composite samples. Disinfection byproducts (DBP) will not be representative of the recycled water discharge concentrations if collected in a 24-hour composite sampler because DBP concentrations will increase as a result of longer chlorine contact times in the sampler. As allowed by CCR Title 22 Section 64432(a)(2), Chromium VI monitoring is not required if Total Chromium is monitored and the detection limit for purposes of reporting (DLR) is less than 0.01 mg/L.

- Delete free chlorine residual (or change to total chlorine residual)
- Delete UV dose
- Delete UVT
- Delete TKN
- Change the total nitrogen sample type from 24-hour composite to grab
- Change the nitrate sample type from 24-hour composite to grab
- Change the regulated organic chemical sample type from 24-hour composite to grab
- Change the disinfection byproduct sample type from 24-hour composite to grab
- Delete Chromium VI (Table M-4)

- Change the TOC sample type from 24-hour composite to grab (if demonstrate grab sampling is representative)
- Allow use of Non-Purgeable Organic Carbon (NPOC) for TOC measurement and reporting (based on comparison monitoring currently underway by MRWPCA)

Response # 20: Water Board and DDW staff agree with the proposed change from free chlorine to total chlorine. Water Board and DDW staff agree with the proposed change to a new analytical method for total nitrogen once the new method is approved by ELAP. All analytical data must be produced at an ELAP-accredited lab. Water Board and DDW staff agree with the proposed sampling method changes from 24- hour composite to grab. Water Board and DDW staff do not agree with the proposed changes which would delete UV dose and UVT. Additionally, we do not accept the proposal to use NPOC in lieu of TOC measurement and reporting. The appropriate revisions will be made to the draft Order.

Comment # 21: Chloramine removal has had inconsistent results a surrogate for UV dose when hydroxyl radicals are present, such as in the AWPF UV/AOP system. MRWPCA requests the following changes for AOP reporting. Until the industry has more clearly demonstrated the benefit of chloramine removal through UV/AOP, the UV dose at the AWPF will be calculated from the flowrate, UV intensity, and UVT.

IV.2.d. Evaluation of Pathogenic Microorganism Removal (Page MRP-22)

ii. Advanced Oxidation Process (AOP) - (UV and hydrogen peroxide at the AWTF): For each day of operation, MRWPCA shall report the calculated daily peroxide dose (based on the peroxide pump speed and bulk feed concentration), ~~percent reduction based on daily average of chloramine (via total residual chlorine) measured upstream and downstream of AOP~~, and the applied UV power shall be reported. For UV, MRWPCA shall report the UV system dose (expressed as greater than a certain threshold such as 300 milli-joules/cm2), UV transmittance (daily minimum, maximum, and average), UV intensity for each reactor (daily minimum, maximum, and average) and the total UV power applied; and

Response # 21: Water Board and DDW staff have no objections to the proposed revisions. The requested changes will be made to the draft Order.

Comment # 22: The groundwater monitoring program prescribed by the Draft Order significantly expands the approach detailed in the approved Engineering Report. MRWPCA estimates that implementing the Draft Order groundwater monitoring requirements will cost $110,000 more each year than originally budgeted for the Engineering Report program. MRWPCA requests a process to modify groundwater monitoring parameters and frequencies after the first full year of injection well operation. The following changes are suggested to outline a process for compiling/reviewing data, proposing a new monitoring program, and receiving approval from DDW and the Central Coast Water Board.

IV.4.a. Groundwater Monitoring (Page MRP-24)

The MRWPCA shall implement the following groundwater monitoring program as described in Tables M-14, M-15, and M-16 when the injection wells begin operation. Some constituents may be eligible for reduced monitoring due to the consistent historic lack of detection and/or other hydrogeologic basis, upon approval by the Executive Officer. After the first full year of monitoring, MRWPCA shall compile results and submit a revised monitoring program to DDW and Central Coast Water Board for review and approval.

Response # 22: Priority Toxic Pollutants (40 CFR 131.38) are required to be monitored quarterly for a minimum of two years before MRWPCA can request a reduction in monitoring to

once a year with DDW approval based on DDW's review of the most recent two years of results of monitoring (Title 22 section 60320.220(a),(c)). MRWPCA must collect two samples prior to GRRP operation and at least one sample each quarter after operation begins to monitoring for total nitrogen, nitrate, nitrite, amd contaminants in table 64449-A and 64449-B at wells meeting Title 22 section 60320.226(a)(1) and 60320.226(a)(2) that receive recharge water within one year's travel time to the wells. Title 22 section 60320.226(e) allows for the reduction of monitoring if approved by DDW. Approval will be based upon review of the most recent two years of monitoring results. Also, please see the response to comment #7 above. Therefore the requested changes in the groundwater monitoring program are denied and MRWPCA will need to revise the Title 22 Engineering Report to reflect the groundwater monitoring required in the draft Order.

Comment # 23: The following monitoring requirements are already specified in Table M-3 and can be deleted as a separate section of the MRP. Section 60320.201 does not include a requirement for collecting the first effluent sample within the first five days of operation.

VI. Other Monitoring Requirements (Page MRP-32)
"Section 60320.201. Advanced Treatment Criteria"

~~(i) Each month a project sponsor shall collect samples (grab or composite) representative of the effluent of the ad1Janoed treatment process and have the samples analyzed for contaminants having MCLs and notification levels (NLs). After 12 consecutive months with no results exceeding an MCL or NL, a project sponsor may apply for a reduced monitoring frequency. The reduced monitoring frequency shall be no less than quarterly. Monitoring conducted pursuant to this subsection may be used in lieu of the monitoring (for the same contaminants) required pursuant to sections 60320.212 and 60320.220. The first sample of the effluent needs to be collected in the first five days of operation of the AWTF.~~

Response # 23: Water Board and DDW staff have no objections to the proposed revisions. The requested changes will be made in the draft Order.

NON-SUBSTANTIVE COMMENTS

NS Comment #24:

111.21. Primary Project Components (Page 3)
1. The following source waters will be treated to secondary standards at the RTP:
• Sewage from the MRWPCA member entities
VIII.A. Regional Water Quality Control Plan (Basin Plan) (Page 8)
43. Four wells were used to establish existing groundwater water quality and assimilative capacity of the aquifer and sub-aquifers. The most recent five years of data (2011-2016) were analyzed for each well <u>and the data are presented in Table 2</u>. Two of the wells draw their water from both the Paso Robles and Santa Margarita aquifers (Ord Grove No. 2 and Paralta). One well draws water exclusively from the Paso Robles aquifer (City of Seaside No. 4) and one well draws exclusively from the Santa Margarita aquifer (ASR-1).

Response # 24: Water Board and DDW staff have no objections to the proposed revisions. The requested change will be made to the draft Order.

NS Comment #25: Table 2 - Existing Groundwater Quality in the Seaside Basin (Page 9)
Footnote Change

*Concentrations are in µg/L except <u>chloride,</u> nitrate, sodium, sulfate, TDS,

and TOC, which are mg/L

Response # 25: Water Board and DDW staff have no objections to the proposed revisions. The requested change will be made to the draft Order.

NS Comment #26: V. Provisions (Page 18)

11. The DDW conditions that are not explicitly included in this Order are incorporated herein by this reference, and are enforceable requirements of this Order. Any violation of a term in this Order that is identical to a DDW ~~C~~condition will constitute a single violation.

Response # 26: Water Board and DDW staff have no objections to the proposed revisions. The requested change will be made to the draft Order.

NS Comment #27: VI. State Water Resources Control Board Division of Drinking Water (DDW) Requirements (Page 20)

Redundant. Delete or merge with requirement in VI.2. on Page 18.

~~17. MRWPCA must submit for approval a draft AOP commissioning and testing protocol, to demonstrate the AOP will provide no less than 0.5 log (69 percent) reduction of 1,4 dioxane.~~

Response # 27: DDW does not accept this proposed change. This requirement is necessary to demonstrate compliance with Title 22 section 60320.201(d).

NS Comment #28: VI. State Water Resources Control Board Division of Drinking Water (DDW) Requirements (Page 20)

Merge requirement VI.19 with requirement VI.4: As required by Title 22 section 60320.4Z22. (Operation Optimization Plan), prior to operation, MRWPCA shall submit an Operation Optimization Plan for review and approval to DDW and the Central Coast Water Board. At a minimum, the Operation Optimization Plan shall identify and describe the operations, maintenance, analytical methods, monitoring (grab and online) necessary for the Project to meet the requirements and the reporting of monitoring results. MRWPCA must submit a draft of the Operation Optimization Plan prior to the construction and commissioning. This draft Operation Optimization Plan can be amended and finalized after the completion of full-scale commissioning and startup testing. A final Operation Optimization Plan must be submitted to DDW 90 days after completion of startup operations.

Response # 28: In the proposed text, the commenter is referring to VI.18 instead of VI.19. Water Board and DDW staff have no objections to combining VI.4 and VI.18 and the correction on Title 22 section reference to “60320.222.” The requested change will be made to the draft Order.

NS Comment #29: Figure 1 - Location of MRWPCA's RTP, AWTF, and Injection Wells (Page 23)

Change "RTF" to "RTP"

Response # 29: The requested change will be made to the draft Order.

NS Comment #30: 111.1. Monthly Reports (Page MRP-9)

g. MRWPCA shall monitor the RO effluent for TOC via grab sample weekly and report in the monthly report. MRWPCA shall also monitor RO influent and effluent for TOC online and report monthly. The daily average and maximum TOC reading and the percent of time that the TOC is greater than 0.5 mg/L must be reported.

Response # 30: The requested change will be made to the draft Order.

NS Comment #31: 111.2.a. Quarterly Reports (Page MRP-10)

vii. A summary of operational concerns describing changes in reporting conditions, including

influent, MF filtrate, RO permeate ~~recycled water~~, UV/AOP water, and groundwater monitoring results, since the last report.
Response # 31: The requested change will be made to the draft Order.

NS Comment #32: 111.3.c. Annual Reports (Page MRP-11)

ii. a summary of any corrective actions and/or suspensions of surface subsurface application of recycled water resulting from a violation; and

Response # 32: The requested change will be made to the draft Order.

NS Comment #33: IV.2.d. Evaluation of Pathogenic Microorganism Removal (Page MRP-22)

i. For the purpose of demonstrating that the necessary log reductions are achieved at the AWTF, MRWPCA shall report the daily average and maximum turbidity, percent of time more than 5 nephelometric turbidity units (NTU), and daily coliform results ~~associated~~ measured in the •.~~with the WRP(s)~~ purified recycled water (as specified in Table M-3);

Response # 33: Water Board and DDW staff have no objections to the proposed changes, except for the terminology change (see response to comment #2 above). The term “purified” will not be included in the revision.

NS Comment #34: IV.4. Groundwater Monitoring (Page MRP-22)

Cite as Title 22 requirement. Delete unnecessary, incomplete language.

a. As required by Title 22, Section 60320.226, ~~P~~prior to operating any injection well, a-MRWPCA shall site and construct at least two monitoring wells downgradient of the injection well§, such that:

(1) at least one monitoring well is located;

(A) no less than two weeks but no more than six months of travel time from ~~through the saturated zone affected by~~ the injection wells, and

(B) at least 30 days upgradient of the nearest drinking water well;

(2) in addition to the well(s) in paragraph (1) and after consultation with DDW, at least one monitoring well is located between the injection wells and the nearest downgradient drinking water well; and (3) samples from the monitoring wells in paragraphs (1) and (2) can be;

(A) obtained independently from each aquifer, initially receiving the water used as a source of drinking water supply, that will receive the injection wells recharge water, and

(B) validated as receiving recharge water from the injection wells.

(b) In addition to the monitoring required pursuant to section 60320.1i20, from each monitoring 'Nell in subsection (a)(1), and each monitoring well in subsection (a)(2) that has recharge water located within one year travel time of the well(s), a project

Response # 34: Water Board and DDW staff have no objections to the proposed changes. The requested changes will be made to the draft Order.

NS Comment #35: IV.4. Groundwater Monitoring (Page MRP-23)

• Siting an additional downgradient well between the Injection Facilities and the nearest downgradient potable water supply (in addition to the downgradient monitoring well used to demonstrate retention time, as described in the bullet point above).

Response # 35: Water Board and DDW staff have no objections to the proposed change. The requested change will be made to the draft Order.

Letter #2 from California American Water (*dated January 20, 2017)*

Comment #1: The Final WDRs should clearly specify the required treatment processes. Condition IV.2 of the Draft Order prohibits "bypass, discharge, or delivery to the use area of inadequately treated recycled water." California American Water notes that the Draft Order does not specify what is "adequate treatment." In Order RB-2004-002, the Division of Drinking Water (then the Department of Health Services) specified in Condition 3 of the DHS findings the treatment processes that must be followed for the Orange County Water District Groundwater Replenishment Project. To ensure no ambiguity in the treatment processes that will protect the Seaside Basin, California American Water suggests that Condition IV.2 of the Draft Order be revised to mimic DHS Condition 3 of Order RB-2004-002.
Response # 1: Title 22 now specifies in each applicable section what adequate treatment is for that process or constituent. No changes are necessary.

Comment #2: The Final WDRs should require maintaining the industrial pretreatment program. Industrial pretreatment programs are important to protecting the beneficial uses of treated wastewater, whether discharged to the ocean or used as a potable water supply. The Regional Board should include a condition in the Final WDRs requiring MRWPCA to maintain and appropriate industrial pretreatment program.
Response # 2: Industrial pretreatment is an NPDES program requirement and is not addressed by this permit. MWRPCA's NPDES permit does require industrial pretreatment. No changes are necessary.

Comment #3: The Final WDRs should require drinking water methods be used for testing. Condition 11.4. of the Monitoring Program allows MRWPCA to choose between either drinking water laboratory methods or wastewater laboratory methods. Because the Project effluent will be used to augment an important regional drinking water source, California American Water recommends that preference be given to drinking water methods where an appropriate drinking water method exists, rather than giving discretion to choose the test method. This way results from the Project can be compared with results of drinking water tests conducted by water purveyors without concern that the test method may cause variability in the results (i.e., allows an "apples-to-apples" comparison).
Response # 3: Title 22, section 60320.204 describes sample methods allowed. Primary and secondary MCL contaminants must be sampled with drinking water methods. Others must be described in an approved Operation Optimization Plan. No changes are necessary.

Comment #4: The Final WDRs should require water purveyors using the Seaside Basin as a drinking water source to be notified of violations in addition to the Regional Board. Condition V.3. of the Draft Order requires MRWPCA to notify the Regional Board within 24 hours of any violation or adverse conditions that results from using recycled from the Project. California American Water requests that the Final WDRs be modified in two ways. First, the time for notification should be require the MRWPCA to provide notice "as soon as they become aware of the circumstances, but no later than 24 hours." Second, in addition to providing timely notice to the Regional Board, MWRPCA should also notify all water purveyors drawing potable water from the Seaside Basin of the same information provided to the Regional Board immediately following notification to the Regional Board. This will allow water purveyors to take any action they deem appropriate to monitor and protect their potable water supplies.
Response # 4: Water Board and DDW staff have no objections to these proposed changes. The requested changes will be made to the draft Order.

ATTACHMENTS

1. Draft Order No. R3-2017-0003
2. Letter from Monterey Regional Water Pollution Control Agency, dated January 19, 2017
3. Letter from California American Water, dated January 20, 2017

RECOMMENDATION

Adopt Order No. R3-2017-0003 as proposed.

Seaside Basin Watermaster
P.O. Box 51502
Pacific Grove, CA 93950
(831) 641-0113

January 12, 2017

Central Coast Regional Water Quality Control Board
895 Aerovista Place, Suite 101
San Luis Obispo, CA 93401

Subject: Hearing Notice on Draft Waste Discharge Requirements Pure Water Monterey Groundwater Replenishment Project - Order No. R3-2017-0003

Dear Sirs:

The Seaside Basin Watermaster (Watermaster) is the Court-appointed manager of the adjudicated Seaside Groundwater Basin, into which the proposed Project will inject advance treated wastewater for groundwater replenishment.

The Watermaster is the Court-appointed body responsible for ensuring that the Basin is managed in accordance with the requirements set forth in the Seaside Basin Adjudication Order (Superior Court of the State of California in and for the County of Monterey, Case No. M66343). Therefore, it would be both appropriate and important that the Watermaster be informed directly (i.e. by both emails to its Technical Program Manager, and by direct U.S. Postal Service mailings to its administrative office) of the types of reports that the WDR requires be submitted periodically to various State agencies. Prompt and timely receipt of these reports is necessary to keep the Watermaster informed on issues affecting Basin management, water quality, public health issues, and other matters related to the Project.

The Watermaster has reviewed the Draft Waste Discharge Requirements you have prepared for this Project has the following comments and requests:

Comments:

1. In Section V of the Findings, paragraph number 30 states that the storage capacity of the "subbasin" is estimated to be 1,000,000 acre-feet. Our consultants have estimated that the storage capacity of the adjudicated Seaside Basin is approximately 52,000 acre-feet. The storage volume stated in the WDR appears to be significantly overstated.
2. In Section V of the Findings, paragraph number 31states that the Seaside Groundwater Basin Salt and Nutrient Management Plan was submitted to the RWQCB by the Monterey Peninsula Water Management District in 2014, but has still not been adopted by the

RWQCB. Please explain what is preventing adoption of that Plan and what additional information or steps will be needed in order for it to be adopted.

3. Many of the Water Quality Goals listed in Table 1 (page 8) of the WDR are missing from the list of constituents in the Recycled Water Reinjection Discharge Limits in Table 4 (page 15) of the WDR. All of the goals should be included in that table, or required elsewhere in the WDR.

Requests:

1. That the WDR include language stating that all of the reports required under the Monitoring and Reporting Program (in Section I thereof) also be sent to the Watermaster at the same time they are sent to the RWQCB. Sending them directly to the Watermaster, rather than relying on other blanket forms of notification, will ensure that important information contained in those reports is not missed or delayed in receipt, so that the Watermaster can take response actions, if appropriate.
2. That a description of the monitoring program protocols required under Section II.3 of the Monitoring and Reporting Program also be sent to the Watermaster, for our use in preparing various reports and in compiling other information for our Annual Report to the Court.

Thank you for your consideration of our comments and requests. If you have any questions regarding them, please contact our Technical Program Manager, Mr. Robert Jaques, at (831) 375-0517 or by his email at bobj83@comcast.net.

Sincerely,

Robert S. Jaques
Technical Program Manager

4.4 Groundwater Resources

Sections

Figures

Tables

This section analyzes the potential for the construction and operation of the Monterey Peninsula Water Supply Project (MPWSP or proposed project), which includes 10 slant wells at CEMEX, to adversely impact local and regional groundwater resources. Specifically, this analysis focuses on how the proposed subsurface slant wells and aquifer storage and recovery (ASR) system improvements would change the groundwater aquifers adjacent to the coast further inland beneath the Salinas Valley, and would change the groundwater levels, flow direction, and water quality within the Seaside Groundwater Basin. The analysis is based on project-specific investigations of the various project components, the review of hydrogeologic models prepared for this and other projects, maps and hydrogeologic and geotechnical reports from the California Department of Water Resources (DWR), United States Geological Survey (USGS), and the California Geological Survey (CGS), and the general plans for Monterey County and the local cities.

The CPUC received several comments on groundwater resources during the April 2015 Draft EIR review period. Some comments focused on significance thresholds and the characterization of baseline conditions. Comments addressed the use of computer modeling and requested an explanation of modeling methodology, specifically addressing the return water component and evaluating a zero return water scenario, while other comments addressed alternate methods of returning water to the basin. Certain commenters requested consideration of more extensive aquifer testing. Where relevant, the comments are addressed in this Impacts section. Note that some groundwater resource issues relative to water supply, return water, and the Monterey County Agency Act are addressed in Section 2.6, Water Rights.

4.4.1 Setting/Affected Environment

This section describes the setting for groundwater resources. The groundwater resources study area encompasses the northern portion of the Salinas Valley Groundwater Basin (SVGB) and the Seaside Groundwater Basin (SGB), specifically, the areas that could be affected by the installation and operation of the source water intake system and the ASR system (see **Figure 4.4-1**).

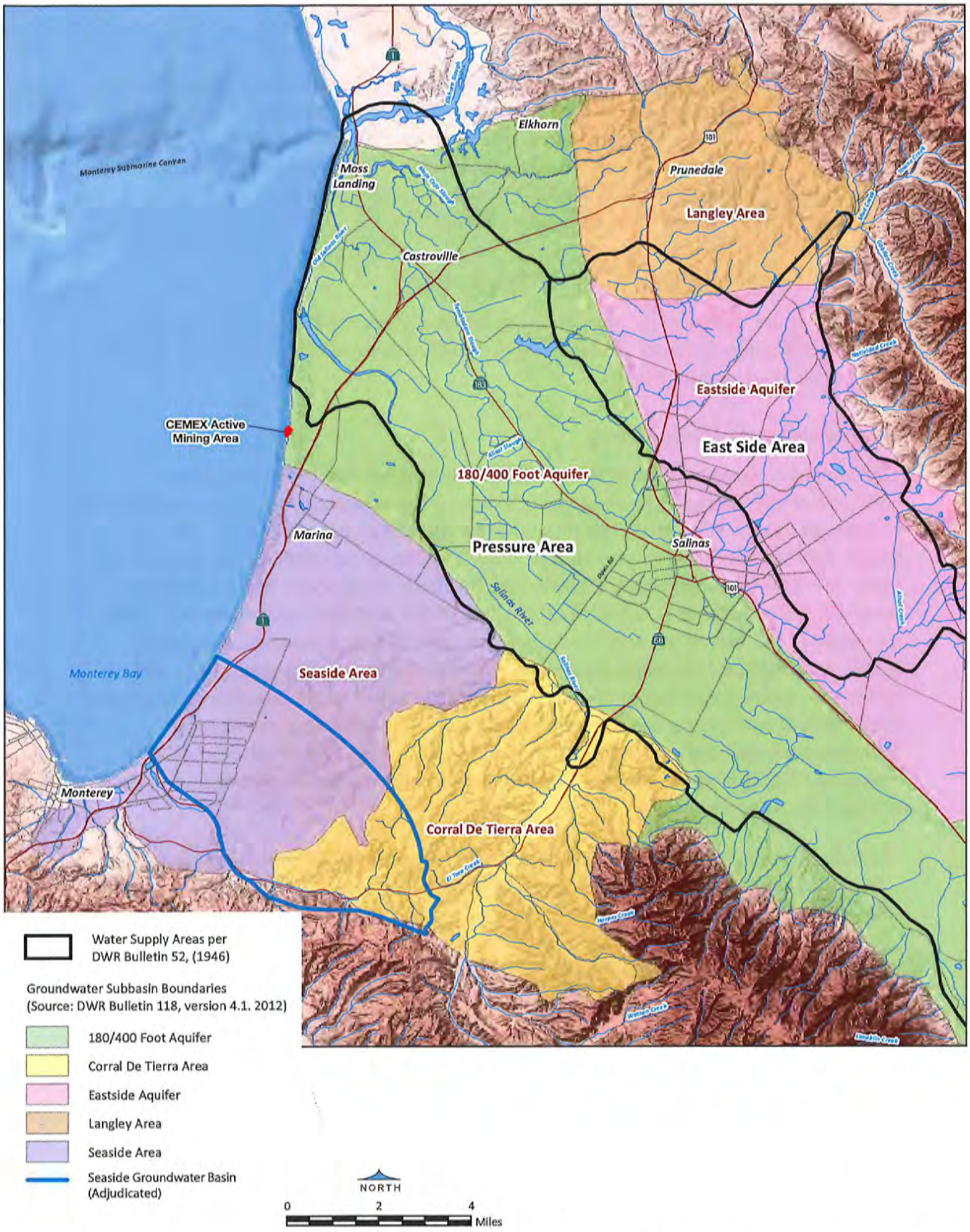
4.4.1.1 Terminology and Concepts

Groundwater is the water beneath the earth's surface, and hydrogeology is the study of how that water interacts with the underlying geologic units of rock and soil. Most groundwater occurs in sand and gravel units that were deposited by water (referred to as alluvium) and later covered by layers of clay, silt, sand, and gravel. Fluvial deposits refer to clay, silt, sand, and gravel that were laid down by rivers and streams as a result of bank erosion, a process in which the materials are transported and redeposited within the river system in the form of bars, points, and floodplains.

Coarse materials such as sand and gravel hold the most groundwater when saturated and are referred to as aquifers. Layers of finer-grained materials such as clay and silt restrict, but do not prevent, the flow of groundwater and are called aquitards. Aquifers can extend over many square miles and are called basins.

A groundwater basin is an aquifer or a stacked series of aquifers with reasonably well-defined boundaries in a lateral direction and a definable bottom. California's groundwater basins typically include one aquifer or a series of aquifers with intermingled aquitards. In general, groundwater basin boundaries are determined by physical attributes such as the lateral extent of aquifers, obstacles to flow such as bedrock, and groundwater divides. A divide is defined by a line on either side of which groundwater moves in opposite directions. A groundwater divide, similar to a surface water divide, separates distinct groundwater flow regions within an aquifer.

Depending on the type of geologic unit overlying a water-bearing zone, groundwater can be unconfined or confined. The water table in an unconfined aquifer does not have an impermeable aquitard lying over it, and thus pressure is exerted by the overlying water and the atmosphere. Groundwater under these unconfined conditions flows from areas of high groundwater elevation to areas of low groundwater elevation. Under confined conditions, vertical flow from or to the



SOURCE: Geoscience, 2013b

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Figure 4.4-1

Groundwater Basins and Areas in the Western Salinas Valley Groundwater Basin

aquifer is restricted by overlying aquitards. Groundwater under confined conditions flows from areas of high pressure to areas of low pressure and is influenced by the pressure, weight, and confining nature of the overlying sediments; water entering the aquifers from areas of recharge; and water leaving the aquifers through natural discharge or through the pumping of supply wells. When a well penetrating a confined aquifer is pumped, internal aquifer pressure is reduced, which can in turn increase the flow of water towards the well.

4.4.1.2 Local and Regional Hydrogeology

This chapter's description of the groundwater system underlying the project area reflects the scientific community's current understanding of the subsurface geologic units and the depth and extent of the aquifers and aquitards.

Hydrogeology Working Group

This comprehensive description of the groundwater system was developed through the collaborative efforts of recognized experts in Monterey Bay coastal geology and groundwater, as well as stakeholders in the groundwater use and management process who are familiar with this region. This body of expertise is the Hydrogeology Working Group (HWG), with members that represent the Salinas Valley Water Coalition, the Monterey County Farm Bureau, California American Water Company (CalAm); the CPUC/MBNMS CEQA/NEPA team members attend the meetings.[1] To identify the area's hydrology, the HWG relied on previous groundwater studies, published geologic maps, observation of well performance, water quality data, and findings from site-specific subsurface investigations and modeling. The data review and eventual formulation of an evidence- and science-based understanding of the local and regional hydrogeology required several years. So, to enable analysis of the impacts of the proposed project, this EIR/EIS presents the best information available for describing the hydrogeologic setting of the study area.

The following sections describe the groundwater basins, the aquifers and aquitard contained within those basins, and the groundwater system underlying the seawater intake system and the ASR system.

Salinas Valley Groundwater Basin

The Salinas Valley lies within the southern Coast Ranges, between the San Joaquin Valley and the Pacific Ocean, and is drained by the Salinas River. Extending approximately 150 miles from the La Panza Range north-northwest to its mouth at Monterey Bay, the valley is bound on the west by the Santa Lucia Range and Sierra de Salinas, and on the east by the Gabilan and Diablo

[1] The HWG developed a collaborative plan of investigation to assess the hydrogeologic conditions in the project area. The draft work plan provided a phased approach to progressively investigate the hydrogeology and the potential effects of the project on aquifers from the use of subsurface slant wells for obtaining feedwater supply. The final work plan incorporated comments and recommendations by members of the HWG, and covered the investigative steps needed to evaluate the project impacts (Geoscience, 2013c). The final work plan became the hydrogeology investigation roadmap and resulted in the implementation of the fieldwork and modeling efforts described in the approach to analysis, Section 4.4.3.2.

Ranges. The 560 square mile Salinas Valley Groundwater Basin (SVGB)[2] underlies the Salinas Valley (MCWRA, 2006). The Monterey Bay acts as the northwestern boundary of the SVGB (Brown and Caldwell, 2015). The SVGB contains 10,000 to 15,000-foot deep deposits of marine and terrestrial clay, sand, silt, and gravel as old as 65 million years (DWR, 2004a). The proposed project components associated with groundwater extraction would be located primarily within the 84,400 acre, 132 square mile subarea of the SVGB known as the 180/400 Foot Aquifer Subbasin (DWR, 2004a).[3] The 180/400 Foot Aquifer Subbasin boundaries generally coincide with those of the SVGB Pressure Area (or Subbasin) traditionally recognized by the Monterey County Water Resources Agency (MCWRA) and California Department of Water Resources. The hydrologic boundaries of the Pressure Area are the Elkhorn Slough to the north, the East Side Area to the east, the Seaside Basin to the south, and the Pacific Ocean to the west. The precise locations of these boundaries fluctuate depending on seasonal variations, longer-term climate changes and local groundwater pumping. The boundaries and names of the basins have been updated to reflect the currently available information, as shown on **Figure 4.4-1**. This figure illustrates the updated basin boundaries in the western part of the SVGB, which were used in the modeling for the proposed project (HydroFocus, 2016). In this EIR/EIS, the primary area of study within the SVGB is within the Pressure Area.

Pressure Area Aquifers and Aquitards

Water-bearing geologic formations present within the Pressure Area include: Quaternary Alluvium (including the Dune Sands and Terrace Deposits), Aromas Sand, Paso Robles Formation, Purisima Formation, Santa Margarita Sandstone, and Monterey Formation. Not all geologic units are present in all areas. Section 4.2, Geology, Soils and Seismicity, provides a detailed description of these geologic units and **Table 4.4-1**, below, summarizes the characteristics as they relate to groundwater storage.

The Pressure Area is made up of distinct aquifers and aquitards that in some cases extend across several underlying geologic formations and collectively form the groundwater system within the subbasin. **Figure 4.4-2**, a north-to-south graphic representation of the hydrogeologic setting, shows the spatial relationships of the aquifers along the coast from Moss Landing to south of the CEMEX site. As shown, the Pressure Area consists of a series of aquifers at varying depths, which in some locations are separated by laterally extensive aquitards. The Pressure Area includes three prominent water supply aquifers and two, less notable, shallower aquifers. The primary aquifers, named for the average depth at which they occur, are the 180-Foot Aquifer, the 400-Foot Aquifer, and the 900-Foot (Deep) Aquifer, (Kennedy/Jenks, 2004; Geoscience, 2008). The primary aquifers and aquitards in the Pressure Area are discussed in detail below.

2 The Salinas Valley Groundwater Basin is also referred to as the Salinas River Groundwater Basin.
3 The 180/400-Foot Aquifer subbasin includes three water bearing units, the 180-Foot, the 400-Foot, and the 900-Foot Aquifers, named for the average depth of each aquifer (USGS, 2011).

TABLE 4.4-1
SUMMARIZED CHARACTERISTICS OF WATER BEARING GEOLOGIC UNITS

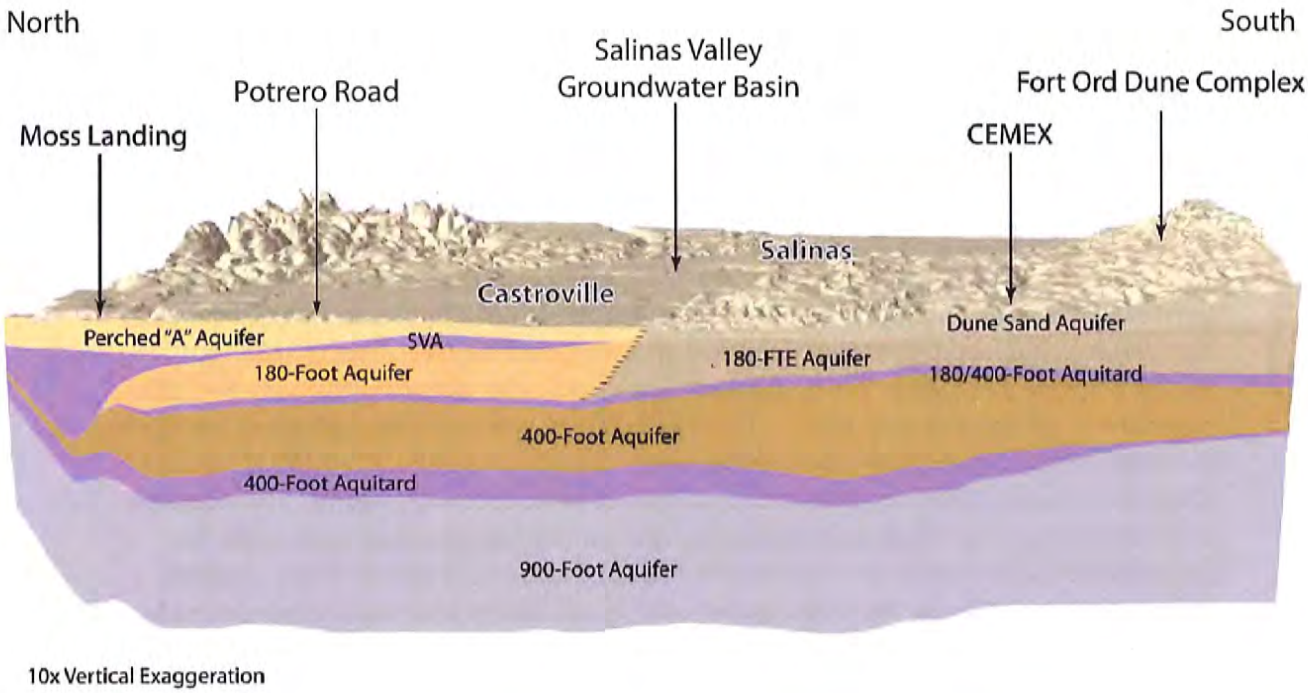
Geologic Unit (Listed youngest to oldest)	Geologic and Groundwater Storage Characteristics
Quaternary Alluvium	The Younger and Older Dune Sands. Younger, sparsely vegetated, active dunes are present along the coastline. Older dune deposits with more established vegetation are present inland. Shallow groundwater is not expected within the elevated dune deposits, except in localized low-lying areas along the coastline.
Terrace Deposits	Former alluvial fan and river floodplain deposits — which may also include marine terrace deposits — that generally consist of sand with some gravels. Terrace deposits at the CEMEX mining facility range from 150 to 163 feet in thickness.
Aromas Sand	Both older river deposits and younger windblown deposits of unconsolidated, brown to red sands with interbeds of clay and poorly sorted gravels.
Paso Robles Formation	Series of fine-grained, oxidized sand and silt beds that contain gravel beds interbedded with some calcareous beds. The formation is inter-fingered with the lower portion of the Aromas Sand and the upper portion of the Purisima Formation. The Paso Robles Formation is present at depths ranging from less than 100 feet to 600 feet in the northern portion of the project area.
Purisima Formation	Layered sand, silt, clay, shale, and some gravel deposited in near-shore and far-shore marine environments. The basal, or lowermost, unit of the Purisima Formation consists of relatively impermeable clay and shale.
Santa Margarita Formation	Marine, coarse-grained sandstone that overlies the Monterey Formation. Relatively small pieces of this unit are present beneath the project area in the Seaside vicinity at depths of about 800 feet deep just north of the Ord Terrace Fault and about 500 feet below the ground surface in between the Ord Terrace and Seaside Faults.
Monterey Formation	Marine sedimentary unit generally consisting of siliceous and diatomaceous interbedded layers of mudstone, siltstone, sandstone, and claystone. Seams of the expandable clay bentonite are also present.

SOURCE: Geoscience, 2016b

Dune Sand Deposits and the Dune Sand Aquifer

Shallow groundwater is present in the Pressure Area and occurs in saturated sand dune deposits above low-permeability clay units such as the Salinas Valley Aquitard where present, or directly above the 180-Foot Aquifer or 180-FTE Aquifer. The shallow groundwater is in the coastal Dune Sand units or in scattered, thin, discontinuous sandy layers both at the coast and inland. Shallow groundwater is not expected to occur within much of the upper, younger Holocene-age[4] Dune Sand deposits, except in localized low-lying areas along the coastline. There is groundwater within the underlying Pleistocene-age[5] Older Dune Sand, which extends offshore beneath the ocean and up to 4 miles inland. The Older Dune Sand, referred to as the Dune Sand Aquifer, extends to 85 to 95 feet below the ground surface beneath the CEMEX site and is about 60 feet thick at the locations of the proposed slant wells. The shallow aquifer underlying the Moss Landing Area is referred to as the Perched A Aquifer and differs from the Dune Sand Aquifer in that it is underlain by a defined layer of less permeable, fine-grained sediments known as the Salinas Valley Aquitard. Water quality of the Perched A Aquifer and Dune Sand Aquifer is directly influenced and controlled by seawater. Because of the aquifer's proximity to the ocean,

4 Holocene time is from the present to 11,000 years ago.
5 Pleistocene time was from 11,000 to 1.6 million years ago.



SOURCE: Adapted from HydroMetric, 2009a

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Figure 4.4-2

Conceptual Model of Coastal Aquifers

most of the water in the Dune Sand Aquifer has been intruded by seawater and is considered saline to brackish (Kennedy/Jenks, 2004).[6] This influence decreases inland where the infiltration of precipitation and applied agricultural water has more of an influence. **Figure 4.4-3** presents a west to east geologic cross section that illustrates the relationship of the aquifers and geologic units from the CEMEX area to east of Highway 1 and Del Monte Boulevard. The upper portions of the proposed slant wells at the CEMEX site would have well screens installed across them, and would draw water from these deposits.

Salinas Valley Aquitard

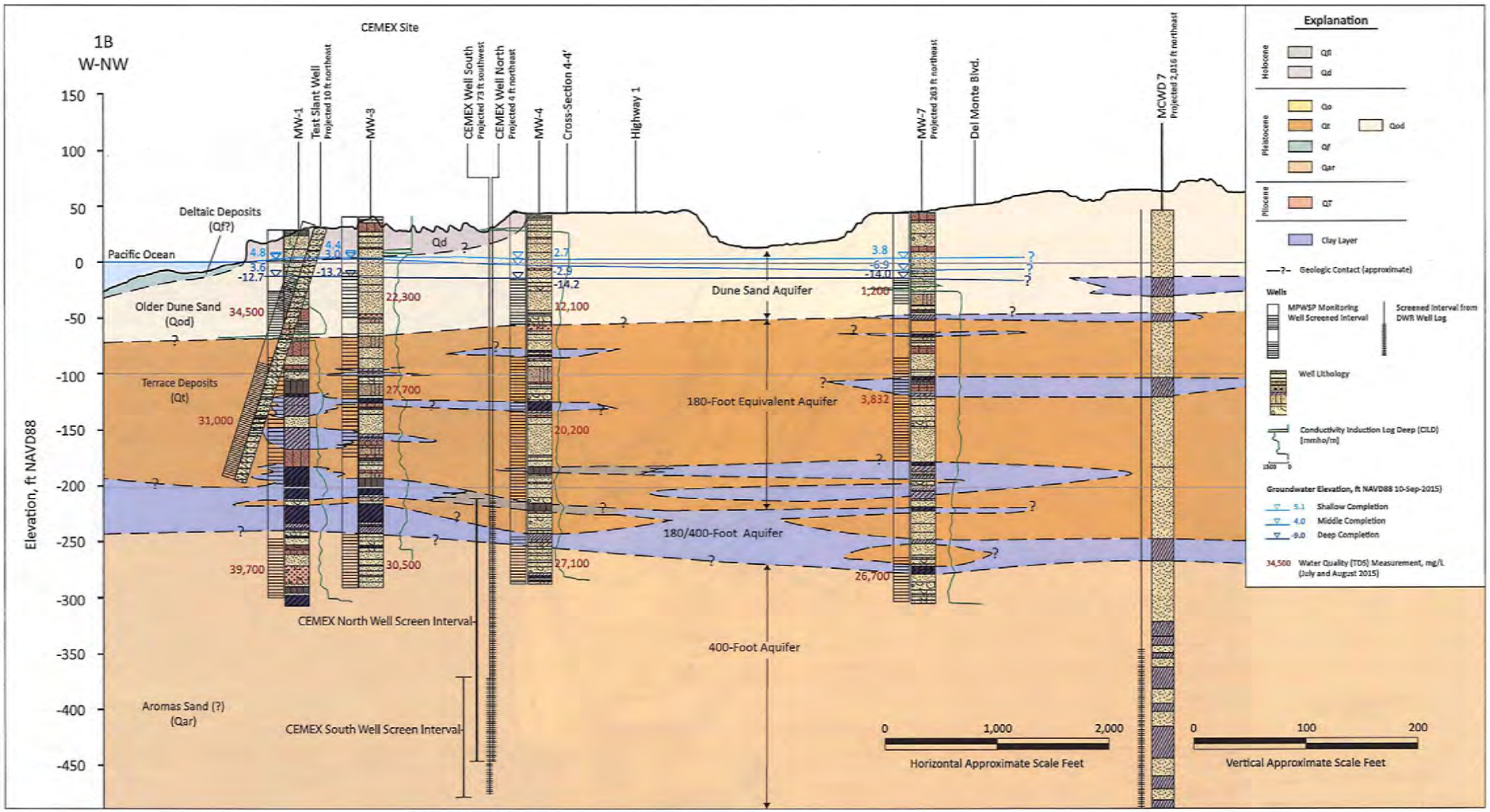
The Salinas Valley Aquitard is a blue or yellow sandy clay formation up to 100 to 150 feet thick that lies mostly north of and generally parallel to the northwest-flowing Salinas River (MCWRA, 2006; Kennedy/Jenks, 2004; Durbin et al., 1978; Geoscience, 2013a). **Figure 4.4-4** shows the extent and thickness of the Salinas Valley Aquitard updated with information provided through the subsurface exploratory program completed at the proposed slant wells site on the CEMEX mining property. The Salinas Valley Aquitard thins and becomes discontinuous away from the centerline of the unit and at the Pacific Ocean, and was not observed in the exploratory borings at the CEMEX site. Consequently, the Dune Sand Aquifer deposits lie directly on top of Terrace Deposits and are thought to be hydraulically connected to the underlying aquifer. The absence or discontinuous nature of the Salinas Valley Aquitard near the proposed slant wells results in unconfined conditions for in the Dune Sand deposits. Elsewhere, the Salinas Valley Aquitard, where present, overlies the 180-Foot Aquifer, creating confined to semi-confined conditions for the underlying aquifers.

180-Foot Aquifer and 180-FTE Aquifer

The location of the 180-Foot Aquifer within the Salinas Valley is variable and extends across more than one stratigraphic or geologic unit. Various interpretations have correlated the aquifer to different combinations of stratigraphic units depending on the investigator, the area under study, and the investigator's interpretation. Consistent with the hydrogeologic understanding developed to support the impact analysis in this EIR/EIS, the 180-Foot Aquifer has been correlated with the lower portions of the Quaternary Alluvium and the upper portions of the Aromas Sand (DWR, 2004a; Geoscience, 2008, 2013a). The lenticular (lens-shaped) sand and gravel bodies that make up the 180-Foot Aquifer indicate that they were originally deposited in a river, where the more laterally extensive units represent river channels that migrated and shifted over time (Kennedy/Jenks, 2004). The 180-Foot Aquifer has been geophysically mapped into the Monterey Bay where the unit is open to the ocean for several miles offshore (Greene, 1970; Eittreim et al., 2000).

The Dune Sand Aquifer lies directly on top of the Terrace Deposits in the area along the coast with no confining layer to separate them. Based on the investigative work to correlate the hydrogeologic units of the Pressure Area, these Terrace Deposits along the coast appear to be at the same depth, and have similar geologic characteristics, as the inland Quaternary Alluvium of

[6] Saline water is water that has the approximate salinity of seawater, while brackish water is more saline than fresh water, but not as saline as seawater.



SOURCE: Geoscience, 2016

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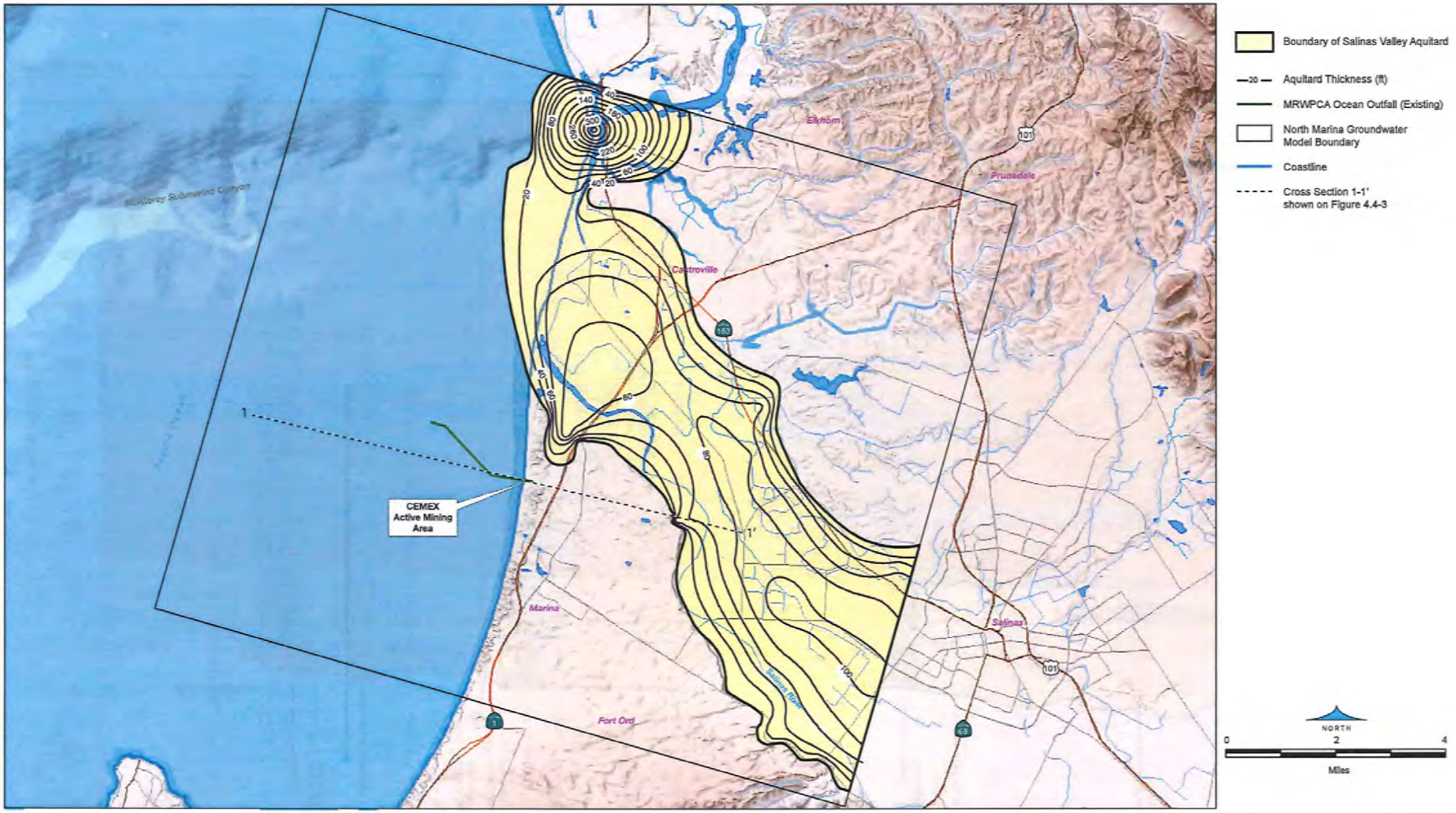
Figure 4.4-3
Project Area Hydrogeologic Cross Section



SOURCE: Geoscience, 2015c

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Figure 4.4-4
Thickness of Salinas Valley Aquitard

the 180-Foot Aquifer in the Salinas Valley (see **Figure 4.4-3**). Even though the Terrace Deposits are older than and lithologically different from the inland deposits of the 180-Foot Aquifer, the units are at the same depth interval, and groundwater likely flows from one unit to the next. **Figure 4.4-2** identifies a "180-FTE Aquifer," which is shorthand for the 180-Foot Equivalent Aquifer; this chapter refers to it by its shorthand form. This unit is composed of terrace deposits that underwent a different depositional process than the inland 180-Foot Aquifer. However, the unit is at the same depth interval and is considered to be connected and equivalent to the 180-Foot Aquifer. Therefore, considering the level to which these units correlate, and to maintain consistency with the nomenclature used in this region, the aquifer interval is referred to as the 180-FTE Aquifer. At the CEMEX site, the Dune Sand Aquifer and the 180-FTE Aquifer are unconfined, as there are no extensive overlying low-permeability clay units.

The Terrace Deposits of the 180-FTE Aquifer are composed of former alluvial fan and river floodplain deposits, possibly with some marine terrace deposits that contain sand, silt, and gravel now buried under the coastal dunes. There is groundwater within the Terrace Deposits, which extend to 240 to 255 feet below the ground surface beneath the CEMEX site, and are about 135 feet thick at the proposed slant well locations, thinning seaward. Based on the recent groundwater testing data discussed in the Groundwater Quality subsection below, the quality of water in the 180-FTE Aquifer is directly influenced by seawater; this influence extends for miles inland, as discussed below in the Seawater Intrusion section. The lower portion of the proposed slant wells at the CEMEX site would have well screens installed across and would draw water from these deposits.

180/400-Foot Aquitard

As shown on **Figures 4.4-2** and **4.4-3**, the 180- and 400-Foot Aquifers are separated by the 180/400-Foot Aquitard (Kennedy/Jenks, 2004). The unit is mostly 50 to 100 feet thick, is rarely as much as 200 to 250 feet thick, and may be absent in some areas. This aquitard is present beneath the CEMEX site at about 220 feet below the ground surface or about 200 feet below mean sea level,) and is 10 to 70 feet thick. The slant wells at the CEMEX site would not penetrate the 180/400-Foot Aquitard.

400-Foot and 900-Foot Aquifers

The underlying 400-Foot Aquifer correlates with the Aromas Sand and the upper Paso Robles Formation (Geoscience, 2008; Yates et al., 2005). At the CEMEX site, the 400-Foot Aquifer is within the Pleistocene Aromas Sand. The unconfined Aromas Sand consists of both older fluvial deposits and younger windblown, or eolian, deposits. The eolian portion of the Aromas Sand crops out just east of the central and southern portion of the project area and extends beneath the project area to offshore on the continental shelf and in the Monterey submarine canyon (CGS, 2002). The unit is up to about 500 feet thick in the northern area and ranges in depth from a few feet near the surface to several hundred feet below the ground surface (HydroMetrics, 2009a). The slant wells at the CEMEX site would not penetrate through the Aromas Sand or deeper geologic units. Based on the recent groundwater testing data, discussed in the Groundwater Quality subsection below, the 400-Foot Aquifer is directly influenced by seawater. This influence extends for miles inland, as discussed below in the Seawater Intrusion subsection.

A blue marine clay separates the 400-Foot Aquifer from the underlying 900-foot (Deep) Aquifer (DWR, 2004a; Geoscience, 2008). The 900-Foot Aquifer correlates with the Paso Robles Formation, the Purisima Formation, and the Santa Margarita Sandstone (Yates et al., 2005). At the CEMEX site, the 900-Foot Aquifer is within the Paso Robles Formation.

East Side Subbasin and Aquifers

The East Side Area is located inland to the east of the Pressure Area and encompasses about 125 square miles along the north side of the Salinas Valley from Gonzales to east of Castroville. The hydrologic boundaries of the East Side Area are generally the Pressure Area to the west, the Gabilan Range along the northeast, and a subarea referred to as the Forebay Subbasin to the south and southeast. With the exception of the relatively impermeable Gabilan Range, the precise locations of the boundaries fluctuate depending on seasonal variations, longer-term climate changes, and local groundwater pumping.

The hydrogeology and groundwater behavior is markedly different in the East Side Area than the Pressure Area due to the different depositional environments and geology (Kennedy/Jenks, 2004). The transition zone between the East Side Area and Pressure Area has been defined based on the transition from predominantly alluvial deposits within the East Side Subbasin to the fluvial deposits that make up the Pressure Area. The clay layers in the Pressure Area pinch out inland into the East Side Area. As noted above, the Salinas Valley Aquitard does not extend much into the East Side Area (Durbin et al., 1978). Water-bearing formations present within the East Side Area include Quaternary Alluvium (both alluvial fan and fluvial deposits), the Aromas Sand, the Paso Robles Formation, and the Purisima Formation (DWR, 2004b).

Seaside Groundwater Basin and Aquifers

The Seaside Groundwater Basin (SGB) encompasses approximately 24 square miles at the southwest corner of the Salinas Valley adjacent to the Pacific Ocean (Yates et al., 2005). The SGB is further subdivided into the Northern and Southern Subbasins by the Laguna Seca Anticline and a segment of the Ord Terrace Fault, which restrict groundwater flow between the subbasins (HydroMetrics 2009a). The two subbasins are further subdivided into coastal and inland subareas with the division boundary just west of General Jim Moore Boulevard.

The SGB consists of three aquifers that correspond with the sedimentary units within the basin: the surficial Aromas Sand (**Table 4.4-1**) (which includes the Dune Sands), a shallow aquifer, and a deep aquifer (HydroMetrics, 2009a). The surficial Aromas Sand Aquifer is unsaturated in many places and, therefore, not directly used to produce potable groundwater as its proximity to the Pacific Ocean makes the water saline to brackish. In 2012, the Sand City desalinization plant produced 208.37 acre-feet (af) of potable water from this saline to brackish unit (CalAm, 2013).

The shallow aquifer is in the unconfined Paso Robles Formation, (**Table 4.4-1**) and generally corresponds with the 400-Foot Aquifer to the north in the SVGB (HydroMetrics, 2009a). The thickness of the unit ranges from about 250 feet just north of the Ord Terrace Fault to over 500 feet in the central and northern portions of the project area. The Aromas Sand, Paso Robles,

and Purisima Formations[7] are not present in the project area south of the Seaside Fault. The deep aquifer is in the underlying confined Santa Margarita Sandstone (see **Table 4.4-1**) and the Purisima Formation, and generally corresponds with the 900-Foot Aquifer in the SVGB. Groundwater resources in the SGB derive from the Paso Robles Formation and Santa Margarita Sandstone; the Santa Margarita Sandstone transitions with the Purisima Formation in the northern area of the SGB. The proposed ASR injection/extraction wells would be located in the Northern Subbasin, close to the boundary with the SVGB, and would be screened in the Santa Margarita Sandstone. The late Miocene[8] to Pliocene Santa Margarita Sandstone has surface outcrops east of the project area (CGS, 2002) and is up to 400 feet thick in places (Durbin, 2007). The proposed ASR injection/extraction wells would be drilled to about 1,000 feet below the ground surface and would be screened within the Santa Margarita Sandstone.

The northern hydrologic boundary of the SGB is a flow divide as groundwater to the north of the divide flows to the SVGB and groundwater to the south flows to the SGB (HydroMetrics, 2013). The northern SGB boundary is a dynamic hydrologic divide, the location of which depends on seasonal rainfall patterns, longer-term climate variations, and pumping rates in the SVGB and the SGB. The boundary passes through the former Fort Ord military base south of the city of Marina. The northern boundaries of the shallow and the deep aquifers in the SGB are at different locations, as discussed in the Groundwater Flow subsection below. The approximate flow divide between the SVGB and the SGB is based on groundwater elevation data derived from sampling conducted in the Paso Robles Formation and generally correlates with the 400-Foot Aquifer in the 180/400-Foot Aquifer Subbasin. The flow divide for the Santa Margarita Sandstone is different and appears to be located farther north due to pumping and aquifer characteristics within the Santa Margarita Sandstone and the Deep Aquifer. The basin boundary in the Dune Sands deposits also differs, and is generally not defined because groundwater resources are typically not obtained from the Dune Sands within the Quaternary Alluvium, and because the Dune Sands are in direct hydraulic communication with the ocean and only saturated along the coastal margin (ICF Jones & Stokes, 2008). The other hydrologic boundaries of the SGB are the Sierra de Salinas /Santa Lucia Range to the south and east and the Pacific Ocean to the west.

4.4.1.3 Groundwater Flow and Occurrence

A groundwater basin is much like a surface water reservoir because when water is removed from storage, the water level drops until the supply is replenished. The replenishment of the aquifer, referred to as recharge, occurs when water enters the aquifer either from the surface or from adjacent aquifers. Along the coast, the ocean can also recharge the aquifers and, in some areas, this causes the salty water from the ocean to mix with the fresh groundwater, causing seawater intrusion. This section summarizes groundwater elevations in the SVGB and SGB and describes the effect of development on groundwater flow patterns. The section also discusses how the groundwater inflow and outflow impact the balance – the amount of water entering a groundwater basin versus the amount of water leaving it – in the SVGB and SGB.

7 Note that the nomenclature of these individual units has evolved over time as subsequent investigators revised their understanding of the stratigraphy of the region. As reflected in this discussion, some investigators have referred to the Paso Robles and Purisima Formations collectively as "continental deposits."

8 Miocene time was from 5.3 to 24 million years ago.

Groundwater Elevations and Flow Directions

Before extensive pumping began in the Salinas Valley, the regional groundwater flow was predominantly toward the coast from inland areas. Since the 1940s, hydrogeologic studies have shown a regional decline in the groundwater table, which has resulted in a sea-to-land groundwater gradient in some coastal areas. The MCWRA conducts a groundwater monitoring program throughout the Salinas Valley that for the fall 2013 monitoring event included 61 wells in the 180-Foot Aquifer and 103 wells in the 400-Foot Aquifer (Brown and Caldwell, 2015). Water-level data collected from wells in the study area indicate that the direction of groundwater flow is from the ocean to inland, as shown on **Figures 4.4-5** and **4.4-6**.

In the Pressure and East Side Areas, groundwater flows northwest from the upper reaches of the SVGB until it reaches the city of Salinas, at which point groundwater in both the 180-Foot and 400-Foot Aquifers flows towards a groundwater depression north of the city (MCWRA, 2014b). Along the coast, flow in both the 180-Foot and 400-Foot Aquifers is towards the east, or landward, and has resulted in seawater intrusion. At the proposed slant well locations, the Dune Sand and 180-FTE Aquifers along the coast are hydraulically connected to the Pacific Ocean, as verified by the saline chemistry of the groundwater samples collected from borings drilled along the coast. The groundwater flow patterns within the Dune Sand Aquifer are not known but, based on the aquifer depth and geologic structure, it is reasonable to expect that they would be tidally controlled, with little to no net horizontal flow in any particular direction.

There is a groundwater divide along the north side of the SGB separating groundwater flow paths between the SGB and the SVGB in both the shallow and deep aquifers, as illustrated on **Figures 4.4-7** and **4.4-8**. The SGB has been divided into four subareas, with the northern two composing the Northern Subbasin and the southern two composing the Southern Subbasin. The proposed ASR injection/extraction wells would be located near the northern border of the Northern Subbasin. There is a groundwater depression in both the shallow and deep aquifers in the Northern Subbasin, resulting in some landward flow along the coast (HydroMetrics, 2015).

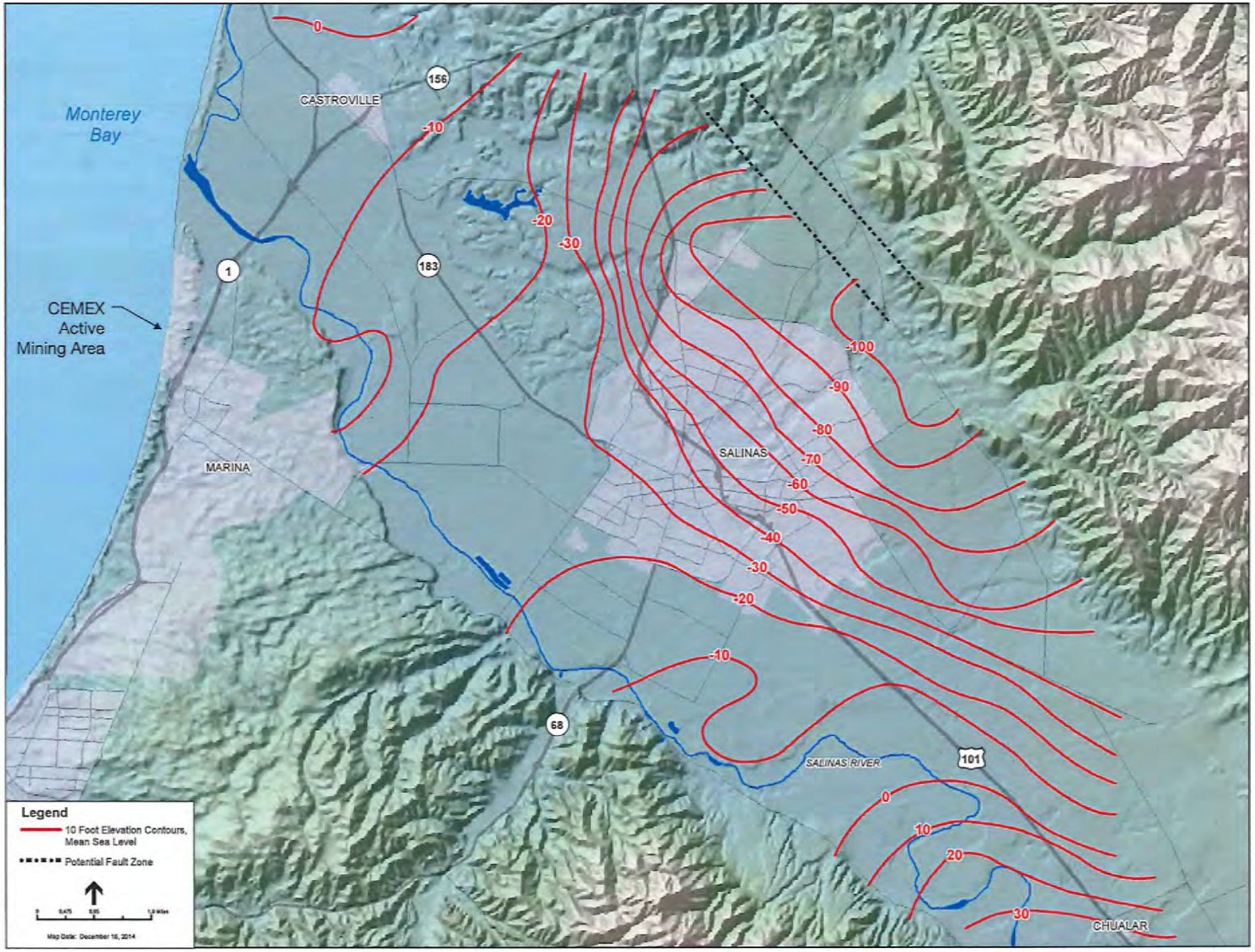
Basin Groundwater Balance

Groundwater balance is a term that describes the amount of water that enters the groundwater system versus the amount of water that leaves. Groundwater enters the system through recharge and can leave the system through groundwater pumping or natural discharge to surface streams. Groundwater recharge occurs from the percolation of rainfall, infiltration from rivers and streams, underflow[9] originating in upper valley areas, and agricultural irrigation and other return flow,[10] including enhanced groundwater recharge.[11] Whether an overlying formation can provide a pathway for recharge depends on numerous factors. For example, recharge from direct

9 Underflow refers to groundwater that is flowing through the subsurface aquifers from higher elevation or higher pressure areas to recharge downgradient water bearing sediments.

10 Return flow is irrigation water that is applied to an area and which is not consumed in evaporation or transpiration and returns to a surface stream or aquifer.

11 Enhanced recharge refers to projects intended to accelerate localized recharge such as infiltration basins. The Castroville Seawater Intrusion Project (CSIP) is an example of a recharge project.

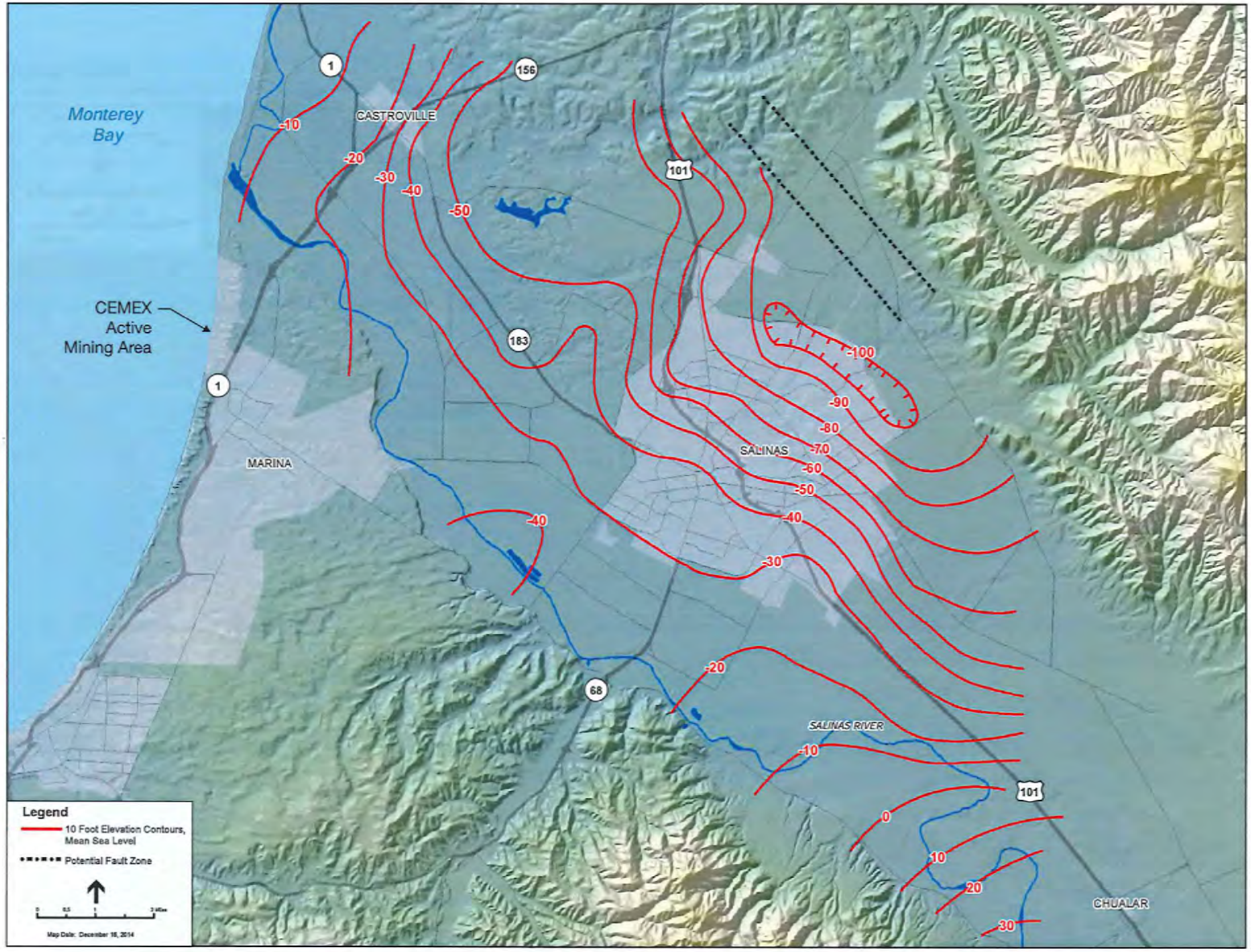


SOURCE: MCRWA, 2014a

205335.01 Monterey Peninsula Water Supply Project

Figure 4.4-5

Salinas Valley Groundwater Basin - Groundwater Elevations in 180-Foot-Aquifer

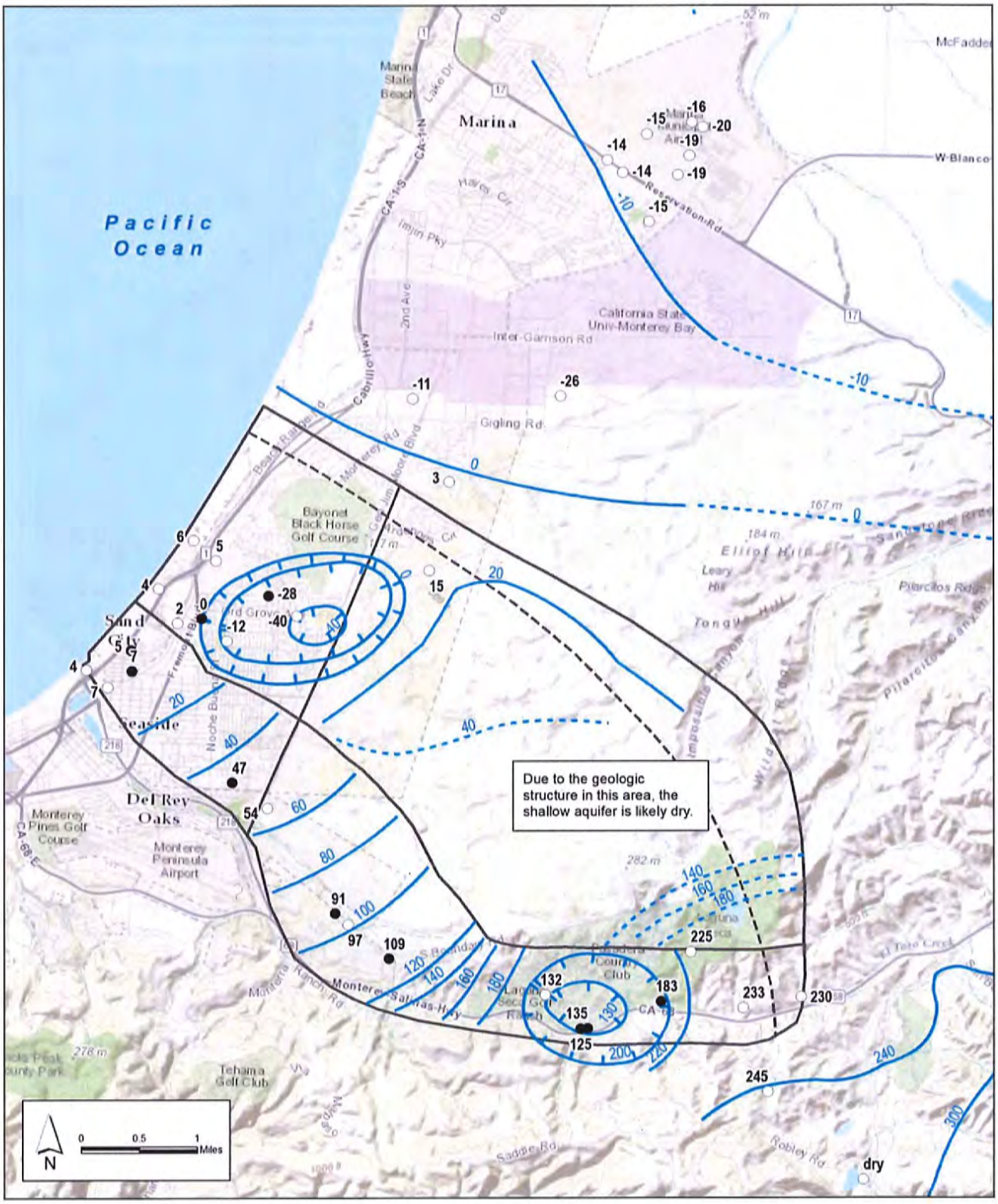


SOURCE: MCRWA, 2014a

205335.01 Monterey Peninsula Water Supply Project

Figure 4.4-6

Salinas Valley Groundwater Basin - Groundwater Elevations in 400-Foot-Aquifer



SOURCE: HydroMetrics, 2015

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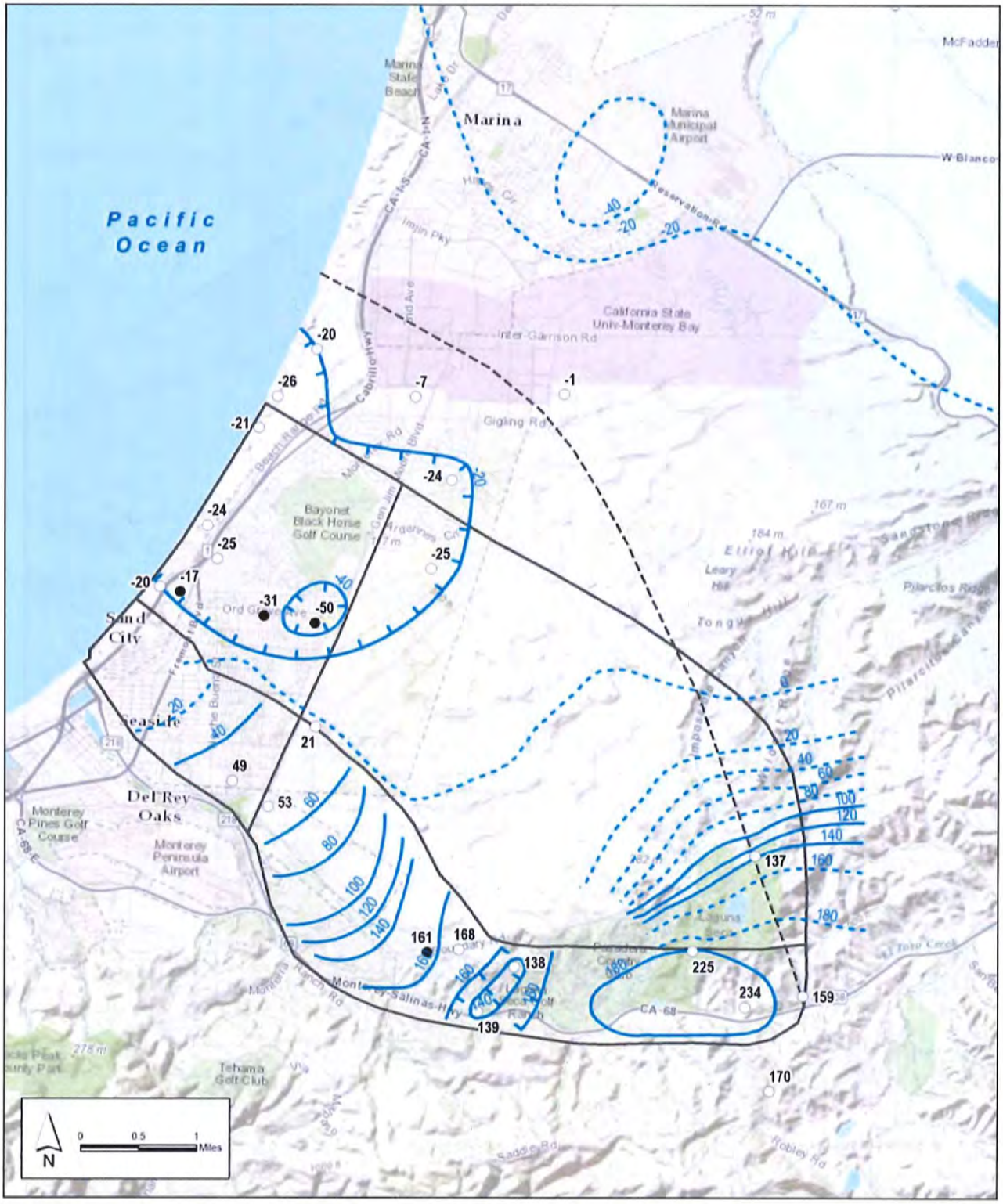
Figure 4.4-7

Groundwater Flow – Seaside Basin Shallow Zone, July/August 2015



SOURCE: HydroMetrics, 2015

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Figure 4.4-8

Groundwater Flow – Seaside Basin Deep Zone, July/August 2015

percolation depends on the absence of near-surface clay layers that can impede the downward flow of water, as is the case in areas where the Salinas Valley Aquitard restricts the downward migration of water (see **Figure 4.4-4**). Similarly, the amount of recharge from underflow depends on the hydrologic interconnections of the water-bearing formations, as well as any groundwater extraction occurring in upgradient areas within the basins. Historically, groundwater withdrawal within both the SVGB and the SGB has outpaced groundwater recharge of fresh water, resulting in overdraft[12] and seawater intrusion conditions (MCWRA, 2014a; Kennedy/Jenks, 2004; HydroMetrics, 2013).

Salinas Valley Groundwater Basin Balance

Inflows and Outflows

A quantitative accounting of the water balance within the SVGB was obtained from the recent study conducted for the MCWRA (Brown and Caldwell, 2015). The study described the current state of the basin as well as the basin's water balance, averaged over the period from 1958 to 1994. The study estimated the overall basin inflow at 504,000 acre-feet per year (afy), of which about 50 percent occurs as stream recharge, 44 percent as deep percolation from agricultural return flows and precipitation, and 6 percent as subsurface inflow from adjacent groundwater basins. Outflow from the basin was estimated at 555,000 afy, of which about 90 percent was identified as groundwater pumping and the remainder as evapotranspiration along riparian corridors.[13] The MCWRA estimated that in the lower basin portion of the Salinas Valley, recharge occurs by infiltration along the channel of the Salinas River (30 percent) and its tributaries (20 percent), irrigation return water (40 percent), and infiltration and precipitation over the valley floor, subsurface inflow, and seawater intrusion (10 percent) (MCWRA, 2006).

The estimated 555,000 afy of outflow subtracted from the estimated 504,000 afy of inflow results in basin overdraft. This imbalance is documented by seawater intrusion within the basin. Because of the current extent of seawater intrusion within the Pressure Area and the threat of additional seawater intrusion and other water quality deterioration in the SVGB, various programs have been designed to protect and restore the basin.

Groundwater Enhancement Programs in the SVGB

Numerous resource protection programs throughout the SVGB promote groundwater recharge. Specifically, the Salinas Valley Water Project (SVWP) has implemented, or has proposed to implement, various programs to stop seawater intrusion, to provide adequate water supplies to meet the current and future needs of the Salinas Valley, and to improve the hydrologic balance of the SVGB. These programs include modifications to the Nacimiento Spillway, the operation of Nacimiento and San Antonio Reservoirs, which are upstream on the Salinas River, and Salinas River recharge, conveyance, and diversion efforts. The two upstream reservoirs regulate stream flow to maximize recharge to groundwater. Lake San Antonio's capacity is 335,000 af and Lake Nacimiento's capacity is 377,900 af (MCWRA, 2007). Due to the extent of the confining layers

[12] Groundwater overdraft occurs when the groundwater levels are lowered due to excessive pumping at a rate that is greater than natural recharge.

[13] The MCWRA State of the Basin Study included the SGB within the Pressure Subarea (180-400 Foot Aquifer Subbasin).

that prevent surface infiltration within the subbasin, reservoir operators regulate flows in the Salinas River to maximize groundwater recharge before flows enter the 180/400-Foot Aquifer Subbasin boundary (RMC, 2006). The rate of recharge varies from year to year depending on the seasonal distribution of rainfall and the total annual precipitation. The operation of the reservoirs increases groundwater recharge by about 30,000 afy (RMC, 2003).

As part of the approved SVWP, changes in reservoir operations were implemented as SVWP Phase I and will continue to be made through Phase II of the SVWP to further enhance water conservation. An inflatable rubber dam diversion facility, operating on the Salinas River as part of the SVWP Phase I, captures excess river flows which are used to supplement the agricultural water supply by routing flows of 30 cubic feet per second to the Castroville Seawater Intrusion Project (CSIP). This rerouted water serves as an in-lieu groundwater supply in that it reduces agricultural pumping of groundwater. Phase II of the SVWP plans to increase the diversion at the rubber dam by 30,000 afy and to develop and implement other actions that would route 20,000 afy to the groundwater depression east of the city of Salinas.

The CSIP is a program that has distributed recycled water through the Monterey Regional Water Pollution Control Agency (MRWPCA) service area since 1998 (MCWRA, 2006; MRWPCA, 2013). Tertiary-treated wastewater is obtained from the MRWPCA and delivered to agricultural users within the Pressure and East Side Subbasins of the SVGB, reducing groundwater extraction in those areas. This redistribution of water provides a form of in-lieu groundwater recharge by effectively reducing groundwater extraction in those areas of the basin within the CSIP delivery area. As of 2012, the CSIP was delivering approximately 14,000 afy of recycled water to farm lands in the CSIP delivery area. The CSIP has a goal of increasing this volume to 22,000 afy in Phase II of the Program (MRWPCA, 2012).

Seaside Groundwater Basin Recharge

From 2003 to 2007, SGB recharge including both primary recharge components (percolation from rainfall and infiltration below stream beds) and secondary recharge components (irrigation return flows, leaks from water and sewer pipes, and septic system flows) averaged 3,570 afy (HydroMetrics, 2009a).

In addition to the basin's natural recharge, since 2006, the Monterey Peninsula Water Management District (MPWMD) has run an ASR program that actively enhances groundwater recharge **Figures 3-2** and **3-9** show the location of the existing and proposed ASR facilities, including the four existing ASR injection/extraction wells. Under the ASR program, Carmel River water is piped to the ASR wells on the former Fort Ord military base, where it is injected into the Santa Margarita Sandstone along the eastern side of the groundwater depression (shown on **Figure 4.48**), and is stored for later extraction and use, as needed. **Table 4.4-2** summarizes the injection volumes.

TABLE 4.4-2
SUMMARY OF ASR INJECTION VOLUMES (AF)

2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
2	175	168	160	351	411	12	60	182	1,111	1,117	131	295	0	215

NOTE: All injection volumes in acre-feet

SOURCE: Pueblo Water Resources, 2014, 2016

Groundwater Extraction

Groundwater is an important water supply source for municipal and agricultural use in Monterey County. Groundwater extraction is monitored closely and reported on an annual basis for both groundwater basins addressed in this EIR/EIS. **Table 4.4-3** summarizes groundwater extraction within the northern SVGB and SGB from 2008 to 2014.

TABLE 4.4-3
GROUNDWATER EXTRACTION SUMMARY FOR THE SALINAS VALLEY AND SEASIDE GROUNDWATER BASINS (AF)

	2008	2009	2010	2011	2012	2013	2014
Salinas Valley Groundwater Basin							
180/400 Foot Aquifer Subbasin	130,139	121,165	103,544	105,172	113,898	117,242	120,890
Eastside Subarea	108,696	98,988	91,300	89,052	95,543	97,622	105,644
Seaside Groundwater Basin							
Coastal Subareas	4,242.1	3,332.0	3,679.9	3,298.4	2,962.8	2,983.52	3,120.51
Laguna Seca Subarea	1,029.9	1,060.6	867.7	853.1	870.1	912.27	919.64

NOTES: All values in acre-feet

SOURCES: MCWRA, 2009, 2015; SGB Watermaster, 2008 through 2014.

4.4.1.4 Groundwater Quality

Groundwater quality in the SVGB and SGB is influenced by natural geochemical properties and flow within the different hydrogeologic formations, groundwater pumping and induced seawater intrusion, land use practices, and accidental releases of contaminants into the environment. Additional water quality concerns for the SGB, and particularly the Santa Margarita Sandstone, include the presence of disinfection by-products in the injected water and long-term changes in the geochemistry of the groundwater system. While this section of the EIR/EIS focuses on groundwater basin water quality, Section 4.7, Hazards and Hazardous Materials, provides additional information on areas with contaminated soil and shallow groundwater.

Groundwater Quality at the Proposed Slant Well Locations

CalAm commissioned a subsurface soil and groundwater investigation to further understand the existing subsurface geologic units, aquifers, and water quality of the proposed slant well locations

on the CEMEX site. The investigation included the installation of nested monitoring wells and the test slant well, subsurface lithologic logging, soil and groundwater sample analysis, aquifer testing, and aquifer conditions modeling (Geoscience, 2013c, 2016a, 2016b). **Figure 4.4-9** shows the locations of the nested monitoring wells. The nested wells have screen intervals to discretely sample the Dune Sand Aquifer, 180-FTE Aquifer, and the 400-Foot Aquifer depth intervals. The subsurface investigation provided information and data to better characterize the subsurface stratigraphy, aquifer conditions, how the aquifer responds to pumping, and groundwater chemistry at various depth intervals. Updated information on subsurface materials informed the design of the proposed slant wells, and data on groundwater flow characteristics and water chemistry facilitated further refinement of the groundwater models used to analyze project impacts.

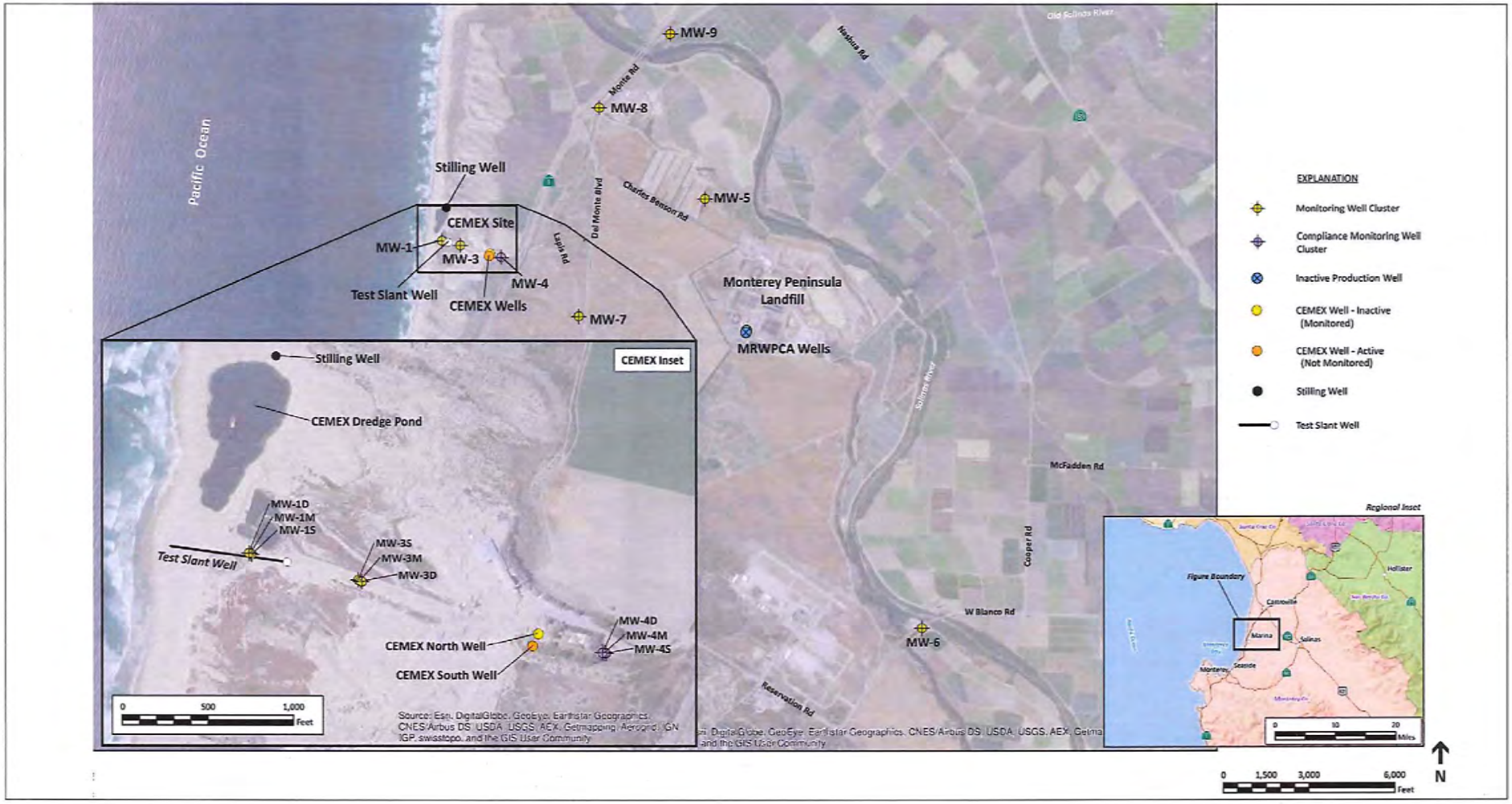
The proposed slant wells would draw water from the Dune Sand Aquifer and the 180-FTE Aquifer from about 30 feet below msl to 200 feet below mean sea level (Geosciences, 2016b). As discussed above in Section 4.2, the Dune Sand Aquifer overlies the 180-FTE Aquifer with no aquitard /between the units. The test slant well is screened across both units and has been sampled on a weekly basis when operational. **Table 4.4-4** summarizes water quality results from the May 19, 2016, sampling event. The table also provides the chemical composition of seawater; as the comparison shows, the water quality from the test slant well closely resembles the average seawater TDS concentration found along the central coast of California.

TABLE 4.4-4
GROUNDWATER QUALITY OF TEST SLANT WELL

Chemical Parameter	Units	Test Slant Well	Central Coast Seawater Average
Bicarbonate as HCO_3^-	mg/L	139	103
Boron	mg/L	3.54	4.35
Bromide	mg/L	59.4	64.5
Calcium	mg/L	542	395
Chloride	mg/L	16,965	18,537
Iron	ug/L	ND	0.003
Magnesium	mg/L	1,180	1,230
Nitrate as NO_3	mg/L	3	0.67
pH (field)	pH units	7.07	7.5-8.5
Potassium	mg/L	287	382
Salinity	psu	29.4	33.69
Sodium	mg/L	9,357	10,329
Sulfate as SO_4	mg/L	2,353	2,598
Total Dissolved Solids (Lab)	mg/L	31,900	33,694

NOTES:
mg/l = milligrams per liter; ug/L = micrograms per liter
psu = practical salinity units; umhos /cm = micromhos per centimeter

SOURCE: Geoscience, 2016a; Hem, 1989



SOURCE: GeoScience, 2016

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Figure 4.4-9

Slant Well and Monitoring Well Locations

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Groundwater Quality in the Santa Margarita Sandstone and the Seaside Groundwater Basin

Santa Margarita Sandstone overlies the Monterey Formation, and sections of the unit are present beneath the project area near Seaside at depths of about 800 feet. The proposed project would install two additional ASR wells (ASR-5 and ASR-6 Wells) in the Santa Margarita Sandstone in the northern subarea of the Seaside Basin to increase the injection, storage and extraction capacity.

In 2007, the MPWMD commissioned a study that evaluated the potential geochemical effects of injecting treated drinking water into the Santa Margarita Sandstone (EcoEngineers, 2008). The water quality data for the Santa Margarita Sandstone came from that study. The study estimated the nature and magnitudes of potential dissolution and precipitation reactions, the potential for scaling or biofouling, and the post-injection concentrations of chemicals in the water as compared with drinking water standards. The study used Carmel River water treated to drinking water standards from the CalAm Begonia Iron Removal Plant, and combined the treated water with rock material and native groundwater from the Santa Margarita Sandstone. After an 18-hour exposure period, the water mixture (referred to in the study as leachate) was reanalyzed for water quality constituents and the concentrations were compared with California Primary and Secondary Maximum Contaminant Level (MCL) drinking water standards. **Table 4.4-5** summarizes the water chemistry of the initial treated water and the resulting leachates from two depth intervals. The results indicated that the leachate obtained from mixing treated water with the Santa Margarita Sandstone and its native water did not exceed drinking water standards and did not show significant differences in water quality.

Water Quality and the Existing ASR System

Pueblo Water Resources prepares annual Summary of Operations reports that document the ASR system's well performance and water quality. The ASR system discussions below draw on the water year 2015[14] monitoring activities unless otherwise cited (Pueblo Water Resources, 2016).

Annual injection operations have occurred at the ASR-1 Well since 2002, altering the groundwater quality in the local area from its pre-injection, naturally-occurring conditions. Consequently, making a clear distinction between native and non-native water quality is both complex and somewhat subjective. This change in native water quality, as confirmed by testing, was observed in distant wells such as Well PCA-E, which is located 6,200 feet west of the ASR injection/extraction wells. Well PCA-E is a monitoring well operated by the MPWMD and screened in the Santa Margarita Sandstone. For the 2013 water year, groundwater in Well PCA-E was estimated to contain 22 to 30 percent injected potable water.

[14] A water year is the 12-month period from October 1 of any given year through September 30 of the following year. The water year is designated by the calendar year in which it ends. That is, the water year that starts on October 1, 2016 and ends on September 30, 2017 is the 2017 water year.

TABLE 4.4-5
WATER CHEMISTRY RESULTS OF MIXING STUDY

Chemical Parameter	Treated Carmel River Water	Leachate 540-580 feet	Leachate 730-770 feet	California MCLs
Alkalinity as $CaCO_3$	129	130	128	NE
Aluminum	0.025	0.025	0.025	1 / 0.2 (Sec)
Ammonia Nitrogen	0.1	0.1	0.1	NE
Arsenic	ND (0.005)	ND (0.005)	ND (0.005)	0.010
Antimony	NR	ND (0.0005)	ND (0.0005)	0.006
Barium	0.056	0.039	0.043	1
Bromide	0.11	0.11	0.11	NE
Beryllium	NR	ND (0.0005)	ND (0.0005)	0.004
Cadmium	NR	ND (0.00025)	ND (0.00025)	0.005
Calcium	36	39	36	NE
Chloride	32	33	33	250 (Sec)
Dissolved Organic Carbon	1.4	1.6	3.4	NE
Chromium	NR	ND (0.0005)	ND (0.0005)	0.10
Cobalt	NR	ND (0.0005)	ND (0.0005)	NE
Dissolved Oxygen	7.43	nana	NA	NE
Electrical Conductivity	510	484	490	900 (Sec)
Fluoride	0.30	0.25	0.27	2
Iron	0.001	ND (0.02)	ND (0.02)	0.3 (Sec)
Lead	NR	ND (0.0005)	ND (0.0005)	0.015[a]
Magnesium	14	14	13	NE
Manganese	0.001	0.001	0.001	0.05 (Sec)
Mercury	NR	0.00017	0.00044	0.002
Molybdenum	NR	0.0031	0.0034	NE
Nickel	NR	0.0011	0.0014	0.10
Nitrate/Nitrite as NO_3	0.05	0.12	0.47	10
Oxygen Reduction Potential (ORP)	749	550	544	NE
pe (= ORP/59.16)	12.66	9.30	9.20	NE
Total Phosphorous	0.34	0.30	0.34	NE
Potassium	2.9	2.9	3.4	NE
pH	7.70	6.71	6.28	NE
Selenium	0.0017	0.0018	0.0021	0.05
Silicon	8.41	8.88	8.41	NE
Silver	NR	ND (0.0005)	ND (0.0005)	0.10[a]
Sodium	42	40	42	NE
Strontium	0.200	0.250	0.250	NE
Sulfate as SO_4	84.9	85.4	79.4	250 (Sec)
Thallium	NR	ND (0.0005)	ND (0.0005)	0.002
Uranium	0.0025	0.0025	0.0060	0.03
Vanadium	NR	0.00073	0.00086	0.05[a]
Zinc	0.210	0.034	0.84	0.5 (Sec)

NOTES:

MCLs = Primary Maximum Contaminant Levels also referred to as Primary Drinking Water Standards; Sec = Secondary MCLs
All concentrations in milligrams per liter (mg/L) except conductivity (micromhos per centimeter), ORP (millivolts), and pH (pH units)
NA = not analyzed ND = not detected above reporting limit NE = not established NR = not reported

[a] Lead has a regulatory action level, not an MCL

SOURCE: EcoEngineers, 2008.

The ASR project has historically used the chloride ion to track the general mixing, dilution, and interaction between injected and native groundwater. Chloride is very stable and highly soluble, and is present in both injected and native groundwater. Pueblo Water Resources continually monitors the response of the Santa Margarita Sandstone to the injection and extraction of treated water. The historical chloride concentration of the native groundwater within the Santa Margarita Sandstone has averaged approximately 120 to 130 mg/L in this area of the Seaside Basin. However, injecting treated water into the Santa Margarita Sandstone reduces chloride concentrations in the injection area. Chloride concentrations decreased to as low as 30 mg/l during the March 2015 sampling event, well below the average chloride concentration of 120 mg/L. As a result, repeated ASR injection, storage, and recovery cycles are expected to incrementally produce water that is similar in nature to the injected water, creating a buffer zone of mixed water that gradually increases over time.

Disinfection Byproducts

As part of the current ASR program, Carmel River water is treated by removing iron and manganese, disinfecting the water with sodium hypochlorite, and injecting the potable water into the Santa Margarita Sandstone (Pueblo Water Resources, 2014). The potable water undergoes a chlorination process to disinfect it of possible microbiological contamination prior to injection into the Santa Margarita Sandstone. This chlorination process is known to produce disinfection by-products, including trihalomethanes (THMs)[15] and haloacetic acids (HAAs)[16] that have regulatory limits for drinking water purposes.

While it has been successfully demonstrated at the Seaside Basin ASR site, as well as at other ASR sites in California and elsewhere, that successive injection/storage/recovery cycles can yield fully potable water upon recovery, issues regarding the fate and stability of disinfection by-products in the subsurface can also affect the potability of the recovered water. The monitoring results evaluated by Pueblo Water Resources indicate that the THMs do increase upon initial injection of treated surface water into the Santa Margarita Sandstone, but that concentrations steadily decrease with time. Groundwater monitoring results indicate that, over the course of that time, the pH has remained neutral (between 6 and 8), indicating relatively stable geochemical conditions. The DBP data collected during the 2015 water year indicated that THMs peaked approximately 30 to 90 days after injection and storage, followed by a gradual decline. After approximately 150 to 210 days of storage, THMs had degraded to below the initial injection levels. HAAs degraded to below reporting limits by 90 to 100 days. More importantly, throughout the 2015 water year, THMs were below the MCL of 80 micrograms per liter and HAAs were below the MCL of 60 micrograms per liter.

15 THMs are a group of four chemicals that are formed along with other disinfection byproducts when chlorine or other disinfectants used to control microbial contaminants in drinking water react with naturally occurring organic and inorganic matter in water. The THMs are chloroform, bromodichloromethane, dibromochloromethane, and bromoform. The USEPA has published the Stage 1 Disinfectants/Disinfection Byproducts Rule to regulate total THMs at a maximum allowable annual average level of 80 parts per billion (USEPA, 2012).

16 HAAs are a group of chemicals that are formed along with other disinfection by-products when chlorine or other disinfectants used to control microbial contaminants in drinking water react with naturally occurring organic and inorganic matter in water. The regulated HAAs are monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid. The USEPA has published the Stage 1 Disinfectants/Disinfection Byproducts Rule to regulate HAAs at 60 parts per billion annual average (USEPA, 2012).

During the testing of the ASR project described above, studies found that levels of hydrogen sulfide in the recovered water were much lower than the concentrations in natural groundwater prior to injection, indicating a lasting and significant improvement of water quality during subsurface water storage.[17] This suggests that conditioning the aquifer may be an ancillary benefit of the ASR in the SGB. That is, ASR may reduce hydrogen sulfide in the extracted groundwater, which would then reduce the amount of chemical treatment that needs to be performed at the Seaside Ozone Treatment Plant. According to a report that summarized the pilot study results for the ASR project, the ozone treatment plant may become unnecessary with continued ASR operations over time (Padre Associates, 2004).

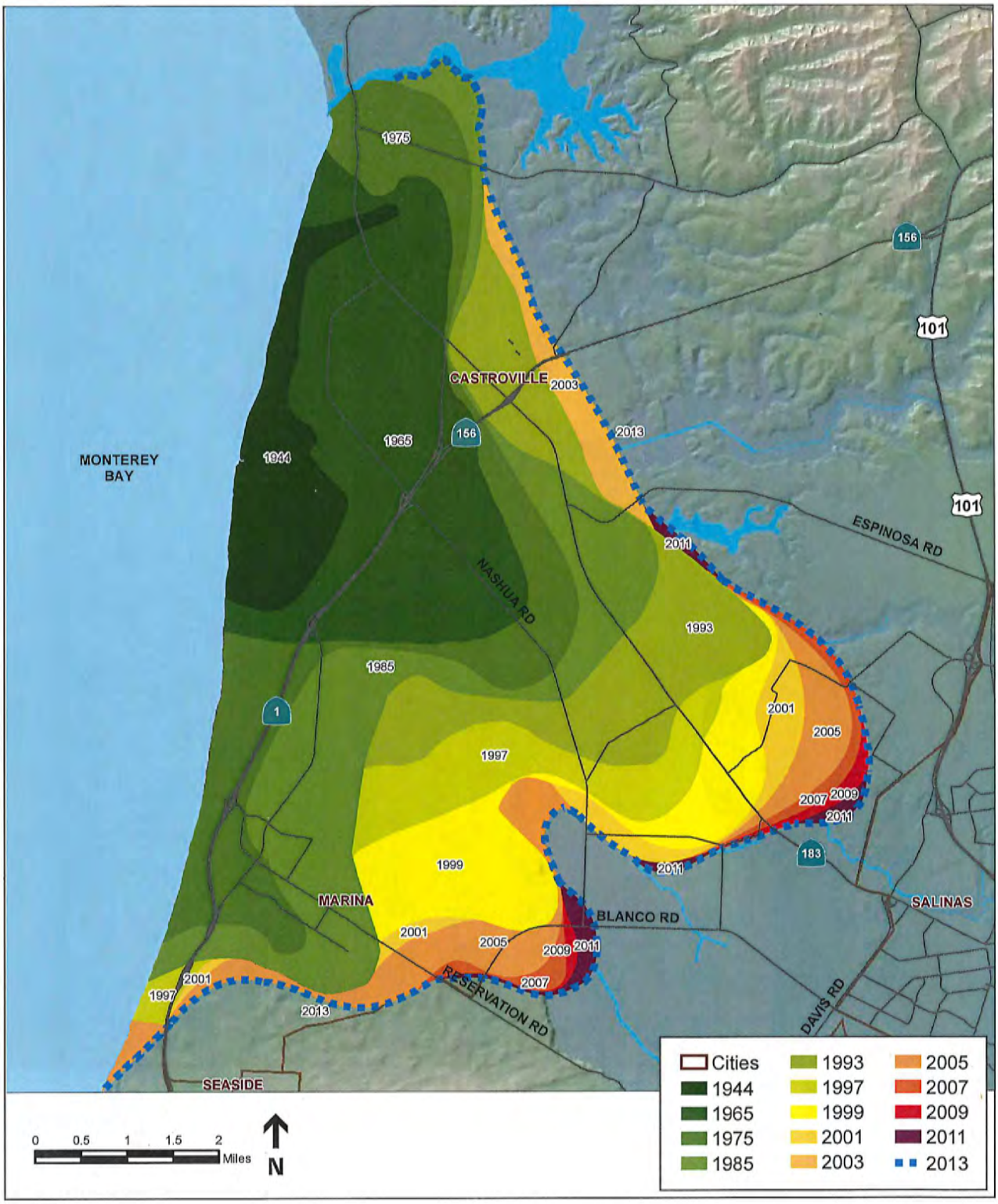
Seawater Intrusion

Figures 4.4-10 and **4.4-11** illustrate the seawater intrusion areas as of 2013 within the 180-Foot and 400-Foot Aquifers, respectively (MCWRA, 2015). Seawater intrusion occurs when ocean water enters fresh groundwater aquifers at the coast and migrates inland. The salty seawater combines with the fresh groundwater to create a mixture referred to as brackish. Brackish groundwater can contain Total Dissolved Solids (TDS) concentrations ranging from that of seawater (about 35,000 mg/L) down to 500 mg/L near the leading edge of the inland seawater intrusion front. Brackish water in the 180-foot aquifer near the proposed project ranges from about 5,000 mg/L to 29,000 mg/L. The California Secondary Drinking Water Standard was amended in 2006 to include a Maximum Recommended Level for TDS in drinking water of 250 mg/L (Cal. Code Regs., tit. 22, § 64449). The MCWRA define the leading edge of inland seawater intrusion as groundwater containing TDS at 500mg/L or more.

The current, standard practice for monitoring the inland advance of seawater intrusion involves TDS analysis of groundwater from a select group of monitoring wells that intersect the seawater-intruded aquifers. The TDS concentration data are used to identify the areas of the aquifer intruded by seawater and to plot the leading edge of the inland seawater intrusion front. The more groundwater wells available in the monitoring program, the better regional seawater intrusion is represented. Regular annual monitoring data can be used to estimate the rate at which seawater is migrating inland. The MCWRA has been conducting seawater intrusion monitoring for many years using several groundwater wells in the western end of the Salinas Valley.

Geophysics are giving researchers the opportunity to study seawater intrusion using high-resolution, regional scale imaging. The technique, sometimes referred to as Electrical Resistivity Tomography (ERT), can be used to differentiate salty water from fresh water hundreds of feet beneath the ground. Electrical resistivity imaging uses a series of sensors placed along a transect line on the ground surface. An electrical current is applied and the sensors measure the electrical resistance the current encounters as it travels at depth between the sensors. Salty water has a lower resistance than freshwater, due to the higher TDS. The high and low resistivity zones in the

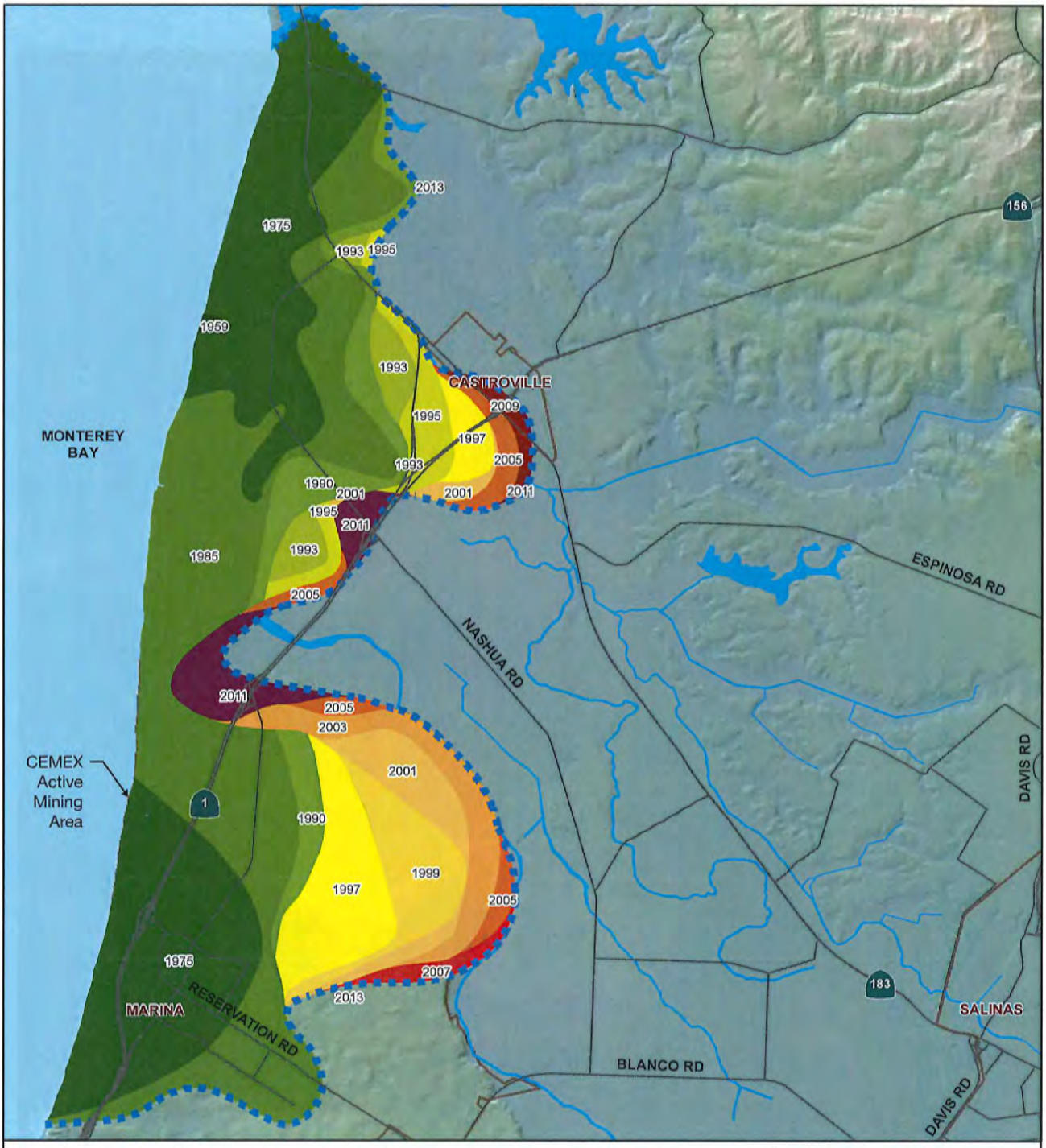
[17] The hydrogen sulfide reduction is likely due to the effects of the injected chlorine residual and dissolved oxygen content. These oxidizers react in the subsurface to stifle anaerobic bioactivity, which normally produces hydrogen sulfide. As the aquifer environment is altered and becomes inhospitable to anaerobes, hydrogen sulfide generation declines. This effect has also been observed in ASR wells in similar coastal aquifers in Santa Barbara, Alameda, and Ventura Counties.



Monterey Peninsula Water Supply Project . 205335.01

SOURCE: MCWRA, 2015b

Figure 4.4-10
Historic Seawater Intrusion in the
Salinas Valley Groundwater Basin - 180-Foot Aquifer



SOURCE: MCWRA, 2014b

Monterey Peninsula Water Supply Project . 205335.01

Figure 4.4-11

Historic Seawater Intrusion in the Salinas Valley Groundwater Basin - 400-Foot Aquifer

subsurface are displayed as a series of colors in a cross section that indicate areas of fresh water, brackish water and seawater. Over the past few years, Stanford environmental geophysics researcher Rosemary Knight has conducted a study to determine the viability of using electrical resistivity techniques to study seawater intrusion along the coast of the Monterey Bay. Professor Knight's initial survey was conducted along a 4-mile segment parallel to the beach between the cities of Seaside and Marina. The study found that the electrical resistivity readings positively correlated with measured TDS concentrations to a depth of 500 feet in four area groundwater wells.

Salinas Valley Groundwater Basin

The SVGB is hydrologically connected to Monterey Bay by ocean outcrops of the 180-Foot and 400-Foot Aquifers a few miles offshore (Eittreim, et. al., 2000; Greene, 1970). The ocean outcrops provide a constant source both of pressure and of direct recharge of seawater, and facilitate the recharge of seawater into those aquifers along the coast when groundwater extraction exceeds natural recharge. As a result, a landward groundwater gradient has developed along the coast and induced groundwater recharge from the ocean since the mid-20th century. Seawater intrusion in the SVGB was first documented in 1946 (DWR, 1946). The overdraft condition has degraded groundwater quality along the coast within the SVGB. Before wells extracted water from the Salinas Valley, there was a balance between the seawater in the ocean and the groundwater in the inland aquifers. Surface water within the watershed would infiltrate down into the aquifer, but it would be at a higher elevation than the surface of the ocean. Gravity requires that the difference in elevation forces the freshwater in the inland areas to migrate down and press back against the seawater. With the development of the Salinas Valley, water supply wells were installed and groundwater was extracted from the aquifer. This action reduced the weight of water on the inland side of the seawater/freshwater interface, creating a pressure imbalance, and resulted in the landward migration of the interface to its current location.

The 2013 estimates of seawater intrusion within the 180-Foot and 400-Foot Aquifers indicate that seawater has intruded to a maximum of approximately 8 miles and 3.5 miles inland, respectively, as inferred from chloride concentrations greater than 500 mg/L. The seawater intrusion degraded groundwater supplies, requiring urban and agricultural supply wells within the affected area to be abandoned or destroyed (MCWRA, 2001). Increased degradation of coastal groundwater aquifers led to restrictions on drilling groundwater wells and extracting groundwater from areas affected by seawater intrusion, as discussed in Section 4.4.2, Regulatory Framework. Such restrictions are intended to reduce further inland migration of seawater and reduce the landward advance of the seawater/freshwater interface.

Seaside Groundwater Basin

Groundwater pumping from aquifers in the SGB has exceeded recharge and freshwater inflows that caused pumping depressions near the coast, as shown on the groundwater flow maps for both the shallow aquifer zone (see **Figure 4.4-7**) and the deep aquifer zone (see **Figure 4.4-8**) (HydroMetrics, 2015). In addition, seawater intrusion has occurred just north of the SGB in the adjacent 180/400 Foot Aquifer Subbasin of the SVGB, as discussed above. The boundary

between these two basins is a groundwater divide that migrates in response to variations in natural recharge and pumping on either side of the divide. HydroMetrics noted increased chloride concentrations in two wells along the coast, although the concentrations have not yet exceeded drinking water standards. These conditions all suggest that the SGB could be vulnerable to seawater intrusion.

Regional Sources of Groundwater Contamination

Former industrial, commercial, and military activities in the region have resulted in soil and groundwater contamination from spills, leaking underground tanks, unlined chemical disposal sites, and inadvertent disposal of chemicals. In particular, groundwater in the aquifers located beneath the former Fort Ord military base, within two miles southeast of the proposed slant well locations at the CEMEX sand facility, are contaminated with volatile organic compounds, mostly trichloroethene (TCE) and carbon tetrachloride. Section 4.7, Hazards and Hazardous Materials, discusses these areas of contamination (see **Figures 4.7-1** and **4.7-2** for the locations of known plumes in the region). The closest of these contaminant plumes to the proposed slant wells, known as the OUCTP A-Aquifer Plume and the OUCTP Upper 180-Foot Aquifer Plume, are present in the indicated aquifers of the SVGB in the vicinity of Reservation Road, east of Del Monte Boulevard in Marina. These plumes have undergone considerable investigation, source removal, and remedial action, and the extent of contamination and constituent concentrations have decreased over time.

4.4.2 Regulatory Framework

This section provides an overview of federal, state, and local environmental laws, policies, plans, regulations, and guidelines (referred to generally as "regulatory requirements") relevant to groundwater resources. A brief summary of each is provided, along with a finding regarding the project's consistency with those regulatory requirements. The consistency analysis is based on the project as proposed, without mitigation. Where the project, as proposed, would be consistent with the applicable regulatory requirement, no further discussion of project consistency with that regulatory requirement is provided. Where the project, as proposed, would be potentially inconsistent with the applicable regulatory requirement, the reader is referred to the specific impact discussion in Section 4.5.5, Direct and Indirect Effects of the Proposed Project, below, where the potential inconsistency is addressed in more detail. Where applicable, the discussion in Section 4.5.5 identifies feasible mitigation that would resolve or minimize the potential inconsistency.

Many of the regulations described in Section 4.3, Surface Water Hydrology and Water Quality, also apply to groundwater resources, including the Porter-Cologne Water Quality Control Act and the *Water Quality Control Plan for the Central Coastal Basin* (Basin Plan). Additional information on the Basin Plan for the Central Coast Regional Water Quality Control Board (RWQCB), as it applies to groundwater resources, is provided below.

4.4.2.1 Federal

Federal Antidegradation Policy

Section 303 of the Clean Water Act (CWA) (33 U.S.C. § 1313) requires that states adopt water quality standards for waters of the United States within their applicable jurisdiction. Such water quality standards must include, at a minimum, (1) designated uses for all waterbodies within their jurisdiction, (2) water quality criteria necessary to protect the most sensitive of the uses, and (3) antidegradation provisions. Antidegradation policies and implementing procedures must be consistent with the regulations in 40 C.F.R. § 131.12. Antidegradation is an important tool that states use in meeting the CWA requirement that water quality standards protect public health and welfare, enhance water quality, and meet the objective of the Act to "restore and maintain the chemical, physical and biological integrity" of the nation's waters. The CWA requires that states adopt antidegradation policies and identify implementation methods to provide three levels of water quality protection to maintain and protect (1) existing water uses and the level of water quality, (2) high quality waters, and (3) outstanding national resource waters. The MPWSP would comply with the Federal Antidegradation Policy through the antidegradation policy implemented by California State Water Resources Control Board Resolution 68-18, as described below.

4.4.2.2 State

State Water Resources Control Board (SWRCB) Resolution 68-16 Anti-Degradation Policy

In 1968, the State Water Resources Control Board adopted an anti-degradation policy aimed at maintaining the high quality of waters in California through the issuance of Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining High Quality Waters in California"). The policy prohibits actions that tend to degrade the quality of surface and groundwater. The Regional Water Quality Control Boards oversee this policy (SWRCB, 1968). The anti-degradation policy states that:

- Whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water, and will not result in water quality less than that prescribed in the policies.

- Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters must meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.

SWRCB has interpreted Resolution No. 68-16 to incorporate the federal anti-degradation policy, which applies if a discharge that began after November 28, 1975 would lower existing surface and groundwater quality.

This policy would apply to the treated water to be injected into the proposed ASR injection/ extraction wells because this element would be required to comply with the state resolution maintaining the existing water quality. The RWQCB currently regulates the ASR operation under Permit 20808C, which monitors water quality of the ASR injection. Through compliance with Permit 2080C, water quality would be maintained and would, therefore, be consistent with SWRCB State Water Board Resolution 68-16.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code) provides the basis for water quality regulation within California and defines water quality objectives as the limits or levels of water constituents established for the reasonable protection of beneficial uses. The SWRCB administers water rights, water pollution control, and water quality functions throughout California, while the Central Coast RWQCB conducts planning, permitting, and enforcement activities. The Porter-Cologne Act requires the RWQCB to establish a regional Basin Plan with water quality objectives, while acknowledging that water quality may be changed to some degree without unreasonably affecting beneficial uses. Beneficial uses, together with the corresponding water quality objectives, are defined as standards, per federal regulations. Therefore, the regional basin plans form the regulatory references for meeting state and federal requirements for water quality control. Changes in water quality are allowed if the change is consistent with the maximum beneficial use of the State waters, it does not unreasonably affect the present or anticipated beneficial uses, and it does not result in water quality less than that prescribed in the water quality control plans. The basin plan regulations also apply to groundwater. The Basin Plan for this location is discussed below in the local regulations subsection.

This Act would apply to the ASR injection/extraction wells because they would have potential to affect water quality and beneficial uses in the Basin through injection of desalinated water. Thus, the proposed project would be required to comply with the Basin Plan water quality objectives established by the Central Coast RWQCB to protect the beneficial uses of the groundwater. This is discussed in the Local Regulations subsection below. Through compliance with the Basin Plan's water quality requirements, the proposed project would be consistent with the Act.

Central Coast Regional Water Quality Control Plan (Basin Plan)

Under the Porter-Cologne Water Quality Control Act, the RWQCB is responsible for authorizing and regulating activities that may discharge wastes to surface water or groundwater resources. The California Water Code (Section 13240) requires the RWQCB to prepare and adopt water quality control plans, or Basin Plans. According to Section 13050 of the California Water Code, Basin Plans designate the waters within a specified area of beneficial uses to be protected, water quality objectives to protect those uses, and a plan to meet the objectives. One significant difference between the State and Federal programs is that California's Basin Plan established standards for groundwater in addition to surface water.

The Basin Plan for the Central Coast, originally adopted in 1971 and last amended in 2011, identifies the beneficial uses of water bodies and provides water quality objectives and standards for waters of the Central Coast of California. The listed beneficial uses for groundwater resources are

- Agricultural water supply (AGR)
- Municipal and domestic water supply (MUN)
- Industrial use (IND)

General objectives are established for taste, odor, and radioactivity; for municipal and domestic supply, additional general objectives are established for bacteria, organic chemicals, and various chemical constituents; and for agricultural supply, general objectives follow the guidelines for water quality from the University of California Agricultural Extension Service. In addition, agriculture supply must be handled such that no controllable water quality factor shall degrade the quality of any groundwater resource or adversely affect long-term soil productivity.

The RWQCB has established water quality objectives for selected groundwater resources; these objectives serve as a basis for evaluating water quality management in the basin. Specific water quality objectives have been defined for the 180-Foot Aquifer and 400-Foot Aquifer for the SVGB, as listed in **Table 4.4-6** below.

TABLE 4.4-6
GROUNDWATER QUALITY OBJECTIVES

Aquifer	Total Dissolved Solids	Chloride	Sulfate	Boron	Sodium	Nitrate as Nitrogen
180-Foot	1500	250	600	0.5	250	1
400-Foot	400	50	100	0.2	50	1

NOTES: All concentration are in milligrams per liter (mg/L)
SOURCE: RWQCB, 2011b.

The Basin Plan would apply to the treated water to be injected into the proposed ASR injection/extraction wells because it could affect the quality and beneficial uses of the Basin's groundwater. Accordingly, these project elements would be subject to regular water quality monitoring by the RWQCB. This water quality monitoring would ensure that any deviation from the established objectives is identified and corrected pursuant to Basin Plan requirements.

Central Coast Regional Water Quality Control Board – Resolution R3-2008-0010, General Waiver for Specific Types of Discharges

In conjunction with the SWRCB Order No. 2003-0003-DWQ, described above, Resolution No. R3-2008-0010 waives the submittal of Reports of Waste Discharge and the issuance of Waste Discharge Requirements for certain low volume discharges with minimal pollutant concentrations. The order includes well development water, monitoring well purge water, and boring waste discharge. This order would allow the listed wastes to be discharged directly to the land surface as long as the discharge is implemented in a controlled manner that does not cause erosion or other adverse effects. The RWQCB Regional Water Board's Resolution includes the

injection and extraction of treated groundwater, such as with the ASR system, as long as the RWQCB Regional Water Board reviews and approves of the system design and operation. The anticipated volumes and quality of well development water, monitoring well purge water, and soil boring waste discharge generated by the proposed project would comply with the requirements of this resolution, thereby ensuring project consistency.

Division of Water Rights Permit 20808C – Amended Permit for Diversion and Use of Water

In 1995, the State Water Board issued Permit 20808 to the Monterey Peninsula Water Management District (MPWMD) for the proposed Los Padres Reservoir project. The permit was later split and modified several times, and now addresses additional requirements for the diversion of surface and under stream flow from the Carmel River, protection of the Carmel Lagoon and fish habitat, and the injection and storage of Carmel River water in the Seaside Basin using the ASR injection/extraction wells. Permit 20808C set requirements for the ASR system and established a maximum annual Carmel River diversion of 2,900 afy for injection and storage in the Seaside Basin, timing and monitoring requirements for diversion, fish protection measures, and rules for the recovery of the stored water. The current annual volume of stored water that can be recovered is 1,500 afy, plus unrecovered carryover water from previous years, if available. In addition, the volume of recovered water may not exceed 1,500 af for a given year if the volume of water injected that year, plus carryover from previous years, does not equal 1,500 af. In that case, only the volume of water injected that year, plus whatever carryover water is available may be recovered. Implementation of the proposed project would allow CalAm to more effectively utilize its Carmel River water rights by increasing its capacity to inject water for storage when river flows are sufficiently high to allow for diversion. CalAm is presently operating within the terms of the permit and nothing about the proposed project would change its ability to operate consistent with the permit.

State Water Resources Control Board Order No. 2003-0003-DWQ, *Statewide General Waste Discharge Requirements for Discharges to Land with a Low Threat to Water Quality*

SWRCB Order No. 2003-0003-DWQ established statewide Waste Discharge Requirements regulating certain low-volume discharges that contain minimal pollutant concentrations, thus allowing for their discharge to land without the preparation of a Report of Waste Discharge. The order includes provisions to address well development water, and to monitor well purge water and the discharge of material generated during drilling. This order allows discharge of the listed wastes directly to the land surface as long as the discharge is implemented in a controlled manner that does not cause erosion or other adverse effects. The Central Coast RWQCB General Order WQ-2011-0223, *Waste Discharge Requirements NPDES General Permit for Discharges with Low Threat to Water Quality*, and its Resolution R3-2008-0010, *General Waiver for Specific Types of Discharges*, provide additional details on how this order would apply to the proposed project. The anticipated volumes and quality of well development water, monitoring well purge water, and soil boring waste discharge would be in quantities typical for temporary water well drilling projects in areas with no existing groundwater contamination. Thus, the proposed project's well development discharges would be consistent with the Order.

Sustainable Groundwater Management Act

Adopted in 2014, the Sustainable Groundwater Management Act (SGMA) provides local agencies the capability to customize groundwater sustainability plans to their regional economic and environmental needs. SGMA creates a framework for sustainable, local groundwater management in California. The DWR and the SWRCB are the lead state agencies responsible for developing regulations and reporting requirements necessary to carry out SGMA. DWR sets basin prioritization, basin boundaries, and develops regulations for groundwater sustainability. The SWRCB is responsible for fee schedules, data reporting, probationary designations and interim sustainability plans (DWR, 2016a). The State of California has designated the Salinas Valley as a priority basin and stakeholders have been working since 2015 to form a Groundwater Sustainability Agency for the Salinas Valley. The MPWMD applied to alter the boundaries of the Seaside/Corral de Tierra areas so they are similar to the adjudicated boundaries of the Seaside Basin. While the SGMA does not have a direct impact on the MPWSP, it is included here as it is new legislation affecting both the Salinas Valley Groundwater Basin and the boundaries of the adjudicated Seaside Basin. The proposed project would not adversely affect groundwater management in the Basin, because it would be extracting groundwater that is not presently being used as a potable or an irrigation supply. Rather, when considering seawater intrusion and water surface elevations in the 400-Foot Aquifer, the proposed project may have a positive contribution to the sustainable management of groundwater. Regarding the former, groundwater modeling shows that the proposed project would retard the advance and limit the ultimate inland extent of seawater intrusion. With respect to the latter, by returning in-lieu desalinated water to the CCSD, the proposed project would provide recharge benefits to groundwater levels in the 400-Foot Aquifer. For these reasons, the proposed project would not conflict with the SGMA.

4.4.2.3 Regional and Local

MCWRA Act (1995) (Agency Act)

In accordance with the Agency Act, MCWRA is charged with preventing the waste or diminution of the water supply in its territory by, among other things, controlling groundwater extractions and prohibiting groundwater exportation from the SVGB (MCWRA, 1995). Specifically, section 9(v) of the Agency Act provides that MCWRA has the power:

> To prevent the export of groundwater from the SVGB, except that use of water from the basin on any part of Fort Ord shall not be deemed such an export. Nothing in this act shall be deemed to prevent the development and use of the Seaside Groundwater Basin for use on any lands within or without that basin.

If any person or entity attempts to export groundwater from the SVGB, the MCWRA may seek an injunction from the Monterey Superior Court to prohibit such export.

The Agency Act further authorizes the MCWRA to commission groundwater studies to determine whether any portion underlying its territory is threatened with the loss of useable groundwater supply and to adopt an ordinance prohibiting further extraction of groundwater from an area and depth defined by the MCWRA.

As discussed more fully in Section 2.7, Water Rights, given the locations of the slant well screens beyond the jurisdictional boundaries of the County, it is not clear whether the Agency Act applies to the proposed project. However, as further discussed in that section, were the Agency Act to apply, it is preliminarily reasonable to conclude that the proposed project would be consistent. This is because the proposed project would return to the SVGB any incidentally extracted useable groundwater. The water available for export would be new supply, or developed water, not extracted from the SVGB.

MCWRA Ordinance 3709

MCWRA Ordinance 3709 prohibits drilling into and pumping groundwater from the 180-Foot Aquifer within specific onshore areas, designated as Territories A and B (MCWRA, 1993). The proposed seawater intake system would be located at the westernmost edge of Territory B. Although the wells would be drilled within Territory B, the source water for the proposed project would be extracted from beneath the ocean floor, an area not located within the restrictive territories identified by Ordinance 3709. As with the Agency Act, it is not clear that the MCWRA Ordinance 3709 applies to the proposed project. However, for the same reasons presented above, if it were to apply, it is preliminarily reasonable to conclude that the proposed project would be consistent. This issue is discussed further in Section 2.7, Water Rights.

Seaside Groundwater Basin Watermaster (California Superior Court, Monterey California, Case No. M66343)

In 2006, through the adjudication of the Seaside Basin, the Monterey County Superior Court created the Seaside Groundwater Basin Watermaster. The purpose of the Watermaster is to assist the court in administering and enforcing the provisions of the judgment, which pertains to the oversight and management of Seaside Groundwater Basin resources. The Watermaster's objective is to help resolve the problems of lowered groundwater levels and the threat of seawater intrusion, which are the result of over-pumping. A primary objective of the proposed project is to reduce drawdown of Seaside Basin groundwater levels. Thus, through its implementation, the proposed project would be consistent with the adjudication of the Seaside Basin.

4.4.2.4 Consistency with Applicable Regional and Local Land Use Plans and Policies Relevant to Groundwater

Table 4.4-7 describes the regional and local land use plans, policies, and regulations pertaining to groundwater that are relevant to the MPWSP and that were adopted for the purpose of avoiding or mitigating an environmental effect. Section 4.8, Land Use, Land Use Planning, and Recreation, presents a general overview of these policy documents. Also included in **Table 4.4-7** is an analysis of project consistency with such plans, policies, and regulations. The analysis concludes that the proposed project would not conflict with any applicable plan, policy, or regulation, as noted in the table.

TABLE 4.4-7
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO GROUNDWATER RESOURCES

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
City of Marina (coastal zone & inland areas)	Marina Municipal Code	Water Wells	Subsurface slant wells and monitoring wells for Seawater Intake System	***Section 13.12.030 Permit—Required.*** No person shall construct, repair, reconstruct, abandon, or destroy any well unless a written permit has first been obtained from the County of Monterey.	This policy is intended to protect public health and safety by ensuring wells are properly constructed, maintained, and decommissioned.	Consistent: The applicant proposes and would be required to obtain a Well Construction Permit from the Monterey County Department of Environmental Health prior to commencement of project well construction.
County of Monterey (coastal zone & inland areas)	Monterey County Code	Water Wells	Subsurface slant wells and monitoring wells for Seawater Intake System	***Section 15.08.030 Permit—Required*** a. No person shall construct, repair, reconstruct or destroy any well, abandoned well, cathodic protection well, observation well, monitoring well, or test well unless a written permit has first been obtained from the Health Officer of the County or his or her authorized representative as provided in this Chapter.	This policy is intended to protect public health and safety by ensuring wells are properly constructed, maintained, and decommissioned.	Consistent: The applicant proposes and would be required to obtain a Well Construction Permit from the Monterey County Department of Environmental Health prior to commencement of project well construction.
County of Monterey (coastal zone & inland areas)	Monterey County Code	Water Wells	Subsurface Slant Wells and monitoring wells for Seawater Intake System	***Section 15.08.110 Technical Standards*** a. Standards. Standards for the construction, repair, reconstruction of or destruction of wells shall be as set forth in Chapter II and Appendices A, B, C D of the Department of Water Resources Bulletin No. 74-81, "Water Well Standards" (December, 1981).	This policy is intended to protect public health and safety by ensuring wells are properly constructed, maintained, and decommissioned.	Consistent: All wells within the State of California are required to be constructed in compliance with DWR Bulletin 74-81.
County of Monterey (coastal zone & inland areas)	Monterey County General Plan	Public Services	Source Water Pipeline, MPWSP Desalination Plant, Desalinated Water Pipeline, Brine Discharge Pipeline, Salinas Valley Return Pipeline, Carmel Valley Pump Station, Main System--Hidden Hills and Ryan Ranch--Bishop Interconnection Improvements	***Policy PS-2.8:*** The County shall require that all projects be designed to maintain or increase the site's pre-development absorption of rainfall (minimize runoff), and to recharge groundwater where appropriate. Implementation shall include standards that could regulate impervious surfaces, vary by project type, land use, soils and area characteristics, and provide for water impoundments (retention/detention structures), protecting and planting vegetation, use of permeable paving materials, bioswales, water gardens, and cisterns, and other measures to increase runoff retention, protect water quality, and enhance groundwater recharge.	This policy is intended to minimize the impacts of new impervious surfaces to increase runoff retention, protect water quality, and enhance groundwater recharge.	Consistent: Most of the Seawater Intake System and water conveyance pipelines would be buried below the ground surface, mainly within existing developed or disturbed areas, and would therefore result in no effect on the absorption of rainfall. The MPWSP Desalination Plant and the Carmel Valley Pump Station would be constructed in unpaved areas and all rainwater would be routed to the permeable surrounding sandy soils.
County of Monterey (coastal zone & inland areas)	Monterey County General Plan	Public Services	Source Water Pipeline, MPWSP Desalination Plant, Desalinated Water Pipeline, Brine Discharge Pipeline, Salinas Valley Return Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Policy PS-2.9:*** The County shall use discretionary permits to manage construction of impervious surfaces in important groundwater recharge areas in order to protect and manage groundwater as a valuable and limited shared resource. Potential recharge area protection measures at sites in important groundwater recharge areas may include, but are not limited to, the following: a. Restrict coverage by impervious materials. b. Limit building or parking footprints. c. Require construction of detention/retention facilities on large-scale development project sites overlying important groundwater recharge areas as identified by Monterey County Water Resources Agency. The County recognizes that detention/retention facilities on small sites may not be practical, or feasible, and may be difficult to maintain and manage.	This policy is intended to preserve impervious surfaces to increase runoff retention, protect water quality, and enhance groundwater recharge.	Consistent: Most of the Seawater Intake System and water conveyance pipelines would be buried below the ground surface, mainly within existing developed or disturbed areas, and would therefore result in no effect on recharge. The MPWSP Desalination Plant and the Carmel Valley Pump Station would be constructed in unpaved areas and all rainwater would be routed to the permeable surrounding sandy soils.
County of Monterey (coastal zone & inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, Desalinated Water Pipeline, Brine Discharge Pipeline, Salinas Valley Return Pipeline, Carmel Valley Pump Station, Main System--Hidden Hills and Ryan Ranch--Bishop Interconnection Improvements	***Policy S-3.2:*** Best Management Practices to protect groundwater and surface water quality shall be incorporated into all development.	This policy is intended to protect surface water and groundwater quality from impacts of development.	Consistent: The proposed project would be subject to the State Construction General Permit, the Monterey County Grading Ordinance, the Monterey County Erosion Control Ordinance, and the RWQCB Resolution R3-2013-0032c, which require the implementation of specific construction-related BMPs to prevent concentrated stormwater run-on/runoff, soil erosion, and release of construction site contaminants. Surface water quality is also discussed in Section 4.3 Surface Water Hydrology and Water Quality.
County of Monterey (coastal zone)	North County Land Use Plan	Water Resources	Source Water Pipeline and New Desalinated Water Pipeline,	***Policy 2.5.1:*** The water quality of the North County groundwater aquifers shall be protected, and new development shall be controlled to a level that can be served by identifiable, available, long term-water supplies...	This policy is intended to maintain the quality of groundwater resources and reduce overdraft of basin groundwater supplies.	Consistent: Water conveyance pipelines would be buried below the ground surface, mainly within existing developed or disturbed areas, and would therefore result in no effect on groundwater quality or recharge.

TABLE 4.4-7 (Continued)
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO GROUNDWATER RESOURCES

Project Planning Region	Applicable Plan	Plan Element/ Section	Project Component(s)	Specific Plan, Policy, or Ordinance	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Plan, Policy, or Ordinance
Fort Ord Reuse Authority (City of Seaside)	Fort Ord Reuse Plan	Conservation	ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Settling Basin, Terminal Reservoir	**Hydrology and Water Quality Policy A-1:** At the project approval stage, the City shall require new development to demonstrate that all measures will be taken to ensure that runoff is minimized and infiltration maximized in groundwater recharge areas.	This policy is intended to preserve impervious surfaces to increase runoff retention, protect water quality, and enhance groundwater recharge.	Consistent: The above-ground components of the proposed ASR system would be constructed in unpaved areas. All rainwater would be routed to the surrounding unpaved sandy areas and allowed to infiltrate into the subsurface as recharge. The below-ground components would not affect groundwater recharge.

SOURCES: FORA, 1997; Monterey County, 1982; Monterey County, 2010

4.4.3 Evaluation Criteria

Implementation of the proposed project would have a significant impact related to groundwater resources if it would:

- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted);
- Violate any ground water quality standards or otherwise degrade groundwater quality.

The following descriptions have been developed to elaborate on how these criteria are applied in the impact analyses in Sections 4.4.5.1 and 4.4.5.2, below. Implementation of the proposed project would be considered to have a significant impact associated with groundwater resources if:

- Construction reduced groundwater supplies, or substantially hindered the ability of surface water to recharge the aquifer, resulting in lower groundwater levels.
- Construction discharges to groundwater exceeded water quality standards or otherwise degraded groundwater quality.
- Extraction from the subsurface slant wells substantially depleted groundwater in the SVGB such that there would be a net deficit in aquifer volume.
- Extraction from the subsurface slant wells lowered groundwater levels in the Dune Sand Aquifer or the 180-Foot Equivalent Aquifer so that nearby municipal or private groundwater production wells experienced either a substantial reduction in well yield or physical damage due to exposure of well screens and well pumps.
- Operation of the proposed ASR injection/extraction wells resulted in groundwater mounding, change in groundwater gradients, or lower groundwater levels such that nearby municipal or private groundwater production wells experienced either a substantial reduction in well yield or physical damage due to exposure of well pumps or screens.
- Extraction from the subsurface slant wells interfered substantially with groundwater recharge.
- Extraction from the subsurface slant wells adversely affected groundwater quality by exacerbating seawater intrusion in the SVGB.
- Injection of desalinated water treated to drinking water standards degraded the quality of native groundwater in the SVGB.
- Operation of the proposed ASR injection/extraction wells were to result in discharges to groundwater resources that degrade groundwater quality

4.4.4 Approach to Analysis

Four primary sources of data and information were used to guide the impact analysis presented in this section: 1) information obtained through subsurface investigations commissioned by CalAm; 2) groundwater modeling; 3) the SWRCB Final Review of California American Water Company's Monterey Peninsula Water Supply Project; and 4) CalAm operating rules for injection and extraction of desalinated water by ASR. The following sections describe the details of these four elements of the impact analysis methodology.

4.4.4.1 Subsurface Investigations

Until recently, the general understanding of the subsurface geology near the CEMEX site was limited to information obtained from a few nearby wells, or from detailed investigations at distant locations, such as Marina State Beach or the former Fort Ord. Recognizing the need to obtain additional subsurface information to design the proposed project, CalAm commissioned a subsurface soil and groundwater investigation at the CEMEX site and at an alternate intake location at Potrero Road. These field investigations acquired supplemental information on subsurface geologic units, the hydrogeologic properties of those units, and the current aquifer water quality. This information in turn was used to better understand the hydrogeologic conditions, and to refine input parameters of the groundwater modeling. Additionally, obtaining data on subsurface stratigraphy and groundwater chemistry at various depth intervals helped refine and optimize construction details of the proposed slant wells.

The investigations included drilling exploratory boreholes to identify and correlate the subsurface geologic units, to collect groundwater quality data, and to build clusters of monitoring wells. The details of the subsurface exploration, including boring logs, well construction details, field screening tests results, and laboratory analytical results, are presented in a July 2014 report titled: *Monterey Peninsula Water Supply Project Hydrogeologic Investigation Technical Memorandum TM 1, Summary of Results - Exploratory Boreholes*). The Hydrogeological Working Group peer reviewed TM1 before the final document was released. TM1 is included in **Appendix C3**, and is also discussed in Section 4.2, Geology, Soils, and Seismicity.

Test Slant Well

CalAm installed the test slant well to further evaluate subsurface conditions and to test the response of the Dune Sand Aquifer, the 180-FTE Aquifer, and the 400-Foot Aquifer to pumping. The results have been used to refine the groundwater models and inform the analysis of the proposed project. The first phase of the test slant well investigation began with the construction of a 724-foot long test well drilled at an angle of 19 degrees below horizontal at the CEMEX site. Special Condition 11 of the Coastal Development Permit, "Protection of Nearby Wells," requires the MPWSP HWG to establish baseline water and TDS levels prior to commencing the long term pumping tests (Geoscience 2015b). The long-term pumping test began in mid-April 2015, and results are available at http://www.watersupplyproject.org/#!test-well/c1f11.

Monitoring Wells Installation and Testing

To monitor the response of the aquifers to pumping from the test slant well and verify that the aquifers would respond as simulated by the groundwater modeling discussed below, CalAm installed a network of monitoring well clusters at the locations shown on **Figure 4.4-9**, along with a water level data logger in the pond that CEMEX uses to dredge sand (Geoscience, 2016b). The details of the subsurface exploration including boring logs, well construction details, field screening tests results, and laboratory analytical results are presented in a report titled: *Monterey Peninsula Water Supply Project, Hydrogeologic Investigation, Technical Memorandum (TM2) Monitoring Well Completion Report and CEMEX Model Update* (Geosciences, 2016b). The Hydrogeological Working Group peer reviewed TM2 before the final document was released; that document is also discussed in Section 4.2, Geology, Soils, and Seismicity. Four of the monitoring well clusters are located west to east along the CEMEX access road, from near the proposed slant wells to near the CEMEX facility entrance. Monitoring well clusters were also installed at the proposed desalination plant site on Charles Benson Road, at the intersection of Lapis Road and Del Monte Road, and along West Blanco Road about 4 miles southeast of the CEMEX site. The clusters monitor water levels and chemistry in the Dune Sand, 180-FTE, and 400-Foot Aquifers. Groundwater elevation and water quality data developed from monitoring the cluster wells are presented in the impact analysis, below.

4.4.4.2 Groundwater Modeling

Groundwater modeling was a primary analytical tool used to evaluate project impacts on groundwater resources. This section describes the groundwater models and how they were used to simulate the groundwater response to the proposed pumping. The results of the groundwater modeling are presented in *North Marina Groundwater Model Review, Update, and Implementation for Future Slant Well Pumpage Scenarios*, August 12, 2016, prepared by HydroFocus, Inc. (**Appendix E2**).

Groundwater Models

What is a Groundwater Model?

Groundwater models are computer simulations that represent water flow in the environment using mathematical equations. By mathematically representing a simplified version of a hydrogeological system, the effects of reasonable groundwater pumping scenarios can be simulated, evaluated, and compared to determine their effects on an aquifer system. The applicability or usefulness of the model depends on how closely the mathematical equations approximate the physical system being modeled.

Groundwater models consist of individual *cells* in a model *domain*. A domain is the entire area and depth within which the model simulates subsurface conditions. The domain is made of smaller units called cells, which represent a defined three-dimensional area, the size of which is dependent on the coverage area of the model. For example, models that cover an entire groundwater basin of many square miles may have cells that represent one square mile area each,

while models designed to evaluate smaller areas have cells representing only 200 square feet. Each cell contains information about the occurrence and flow of groundwater at that particular location. Using subsurface hydrogeological information from soil borings, well logs, and geologic mapping, each cell is assigned, or populated with, parameters to describe how water moves through that cell. Parameters typically include hydraulic conductivity (the ability of water to flow through a given material), permeability and porosity (the relative amount of open spaces between grains in the geologic material), and the direction of water flow into and out of each of the model cells. Vertical layers are then established based on the subsurface geologic characteristics, such as permeable aquifer zones and less permeable aquitards. After the cells are populated, the model is calibrated with actual groundwater information (depth, hydraulic conductivity, etc.) so that the model can better represent real world conditions.

Once the model has been populated and calibrated, it can be used to predict the effects of hydrological changes, like groundwater extraction, on the behavior of the aquifer or aquifers. The models used for this analysis tested the anticipated response of the aquifer or aquifers to various operating scenarios. The scenarios considered changes in land use conditions, rate and location of project pumping, and implementation of other water supply projects. The results of the scenarios are also compared against baseline, or current, conditions to determine and identify potential effects or impacts.

Limitations of Groundwater Models

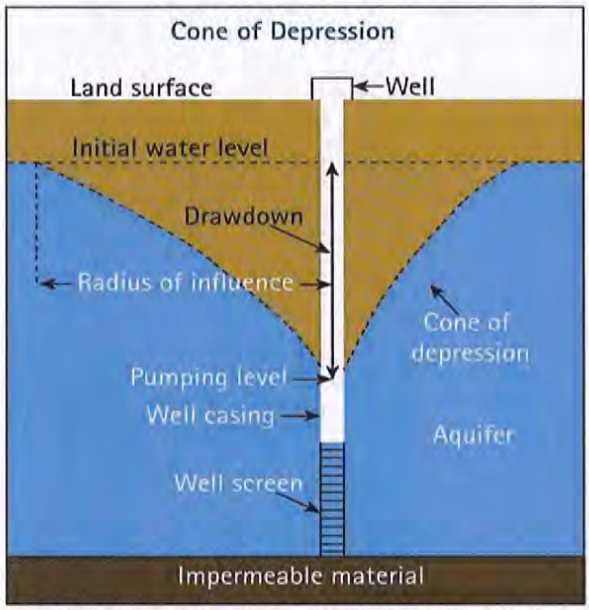
Groundwater models simulate aquifer conditions based on a specific set of data that describes parameters such the subsurface characteristics, groundwater flow, and land use. The more robust the data set, the more capable the model will be to accurately simulate subsurface conditions. Most groundwater models use conservative input parameters so that the output overstates the actual aquifer response. Nevertheless, groundwater models are mathematical-based computer programs that rely on input parameters and, consequently, there is a degree of uncertainty. However, the models used to analyze the proposed project have been used previously and have benefited from input data derived from site-specific subsurface information. Given that, and given the fact that these models were calibrated with known data, the level of degree of uncertainty for this analysis is considered tolerable.

Groundwater Model Terminology

Certain terminology is used in groundwater modeling to describe and illustrate the nature, extent, and movement of groundwater in aquifers, and the response of the aquifers to changes, such as pumping. In addition to calculated values (e.g., changes in the volume of water in storage), the spatial results of the model simulations are commonly expressed as maps that show the simulated response to the pumping of the wells under various scenarios. The maps show the cone of depression, the radius of influence, and particle tracking, terms that are described and illustrated below.

- **Cone of depression** – As water is extracted from a well, it is pulled into the screened section of the slant wells and removed from the subsurface water-bearing unit. Groundwater elevations would decrease around the slant wells in a radial fashion, resulting in a cone of

drawdown centered at the slant wells. This cone would be the steepest and deepest closest to the well screen and rapidly become flatter and shallower away from the slant wells.



SOURCE: http://www.ngwa.org/Fundamentals/use/PublishingImages/cone_of_depression.gif

- **Radius of influence** – The radial extent of the area affected by the slant wells—that is, the area within which water levels are anticipated to decrease—is called the radius of influence. The anticipated affected area is depicted using groundwater elevation contour maps. Similar to topographic elevation contours, groundwater contours show the shape and elevations of the groundwater surface. The maximum radius of influence is typically defined as the distance by which the water levels are anticipated to decrease by some amount, such as one foot.

- **Particle tracking** – Using the groundwater elevation maps, the groundwater model can also generate particle tracking maps. Particle tracking maps show the flow path of a particle of water over time. In forward tracking, a particle is placed at a specific cell in the model domain and the model then simulates the path the particle of water will take through other cells as model time moves forward. In reverse tracking, the model simulates the path of where the particle came from, to identify its source.

North Marina Groundwater Model

The NMGWM is a detailed hydrologic computer model covering approximately 149 square miles and includes Elkhorn Slough to Prunedale on the north side, Prunedale to south of Salinas on the east side, south of Salinas to just north of the Fort Ord Dunes State Park on the south side, and extending into Monterey Bay (**Figure 4.4-12**). The NMGWM was originally developed in 2008, integrating information from the regional-scale Salinas Valley Integrated Groundwater and Surface Water Model (SVIGSM) including aquifer parameters, recharge and discharge terms, and boundary conditions in the North Marina area.

SOURCE: Geoscience, 2015c

205335.01 Monterey Peninsula Water Supply Project

Figure 4.4-12

Groundwater Model Boundaries

The NMGWM is based on model codes of MODFLOW. MODFLOW is a modular finite-difference flow model, which is a computer code that solves the groundwater flow equation. MODFLOW is public domain software that the U.S. Geological Survey developed in the early 1980s. Since MODFLOW's release, the USGS has released numerous updated versions, and MODFLOW is now the de facto standard code for aquifer simulation.

The cell size of the NMGWM is 200 feet by 200 feet oriented along 300 rows and 345 columns, and eight layers of variable thicknesses. Details of the review, update, and refinement of the NMGWM used for this analysis, is presented in **Appendix E2**.

The NMGWM considers the combination of the Dune Sand Aquifer and the 180-FTE as the source aquifers for project source water. Consequently, the modelers added an additional model layer for the Dune Sand Aquifer. The addition of the new model layer was based on the results of the site-specific borings, review and extension of existing geologic cross-sections, creation of revised geologic cross-sections, and evaluation of recent aquifer parameter information for the area. **Table 4.4-8** presents a correlation of geologic units, aquifers, and model layers.

The areal extent and thickness of other model layers were also refined using that same information. The NMGWM model layers and associated parameters such as horizontal and vertical hydraulic conductivity,[18] specific storativity,[19] specific yield,[20] and leakage[21] were refined using the data collected from the site-specific hydrogeologic investigations (Geoscience, 2013c). In addition, the NMGWM model incorporates the anticipated changes in sea level rise due to global climate change (ESA, 2013).

The following terms and concepts associated with the NMGWM are important to understand while reviewing the impact analyses for groundwater resources presented in this section. **Appendix E2** contains some additional details.

Superposition Groundwater Modeling

For this project, the NMGWM is converted to a superposition model and only solves for the groundwater changes due solely to the proposed project. These changes are independent of the effects from the other stresses on the basin such as seasonal climate and agricultural pumping trends, other pumping wells, injection wells, land use, or contributions from rivers. By using superposition, the actual effects of only the proposed project can be isolated from the combined effects of all other basin activity. For example, when the NMGWM reports a 1-foot drawdown in a well, it is understood that the one foot of drawdown would be the effect on the basin of the proposed project only. That well may experience greater drawdown due to other stresses, such as drought or other nearby pumping wells, or may experience increases in water levels due to

[18] Hydraulic conductivity is the rate of water flow through a cross sectional area of an aquifer.
[19] Specific storativity is the amount of water taken out or put back into a unit volume of an aquifer when the water level changes.
[20] Specific yield is the amount of water that will drain from an aquifer just due to gravity.
[21] Leakage is the flow of water from one hydrogeologic unit to another. The leakage may be natural, as through a semi-impervious confining layer, or human-made, as through an uncased well.

TABLE 4.4-8
CORRELATION OF GEOLOGIC UNITS, AQUIFERS, AND MODEL LAYERS

180/400-Foot Aquifer Subbasin			CEMEX Area			Models and Corresponding Horizontal Model Layers	
Surface Geologic Units	**Surface Geologic Units Map Symbol**	**Hydro-stratigraphic Units**	**Surface Geologic Units**	**Surface Geologic Units Map Symbol**	**Hydro-stratigraphic Units**	**North Marina Groundwater Model (NMGWM)**	**CEMEX Model**
Ocean Floor	Qf	Ocean Floor	Ocean Floor	Qf	Ocean Floor	1	1
Alluvium	Qal(a)	Perched "A" Aquifer	Dune Sand	Qd	Dune Sand Aquifer	2	2
			Older Dune Sand	Qod			3
							4
Older Alluvium	Qo	Salinas Valley Aquitard	Older Terrace/ Marine Terrace	Qt (Qmt)	180-Foot Aquifer Equivalent	3	5
						4	6
Older Alluvium/ Marine Terrace	Qo/Qmt	180-Foot Aquifer Equivalent					7
Older Alluvium/ Older Alluvial Fan - Antioch	Qo/Qfa						8
Older Alluvial Fan – Placentia	Qfp	180/400-Foot Aquitard	Aromas Sand	Qar	180/400-Foot Aquitard	5	9
Aromas Sand (Undifferentiated)	Qae	400-Foot Aquifer			400-Foot Aquifer	6	10
Aromas Sand – Eolian Facies	Qae						
Paso Robles Formation	QT	400-900-Foot Aquitard	Paso Robles Formation	QT	400-900-Foot Aquitard	7	11
		900-Foot Aquifer			900-Foot Aquifer	8	12

NOTES:

[a] Subsurface Holocene geologic unit not mapped at surface

SOURCE: Geoscience, 2015c.

reduced regional pumping or an extremely wet year. But the proposed project's contribution to that drawdown in the well would remain only 1-foot. Superposition is described in **Appendix E2**, Section 5.2.

Return Water Considerations

The MPWSP proposes to return a certain fraction of water (referred to here as return water) extracted by the slant wells to water users in SVGB as desalinated product water. As a brief review, the Agency Act does not allow groundwater pumped from the SVGB to be exported for any use outside the SVGB (See full discussion in Chapter 2.7, Water Rights). Since the groundwater in this area has been intruded by seawater for decades, the proposed slant wells at CEMEX would extract brackish water, which is a mixture of ocean water and water originating from the inland aquifers of the basin. The freshwater portion of the brackish source water that originated from the inland aquifers would constitute the proposed return water. To achieve consistency with the Agency Act, the MPWSP proposes to return the freshwater component of the brackish water that is extracted through the slant wells. The exact quantity of water to be returned annually would vary and would be determined each year using a mathematical formula. However, for groundwater modeling and impact analysis purposes in this EIR/EIS, it is estimated that somewhere between 0 and 12 percent of the source water withdrawn for the project would comprise water originating from the inland aquifers, and thus would be returned to the basin. The water would be returned to the SVGB through deliveries of up to 800 afy of desalinated product water to the Castroville Community Services District (CCSD). This water would be piped to the CCSD and the CSIP and provided to water customers instead of their pumping an equal amount from the ground. This method of returning water is referred to as in-lieu recharge because the delivered water would reduce the need to pump groundwater in corresponding quantities. The NMGWM accounts for the 0 to 12 percent range by simulating the aquifer response in the various scenarios with a 0, 3, 6, and 12 percent returned product water.

Model Period

The model period for the NMGWM is 63 years. The model scenarios are run over a set time period, beginning with the baseline conditions and extending out to a future point in time, typically set as the life span of a given project. Over this time period, land use, climate conditions, and, if located along the coast, sea level rise would be expected to change. However, as discussed above, superposition modeling does not account for other stresses on the basin except for the effects on groundwater flow from projected sea level rise over the 63 years of modeled operations.

Sea Level Rise

Sea level along the coast of the Monterey Bay is expected to increase over the next six decades, resulting in a landward migration of the coastline and increased inland groundwater gradients at the coast. Sea level rise can influence the amount of ocean water extracted by slant wells and the resulting drawdown. An increase in sea level hastens the inland advance of ocean water above the underlying well screens, and as a result increases the potential for ocean water to flow into the wells. Between 2012 and 2073, sea level is projected to rise by 18.0 inches (ESA, 2013). The effects of sea level rise were integrated into the analysis by modeling the effects of the current sea

level and that expected after 63 years of pumping at the slant wells. The impact analysis refers to current sea level (sea level conditions in 2012, or Model Year 1) and sea level projected for the year 2073, or Model Year 61. Details of the use and application of sea level rise in the NMGWM for is described in **Appendix E2**, sections 4.3 and 5.2.

Model Scenarios

Modeling scenarios were developed to project the drawdown from groundwater pumping at the CEMEX site and the alternative location at Potrero Road, and to assess the uncertainty in drawdown to model assumptions and input. A full list of the modeling runs and assumptions is provided in **Appendix E2**, Table 5.2. The scenarios incorporated the slant well pumping rates, sea level rise, four return water percentages, and aquifer distribution in various configurations.

Calibration

Groundwater models are calibrated by comparing the output, such as simulated groundwater levels, to the groundwater levels measured in monitoring wells within the vicinity. The NMGWM was calibrated with information provided by the localized CEMEX Model, discussed below, and groundwater levels measured in the monitoring wells installed to evaluate slant well pumping. In addition, the NMGWM was calibrated to various monitoring wells in the vicinity, including those installed south of the CEMEX site near Fort Ord. See **Appendix E2** for detailed information on the NMGWM calibration methodology.

Sensitivity Analysis

Sensitivity analyses are performed to determine to what degree certain modeling parameters influence the output results. NMGWM development involved analysis of the sensitivity of model-calculated drawdown to uncertainty in pumping rates, return water volumes, and projected sea level rise. Uncertainty also exists in modeled aquifer parameters and relative contributions of the Dune Sand Aquifer and 180-FT/180-FTE Aquifer to total slant well pumpage. Sensitivity analyses were performed to determine the effects of the aquifer contribution between the Dune Sand Aquifer and the 180-FTE Aquifer and to assess whether varying extraction volumes from each aquifer would alter the modeling results. The NMGWM was run under the 0 percent return water scenario for three Dune Sand/180-FTE Aquifer distributions: 21/79, 44/56, and 66/34 percent. The 44/56 aquifer distribution is most likely and is assumed for the impact analyses below. Additional details on the sensitivity analyses performed for the NMGWM are provided in **Appendix E2**, Section 6.0.

Localized CEMEX Model

The CEMEX model is a MODFLOW-based model that was developed to more accurately model the local effects of slant well pumping. Because the monitoring well cluster locations on the CEMEX site are relatively close to the proposed slant well locations, and because the NMGWM cell size is 200 feet by 200 feet, it was possible that the slant wells and monitoring well clusters might be located in the same model cell. This proximity could reduce the ability of the NMGWM to simulate the changing conditions between the slant and monitoring wells and to estimate the

radius of influence during pumping. To address this, the CEMEX model was developed for the immediate area of the slant wells at the CEMEX site with a cell size of 20 feet by 20 feet (Geoscience, 2014a, 2015c, 2016b). The purpose of the CEMEX model is to better evaluate the localized effects of pumping the slant wells, including the cone of depression and the changes to salinity. Ultimately, the results of this localized model were incorporated into the NMGWM results. **Figure 4.4-12** shows the model boundaries of this CEMEX model.

Seaside Groundwater Basin Modeling

The proposed project includes the injection and storage of treated water in the Santa Margarita Sandstone in the SGB as an addition to the ASR program. Groundwater modeling was previously conducted as part of the development of the ASR program and was presented in the *Final Environmental Impact Report/Environmental Assessment for the Monterey Peninsula Water Management District Phase 1 Aquifer Storage and Recovery Project,* dated August 2006 (MPWMD, 2006). The 2006 ASR modeling results were used to understand the response of the aquifers in the SGB to changes and to inform basin management decisions, such as how to operate the ASR program. The results of the SGB modeling were used to evaluate the impacts of the proposed project on the SGB. The SGB model is described below.

The 2006 ASR modeling effort evaluated changes in groundwater levels and long term changes in groundwater storage in the Santa Margarita Aquifer from operation of the ASR wells. The groundwater model was developed utilizing the WinFlow software program, which simulates two-dimensional steady-state and transient groundwater flow, and used published aquifer parameters for the Santa Margarita aquifer. The model simulated the groundwater level and storage response based on an approximate injection volume of 2,426 af over the course of 183 days and extraction volume of 2,002 af over the course of 153 days, which represented the range of likely "extreme" injection and extraction conditions that could be encountered over the life of the ASR project. The results of the groundwater modeling indicated that long term operation of the ASR program would result in a beneficial impact on SGB storage and groundwater levels at existing water supply wells.

Subsequently, HydroMetrics developed the Seaside Basin Groundwater Model for the Seaside Groundwater Basin Watermaster based on MODFLOW-2005 and SEAWAT 2000 to assist with groundwater management decisions (HydroMetrics, 2009b). The model domain included both the Seaside Basin and the area outside and to the north of the Basin. The model simulates five geologic layers: the Aromas Sand, the upper Paso Robles Aquifer, the middle Paso Robles Aquifer, the lower Paso Robles Aquifer, and the Santa Margarita Sandstone/Purisima Formation. The model simulates groundwater conditions between January 1987 and December 2008. As a part of developing the conceptual model and groundwater simulation, HydroMetrics concluded that the Santa Margarita Sandstone is "highly confined beneath thick clay beds near the ocean, and it does not receive significant deep percolation recharge near the ocean."

4.4.4.3 SWRCB Final Review of California American Water Company's Monterey Peninsula Water Supply Project

The SWRCB evaluation of the proposed project was considered as guidance for the analysis of groundwater impacts because it elucidates and provides context for the nexus between the thresholds of significance used in this section and recommendations and considerations of the SWRCB relative to water rights. Please refer to Chapter 2, Water Demand, Supplies, and Water Rights, which discusses the legal aspects in further detail.

To provide further clarification, on July 31, 2013, the SWRCB reviewed the proposed project (SWRCB, 2013). The SWRCB described its understanding of the physical setting, the components of the proposed project, and the legal analysis regarding the water to be produced by the slant wells.

The SWRCB reviewed the proposed project and provided specific investigation and modeling requirements to demonstrate that the proposed project "will not harm or cause injury to any other legal user of water" from the SVGB (SWRCB, 2013). The SWRCB identified three possible categories of injury that could occur from the MPWSP. The three foreseeable injuries that overlying users could experience are (1) a reduction in the overall availability of fresh water due to possible incidental extraction by the MPWSP; (2) a reduction in water quality in those wells in a localized area within the capture zone, or area of influence; and, (3) a reduction in groundwater elevations that requires users to expend additional pumping energy to extract water from the Basin.

From its review of the project, SWRCB stated that:

> "Key factors will be: (1) how much fresh water Cal-Am extracts as a proportion of the total pumped amount, (to determine the amount of water, that after treatment, would be considered desalinated seawater available for export as developed water); (2) whether pumping affects the water table level in existing users' wells, (3); whether pumping affects seawater intrusion within the Basin (4) how Cal-Am returns any fresh water it extracts to the Basin to prevent injury to others; and (5) how groundwater rights might be affected in the future if the proportion of fresh and seawater changes in the larger Basin area or the immediate area around Cal-Am's wells."
>
> "If overlying groundwater users are protected from injury, appropriation of water consistent with the principles discussed in this report may be possible. To export water outside the Basin, Cal-Am must show 1) the desalinated water it produces is developed water, 2) replacement water methods to return water to the Basin are effective and feasible, and 3) the MPWSP can operate without injury to other users. A physical solution could be employed to assure all groundwater users rights are protected."

The SWRCB recommended the following actions to support the conclusion of no harm:

> "Studies are needed to determine the extent of the Dune Sand Aquifer, the water quality and quantity of the Dune Sand Aquifer, the extent and thickness of the SVA and the extent of the 180-Foot Aquifer."
>
> "The effects of the MPWSP on the Basin [i.e., the SVGB] need to be evaluated. Specifically, a series of test boring/wells would be needed to assess the hydrogeologic

conditions at the site. Aquifer testing also would be needed to establish accurate baseline conditions and determine the pumping effects on both the Dune Sand Aquifer and the underlying 180-Foot Aquifer. Aquifer tests should mimic proposed pumping rates."

"Updated groundwater modeling will be needed to evaluate future impacts from the MPWSP. Specifically, modeling scenarios will need to be run to predict changes in groundwater levels, groundwater flow direction, and changes in the extent and boundary of the seawater intrusion front. Additional studies also will be necessary to determine how any extracted fresh water is replaced, whether through re-injection wells, percolation basins, or through existing recharge programs. It may also be necessary to survey the existing groundwater users in the affected area. The studies will form the basis for a plan that avoids injury to other groundwater users and protects beneficial uses in the Basin. To ensure that this modeling provides the best assessment of the potential effects of the MPWSP, it is important that any new information gathered during the initial phases of the groundwater investigation be incorporated into the groundwater modeling studies as well as all available information including current activities that could influence the groundwater quality in the Basin."

4.4.4.4 Injection and Extraction of Desalinated Water for the ASR Program

The proposed project includes the injection, storage and extraction of treated water from the desalination plant into the Santa Margarita Sandstone in the SGB as an addition to the ASR program. CalAm would manage the injection and extraction of the Carmel River and desalinated water sent to the ASR system to avoid injecting water to, or extracting water from the ASR system, in a manner that might damage the aquifer, or exacerbate overdraft or seawater intrusion (CalAm, 2014). Specifically, the location of the existing groundwater depression in the SGB must be reviewed each year and extraction may only be conducted in wells located east (up gradient) of the center point of the depression and only in a certain preferential order (ASR wells first, then other specific production wells, as needed) to avoid pumping from near the coastline, which could accelerate seawater intrusion. See Section 3.4.2, Description of the Proposed Project provides additional details including the limitations on the rate of injection to prevent over-pressurization and compression of plugging materials in the injection wells.

4.4.5 Direct and Indirect Effects of the Proposed Project

The following impact analyses focus on potential effects on groundwater resources and water quality associated with the proposed project, MPWSP which includes 10 slant wells at CEMEX. The analyses of project impacts considered project plans, current conditions within the project area, applicable regulations and guidelines, and previous environmental assessments. **Table 4.4-9** summarizes the proposed project's impacts and significance determinations related to groundwater resources.

TABLE 4.4-9
SUMMARY OF IMPACTS – GROUNDWATER RESOURCES

Impacts	Significance Determinations
Impact 4.4-1: Deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level during construction.	NI
Impact 4.4-2: Violate any groundwater quality standards or otherwise degrade groundwater quality during construction.	LS
Impact 4.4-3: Deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level during operations so as to expose well screens and pumps.	LS
Impact 4.4-4: Violate any groundwater quality standards or otherwise degrade groundwater quality during operations.	LSM
Impact 4.4-C: Cumulative impacts related to Groundwater Resources	LS

NOTES:
NI = No Impact
LS = Less than Significant impact, no mitigation proposed
LSM = Less than Significant impact with mitigation

4.4.5.1 Construction Impacts and Mitigation Measures

Impact 4.4-1: Deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level during construction. *(No Impact)*

Impact 4.4-1 addresses the effects on groundwater resources that could occur during the construction of the proposed project. In accordance with the significance criteria (Section 4.4.3 above), a significant impact would occur if construction activity reduced groundwater supplies or substantially hindered the ability of surface water to recharge the aquifer, resulting in lower groundwater levels. Under the MPWSP, temporary groundwater use during installation of the slant wells and the ASR injection/extraction wells could deplete groundwater supplies. Impact 4.4-3, below, evaluates the operational impacts related to the decrease in recharge.

Water Supply for Slant Well and ASR Drilling and Construction

The proposed slant wells and ASR injection/extraction wells would be built using a dual-wall, reverse-circulation rotary drill rig.[22] Some large-scale drilling projects (comparable to the proposed drilling and well construction) require large volumes of water during well drilling to reduce friction in the drill casing and to help flush rock fragments and pulverized cuttings generated from drilling out the borehole. The volume of water needed for the proposed slant well construction could be

[22] Dual-wall, reverse-circulation rotary drilling uses a drilling rig with two rotary drives. One drive rotates the outer drilling casing into the subsurface with a hardened drive or cutting shoe, while the other drive rotates an inner drill pipe and cutting bit. In reverse circulation, air or water is pumped under pressure down between the outer drill casing and inner drill pipe, and air, water, and cuttings are returned to the surface in the inner drill pipe. Upon reaching the desired depth, the inner drill string is removed and the well casing, filter pack, and surface seal is built inside the outer casing, allowing the well to be built while holding the native formation materials back from the borehole. Upon completion, the outer casing is withdrawn, leaving the finished well in place.

between 4 to 5 million gallons, but there might be much less, and perhaps none, depending on how the drilling proceeds (Geoscience, 2014b). The water required for ASR injection/extraction well construction would be less. If the proposed project requires well drilling water, it would be purchased from an outside water purveyor and delivered to the drill site by truck; water would not be extracted from local groundwater sources. No impact on local groundwater supplies would occur because the water needed to build the wells would be provided from an offsite water purveyor and would not be extracted from local groundwater sources.

Water Supply for Pipelines and Other Facility Construction

The proposed project pipelines and MPWSP Desalination Plant, Terminal Reservoir, and Carmel Valley Pump Station would be built using standard construction methods that would require water for dust suppression, concrete washouts, tire washing, and general site maintenance. Water for these operations would be purchased from a local water purveyor and delivered to each construction site by truck. Construction of these facilities would use water in amounts that are typical for this type of project, and groundwater pumping would not be necessary. Therefore, construction of the pipelines and support facilities would not impact groundwater supplies.

Impact Conclusion

There would be no impacts associated with groundwater supplies and recharge during the construction of project facilities.

Mitigation Measures

None proposed.

Impact 4.4-2: Violate groundwater water quality standards or otherwise degrade groundwater quality during construction. *(Less than Significant)*

In accordance with the significance criterion (Section 4.4.3, above), a significant impact would occur if construction discharges to groundwater exceeded water quality standards or otherwise degraded groundwater quality. This analysis evaluates whether construction operations, such as well drilling and the construction of pipelines and other facilities, would result in impacts on groundwater quality. Section 4.3, Surface Water Hydrology and Water Quality, addresses impacts related to surface water quality; Section 4.5, Marine Biological Resources, addresses impacts related to the marine environment.

Water Quality Impacts Associated with Construction of Slant Wells

The nine new slant wells would be built at depths that extend through the Dune Sand Aquifer and the 180-FTE Aquifer, similar to the existing test slant well. The 180-FTE Aquifer is likely hydrologically connected to the inland 180-Foot Aquifer. Inland of the current seawater intrusion front, wells in the 180-Foot Aquifer are used for irrigation and drinking water supplies. The proposed slant wells would be built using a dual-rotary drill rig that uses air, the water already

present in the geologic materials, bentonite mud, and, when necessary, additional potable water to circulate the drill cuttings. If potable water were added, the quality of that water would be better than that of the underlying brackish water and therefore would not degrade groundwater quality. Considering the proposed drilling method, there is a very low potential for groundwater degradation to occur during drilling and, thus, this impact would be less than significant.

Water Quality Impacts Associated with Construction of ASR Injection and Extraction Wells

The ASR injection/extraction wells would be drilled without the use of drilling muds. However, when necessary, and depending on the formation material encountered, commercially available additives might be combined with the drilling water to increase fluid viscosity and stabilize the walls of the boring to prevent reactive shale and clay from swelling and caving into the hole. Other products would be used to enhance the drilling performance and help reduce the buildup of solids, decrease friction, and aid in reducing solids suspension. Drilling mud additives are commonly used by the well drilling industry for the drilling and installation of groundwater wells, and do not contain chemicals that would degrade groundwater quality. Because the additives are combined with the water and are circulated through the borehole annulus during drilling, they react locally within the borehole and do not migrate into the surrounding groundwater formation. The additives are noncorrosive and biodegradable, and do not contain chemicals that would degrade groundwater quality. Therefore, while the use of bentonite muds would be necessary during the drilling of the ASR injection/extraction wells, the potential for degradation to groundwater is low and the impact would less than significant. Section 4.3, Surface Water Hydrology and Water Quality, addresses the management and disposal of drilling muds and slurries.

All Other Facilities (MPWSP Desalination Plant, Terminal Reservoir, Carmel Valley Pump Station, and All Pipelines)

The proposed pipelines would be built along the TAMC right-of-way, Monterey Peninsula Recreational Trail, and existing road rights-of-way. The Carmel Valley Pump Station would be built on an existing concrete pad. These facilities do not require construction activities within groundwater-bearing zones and thus would have a very low potential to degrade groundwater quality. While pipeline trenches may encounter shallow groundwater, the construction operation of laying a pipeline and backfilling the trench would not release contaminants into the shallow groundwater zone. This impact would be less than significant.

Impact Conclusion

Impacts associated with discharges to groundwater and impacts on groundwater quality during the construction of project facilities would be less than significant.

Mitigation Measures

None proposed.

4.4.5.2 Operations Impacts and Mitigation Measures

Impact 4.4-3: Deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level during operations. (*Less than Significant*)

Impact 4.4-3 evaluates the potential effects of extracting and injecting groundwater as proposed by the MPWSP. This impact analysis addresses the following:

- Changes in available supply in the SVGB from groundwater pumping at CEMEX,
- Effect of groundwater extraction at the CEMEX site on nearby groundwater supply wells,
- Effect of injection and extraction through ASR wells on the SGB, and
- Changes in aquifer recharge in SVGB.

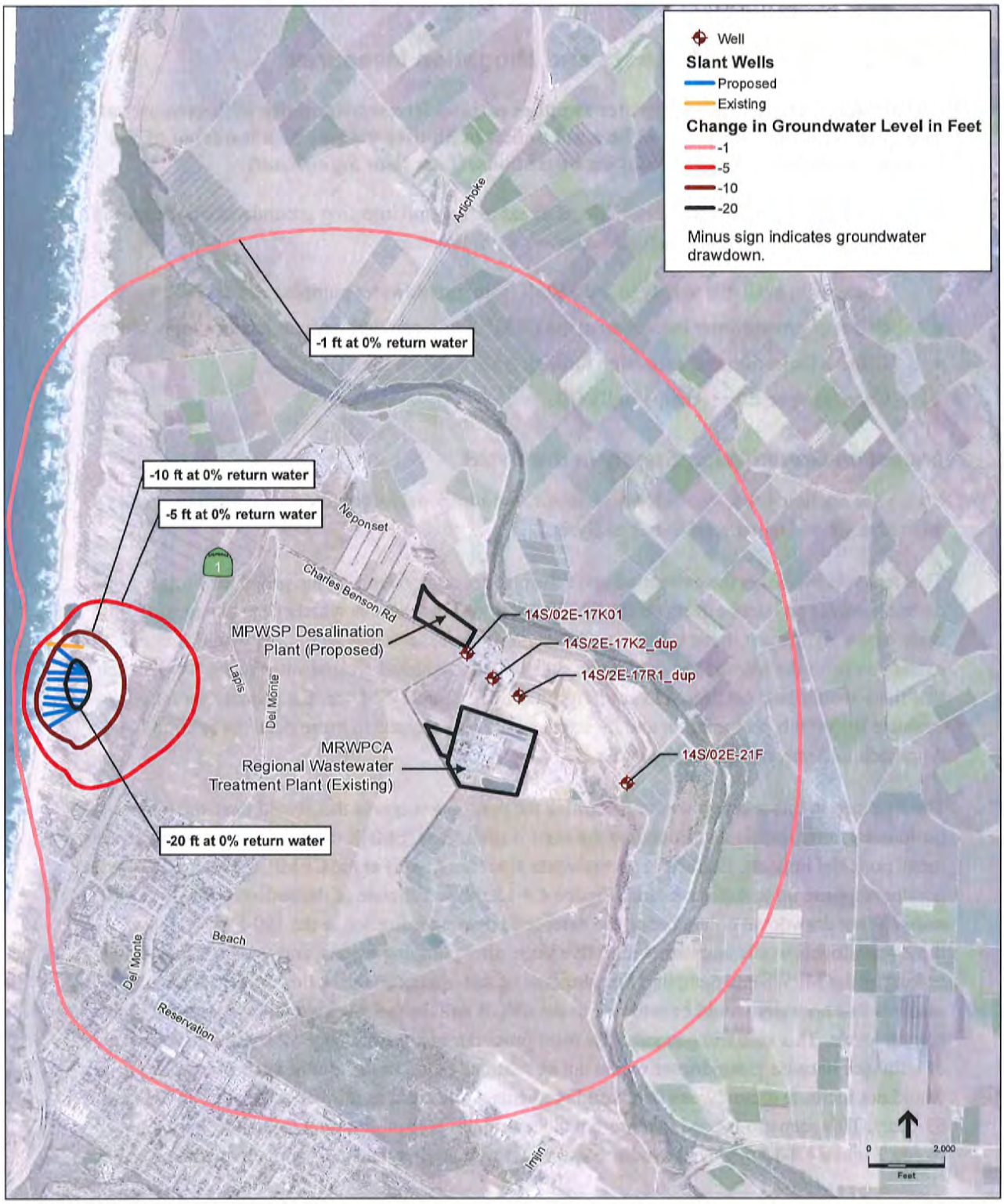
Impact on Groundwater Supply in the SVGB

Please see Section 4.4.4, *Approach to Analysis*, for additional information on modeling, methodology and terms used in this analysis.

This analysis evaluates the extraction and return water components of the proposed project to determine their physical effects on the SVGB basin and determines whether the changes, if any, constitute a significant impact. The significance criterion states that an impact would occur if extraction from the subsurface slant wells substantially depleted groundwater in the SVGB such that there would be a net deficit in aquifer volume. The NMGWM was the primary tool used to evaluate the effects on the basin and its aquifers and is discussed in more detail in Section 4.4.4 Approach to Analysis and in **Appendix E2**.

The first step in this analysis was to determine the pumping scenario that would have the most profound aquifer response surrounding the slant wells at the CEMEX site in order to conservatively judge potential impacts. Extracting groundwater from slant wells at the CEMEX site could cause an aquifer response up to 4 miles inland. **Figure 4.4-13** shows the cone of depression with -1, -5, -10, and -20-foot drawdown contours and the extent of pumping influence in the 180-FTE Aquifer; these drawdowns would stabilize within five years after pumping begins, and would remain stable as long as the MPWSP is pumping. For purposes of this impact analysis, this model scenario assumes that no water would be returned to the SVGB and the sea level would be consistent with current levels. This scenario generates the most pronounced cone of depression with the largest area of influence because groundwater would not be returned to the basin, and because current sea level would not increase groundwater levels and gradients at the coast as it is expected to do in the next 63-years. This scenario is used to represent the maximum area of pumping influence. In other words, **Figure 4.4-13** depicts the improbable worst case aquifer response from the proposed project.

The second step in this analysis was to use the drawdown contour map on **Figure 4.4-13** to determine the area of influence and maximum drawdown caused by the slant well pumping. As shown by modeling result depicted on Figure 4.4-13 the center of the cone of depression and thus, the capture zone for the slant wells show that the majority of the groundwater drawn into the



SOURCE:HydroFocus, 2016

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Figure 4.4-13

Proposed Action: Response of 180-Foot Aquifer after 63 Years
0% Return Water

proposed MPWSP slant wells would originate in the aquifer zones located at and offshore of the coast and would be composed primarily of seawater. This is illustrated by the configuration of the cone of depression shown in **Figure 4.4-13**. The western extent of the cone of depression is just offshore and in close proximity to the slant wells where the drawdown is deepest and contours are steeper, indicating more flow to the slant wells and higher yield near the coast. At the coast, seawater entering the slant wells would have the shortest and least restricted pathway through the overlying sea floor deposits. The drawdown contours extend inland but at considerably shallower gradients, between -1 and -5 feet, indicating that the inland basin is less permeable, and that groundwater must flow through thicker sediments to reach the slant wells. This additional resistance to flow reduces the volume of water available to the slant wells and flattens the gradient. The cone of depression shown on **Figure 4.4-13** illustrates that the majority of the water pumped at the slant wells would originate at the coast and just offshore, where the drawdown is most pronounced while a smaller volume of groundwater would be extracted from the inland portion of the 180-Foot Aquifer.

The third step in this analysis was to assess the quality and current use of the groundwater that would be extracted by the slant wells. The MPWSP slant wells would not extract potable groundwater. The groundwater in the 180-foot Aquifer that is underlying the area influenced by the MPWSP pumping, up to about 4 miles inland, has been intruded with seawater for decades, and far exceeds the State Drinking Water Standard of 500 mg/L of total dissolved solids (TDS).[23] The inland groundwater has been degraded by legacy and ongoing seawater intrusion and is not being produced for beneficial potable uses. **Figure 4.4-10**, above, shows the areas of groundwater in the 180-Foot Aquifer degraded by seawater intrusion over time. The CEMEX site and the area of influence from slant well pumping in the 180-FTE are well within the area degraded by historical sea water intrusion.

Recent testing for TDS in groundwater within the area of influence of the proposed MPWSP slant well pumping verifies the degree of seawater intrusion. Water samples from Monitoring Well MW7M (180-FTE Aquifer) and MW-7D (400-Foot Aquifer), located just over a mile southeast from the proposed slant well location, contained TDS concentrations at 3,832 mg/L and 26,700 mg/L, respectively. Samples from Monitoring Well MW-8M and MW8D, located 1.5 miles to the northeast, had TDS concentrations of 24,000 mg/L and 583 mg/L, respectively. Monitoring Well MW-9S (Dune Sand Aquifer) and MW-9M (180-FTE Aquifer), located 2 miles to the northeast, had TDS concentrations of 3,204 mg/L and 29,000 mg/L, respectively. These data show that groundwater within the inland area of influence of the proposed MWSP slant wells is brackish with elevated TDS attributable to seawater intrusion; the groundwater in the Dune Sand, 180-FTE and 400-foot Aquifer is therefore unsuitable for potable supply.

Current groundwater production in the Dune Sand Aquifer, the 180-FTE Aquifer, and the 400-Foot Aquifer, which are projected to exhibit a response to MPWSP slant well pumping, is limited to minor irrigation and dust control. There are no water supply wells pumping potable water. Most of the wells in this area are no longer active because of seawater intrusion.

[23] TDS is a test for groundwater that can be used to quantify the amount of salts in a sample and is used to test for salinity.

Furthermore, groundwater production is restricted within the seawater intruded coastal areas in the vicinity of the CEMEX site through MCWRA Ordinance 3709, which prohibits drilling wells and pumping groundwater from the 180-FTE Aquifer in order to protect groundwater resources. The slant wells at CEMEX and the area of pumping influence east of CEMEX are within the jurisdictional boundary of Ordinance 3709.

Conclusions of Impact Analysis – Depletion of Groundwater Supply from the SVGB

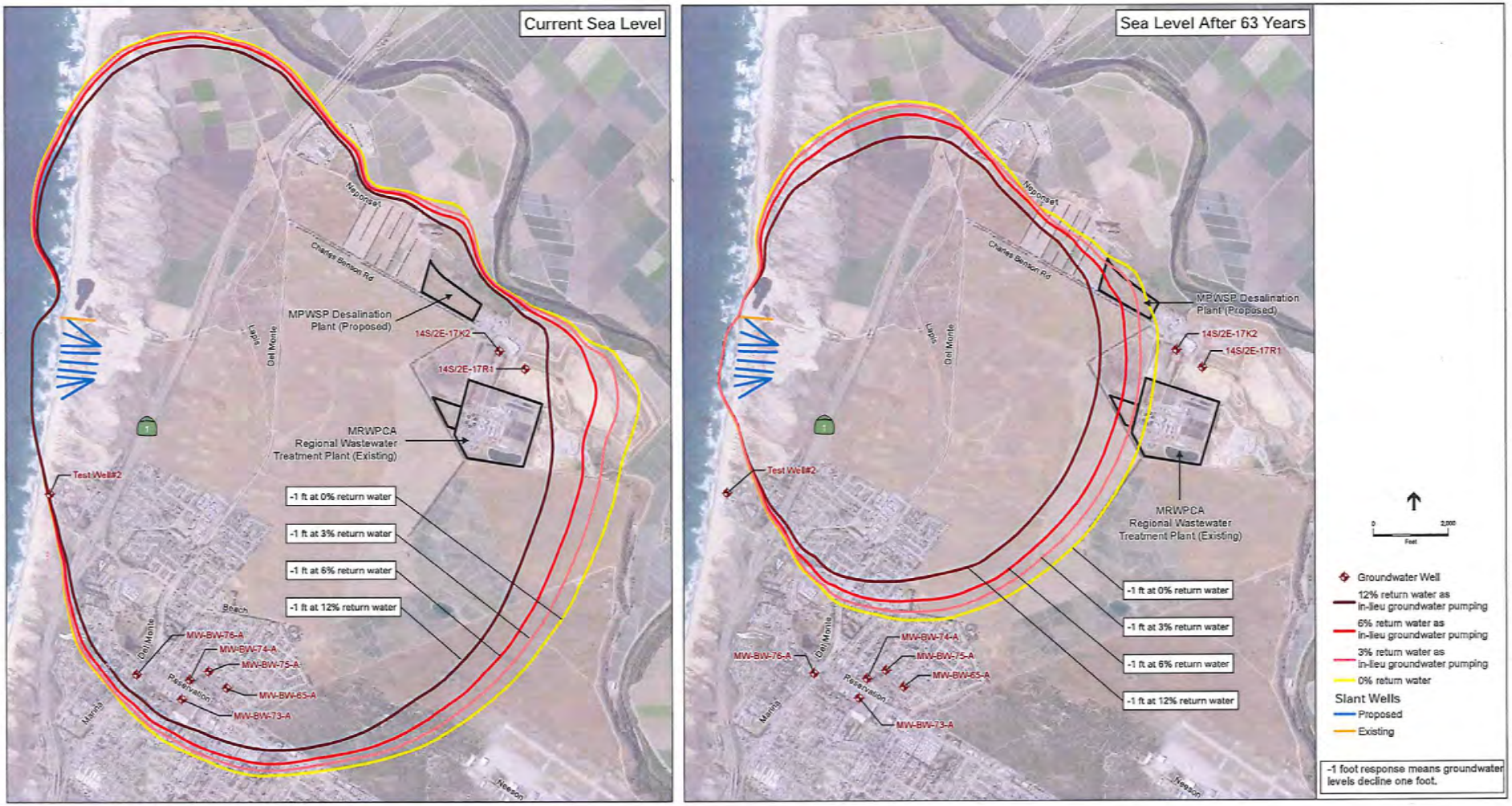
The proposed project would not deplete groundwater supplies; it would extract primarily seawater and a smaller volume of brackish inland groundwater from a localized area with only minor localized groundwater drawdown. The area influenced by the MPWSP groundwater pumping is within a zone that is degraded by seawater intrusion and therefore unusable for potable water supply due to its high salinity. When desalinated water is returned to the basin as part of the MPWSP, groundwater conditions in the 400-Foot Aquifer underlying the CSIP, CCSD, and adjacent areas would improve as water levels increase as a result of in-lieu groundwater recharge. The return water component of the MPWSP would benefit each of the aquifers by either reducing the area of influence or by increasing groundwater levels in other areas. The effects of return water on the basin water levels are discussed below and shown on **Figures 4.4-14** through **4.4-16**. If the proposed project did not return any water, localized depressed groundwater levels would persist in the three affected aquifers throughout the life of the project. However, the area affected by groundwater pumping would remain localized and the proposed project would continue to extract only brackish, degraded groundwater from the coast and, to a lesser extent, the inland portion of the aquifer. Based on the conclusions of this analysis, this impact would be less than significant.

Impact on Nearby Production Wells

An impact would be considered significant if the proposed project lowered groundwater levels in a nearby municipal or private groundwater production well enough to cause a substantial reduction in well yield, or to cause physical damage due to exposure of well screens and well pumps. The nearby production wells that could be affected by MPWSP pumping at the CEMEX site are shown on **Figure 4.4-14** and listed in **Table 4.4-10**.

This impact analysis presents and discusses the NMGWM data that were used to determine the aquifer response to the proposed MPWSP extraction of groundwater at the CEMEX site. These data are used to assess the impacts on the nearby, active groundwater supply wells located within an area extending about 4 miles inland from the CEMEX site.

The aquifer response to the proposed project is shown for the Dune Sand Aquifer, (**Figure 4.4-14**), the 180-FTE Aquifer (**Figure 4.4-15**), and the 400-Foot Aquifer (**Figure 4.4-16**). These figures also show the local nearby water supply wells described in **Table 4.4-10** but locate only those supply wells that are screened in the specified aquifer. For instance, only wells screened in the 180-FTE Aquifer are shown on **Figure 4.4-15**. Each figure also provides a side-by-side comparison of the aquifer response at current sea level in Model Year 1 and the predicted sea level in Model Year 63.

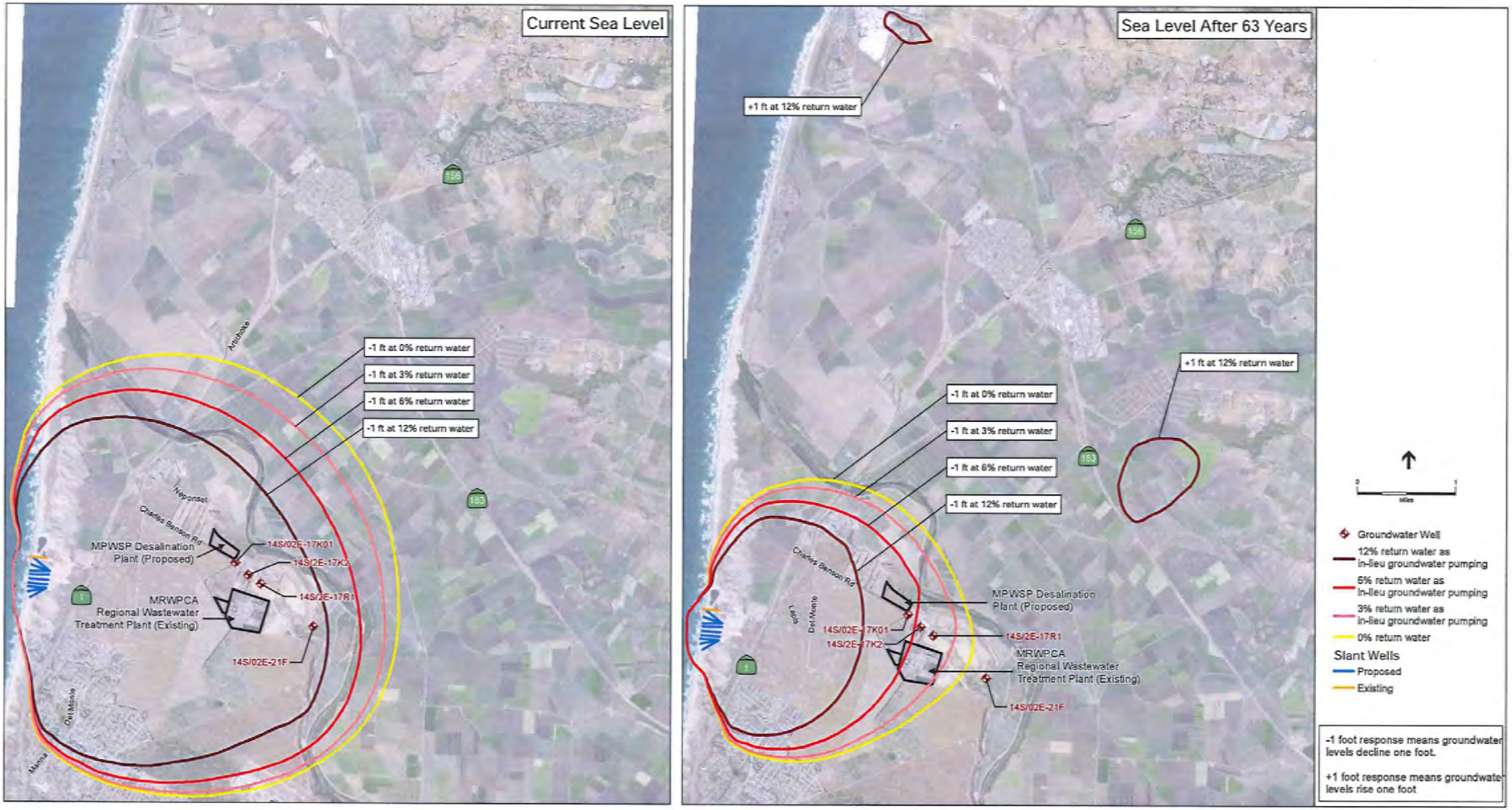


SOURCE:HydroFocus, 2015

205335.01 Monterey Peninsula Water Supply Project

Figure 4.4-14

Proposed Action: 1-Foot Response in Dune Sand Aquifer

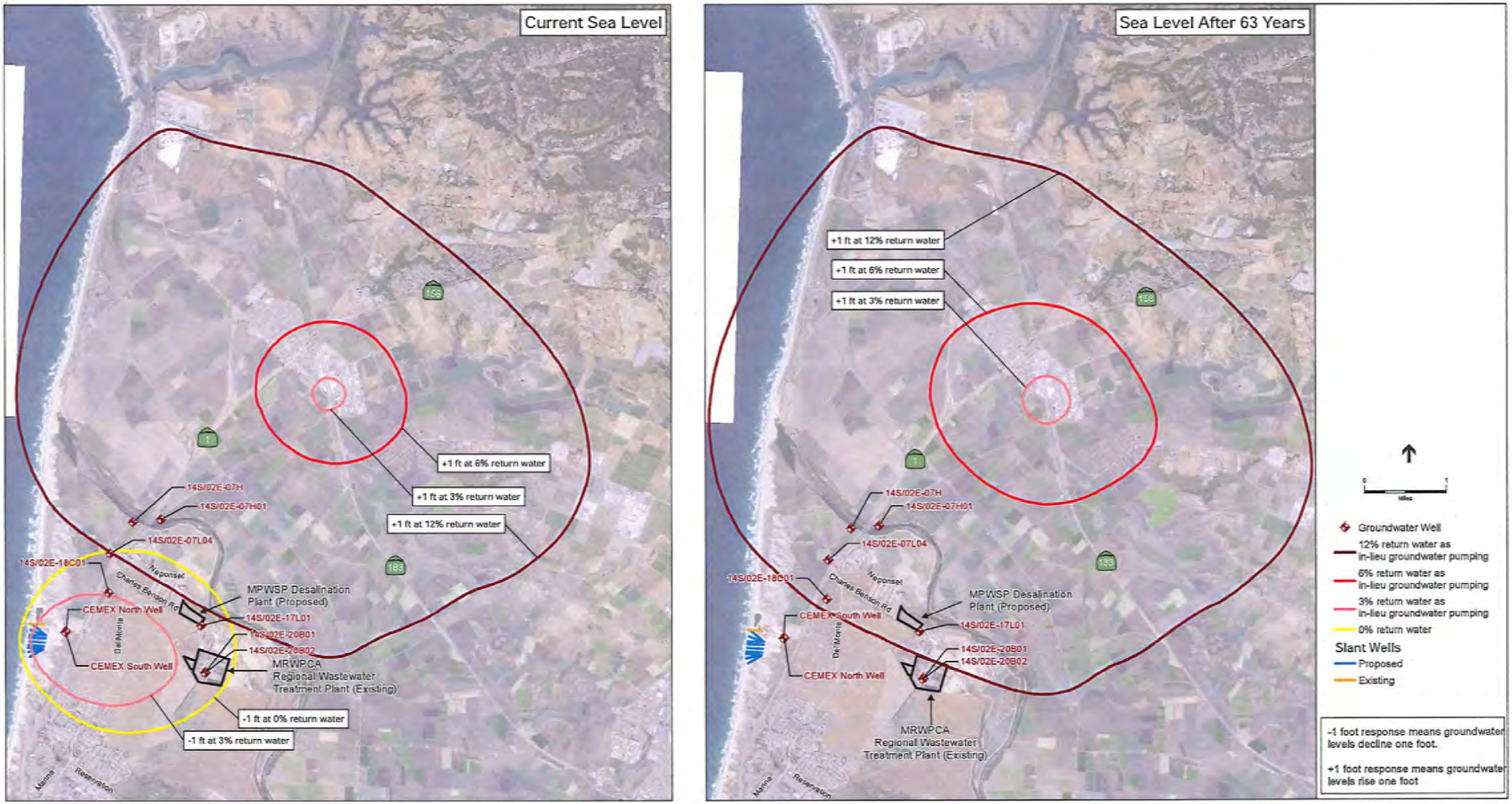


SOURCE:HydroFocus, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.4-15

Proposed Action: 1-Foot Response in 180-Foot Aquifer



SOURCE:HydroFocus, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.4-16

Proposed Action: 1-Foot Response in 400-Foot Aquifer

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TABLE 4.4-10
KNOWN ACTIVE SUPPLY WELLS WITHIN VICINITY OF THE PROPOSED MPWSP SLANT WELLS

Well Owner	Well Number/ID	Aquifer	Use Status
CEMEX	South Well North Well	400	South Well is located about 1,600 feet southeast of the insertion point of the proposed slant wells. The well screen is set between 400 and 506 feet and is separated from the intake portion of the slant wells by the 180/400-Foot Aquitard. CEMEX North collapsed and is unusable.
Ag Land Trust	14S/02E-18C01	400	"Small Well" (14S/2E-18C1) is located between Lapis Road and east of Highway 1 and is used to supply a water truck filling station for dust control.
	14S/02E-18E01	900	"Big Well" (14S/02E-18E01) is located adjacent to the west side of Highway 1, north of the access road to the CEMEX property. The Big Well has no pump, but is reportedly occasionally hand-bailed for irrigation on local restoration projects.
MRWPCA Regional Wastewater Treatment Plant	14S/02E-20B01	400	Three wells are located just southeast of the proposed MPWSP Desalination Plant, but only the well screened across the 900-Foot Aquifer is active and is used for domestic purposes (i.e., drinking water, washing, toilets).
	14S/02E-20B02	400	
	14S/02E-20B03	900	
Monterey Peninsula Landfill	14S/02E-17K01	180	Located adjacent to and southeast of the proposed desalination plant site on Charles Benson Road. Four wells are screened across the Dune Sand Aquifer and/or the 180-FTE Aquifer. Three of the water supply wells are used for dust control; the fourth well is inactive.
	14S/02E-17K02	DSA and 180	
	14S/02E-17R01	DSA and 180	
	14S/02E-21F	180	
Bill Baillee/Unknown	14S/02E-07H	400	Two local private wells owned by Bill Baillee (14S/02E-07H and 14S/02E-07H01) and two with unknown owners (14S/02E-17L01 and 14S/02E-07L04). These wells are screened across the 400-Foot Aquifer.
	14S/02E-07H01	400	
	14S/02E-17L01	400	
	14S/02E-07L04	400	
Municipal Wells			Municipal wells are mentioned here, but they are not shown on figures because the City of Marina's Wells 10, 11, and 12 are over 2 miles to the southeast, and are screened in the 900-Foot Aquifer (MCWD, 2005). The Ord Community Wells 29, 30, and 31 are located 5 plus miles to the southeast and are screened in the lower 180-Foot and the 400-Foot Aquifers (MCWD, 2005)

NOTES:

MRWPCA = Monterey Regional Water Pollution Control Agency
DSA = Dune Sand Aquifer
180 = 180-FTE Aquifer or 180-Foot Aquifer
400 = 400-Foot Aquifer
900 = 900-Foot Aquifer

SOURCE: Geoscience, 2015c; MRWMD, 2003.

The extent of aquifer response is shown using the -1-foot groundwater contour. This contour was chosen to delimit the minimum regional response of MPWSP pumping. Groundwater levels inside the -1-foot contour would have a groundwater drawdown greater than 1-foot. **Figure 4.4-13** shows where the -1, -5, -10, and -20-foot drawdown contours would be inside the cone of depression formed under the pumping scenario with the greatest magnitude of aquifer response (0 percent return water under current sea level conditions). **Figures 4.4-14** through **4.4-16** show the -1-foot contour under the 0, 3, 6, and 12 percent return water scenarios.

Groundwater modelers used these return water percentages to capture minimum, maximum, and mid-range estimates of return water volumes. The amount of return water, if any, has not yet been established, but is expected to be anywhere between 0 percent and 12 percent. A 0 percent return volume would mean the MPWSP would extract water but not return water to the basin as in-lieu recharge. This would depict the condition that causes the greatest magnitude of aquifer response from MPWSP pumping, also referred to as the "worst case" condition.

Results of Impact Analysis - Proposed Project on Nearby Production Wells

Observations of Pumping Response Applicable to all Aquifers

The maximum pumping response in all three aquifers is depicted by the -1-foot contour at 0 percent return water, under current sea level rise conditions. The -1-foot contours resulting from 3, 6 and 12 percent return water consistently show an aquifer response less than that resulting from the 0 percent return water scenario. The area of pumping influence would be less pronounced under the sea level rise conditions expected after 63 years of operation because higher sea levels exert greater pressures at the coast, making more seawater available to the slant wells. Consequently, groundwater levels may decrease in a well when the MPWSP starts running, but could increase over the 63 years of operation.

Aquifer Response in Dune Sand Aquifer

The Dune Sand Aquifer response from MPWSP pumping, with current sea level conditions and 0 percent return water, would extend a maximum of about 3 miles inland from the CEMEX site (**Figure 4.4-14**). Under sea level conditions after 63 years, the area of influence would be reduced in size by about a mile. Monterey Peninsula Landfill wells 14S/2R-17K2 and 14S/2R-17R1 are screened in the Dune Sand Aquifer.

Aquifer Response in 180-FTE Aquifer

The greatest observed groundwater response to MPWSP pumping would be in the 180-FTE Aquifer under the current sea level conditions (**Figure 4.4-15**). The -1ft contour resulting from the 0 percent return water scenario would extend a maximum distance of about 3.6 miles to the northeast. With sea level rise after 63 years, the aquifer response for all three return water scenarios would be reduced by about a mile. Under the 12 percent return water scenario, two localized areas of groundwater level increase would develop: one would be located 5 miles to the northeast, near Highway 183, and one would develop about 6.5 miles north, near Dolan Road in Moss Landing. Two small circular +1-ft contours indicate an increase in the groundwater level of 1 foot or more.

This increase represents the effects of 12 percent return water, with the corresponding reduced pumping in the 400-Foot Aquifer underlying CSIP and CCSD.[24] Monterey Peninsula Landfill wells 14S/2R-17K01, 14S/2R-K02, 14S/2R-17R1, and 14S/2R-21F are screened in the 180-FTE Aquifer.

Aquifer Response in the 400-Foot Aquifer

Under the 0 percent return water scenario and current sea level conditions, the aquifer response would extend inland about 2.5 miles from the CEMEX site (**Figure 4.4-16**). Aquifer response with 3 percent return water and the current sea level would produce two conditions in the 400 Foot Aquifer: an area of pumping response extending inland from CEMEX about 1.8 miles, and an area of localized groundwater level increase near the CCSD. Under a 6 percent return water scenario, and under the current sea level conditions, the only aquifer response would be a groundwater level rise encompassing the CCSD and portions of the CSIP delivery area near Castroville. This change would be a likely result of CCSD reducing groundwater pumping as a result of receiving desalinated return water. With 12 percent return water and at current sea level rise, the groundwater levels in the 400-Foot Aquifer could increase by at least one foot north of the Salinas River, including the CCSD and CSIP areas, and areas east of Highway 183.

The aquifer response with 0 percent return water and sea level conditions after 63 years could result in no aquifer response in the 400-Foot Aquifer. This is because higher sea level would provide more pressure at the coast and available seawater to the slant wells and thus less water would be drawn up from the 400-Foot Aquifer. With 3, 6, and 12 percent return water and sea level rise after 63 years, the aquifer response would be similar to current sea level conditions, resulting in increased water levels extending out from the city of Castroville for about 3 to 4 miles in all directions. The CEMEX South Well, the Ag Land Trust Well (14S/02E-18C01), the MRWPCA Regional Wastewater Treatment Plant wells (14S/02E-20B01, 14S/02E-20B02), and the Bill Baillee/unknown wells (14S/02E-07H01, 14S/02E-07H, 14S/02E-07L01, and 14S/02E-07L04) are screened in the 400-foot Aquifer.

Impact Conclusion – Impact of Proposed Project on Nearby Production Wells

This analysis demonstrated that certain groundwater supply wells located within the slant well area of influence could experience a change in groundwater level between 1 and 5 feet during the life of the project.

The NMGWM considered the effects of the project with and without returning water to the SVGB. The "worst-case" groundwater level declines would occur under the 0 percent return water scenario because, under the 0 percent return water scenario, no water would be returned to the CCSD or CSIP for in-lieu groundwater recharge and pumping in the 400-Foot Aquifer would not be reduced. However, if 3 to 12 percent return water is supplied as in-lieu groundwater recharge, there would be less of a response to MPWSP pumping in the Dune Sand Aquifer, the 180-FTE Aquifer, and the 400-Foot Aquifer. Increased sea level rise over the next 63 years would additionally reduce the area influenced by MPWSP pumping.

[24] The two isolated areas of increased groundwater levels in the 180-aquifer (sea level rise conditions after 63 years) are likely due to a pressure response detected by the model that occurs between the two aquifers rather than aquifer leakage or actual groundwater flow between aquifers.

The nearby groundwater production wells affected by the change in groundwater levels are built in the Dune Sand Aquifer, 180-FTE Aquifer, or the 400-Foot Aquifer and thus have casings, pumps, and screens at depths considerably deeper than the depths at which MPWSP pumping could affect the water levels. A water level decline between 1 and 5 feet would not expose screens, cause damage, or reduce yield in the groundwater supply wells influenced by MPWSP pumping. Based on the modeled response of the 24.1-mgd extraction rate at the CEMEX site, the impact on nearby water supply wells would be less than significant.

Applicant Proposed Mitigation Measure

CalAm recognizes the long-term nature of the proposed project and the need to provide continued verification that the project would not contribute to lower groundwater levels in nearby wells within the SVGB. So, as part of the project, CalAm proposes to expand the existing regional groundwater monitoring program to include the area where groundwater elevations are anticipated to decrease by one foot or more in the Dune Sand Aquifer and the 180-FTE Aquifer. This constitutes an Applicant-Proposed mitigation measure that is presented and evaluated at the end of **Impact 4.4-3**.

Impacts of ASR Injection/Extraction Wells

The volume of treated desalinated water routed to the ASR system would depend on precipitation and the water supply demands in any given year, but is expected to be about 2,100 afy. The injection of this additional water into the confined Santa Margarita Sandstone could create short-term groundwater mounding, which can cause localized changes in groundwater levels and flow. A significant impact could occur if operation of the proposed ASR injection/extraction wells resulted in groundwater mounding, change in groundwater gradients, or lower groundwater levels such that nearby municipal or private groundwater production wells were to experience a substantial reduction in well yield or physical damage due to exposure of well pumps or screens. **Figure 4.4-7** shows the groundwater surface and flow patterns in July/August 2015 in the Shallow Zone Aquifer of the SGB, within which the ASR injection/extraction wells would be screened, along with the location of local water supply production wells.

The MPWMD's ASR EIR (2006) analyzed the impacts on groundwater storage and water levels in the SGB. The analysis presented a pilot study and a groundwater model to evaluate the impacts on groundwater storage in the SGB through operation of the ASR program. The analysis determined that up to 2,426 afy could be injected through the implementation of the ASR program, of which up to 2,003 afy would be extracted. The findings of the analysis concluded that injecting excess treated Carmel River water into the ASR injection/extraction wells was beneficial to groundwater storage within the SGB, so long as extraction did not exceed injection on an annual basis.

Since the MPWMD's ASR project was approved with injection beginning in 2001, 2 afy to 1,117 afy of excess Carmel River have been injected into and extracted from storage for a total of about 4,175 af through 2013 (Pueblo Water Resources, 2014). Although the program has not achieved 2,426 afy, the annual volume of water evaluated in the ASR EIR, the groundwater monitoring results indicate that the injection and extraction of water does not adversely affect groundwater storage in the SGB. However, the MPWMD ASR program can only divert winter

flows from the Carmel River that are in excess of in-river needs, and is therefore rainfall dependent. Furthermore, the program does not increase storage in the SGB, since the injected Carmel River water is subsequently pumped back out to reduce CalAm's pumping from the Carmel River and the SGB.

The proposed project would include the installation of two additional ASR injection/extraction wells to increase the reliability of the ASR program to inject and extract Carmel River water, and to allow for the injection and ultimate extraction of treated desalinated water. However, the injection and extraction volumes of water from the desalination plant would be managed such that there would be no net negative change to the storage of groundwater on an annual basis. That is, the volume of water in storage would not be allowed to decrease due to extraction. Water injected in a particular year but not used in that same year could be stored for the next year.

In addition, CalAm must return to the basin 700 afy of water for the next 25 years to mitigate its overdraft of the SGB (Seaside Groundwater Basin Watermaster, 2012b). To accomplish this water exchange, CalAm would extract only 774 afy of its 1,474 afy SGB adjudicated allocation. The payback of 700 afy for 25 years would result in the retention of 17,500 afy in storage, reducing the historical overdraft of the SGB and increasing groundwater levels.

Impact Conclusion – Operation of the ASR Injection/Extraction Wells

Injection and extraction would be managed so that the water provided from the desalination plant would not constitute a net negative change in storage. Because the storage in the aquifer would increase by 700 afy for the first 25 years and then remain constant thereafter, impacts related to mounding, change in groundwater flow directions and excessive extraction would not occur and the impact would be less than significant.

Impacts on Groundwater Recharge

The MPWSP could interfere with groundwater recharge by decreasing groundwater elevations from groundwater pumping, thereby disrupting the existing surface water–groundwater interaction on the Salinas River or creating additional impervious surfaces through the construction of project facilities. Impervious surfaces reduce the volume of rainwater that infiltrates down to the aquifer. A significant impact would occur if the proposed project causes a net deficit in aquifer volume or lowers the local groundwater table level so as to interfere substantially with groundwater recharge. The proposed project's contribution to alteration of the surface water-groundwater interaction and the increase in impervious surfaces is discussed below.

Impacts of the Project on the Surface Water-Groundwater Interaction at the Salinas River

As a river flows over the land surface, it may lose water to the subsurface or gain water by intersecting groundwater from the underlying water table,[25] depending on the depth to groundwater relative to the level of the riverbed. This surface water-groundwater interaction

[25] The water table is the surface of the shallowest aquifer that is unconfined and open to the overlying atmosphere. In this case, the groundwater surface of the Dune Sand Aquifer or the inland Perched A Aquifer would be the water table.

causes groundwater to discharge to streams in some areas and causes surface water to infiltrate to the subsurface aquifers in others. When a river gains groundwater from the aquifer, that is called a gaining stream; when it loses groundwater to the aquifer, it is called a losing stream. In the case of the MPWSP, the portion of the Salinas River within the area of influence from the slant well pumping is a gaining stream. Consequently, the slant well pumping could draw in groundwater that would otherwise discharge to the river. The proposed project would not directly pull surface water from the Salinas River.

The NMGWM can estimate the loss of groundwater outflow to a surface water feature such as the Salinas River. Based on the modeling, the estimated volume of groundwater removed from the river recharge system would be approximately 400 afy. A similar condition exists for Tembladero Slough, where the volume of groundwater removed by the slant well pumping from that system would be about 65 afy. The volume of water flowing to the ocean through the Salinas River in 2012 was about 250,000 afy, so the reduction of 400 afy is about 0.16 percent of the total flow. From a surface water supply standpoint, this magnitude of groundwater diversion from the Salinas River would be a minor, if not immeasurable, reduction in surface water supply. The same conclusion is applied to the Tembladero Slough, where the removal of 65 afy of groundwater discharge would not constitute a recognizable loss in supply for that system. The reduction of surface water attributable to slant well pumping is not a substantial reduction of water supply and thus this impact would be a less than significant impact.

Impacts of the Project on the Surface Water-Groundwater Interaction at CEMEX

The CEMEX facility has several ponds on its property. The largest pond, located to the north of the slant wells, is the source of the sand mined by CEMEX. The impact analysis of MPWSP pumping effects on recharge considered the largest pond to determine whether the proposed project would have an adverse impact on its recharge or on the current sand mining operations. A significant impact would occur if the proposed pumping at CEMEX reduced recharge to the Dune Sand Aquifer or interfered with or otherwise limited the ability of CEMEX to operate due to intolerable draw down in its main sand mining pond.

Pond Operation

The bottom of the large CEMEX dredge pond is assumed to be at about 10 to 20 feet below the surface water level in the pond (Geoscience, 2015b). The water level in the pond is in hydraulic connection with the ocean, receiving ocean water as seepage through the beach sand and occasional storm surges over the beach and into the pond. Winter storm surges push sand with very little silt or clay particles over the beach and into the largest pond, and the sand settles to the bottom of the pond. CEMEX then dredges the sand from the pond, sorts the sand into different grain sizes depending on the desired end product, and washes the sand to remove residual salts from seawater. The wash water is routed to the smaller ponds located north and east of the location of the proposed slant wells, where the seawater seeps into the sand and migrates back to the ocean. The larger, deeper sand source pond is in an area composed entirely of sand. The water level in the largest pond is controlled by the ocean tides (Geoscience, 2015b). Occasionally, storm surges remove the sand barrier between the larger dredge pond and the ocean and the pond

temporarily becomes a small bay, as occurred in March 2016. The smaller, shallower wash water ponds are fed entirely by the wash water and are not directly connected to either to the ocean or the underlying groundwater; wash water either evaporates or infiltrates into the shallow sand and migrates to the ocean.

A water level transducer was installed in the large dredge pond on the CEMEX property to monitor changes in water elevations. The most recent monitoring report indicates that the pond is tidally influenced (Geoscience, 2015a, b) due to the proximity of the pond to the ocean (within 200 feet). In addition, the pond water level monitoring indicates that the sand mining operations conducted on Monday through Friday also affect pond water levels. Pond water levels fluctuate and decrease during the week as sand and water is pumped out of the pond and then stabilize on Saturday and Sunday when the sand mining operations are closed.

Impact Analysis for CEMEX Dredging Pond Drawdown

This impact analysis is based on the analysis completed for the test slant well, which was completed in September 2014, and is also informed by data that was generated in April 2015 after a five-day constant discharge pump test of the test slant well.

In the September 2014 analysis, the localized CEMEX model was used to determine whether the dredge pond would be influenced by pumping at the proposed test well operating at 2,500 gallons per minute (gpm) (Geoscience, 2014a). The localized CEMEX model simulates the response of the Dune Sand Aquifer in its second, third, and fourth vertical layers. The depth of the large dredge pond falls within the second and part of the third model layer so the response in the dredge pond would be captured as a response in the upper portion of the Dune Sand Aquifer. The CEMEX model simulated the test well pumping for 8 months at 2,500 gpm. The results of the model run showed a drawdown at the dredge pond of about 1 foot. If a drawdown of 1 foot occurred for a pumping rate of 2,500 gpm from one well (the test slant well), there is a possibility that additional drawdown would occur in the pond during operation of the all of the proposed slant wells, which would operate at the combined pumping rate of 24.1 mgd or about 16,736 gpm. However, when compared to the daily tidal fluctuations in the dredge pond water levels of up to eight feet throughout the year, the decline in the water surface of any depth would be masked by the consistent recharge and tidal influence from the ocean.

On March 8, 2015, a water-level transducer was installed in the dredge pond, and it has been collecting data ever since. In April 2015, a five-day constant-discharge pumping test was conducted (Geoscience, 2015b). The transducer showed a series of cyclical fluctuations from March 8 through March 21, followed by relatively flat levels through April 2, followed by similar pattern of cyclical fluctuations at similar elevations through April 11. The cyclical fluctuations are due to a combination of tidal influence and the routine dredging of the pond for sand. The early March fluctuations, which occurred before the pumping test, and the early April fluctuations, which occurred during the pumping test, show a similar pattern at about the same water level, indicating that the water level in the dredge pond was not being influenced by the pumping of the test slant well. This also indicates that as the pond is dredged, the water levels quickly recover, with seawater seeping through the loose sand on the beach.

While pumping at the slant wells could elicit a drawdown response in the large dredge pond over periods of extended pumping, the magnitude of that response would not interfere with recharge to the Dune Sand Aquifer, nor would it inhibit sand mining operations by depleting available water supplies to the pond. This impact is less than significant.

Impacts Related to Impervious Surfaces

Slant Wells

The seawater intake system at the CEMEX site would consist of ten subsurface slant wells and associated pipelines, with aboveground electrical control cabinets at each well head. Each of the five new well head sites would be on a 5,250- to 6,025-square-foot concrete pad within the coastal sand dunes, where the surrounding and underlying soil is loose sand. The pipelines would be completed below ground. Precipitation would continue to infiltrate into the subsurface sands and flow around the well head pads to the water table or migrate to the ocean. This minor amount of added impervious surface would not meaningfully reduce potential recharge area of the shallow aquifer.

ASR Injection/Extraction Wells

Each of the two new ASR injection/extraction wells and pumps, and electrical control system would be housed in a 900-square-foot concrete pump house. The two 900-square-foot pump houses would be surrounded by unpaved soil. Rainwater falling on the pump houses would flow off the structures into the surrounding unpaved areas and would infiltrate down to the water table. Therefore, there would be no reduction to groundwater recharge.

MPWSP Desalination Plant

The MPWSP Desalination Plant would consist of several structures that would result in the creation of about 15 acres of new impervious surfaces that would restrict rainfall from infiltrating into the subsurface. However, rainwater falling on these structures would be routed through conventional drainage structures unpaved onsite area. Rainwater would still be able to infiltrate into the subsurface and recharge the underlying aquifer. Therefore, there would be no reduction to groundwater recharge.

Terminal Reservoir

The Terminal Reservoir would consist of two water storage tanks that would be constructed on a 0.75-acre concrete pad within a fenced 3.5-acre area. The concrete pad would create new impervious surface that would restrict rainfall from infiltrating into the subsurface. Rainwater falling on this structure would be routed to the surrounding area that would remain unpaved. Rainwater would still be able to infiltrate into the subsurface and recharge the underlying aquifer. Therefore, there would be no reduction in groundwater recharge.

Carmel Valley Pump Station

The Carmel Valley Pump Station would be enclosed in a 500-square-foot, single-story building built in an unpaved area. The surrounding area would remain unpaved, providing a route for

rainwater falling on the pump station to infiltrate into the ground and recharge the underlying aquifer. The Carmel Valley Pump Station would not result in a reduction to groundwater recharge.

Pipelines

Construction workers would install 21 total miles of pipelines within or adjacent to existing roads and recreational trails. Most pipeline segments would be installed using conventional open-trench technology. The typical trench width would be 6 feet, and the overall construction corridor for pipeline construction would vary from 50 to 100 feet, depending on the size of the pipe being installed. The trenches would be backfilled and the surfaces restored to their pre-existing conditions. Therefore, there would be no change to the existing amount of impervious surfaces and no change to the existing volume of groundwater recharge.

Impact Conclusion Groundwater Recharge

The MPWSP slant wells would divert and capture some groundwater that would otherwise have flowed to the Salinas River and the Tembladero Slough. The amount of groundwater loss from both of these surface water systems would be minor, if not immeasurable, considering the volume of water that flows through them. The reduction of surface water attributable to slant well pumping is not a substantial loss to groundwater supply, nor does it constitute a substantial interference to surface water recharge and thus this impact would be less than significant. While pumping at the slant wells could cause drawdown in the large dredge pond over periods of extended pumping, the magnitude of that response would not interfere with recharge to the Dune Sand Aquifer, nor would it inhibit sand mining operations by depleting available water supplies to the pond. This impact is less than significant. Facilities proposed for the project would slightly increase the amount of impervious surfaces in the project area, but would not reduce the potential for surface water to recharge the underlying aquifers. Impacts associated with changes to groundwater recharge during the operation of all project facilities would be less than significant.

Impacts on All Other MPWSP Components

None of the other proposed facilities would involve the injection or extraction of groundwater. Therefore, there would be no impact on groundwater supplies from the operation of the monitoring wells, MPWSP Desalination Plant, Terminal Reservoir, pipelines, and pump stations.

Conclusion for Impact 4.4-3

The proposed project would extract mostly seawater and some brackish groundwater from a localized area; no fresh water supplies would be removed from the basin. When water is returned to the basin, groundwater conditions in the 400-Foot Aquifer underlying the CSIP and CCSD and adjacent areas would improve. Water levels in nearby wells may decline in the 180-FTE Aquifer between 1 and 5 feet, but that would not expose screens, cause damage, or reduce yield in the groundwater supply wells. Injection and extraction through the ASR well system would be managed so that the water provided from the desalination plant would not constitute a net change in storage. The reduction of surface water from the Salinas River attributable to slant well pumping would not be a substantial loss to water supply, nor would it constitute a substantial

interference to surface water recharge. Pumping at the slant wells could cause drawdown in the large dredge pond over periods of extended pumping, but the magnitude of that response would not interfere with recharge. The MPWSP may slightly increase the area of impervious surface in the project area, but it would not reduce the potential for surface water to recharge the underlying aquifers. Impacts associated with changes to groundwater recharge during the operation of all project facilities would be less than significant.

Applicant Proposed Measure - Groundwater Monitoring and Avoidance of Well Damage

The project applicant has proposed to expand the existing regional groundwater monitoring program to include the area where groundwater elevations are anticipated to decrease in the Dune Sand Aquifer and the 180-FTE Aquifer. This Applicant Proposed Measure is not required to reduce a potential impact to less than significant.

Applicant Proposed Measure

Applicant Proposed Measure 4.4-3 applies only to the Seawater Intake System.

Applicant Proposed Measure 4.4-3: Groundwater Monitoring and Avoidance of Well Damage.

Prior to the start of MPWSP construction, the project applicant, working with the MCWRA, shall fund and develop a groundwater monitoring and reporting program that expands the current regional groundwater monitoring network to include the area near the proposed slant wells. Once expanded, the program will monitor groundwater levels and water quality within the area where groundwater elevations are anticipated to decrease in the Dune Sand Aquifer and the 180-FTE Aquifer and within at least one mile outside of the predicted radius of influence. The area of groundwater monitoring shall be determined by MCWRA and the MPWSP HWG. The elements of the groundwater monitoring program proposed under this measure are described below.

- Using a current survey of wells within the pumping influence of the slant wells, CalAm will offer to private and public well owners the opportunity to participate in a voluntary groundwater monitoring program to conduct groundwater elevation and quality monitoring. The voluntary groundwater monitoring program shall include retaining an independent hydrogeologist to evaluate the conditions and characteristics (e.g., well depth, well screen interval, pump depth and condition, and flow rate) of participating wells prior to the start of slant well pumping. Water elevation and quality monitoring shall begin following initial groundwater well assessment.
- Based on a review of the well network of voluntary well owners, CalAm will identify areas lacking adequate groundwater data and if deemed necessary, install new monitoring wells. These new wells would be in the 180-Foot Aquifer.
- Seven clusters of monitoring wells were recently completed on and near the CEMEX property. These well clusters monitor various depths within the Dune Sand Aquifer, the 180-Foot Aquifer, and the 400-Foot Aquifer and shall be included in the monitoring network.
- Using the groundwater data developed through the voluntary well monitoring program and data gathered at the new monitoring wells, CalAm will evaluate

whether project pumping is causing a measurable and consistent drawdown of local groundwater levels in nearby wells that is distinguishable from seasonal groundwater level fluctuations. In the event that a consistent and measurable drawdown is identified, CalAm will determine if the observed degree of drawdown would damage or otherwise adversely affect active water supply wells. Adverse effects from lowered groundwater levels in existing active groundwater supply wells can include cavitation[26] due to exposure of the well screen, water elevation declines that draw water below pump intakes, reduced well yields and pumping rates, and changes in groundwater quality indicating that project pumping is drawing lower quality water toward the well. Adverse effects would only occur in active wells; inactive wells would not be considered for mitigation.

- If it is determined that a nearby active groundwater well has been damaged or otherwise negatively affected by the project pumping of the slant wells, the project applicant shall coordinate with the well owner to arrange for an interim water supply and begin developing a mutually agreed upon course of action to repair or deepen the existing well, restore groundwater yield by improving well efficiency, provide long term replacement of water supply, or construct a new well.

Applicant Proposed Measure 4.4-3 would monitor changes in the groundwater surface elevations caused by the proposed pumping at the slant wells through a voluntary program and use of new groundwater monitoring wells. If it is determined that the project is causing groundwater levels to damage local active wells, this measure would ensure that active wells are repaired or replaced. Implementation of **Applicant Proposed Mitigation Measure 4.4-3** is not necessary to address any significant project effect.

Impact 4.4-4: Violate any groundwater quality standards or otherwise degrade groundwater quality during operations. (*Less than Significant with Mitigation*)

Impact 4.4-4 addresses the impacts on groundwater quality during the operation of the proposed project. Water quality considerations associated with the project operations include the exacerbation of seawater intrusion and the potential for the proposed project to cause new contamination, or to extend the limits of existing groundwater contamination through pumping at the seawater intake system, ASR injection/extraction wells, and other project facilities. The slant wells would extract water from the Dune Sand Aquifer and the 180-FTE Aquifer of the SVGB, while the ASR wells would periodically inject water into and extract groundwater from the Santa Margarita Sandstone in the SGB.

Operation of Subsurface Slant Wells

Impact on Groundwater Quality Within Slant Well Pumping Area of Influence

This impact analysis considers the effect of continuous pumping at the CEMEX site on local groundwater quality in the Dune Sand and 180-FTE Aquifer. As discussed in Impact 4.4-3, and

[26] Cavitation is caused by introducing air into well water by exposing the well screen or pump. The air can cause a drop in liquid pressure moving through the pump impeller's opening, causing bubbles to form and collapse. The hydraulic impacts caused by the collapsing bubbles can be strong enough to damage the pump.

shown in **Figures 4.4-10** and **4.4-11**, the water quality in the Dune Sand and 180-FTE Aquifers is degraded from seawater intrusion and has been for decades. The MPWSP slant wells would pump that water for the desalination plant source water. **Figure 4.4-13** shows the extent of the cone of depression formed in the 180-FTE Aquifer during slant well pumping at the CEMEX site and the resultant groundwater drawdown projected under the conservative pumping scenario where sea level is at current levels and no water is return to the basin as part of the MPWSP.

The timeframe over which the cone of depression would develop to its full extent is also an important consideration in this analysis. According to the NMGWM, the time required for the cone of depression in the 180-FTE Aquifer to reach its maximum extent, as shown in **Figure 4.4-13**, is between 1 and 5 years after groundwater project start-up. After 5 years, the cone of depression would equilibrate and remain somewhat stable throughout the projected 63 years of operation. Based on this timeframe, localized changes in water quality could be realized within the first 5 years of project operation and could stabilize at that level. The NMGWM also projects that the timeframe for groundwater recovery after the MPWSP is offline would be in the range of 1 to 5 years.

From the time the slant wells begin pumping, and throughout the life of the project, local groundwater quality around the slant wells and within the cone of depression could change from the brackish quality it is now to higher salinity groundwater. The degradation in water quality (measured as an increase in TDS) would occur because the slant wells would draw in the brackish water that is currently in the aquifer formation and seawater would flow in to replace it. This effect would be most detectable near the coast at the CEMEX site and less pronounced inland because seawater would enter the slant wells more readily closer to the Monterey Bay compared to farther east where a smaller fraction of brackish groundwater would be drawn from the inland portion of the aquifers.

This impact analysis considers whether this projected degradation in localized water quality would constitute a significant impact. A significant impact would occur if the proposed project violated water quality standards or degraded a groundwater source such that it would interrupt or eliminate the available potable groundwater for other users in the basin. Groundwater in the Dune Sand and the 180-FTE Aquifers within the area projected to be affected by slant well pumping is not used for potable supply or irrigation. As stated in Impact 4.4-3, the use of the current groundwater production in this area is limited to minor irrigation and dust control. There are no water supply wells pumping potable water, and most of the wells in this area are no longer active because of seawater intrusion. Furthermore, groundwater production is restricted in the vicinity of the CEMEX site through MCWRA Ordinance 3709, which prohibits drilling wells and pumping groundwater from the 180-FTE Aquifer in order to protect groundwater resources.

Based on current groundwater quality and the minimal groundwater use within the area affected by slant well pumping, the localized change in groundwater quality that could occur as a result of slant well pumping is not expected to violate water quality standards or interrupt or eliminate the potable or irrigation groundwater supply available to other basin users. Therefore, this impact is considered less than significant.

Impact on Seawater Intrusion

As shown on **Figures 4.4-10** and **4.4-11**, the current location of the seawater/freshwater interface is about 8 miles inland in the 180-Foot Aquifer and 3.5 miles inland in the 400-Foot Aquifer. Once operational, the proposed slant wells would extract 24.1 mgd from the subsurface. A significant impact would occur if the proposed project caused the seawater/freshwater interface to migrate further inland, thereby exacerbating the seawater intrusion condition in the SVGB.

The effects on seawater intrusion were evaluated using the NMGWM with particle tracking (described in the Approach to Analysis section, above). **Figure 4.4-17** shows the coastal seawater intrusion in the SVGB using the seawater/freshwater interface location estimated by the MCWRA and shown in **Figures 4.4-10** and **4.4-11**. Before running the model to simulate the 63 years of operation, individual water "particles" were placed along the leading edge of the mapped seawater intrusion front. Without the project, these particles are expected to continue to migrate inland with the movement of the seawater/freshwater interface. The NMGWM is a superposition model, meaning that modeled project effects are isolated from all other stresses in the basin, such as the effects from other groundwater pumpers, inland pressure gradients, injection systems, and recharge. In superposition, the NMGWM output is therefore the change attributable solely to the slant well pumping. **Figure 4.4-17** depicts the resulting particle-tracking outputs, showing that a number of particles radiate away from the seawater/freshwater front back towards the coast. In **Figure 4.4-17**, some particle locations change substantially, whereas others do not. As to those that do change, the change in particle location shows where the seawater front would be after 63 years of MPWSP pumping *if that was the only factor affecting groundwater movement in the basin* (no recharge, no groundwater pumping, no pressure gradients, etc.). Therefore, Figure 4.4-17 illustrates the MPWSP's contribution to redirecting or reversing the inland advance of seawater intrusion. Because there are many stresses in the basin, the MPWSP project would not necessarily draw the leading edge of the seawater intrusion line back towards the coast to the extent shown by the particle-tracking output, but it does indicate that the MPWSP provides a benefit for the basin. Based on the particle-tracking results, the MPWSP would not exacerbate seawater intrusion, and groundwater extraction from the coast, as part of project operations, would be expected to retard future inland migration of the seawater/freshwater interface. The proposed project would facilitate the reduction of seawater intrusion in the long term, and the impacts of the proposed project are considered less than significant.

Impacts Associated with Existing Groundwater Remediation Systems

Past industrial, commercial, or military sites have residual soil and groundwater contamination caused by past spills, leaking underground tanks, unlined chemical disposal sites or inadvertent land disposal of chemicals in the SVGB and the SGB, as discussed in detail in Section 4.7, Hazards and Hazardous Materials. When contaminated groundwater is found at these sites, a common remedy is to pump the contaminated water out, treat it, and either dispose of it or use it for non-potable supply; this process is referred to as "pump and treat." Pumping contaminated water out of the ground requires extraction wells that, similar to the slant wells proposed by the proposed project, can create a cone of depression and an accompanying area of influence. When the area of influence of a pump and treat site intersects that of another water extraction system,

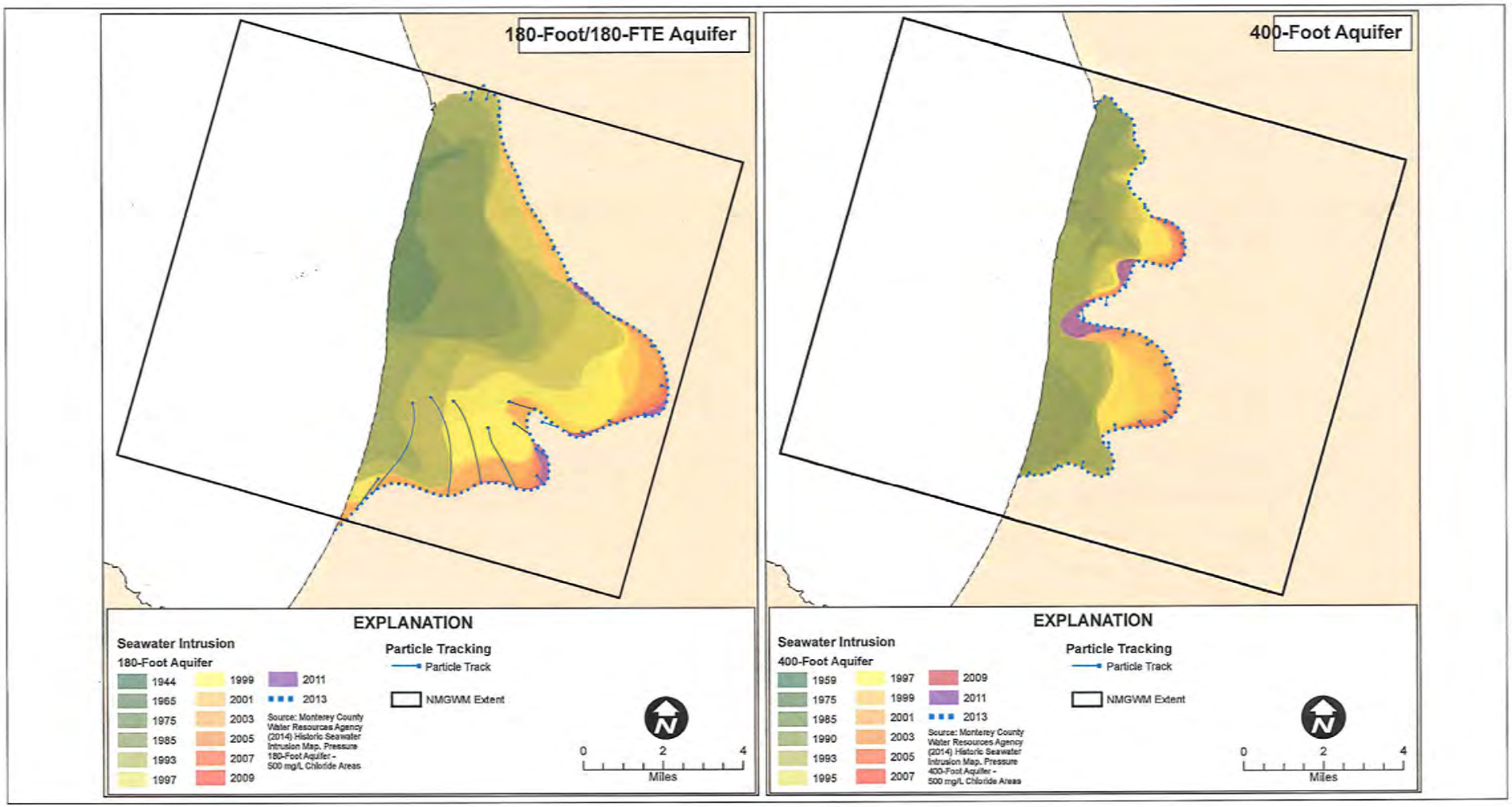
the cones of depression interfere with each other and can cause the groundwater contamination to spread into previously uncontaminated or previously remediated areas.

The proposed slant wells would produce a radius of influence in the Dune Sand Aquifer and the 180-FTE Aquifer, as shown on **Figures 4.4-14** and **4.4-15** and as discussed in Impact 4.4-3. Within the CEMEX area, the NMGWM projects that groundwater elevations could decrease and that decrease could incrementally affect groundwater flow directions. If there are nearby inland sites that are remediating contaminated groundwater in the same aquifers and that are located within the radius of influence of the slant wells, then the pumping of the slant wells could potentially interfere with those remediation activities, pulling contaminated groundwater into currently uncontaminated areas and degrading the existing water quality. This would violate the state policy of maintaining the existing water quality. A significant impact would occur if the proposed project created a condition that would violate water quality standards or otherwise degrade water quality.

The U.S. Army has been conducting investigation and cleanup activities at the former Fort Ord military reservation since 1986 (Fort Ord Base Realignment and Closure Office, U.S. Army, 2012). The ongoing remediation will continue until contaminant levels in the groundwater are reduced to clean-up levels or below, and are protective of human health. The northwestern border or the former Fort Ord is located within 2 miles southeast of the seawater intake system.

As discussed in the Setting for Section 4.7, Hazards and Hazardous Materials, the former Fort Ord military base has several plumes of contaminated groundwater located southeast of the seawater intake system, as shown on **Figure 4.7-1**. Source removal and ongoing groundwater remediation efforts have effectively reduced the contaminant concentrations and extents in these plumes. Three of the plumes closest to the slant wells are located within the area in which the NMGWM estimates groundwater levels would decrease by one to two feet in the Dune Sand Aquifer and the 180-Foot Aquifer. The A-Aquifer is a shallow inland aquifer above the 180-Foot Aquifer and is not known to be hydraulically connected to the Dune Sand Aquifer at the proposed slant well locations. **Figure 4.7-1** shows the location and current configuration of the contaminant plumes and **Figure 4.4-15** shows the -1-foot drawdown contour of what is considered the "worst case" aquifer response from the proposed project (180-FTE Aquifer, no return water, with 2012 sea level conditions). Comparison of **Figures 4.7-1** and **4.4-15** shows that the -1-foot contour is approaching the contaminant plumes. If the drawdown caused by the slant well pumping were to intersect and alter the local flow gradient near the plumes, the slight change could influence the plumes to migrate further northwest into currently uncontaminated areas and to degrade water quality. The possible overlap of the slant well radius of influence with each of these plumes is discussed below.

OUCTP A-Aquifer Plume. The OUCTP A-Aquifer Plume, located about 2 miles southeast of the slant wells, is contaminated by carbon tetrachloride. This plume was previously under remediation by pump-and-treat technology (Ahtna, 2016). The A-Aquifer plume is currently being treated using enhanced in situ bioremediation, followed by monitored natural attenuation. This method involves enhancing naturally occurring microbes to break down the contaminants



SOURCE: HydroFocus, 2016

Monterey Peninsula Water Supply Project . 205335.01

Figure 4.4-17

Proposed Action Impact on Location of Freshwater/Seawater Interface

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into non-toxic compounds, and does not require the extraction of groundwater. As a consequence, there are no longer any operational extraction wells producing cones of depression within the area of the OUCTP A-Aquifer Plume. If the radius of influence of the proposed slant wells does reach the western portion of the OUCTP A-Aquifer Plume, then the decrease in groundwater elevations could alter the existing groundwater flow direction. This change in flow direction could pull the OUCTP Plume further northwest, spreading the contamination to areas that are not now contaminated above action levels. As previously discussed, this location is about 2 miles from the slant wells. At this distance, the NMGWM simulations decrease in accuracy and the anticipated 1 to 2-foot groundwater elevation decrease within the radius of influence is less certain to extend this far. Nonetheless, the simulation indicates that the decrease in groundwater elevations is possible and could result in a significant impact. This impact would be reduced to less than significant with the implementation of **Mitigation Measure 4.4-4 (Groundwater Monitoring and Avoidance of Impacts on Groundwater Remediation Plumes)**, which would require CalAm to monitor groundwater flow directions at the nearby known contaminated groundwater plumes and to work with the responsible parties if the proposed project would adversely impact those ongoing remediation efforts.

OUCTP Upper 180-Foot-Aquifer Plume. The OUCTP Upper 180-Foot Aquifer Plume, located a little over 3 miles southeast of the slant wells, is using pump-and-treat technology for groundwater remediation (Ahtna, 2016). At its largest, the treatment system had seven extraction wells operating throughout the extent of the plume, including at the westernmost edge of the plume. As cleanup of the plume has proceeded, the extent of the plume has become smaller as concentrations in the groundwater have decreased. Currently, only one extraction well is in operation in the central area of the plume. The operation of the extraction well also serves to contain the plume and prevent its migration further west because groundwater flows toward the extraction well and cannot escape further west. As measured during the December 2014 monitoring event, the cone of depression around the extraction well was about 22 feet below the surrounding groundwater levels. With a cone of depression of 10 or more feet, the 1- to 2-foot decrease in groundwater levels caused by the proposed slant wells would be unable to overcome the cone of depression at the extraction wells. Therefore, with the ongoing extraction system, the impact of the slant wells would be less than significant and no mitigation is proposed.

Impacts Associated with ASR Injection/Extraction Wells

Interference with Existing Groundwater Remediation Systems. The injection of desalinated product water into the proposed ASR-5 and ASR-6 Wells would increase groundwater elevations and the volume of water in underground storage. This increase in groundwater elevations would alter groundwater flow patterns in the vicinity of the proposed ASR-5 and ASR-6 Wells. If there are nearby sites that are remediating contaminated groundwater in the Santa Margarita Sandstone aquifer and are located within the area where groundwater elevations are expected to rise, then the increase of groundwater elevations could interfere with those remediation activities, pushing contaminated groundwater into currently uncontaminated areas and degrading the existing water quality.

As previously discussed, the addition of the ASR injection/extraction wells would increase the capacity to inject and store water in the Santa Margarita Sandstone in the SGB. The SGB is separated by a groundwater divide from the SVGB to the north, where the former Fort Ord sites discussed above are located. As previously discussed, water would be injected and extracted from the desalination plant into the SGB such that there would be no net negative change in storage on an annual basis.

The target aquifer for injection and storage is in the Santa Margarita Sandstone, at a depth of about 1,000 feet below the ground surface. Currently, a groundwater depression caused by historical overdraft is located to the south of the ASR system, with its center close to General Jim Moore Boulevard, as shown on **Figures 4.4-7** and **4.4-8**. The presence of this groundwater depression would cause the additional water injected and stored in the Santa Margarita Sandstone to flow toward that depression to the south. Consequently, only remediation sites with groundwater contamination in the Santa Margarita Sandstone at about 1,000 feet below the ground surface and located within the area between the ASR injection/extraction wells and the center of the groundwater depression could be affected. As shown on **Figure 4.7-2**, the nearest contaminated sites are located along Del Monte Boulevard, near the coast and west of the groundwater depression; however, the contamination is in the surficial Aromas Sand Aquifer. There are no known contaminated sites undergoing groundwater remediation in the area between the ASR injection/extraction wells and the edge of the groundwater depression. Therefore, the potential for the ASR injection/extraction wells operation to interfere with groundwater remediation activities at nearby contaminated sites would be low and thus, this impact is less than significant.

Addition of Treated Water to the Santa Margarita Aquifer. The ASR component for the proposed project would continue to utilize and augment the existing ASR system. The expansion includes the construction of two additional ASR injection/extraction wells along General Jim Moore Boulevard (see **Figure 3-9a**) that would increase the reliability of storing Carmel River water in the SGB, and would facilitate the injection, storage, and extraction of desalinated water. The seawater pumped from the slant wells would be treated to potable drinking water standards at the proposed desalination plant and pumped through the water supply distribution system to the SGB, where the water would be injected into the ASR injection/extraction wells for later recovery during dry periods (see **Figure 3-2**). As discussed in the Setting, the primary water quality concern associated with ASR projects using potable water is that DBPs, including THMs and HAAs, are formed during the disinfection process. Additionally, the injection of oxygenated water could potentially alter the geochemistry of the groundwater and increase the concentration of minerals in groundwater.

The existing ASR system treats surface water from the Carmel River to drinking water standards and then injects that treated water into storage in the Santa Margarita Sandstone for later extraction and use. As discussed in the Setting, the MPWMD conducted investigations to evaluate the effects of injecting water treated to drinking water standards into the Santa Margarita Sandstone. Their investigations, as well as ongoing monitoring, concluded that the DBPs do increase upon initial injection of treated surface water into the Santa Margarita Sandstone, but

concentrations steadily decreased with time and the existing conditions are restored over the course of six to eight months (Pueblo Water Resources, 2014). Groundwater monitoring results indicate that over the course of that time, the pH remains neutral (between 6 and 8), indicating relatively stable geochemical conditions.

The RWQCB currently regulates the ASR project under Permit 20808C. The MPWMD continues to conduct groundwater studies and monitoring to document the changes to the groundwater system due to ASR, and to ensure that the ASR project does not degrade groundwater quality within the SGB. The RWQCB will continue to require a monitoring and response program for continued operation of the project and to protect groundwater quality in the Santa Margarita Sandstone. Expansion of the ASR project would require the approval from the RWQCB for implementation, which would require a similar level of water quality testing and monitoring to ensure that the injected water would not degrade the receiving groundwater in the SGB.

In accordance with the evaluation criteria, this impact would be significant if adding treated desalinated water into the current ASR system degraded the existing groundwater quality. **Table 4.4-11** compares the water chemistry of the treated Carmel River water to the water chemistry of desalinated water currently produced by the Sand City desalination plant. The Sand City desalination plant uses the same technology that would be used by the proposed desalination plant, so the resulting water chemistry would be similar. As shown in **Table 4.4-11**, the water chemistry of the treated Carmel River water is similar to the Sand City desalination plant product water. Therefore, it would be reasonable to expect that the Santa Margarita Sandstone would have the same reaction to the injection of the treated desalination plant water as to the treated Carmel River water. This is a less than significant impact.

Maintenance of the ASR Wells. ASR injection/extraction wells sites are susceptible to well plugging because all water sources have at least some level of suspended solids, which can include particulates, bionutrients, or oxidants (Pueblo Water Resources, 2014). During injection, a trace amount of suspended solids is collected in the gravel pack of the well, in the aquifer material surrounding the gravel pack of the well, and in the silt trap of the well pipe.[27] Over time, the accumulated silt will clog the pore spaces of the well gravel pack and native aquifer materials, restricting the flow of aquifer water into the well and reducing well efficiencies. As a part of the routine operation of the ASR injection/extraction wells, each well must be periodically cleaned to maintain well efficiency. The cleaning process involves backflushing the wells and pumping out the turbid water. The inappropriate discharge of this turbid, sediment-laden, backflush water could adversely affect groundwater resources.

[27] The silt trap of the well is a blank (no well screen openings) section of well pipe below the well screen that provides a place for sediment to accumulate without clogging the well screen.

TABLE 4.4-11
WATER CHEMISTRY OF TREATED CARMEL RIVER WATER AND SAND CITY DESALINATED WATER

Chemical Parameter	Treated Carmel River Water	Treated Sand City Desalinated Water
Alkalinity as $CaCO_3$	129	55 - 125
Aluminum	0.025	nd (0.010)
Ammonia Nitrogen	0.1	na
Arsenic	nd (0.005)	nd (0.001)
Antimony	na	nd (0.0004)
Barium	0.056	0.014
Boron	na	0.5 – 0.877
Bromide	0.11	na
Beryllium	na	nd (0.0003)
Cadmium	na	nd (0.001)
Calcium	36	18 – 45
Chloride	32	72
Dissolved Organic Carbon	1.4	na
Chromium	na	nd (0.007)
Cobalt	na	na
Dissolved Oxygen	7.43	9.77
Electrical Conductivity	510	315 – 690
Fluoride	0.30	0.10
Iron	0.001	nd (0.06)
Lead	na	nd (0.001)
Magnesium	14	nd (1) – 8
Manganese	0.001	nd (0.010)
Mercury	na	nd (0.0002)
Molybdenum	na	0.003
Nickel	na	0.001
Nitrate/Nitrite as NO_3	0.05	na
Oxygen Reduction Potential (ORP)	749	128.8
Ortho-Phosphate	na	nd (0.77)
Total Phosphorous	0.34	na
Potassium	2.9	nd (5)
pH	7.70	7.51
Selenium	0.0017	nd (0.002)
Silicon	8.41	nd (10) – 12
Silver	na	nd (0.010)
Sodium	42	51.9
Strontium	0.200	0.131
Sulfate as SO_4	84.9	19.2
Thallium	na	nd (0.0003)
Uranium	0.0025	na
Vanadium	na	nd (0.050)
Zinc	0.210	nd (0.050)

NOTES: All concentrations in milligrams per liter (mg/L) except conductivity (micromhos per centimeter), ORP (millivolts), and pH (pH units)
na = not analyzed
nd = not detected above reporting limit in parentheses

SOURCE: EcoEngineers, 2008; Sand City Desalination Plant, 2011, 2014.

The well maintenance activities of the existing ASR injection/extraction wells have indicated that a weekly frequency of backflushing keeps the aquifer pore spaces clear of sediment and maintains well efficiencies (Pueblo Water Resources, 2014). The backflushing process consists of the following steps:

- Removing the well pump assembly
- Mechanically brushing the wells screens to dislodge sediment
- Bailing out the sediment-laden water
- Airlifting and swabbing the well pipe
- Chemically treating the well screen with glycolic acid and hydrochloric acid to remove and inhibit scale growth in the well screens
- Airlifting and swabbing the well pipe
- Chlorinating the well overnight, followed by airlifting to remove the chlorine solution the next day

Reports indicate that the initial discharge of backwash is a deep orange-brown turbid water, becoming cloudy after about 5 minutes, and clear within about 15 to 20 minutes for each screen interval being cleaned (Pueblo Water Resources, 2014). The effectiveness of the backflushing is checked by 10-minute specific capacity tests to verify the return of the well efficiency.

The discharge water would be pumped through subsurface piping and conveyed through the proposed ASR Pump-to-Waste Pipeline to the existing settling basin for the Phase I facilities at the intersection of General Jim Moore Boulevard and Coe Avenue, and infiltrated into the ground (**Figure 3-9a**). The settling basin is unlined to allow the discharge water to infiltrate into the subsurface soils, eventually migrating down back into the aquifer and leaving the sediment in the basin. The sediment that would accumulate in the basin would be periodically removed and disposed of at an appropriate disposal site. The depth to groundwater beneath the settling basin is about 350 or more feet below the ground surface (Pueblo Water Resources, 2013). It is reasonable to expect that a 350-foot deep water column of sediments would be adequate to successfully remove the sediment and polish the water before the water infiltrates into the aquifer.

As a part of the project design, the periodic backflushing of ASR-5 and ASR-6 Wells would use the same process used for the existing ASR injection/extraction wells. Pipelines would be built to connect wells ASR-5 and ASR-6 into the existing pipeline system that includes the pipeline that discharges to the existing settling basin. Routing the discharge water to the existing settling basin and infiltrating it through soil would remove the sediments. Considering this process would be conducted when needed, water quality impacts associated with discharge water would be less than significant impact.

MPWSP Desalination Plant and All Pipelines and Conveyance Facilities

No other project facilities would inject or extract water. Therefore, these project facilities would cause no impact related to groundwater quality or interference with existing groundwater remediation activities.

Impact Conclusion

Slant well pumping at the Cemex site could intersect the OUCTP A-Aquifer plume and degrade groundwater in areas not affected by the current contaminant plume. This is considered a significant impact that could be reduced to less than significant by **Mitigation Measure 4.4-4**. The OUCTP Upper 180-Foot Aquifer Plume would not be impacted by the MPWSP pumping because the magnitude of drawdown (about 1-2 feet) would be masked by the cone of depression currently created by the pump and treat remediation system. The proposed project would result in a less than significant impact related to interference with existing groundwater remediation activities, with the possible exception of two of the OUCTP plumes at the former Fort Ord. The impact would be reduced to less than significant with the implementation of **Mitigation Measure 4.4-4**, described below.

All Other Project Components

The operation of the MPWSP Desalination Plant, monitoring wells, Terminal Reservoir, pipelines, and pump stations would not involve the use of or discharges to groundwater. Therefore, there would be no impact relative to groundwater quality.

Impact Conclusion for Groundwater Quality

For the slant wells, the seawater/freshwater interface would migrate back toward the ocean, which would be a less-than-significant impact. For the slant wells, the potential impact of interference with existing remediation systems would be reduced to less than significant with the implementation of Mitigation Measure 4.4-4. For the ASR injection/extraction wells, the net addition of injection water is considered a less than significant impact. For the ASR injection/extraction wells, the potential impact of interference with existing remediation systems would be less than significant. The operation of all other project facilities would have no impact on groundwater quality.

Therefore, for the proposed project as a whole, the potential operations impacts would be less than significant with mitigation, relative to groundwater quality.

Mitigation Measure

Mitigation Measure 4.4-4 applies only to the Seawater Intake System.

> **Mitigation Measure 4.4-4: (Groundwater Monitoring and Avoidance of Impacts on Groundwater Remediation Plumes).**
>
> Prior to the start of MPWSP construction, the project applicant shall incorporate the future quarterly groundwater elevation monitoring results for the two OUCTP plumes into the well monitoring program described above in **Applicant Proposed Measure 4.4-3** until the

two OUCTP plumes have been appropriately remediated and the RWQCB no longer requires remediation activities. Groundwater elevation data shall be obtained from the periodic monitoring reports developed by the U.S. Army and its contractors. The elements of the additions to the groundwater monitoring program proposed under this mitigation measure are described below.

- Using the most recent monitoring reports available through the U.S. Army and its contractors, the groundwater elevations in the A-Aquifer and the Upper 180-Foot Aquifer for wells at and downgradient of the westernmost edge of the two OUCTP plumes shall be incorporated into the well monitoring program described above for **Applicant Proposed Mitigation Measure 4.4-3**.
- The groundwater elevation results shall be evaluated by Cal Am and its consultants on a quarterly basis to assess whether the cone of depression from the proposed seawater intake system is approaching or has reached the edge of the two OUCTP plumes. If the analysis concludes that the slant well pumping could intersect or could influence the flow direction of two OUCTP plumes, then the project applicant shall reimburse the U.S. Army for the necessary additional costs to address changes in the plume flow direction, arrest migration of the plumes, and/or to remediate areas of new contamination created by slant well pumping. CalAm shall consider using existing groundwater remediation and monitoring wells that remain on the site to expand the existing treatment systems.
- When the ongoing remediation of the two OUCTP plumes has been completed and the RWQCB authorizes closure of the two OUCTP plumes remediation activities, this mitigation measure shall no longer apply.

Mitigation Measure 4.4-4 would monitor changes in the groundwater surface elevation caused by MPWSP pumping near the two OUCTP Plumes. If it is determined that MPWSP pumping could interfere with the Fort Ord plumes, this mitigation measure requires CalAm to take actions so the plumes do not expand and contaminate other areas, such as reimbursing the US Army for work necessary to change the plume flow direction, arrest migration of the plumes, and/or to remediate areas of new contamination created by slant well pumping. This mitigation would reduce the impacts to less than significant.

4.4.6 Cumulative Effects of the Proposed Project

The cumulative scenario and cumulative impacts methodology are described in Section 4.1.7. Table 4.1-2 lists potential cumulative projects.

Impact 4.4-C: Cumulative impacts related to Groundwater Resources. (*Less than Significant*)

The geographic scope of the cumulative analysis for groundwater resources includes portions of the SVGB and the SGB. Within the SVGB, it is the western half of the Pressure Area extending from the coast of the Monterey Bay to about Davis Road in Salinas and from Moss Landing south

to the jurisdictional boundary of the Pressure Area and the SGB (**Figure 4.4-1**). The geographic scope within the SGB includes the entire basin as it is shown in **Figure 4.4-1**.

The geographic scope also includes a vertical element, which includes the underground aquifers in the SVGB and the SGB. In the SVGB, the aquifers of concern are the Dune Sand Aquifer, 180-FTE Aquifer, 180-Foot Aquifer (inland and east of CEMEX), and 400-foot Aquifer. In the SGB, the aquifer of concern is the surficial shallow aquifer, which is in the unconfined Paso Robles Formation and the underlying confined Santa Margarita Sandstone.

Cumulative groundwater impacts would be significant if they would substantially deplete or interfere with groundwater supplies, violate water quality standards, or degrade water quality. This analysis evaluates cumulative impacts within the basins associated with the aquifer response to groundwater extraction and injection. The significance thresholds are based on the physical effects from changes to the volume and quality of the groundwater. The surface infrastructure associated with the slant wells and the ASR wells, such as pipelines and pump stations, would not impact groundwater resources and is therefore not discussed further in this section.

Baseline conditions evaluated in the project-specific analysis in Section 4.4.5 reflect the contributions of past actions, including existing, operational projects that withdraw or return groundwater, on groundwater resources within the geographic scope. Therefore, the timeframe considered for the cumulative analysis is the life of the project plus two years to allow for aquifer recovery. Substantial quantities of groundwater would not be used or affected during the project construction phase; therefore, construction-phase effects are not addressed since the project's contribution to any cumulative effects would not be cumulatively considerable in nature or extent (*less than significant*).

The current and reasonably foreseeable future projects listed in **Table 4.1-2** that are within the geographic scope and have the potential to combine with the groundwater-related impacts of the proposed project are the Salinas Valley Water Project Phase II (No. 1), the Interlake Tunnel (No. 24), and the Regional Urban Water Augmentation Project (RUWAP) Desalination Element (No. 31). These projects are located within the SVGB. There are no known present or reasonably foreseeable future cumulative projects in the Santa Margarita Sandstone of the SGB.

The potential cumulative operations-phase groundwater resources impacts are discussed below.

Salinas Valley Water Project Phase II (No. 1)

The Salinas Valley Water Project Phase II would deliver additional surface water to the Pressure Area and East Side Area to offset pumping and help retard seawater intrusion. This would occur in the 180-Foot Aquifer and the 400-Foot Aquifer. Phase II would have a beneficial effect on the Pressure Area of the SVGB as it would curtail groundwater extraction and reduce stress on the groundwater aquifers. The MPWSP would draw seawater and brackish inland water from the western edge of the Pressure Area, which, over time, is expected to facilitate the retreat of the seawater intrusion front. If the MPWSP ultimately returns a portion of the desalinated product

water to the basin as in-lieu groundwater recharge, then it would benefit the 400-foot aquifer by reducing groundwater pumping in the area underlying the CSIP and CCSD.

The MPWSP would capture about 400 afy of shallow groundwater that would otherwise discharge to the Salinas River and the Monterey Bay. The MPWSP's 400 afy contribution would only amount to about 0.3 percent of the 135,000 afy diversion of groundwater that would otherwise enter the Salinas River proposed under Phase II, and would not result in a significant reduction in surface supply. Notwithstanding minor, potential cumulative reductions in Salinas River flows, Phase II and the MPWSP would have a cumulative beneficial effect on groundwater resources in the Pressure Area of the SVGB. Overall, Phase II and the MPWSP would have a cumulative beneficial effect on the SVGB.

Interlake Tunnel (No. 24)

The Interlake Tunnel Project would produce additional surface water storage and supply for downstream groundwater recharge and reduction of saltwater intrusion in the SVGB. The MPWSP would, over the course of the project, contribute to retarding the advancement of sea water intrusion through groundwater pumping in the already intruded western portion of the Pressure Area. The MPWSP would also enhance groundwater supplies in the 400-foot aquifer if the proposed project ultimately returns water to the basin. Overall, once implemented, both projects would eventually contribute to a cumulative beneficial impact for groundwater supply and quality.

RUWAP Desalination Element (No. 31)

As explained in Table 4.1-2, it is not reasonably foreseeable that MCWD would implement its prior plan to build a 2,700 afy desalination plant at its Armstrong Ranch property. However, the planning effort involving MCWD, Fort Ord Reuse Authority (FORA), and MRWPCA will explore the most cost effective and technically efficient mix of potential water sources, one being desalination. The feasibility study could conclude that a smaller desalination plant, such as a plant producing 1,000 afy, could be a viable option to provide the 973 afy shortfall to support the FORA Base Realignment Plan (BRP). This cumulative impact discussion, therefore, assumes that desalination would be chosen as a preferred water supply option and a 1,000 afy plant would be proposed at the MCWD Armstrong Ranch property, with intake wells located along the coast south of the CEMEX site near Reservation Road.

The cones of depression created by MPWSP pumping in the Dune Sands Aquifer and 180-FTE Aquifer are depicted in **Figures 4.4-14** and **4.4-15**, respectively. As shown, the cones of depression, delimited by the -1-foot drawdown contour, would extend south up to 2 miles to include the MCWD Reservation Road property under all sea level and return water scenarios. The MPWSP would pump about ten times the amount of groundwater per day than a smaller (1,000 afy) MCWD plant and, thus, the area of influence from the MPWSP pumping would cover a larger area than the MCWD project. If the proposed MCWD project were also pumping near the coast, its cone of depression, expected to be smaller and more confined, would likely intersect or be encompassed by the cone of depression created by MPWSP pumping. When cones of

depression from two or more pumping wells overlap, it causes what is referred to as well interference. Interference between pumping wells can create a combined drawdown effect where groundwater levels are lower than would be expected from the individual pumping wells. Typically, the combined drawdown of two or more wells is equal to the sum of the drawdowns caused by each well individually. Well interference between the slant wells at MPWSP and MCWD would cause a significant cumulative impact if groundwater levels were lowered in a nearby municipal or private groundwater production well such that the well would be damaged, yield would be substantially reduced, the well owner would be required to deepen or abandon the well, or if it would otherwise deplete groundwater in the SVGB, making it unavailable to other users.

If groundwater pumping for the MPWSP and the MCWD desalination plants were to happen simultaneously, it is reasonable to predict that the cones of depression from the two systems would be close enough to cause some degree of well interference and increased drawdown near the coast, between the CEMEX site and the MCWD property at Reservation Road. There are no operating groundwater production wells in this area. As discussed in **Impact 4.3-3**, current groundwater production in the MPWSP source aquifers is limited to minor irrigation and dust control. There are no groundwater water supply wells pumping potable water in this area, and most wells in this area are no longer active because of seawater intrusion.

With the operation of both the MPWSP and a desalination project at MCWD, the decline in groundwater levels due to well interference would not adversely affect operating groundwater production wells. The cumulative effect of the two projects would also not deplete the basin groundwater supply because the groundwater in this area is degraded by seawater intrusion and is unusable for potable water supply or irrigation use due to its high salinity. Additionally, with the MCWD desalination plant and the MPWSP operating simultaneously, there could be a combined beneficial effect because with the two projects, the zone of capture for inland flowing seawater would expand to the south to extract more intruding seawater and aid in retarding the inland advance of the existing seawater intrusion front. The RUWAP desalination element and the MPWSP, if they were to be operated concurrently, would not result in a significant cumulative impact and could contribute to a beneficial effect to reduce of seawater intrusion.

Because the MPWSP combined with the possible RUWAP desalination element would not result in a significant adverse cumulative impact and may have beneficial consequences, and the Salinas Valley Water Project Phase II and the Interlake Tunnel would have beneficial effects, the cumulative effect of these four possible projects on groundwater resources would be less than significant. Therefore, the proposed project would not have a cumulatively considerable contribution to a significant cumulative impact during operations (*less than significant*).

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○	○ ○ Desalination Project	○ ○ Pure Water Monterey
○ September 2016	○ Pipeline Decision	○ WPA Decision
○ December 2016	○ Draft EIR/EIS	○
○ January 2017	○ Start Construction on Pipeline	○ Start Construction
○ November 2017	○ Final EIR/EIS and CPUC Approval	○
○ March 2018	○ Coastal Commission Hearing for Permit	○ Project Complete - Delivery of Water
○ April 2018	○ Start Construction on Desal	○
○ March 2020	○ Project Complete – Delivery of Water	○

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STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD

ORDER WR 2016-0016

In the Matter Of Application of

California American Water Company

To Amend State Water Board Order 2009-0060

SOURCE: Carmel River

COUNTY: Monterey County

ORDER AMENDING IN PART REQUIREMENTS OF STATE WATER BOARD ORDER WR 2009-0060

BY THE BOARD:

1.0 OVERVIEW

For decades, California-American Water Company (Cal-Am) has been unlawfully diverting water from the Carmel River to provide municipal water to a large area of the Monterey Peninsula. State Water Resources Control Board (State Water Board) Order WR 2009-0060 (hereafter, WR 2009-0060) is a cease and desist order that, among other requirements, established a compliance timeline for cessation of Cal-Am's unlawful diversions from the Carmel River by December 31, 2016. This timeline was based on evidence gathered at hearing that indicated that a regional desalination plant would be built, enabling the area's municipal water needs to be met by new water supplies. It is now clear that no desalination plant will be in operation by the end of this year. In light of this recognition, Cal-Am has proposed modifying the compliance schedule to accommodate the anticipated pace for approval and implementation of several proposed projects (1) a different desalination plant, the Monterey Peninsula Water Supply Project; (2) a water recycling project, entitled Pure Water Monterey; and (3) the expansion of the facilities for an existing groundwater storage project entitled Aquifer Storage and Recovery (ASR). These projects are undergoing review by permitting agencies.

Since the adoption of WR 2009-0060 in 2009, Cal-Am's diversions from the Carmel River have consistently been well below the annual diversion levels set by WR 2009-0060, but still remain thousands of acre-feet per annum above the amount available under Cal-Am's lawful water rights.(See Table 1, p. 2.) The reductions in Carmel River diversions have resulted from a number of factors, including conservation and efficiency measures and implementation of local supply projects, combined with a moratorium on increased water use within Cal-Am's service area. To address the impacts of its diversions, Cal-Am has also applied significant resources to fishery conservation and habitat improvement programs.

Seven years after adoption of WR 2009-0060, the State Water Board is again placed in a position of deciding whether to adopt a compliance schedule that may allow for obtaining lawful supplies with less disruption to existing communities than meeting the required legal pumping limit by December 31, 2016. For the reasons described herein, this order adopts a new compliance schedule that essentially maintains an ongoing diversion level as long as specified progress towards alternative supplies is met, but sharply drops allowable diversions should the progress towards these supplies slip. In taking this action, the State Water Board is facilitating local cooperation in development of alternate water supplies and at the same time requiring that unauthorized diversions end by December 31, 2021, regardless of whether the envisioned projects are timely built.

2.0 BACKGROUND

WR 2009-0060 and State Water Board Order WR 95-10 (hereinafter WR 95-10) detail specific information regarding Cal-Am's lawful and unlawful diversions from the Carmel River, which does not require repetition here.

Since the adoption of WR 2009-0060, Cal-Am has lowered its diversions from the Carmel River more rapidly than the minimum compliance terms in the CDO required, and has not missed the CDO diversion reduction requirements in any year.

Table 1

Water Year (Oct. 1 – Sept. 30)	Carmel River Pumping (to nearest acre-foot)	Pumping Limit under Order 2009-0060
2009-2010	9,786	10,209
2010-2011	8,559	9,994
2011-2012	7,646	9,883
2012-2013	8,008	9,772
2013-2014	7,744	9,661
2014-2015	7,228	9,550

The pumping limit under Order 2009-0060 for Water Year (hereinafter also WY) 2015-2016 is 9,318, and there is no indication from current reporting or based on recent historical use, to think that Cal-Am will not fall well under this mark.

The reductions in pumping are the result of demand reductions as well as new supplies, both of which were required under WR 2009-0060. In terms of demand reduction, Cal-Am and the Monterey Peninsula Water Management District (District) have adopted programs encouraging conservation by business and residential customers, including turf replacement programs, water efficiency requirements, and tiered conservation rates. Cal-Am has also implemented new technologies to identify and address leaks. Additionally, Cal-Am has proposed revisions to its water rationing program pending at the California Public Utilities Commission (CPUC). The CPUC anticipates making a decision on the proposed changes in October 2016.

Three new non-Carmel River supplies have either already come online, expanded or have received regulatory approval since 2009. Sand City's desalination plant provides to Cal-Am, in the form of offset deliveries, a minimum of 94 acre-feet per annum (afa), and the balance of its

capacity which is not needed for expanded use in Sand City. Pebble Beach's water recycling facility has expanded its capacity and technology, and increased its offset of Cal-Am's unlawful pumping to an average of 970 afa. Its average offset prior to the technology changes completed in 2008 was 450 afa. This increase far out-measures the modest increase in usage entitlements, which now measure 65 afa, and are expected to reach on the order of 140 afa[1] by the end of the proposed compliance period. As of June 2016, the City of Pacific Grove was scheduled to have begun construction of a recycled water plant that will offset 100 to 125 afa of current Cal-Am deliveries for golf course and cemetery irrigation.

Additionally, Cal-Am has pursued lawful water rights in the Carmel River. Cal-Am has obtained water right Permit 21330, allowing lawful diversion in the high flow season, under certain bypass flow conditions, at a rate of 4.1 cubic feet per second with an limit of 1,488 afa. This water may only be used within the Carmel River watershed, rather than throughout the Cal-Am service area. In WY 2014-2015, Cal-Am diverted approximately 42 acre-feet under this water right.

Joint owners Cal-Am and the District have lawful water rights under Permit 20808A and Permit 20808C to develop and use up to 5,326 afa (2,426 afa and 2,900 afa, respectively) of pumping from the Carmel River under certain bypass flow conditions for operation of the ASR project. The ASR project has expanded its capacity since the adoption of WR 2009-0060, although increased water has not been available for diversion during the recent drought. The ASR project diverted just over 1,110 afa of water in WY 2009-2010 and WY 2010-2011, and between 0 and 210 afa in the drier water years from WY 2011-2012 through WY 2014-2015. The ASR water is pumped to the Seaside Groundwater Basin and WR 2009-0060 requires Cal-Am to recover the ASR water during the months most beneficial to the fishery. By June 1 of each year, Cal-Am, National Marine Fisheries Service (NMFS) and the California Department of Fish and Wildlife (CDFW) agree on a schedule for using the ASR water by reducing Carmel River pumping for fishery benefits. Cal-Am's diversions from the Carmel River are reduced on a one-to-one basis with the scheduled recovery. NMFS and CDFW can and have agreed to allow some ASR water to be carried over in Seaside Groundwater storage for the next water year's use, as allowed under WR 2009-0060. Cal-Am carried over 215 acre-feet of ASR water, and WY 2015-2016 storms allowed for an additional 699 acre-feet of ASR diversions such that Cal-Am had 914 acre-feet of available ASR water stored in the Seaside Groundwater Basin by June 1, 2016. NMFS and DFW agreed that Cal-Am would recover the ASR water from June through September of 2016, and carry over approximately 315 acre-feet for WY 2016-2017.

Water previously pumped from the Carmel River for the Odello Ranch under License 13868A, is being provided to offset Cal-Am's unlawful diversions on an interim basis. The water will not be available on a long-term basis. The project provided 85 acre-feet of water to offset Cal-Am's unlawful diversions in 2015, and will provide a minimum of 50 acre-feet in 2016 and 25 acre-feet in 2017. Cal-Am and the Eastwood Trust have reached an agreement for Cal-Am to divert up to 85 afa on an interim basis, to the extent that the water is not being sold by the Malpaso Water Company to other users.

[1] Pebble Beach estimates that deliveries of water under new entitlements through the end of December 2020 will be 140 afa. While the application now requests an extension of the compliance deadline for an additional year, there is no reason to think that this number will be significantly different by 2021, given the prior rate of growth in the area and the necessarily imprecise nature of such estimates.

Since adoption of WR 2009-0060, Cal-Am has also funded or otherwise implemented significant measures to improve fish habitat and survival. WR 2009-0060 required some of these measures, while others were implemented as part of an agreement with the NMFS and the CDFW.

After the failure of efforts to build the Coastal Water Project and the Regional Desalination Project[2], it became clear that there would not be a lawful alternative supply of water for the Cal-Am service area prior to the end of 2016, when WR 2009-0060 requires Cal-Am to end all unlawful diversions from the Carmel River.

In 2014, Cal-Am approached State Water Board staff regarding the possibility of reaching an agreement on a proposal to amend the CDO's compliance schedule which State Water Board staff would recommend to the State Water Board for consideration. Staff met with Cal-Am and other stakeholders over a period of two years in an effort to craft a proposal that staff, Cal-Am, and a range of stakeholders could endorse. At points over the two year period, the discussion included representatives from Cal-Am, the District, the Monterey Peninsula Regional Water Authority, the Sierra Club, the Planning and Conservation League, the Pebble Beach Company, and NMFS.[3] The group was able to reach an agreement on a framework for a proposal to amend the Cal-Am CDO's compliance schedule until the end of December 2020, even as some of the specifics remained contested. The broad area of agreement was maintaining a diversion limit significantly lower than that required for WY 2015-2016 in the current CDO as long as milestones based on securing alternative water supplies are met. Failure to meet the milestones would result in significant reductions of the diversion limits under the compliance schedule, such that Cal-Am's diversions from the Carmel River would be limited to lawful diversion limits prior to the end of the compliance period.

Cal-Am, in conjunction with the District, Monterey Peninsula Regional Water Authority, the City of Pacific Grove and the Pebble Beach Company, submitted an application to amend the Cal-Am CDO on November 20, 2015. On April 28, 2016, Cal-Am submitted a revised application to amend the CDO, in light of significant delays in the CPUC's schedule for consideration of a proposed desalination facility, the Monterey Peninsula Water Supply Project (MPWSP) Desalination Project. These delays resulted from the CPUC's desire to prepare a joint environmental impact statement and environmental impact report in conjunction with a federal partner, the Monterey Bay National Marine Sanctuary. In addition, the CPUC needed to evaluate a potential conflict of interest issue involving one of the contractors evaluating the project under the California Environmental Quality Act. There have also been repeated interruptions in operations of the test wells used to evaluate the impacts and viability of the proposed facility's slant well technology.

3.0 CAL-AM'S PROPOSAL

Cal-Am's April 28, 2016 revised application to amend WR 2009-0060 was submitted pursuant to Water Code section 1832, which allows the State Water Board to "modify, revoke or stay" cease and desist orders.

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[2] The CPUC approved an alternative to the Coastal Water Project – the Regional Desalination Project.

[3] Cal-Am and other stakeholders indicated that a broader group met in preparation for meetings with staff, including participation by the Carmel River Steelhead Association, Quail Lodge, Bernardus Lodge, and Carmel Valley Ranch.

The primary change Cal-Am proposes is maintaining an "effective diversion limit" (or EDL) of 8,310 afa from the Carmel River from the start of WY 2015-2016 until December 31, 2021, as long as alternate water supply projects meet defined approval and construction milestones. Cal-Am proposes a milestone for each water year from 2017-2018 until the end of December 2021. If Cal-Am fails to achieve a milestone by the last day of the water year, then the effective diversion limit would be reduced by 1,000 afa for the following water year.[4] For example, if construction on the Pure Water Monterey project fails to begin and the CPUC fails to issue a certificate of public convenience and necessity for the proposed MPWSP Desalination Project by September 30, 2018, then the proposed effective diversion limit for WY 2018-2019 would be 7,310 acre-feet. Thus, if Cal-Am fails to meet each milestone, the effective diversion limit would fall by 1,000 afa each water year from WY 2018-2019 on. The limit for WY 2021-2022 would be 4,310 acre-feet until the end of December 2021. As discussed above, WR 2009-0060 requires all unlawful diversions from the Carmel River to end by December 31, 2016. This EDL would replace the "base level" that formed the foundation for diversion limits under WR 2009-0060.

Cal-Am also proposes several changes to the manner of calculating the diversion limit, or of assessing compliance with that limit.

One significant change in determining compliance with a diversion limit is Cal-Am's proposal that it be allowed to accrue "credits" in years in which its diversions are lower than the EDL for a particular water year, starting in WY 2015-2016. Cal-Am could then apply any such "credits" to be able to pump more than the EDL in future years, without penalty. WR 2009-0060 had no such credit system. Cal-Am's proposal includes a Cap on Carryover Credits that would need to be calculated to confirm that the sum of non-ASR diversions from the Carmel River plus the amount of ASR water recovered that year cannot exceed the EDL plus 750 afa.

Another substantial calculation change that Cal-Am proposes is to amend the accounting for winter pumping under the ASR.

Under WR 2009-0060, any ASR diversions are counted towards the annual limit on Carmel River diversions: Here, Cal-Am proposes to count only the first 600 afa towards the diversion limit. Thus, as proposed, diversions to storage under the ASR program above 600 afa could occur without impacting Cal-Am's subsequent diversions from the Carmel River in a particular water year. For example, Cal-Am reported diversion of 699 afa to ASR storage in WY 2015-2016, so 99 afa would not be considered in measuring compliance with the EDL.

A third significant change to calculating the diversion limits would be the manner in which the limit is changed by the addition of lawful supplies. Under WR 2009-0060, production from new sources of water generally lowered the Carmel River diversion limit acre-foot by acre-foot. Under Cal-Am's proposed application, the EDL would be lowered for water delivered under the Pure Water Monterey water recycling project in this same manner, and the reductions for Sand City desalination project and for accounting for Pebble Beach entitlements would continue unchanged (except that the provision on unlawful diversions to serve Pebble Beach entitlements would be extended until December 31, 2021). However, Cal-Am proposes that fifty percent of

[4] The deadline for measuring achievement of a milestone for the 2021-2022 water year is December 31, 2021. Because this is the end of the compliance period, failure to meet this milestone would not result in a reduction of the effective diversion limit, as the limit to Carmel River diversions after that time is the limit of Cal-Am's lawful water rights.

any water Cal-Am may acquire from other willing water right holders on the Carmel River be added to the EDL, with the other fifty percent being added to instream use. Additionally, Cal-Am proposes that water rights purchased from the Malpaso Water Company LLC to Cal-Am be added to the EDL. Finally, Cal-Am proposes that the EDL not apply to excess pumping that any of the petitioners establish was necessary to meet reductions required by mitigation measures imposed by the Seaside Basin watermaster or the court to address seawater intrusion within the Seaside Groundwater Basin.

Cal-Am's application also includes new reporting requirements. The first new reporting requirement is an annual report to the State Water Board regarding progress towards each milestone due 120 days prior to its deadline. In the event that the annual milestones report anticipates a delay in achieving a milestone, Cal-Am proposes that the State Water Board determine whether the delay is beyond the control of the applicants, and, if so, that the State Water Board determine whether or not to lower the EDL by 1,000 afa after a missed milestone. The second proposed reporting requirement is Cal-Am's funding of an annual report on the status of the Carmel River steelhead population that may include adaptive management recommendations.

Cal-Am's application also notes Cal-Am's substantial completion of downstream fish passage facilities at Los Padres Dam, and states that the company will endeavor to remove the Old Carmel River Dam and Sleepy Hollow Ford prior to September 30, 2017.

4.0 NOTICE AND COMMENTS RECIEVED

The State Water Board noticed Cal-Am's application on May 6, 2016. The State Water Board received 16 comments prior to June 1, 2016, the deadline for consideration of comments by staff prior to releasing a preliminary staff recommendation. Staff released a preliminary staff recommendation, along with a rationale document explaining the reasoning behind the proposed adoption of the broad framework of the extension, and for the recommended changes from certain terms in the submitted application. The document further set notice of a comment deadline of July 13, 2016 for written comments. The State Water Board received an additional 77 comments prior to the written comment deadline of July 13, 2016. All comments received were posted on the State Water Board, Division of Water Rights page for the Cal-Am CDO Change Application:
http://www.waterboards.ca.gov/waterrights/water_issues/projects/california_american_water_company/index.shtml.

5.0 ANALYSIS

5.1 Adoption of Proposed Approach to Extension of CDO

Seven years after adoption of Order 2009-0060, the State Water Board finds itself in a situation that is in some respects analogous to the situation before it at the Cal-Am CDO hearings. A project that was presented to the State Water Board as a solution to end unlawful diversions has failed to come to fruition: then, the Los Padres Dam, here the Coastal Water Project.

Cal-Am's service area continues to depend on thousands of acre-feet of unlawful diversions from the Carmel River each year. Cal-Am has plans to develop a substitute supply that could resolve reliance on unlawful diversions, and proposes a CDO compliance schedule that would allow continued diversions at recent historic levels during the foreseeable timeframe for construction. The plans are supported by a number of stakeholders, but there is also substantial opposition. Permitting is incomplete and construction not yet begun.

In other ways, however, the situation is different than that in 2009. Cal-Am has complied with the compliance schedule in WR 2009-0060, including making significant reductions in diversions from the Carmel River despite the ultimate failure of the Coastal Water Project and the Regional Desalination Project. WR 2009-0060 required Cal-Am to reduce diversions from the Carmel River as much as possible and set minimum reductions. Cal-Am reduced diversions at a faster rate than the minimum required under the order. (See Table 1, p. 2.) The pumping limit Cal-Am is currently requesting is approximately 2,000 afa less than the first limit for diversions imposed under WR 2009-0060, and the actual reductions top 3,000 af of reduction in some years. These amounts constitute a reduction of approximately one third to almost half of the average annual unlawful diversions found in 2009.

Additionally, Cal-Am has undertaken or funded a number of fishery restoration actions since 2009. As required under an agreement with NMFS and CDFW, Cal-Am has funded a number of significant habitat improvement and fishery recovery projects as mitigation for unlawful diversions. Cal-Am helped fund removal of the San Clemente Dam, with benefits for not only the steelhead fishery, but also public safety. Under an agreement with NMFS, Cal-Am has contributed funding towards a series of steelhead recovery projects identified by the State Coastal Conservancy in consultation with NMFS, CDFW and Carmel River stakeholders. These include ongoing projects to facilitate fish passage by removing barriers, including removal of Old Carmel River Dam and Sleepy Hollow Ford anticipated by the end of September 2017,[5] to restore habitat upstream of San Clemente Dam and in the Carmel Lagoon and to augment water availability for fisheries purposes in the Carmel Lagoon and during the summer. Cal-Am and other stakeholders have also constructed downstream fish passage facilities at Los Padres Dam and the company is helping fund a planning effort to address long-term disposition of Los Padres Dam. These actions are in addition to ongoing habitat restoration and steelhead rescue operations on the lower Carmel River. NMFS has commented that the habitat has improved since 2009, and that an additional four years of diversion at levels similar to recent years would be unlikely to cause jeopardy.

Further significant habitat restoration actions have also been set in motion, indicating that habitat improvement will continue over the next few years even absent an immediate cessation of Cal-Am's unlawful diversions.

Cal-Am has also funded a forbearance agreement with Rancho Cañada to add approximately 300 afa to the Carmel River for the next three years. This agreement is part of a larger effort to convert much of the property to riparian habitat, with additional potential ecological benefits. Cal-Am is also a purchaser of water from Malpaso Water Company, to offset unlawful

[5] This order adds reopener provisions if these anticipated efforts to undertake major habitat expansion efforts do not continue to develop according to the schedule set forth. That schedule would enable realization of the project benefits for almost the entire duration of the extension of the compliance schedule.

diversions, and with the funds from the purchase to facilitate the transfer of the Eastwood/Odello Ranch for wetland restoration near the Carmel Lagoon.

Thus, the current situation on the Carmel River has improved in that the Cal-Am service area has meaningfully reduced its dependence on unlawful diversions, fish habitat has undergone improvement and expansion, plans are underway to undertake additional large fishery habitat improvements, robust fish rescue and habitat restoration efforts have been ongoing for years and will continue throughout the requested extension period, and additional instream flows have been secured. These factors all indicate that the impact of extending the compliance period will not be as great as the impacts found in 2009. The broad terms of the proposed revisions to the compliance plan also provide a framework that encourages success in constructing new water supplies, and that allow for planned reductions to lawful levels of diversions regardless of the success of supply projects.

Cal-Am is proposing a more diversified approach to water supply on the Monterey Peninsula than the efforts in 2009, so that the water supply does not depend so heavily on the success of any one project. In 2009, the State Water Board required Cal-Am to diligently pursue small projects, including requiring implementation of small projects that would result in at least 500 afa of additional water supply, and also required annual reductions in Carmel River diversions of between 121 and 242 afa. The central element of the effort to reduce diversions to sustainable levels, however, required construction of the Coastal Water Project. Development of a water supply project large enough to address the region's water needs has proven a challenge, given the failure of several major proposed water supply projects: the New Los Padres Dam, the Carmel River Dam and Reservoir Project, the Coastal Desalination Project, and the Regional Water Supply Project. Here, Cal-Am has proposed three potential projects to substitute for unlawful Carmel River diversions: a 6,250 to 9,752 afa desalination facility currently undergoing environmental review and permitting at the CPUC; a 3,500 afa water recycling project with completed environmental review that is currently undergoing expedited permitting review at the CPUC, with a decision expected in August 2016; and a proposed expansion of facilities to complete the ASR groundwater storage project, which is permitted to produce up to 5,326 afa, albeit subject to water availability. Each of these projects has the potential to provide a significant amount of new lawful water supplies to the Cal-Am Service area, and to greatly reduce Cal-Am's remaining unlawful diversions of approximately 3,500-4,500 afa.

The application changes the incentive for conservation and for adopting smaller-scale projects. WR 2009-0060 required yearly reductions in diversion amounts and did not specify whether these reductions stem from conservation measures or small water supply projects. As described above, conservation and small projects have resulted in a combined reduction of approximately 2,000 to 3,000 afa of demand from the Carmel River. As these projects were the first to be implemented, they likely represent some of the lowest-hanging fruit in terms of demand reduction. Rather than imposing additional reductions, the application proposes adopting a "credit" system that incentivizes conservation and small projects. Should the larger projects fail to proceed on their expected timelines, Cal-Am can draw on these credits to offset the majority of the required reduction in diversions. Thus, Cal-Am and other stakeholders can anticipate whether the milestones will be met, and undertake efforts to build credits in anticipation of failures to meet milestones, but are otherwise not required to expend additional resources on conservation and small projects. Stakeholders can thus focus efforts on working to make implementation of the larger supply projects go more smoothly.

The Board implements the overall concept of credits in this order, but imposes more limits on the accrual and use of credits so as to avoid overwhelming other incentives and results of the extended compliance schedule. (see explanation below)

The milestones approach proposed is similarly broadly acceptable, as it accomplishes two important goals. First of all, it provides structural encouragement to timely develop lawful water supplies for the Cal-Am service area. Implementing a large municipal water supply project is a long-term decision that affects a wide range of stakeholders and involves impacts to costs of service to existing users, to the environment, and to the cost of and potential for municipal growth. The potential for sharp reductions in water availability provides an incentive to multiple stakeholders to make diligent progress, and to shift the baseline of a discussion regarding the area's water needs away from a status quo that relies on cheap unlawful diversions. If the alternative to implementation of a project is severely limited access to water there is an incentive to implement change from the status quo.[6] It is the Board's hope that the focus on annual deadlines with large but achievable reductions of up to 1,000 afa for failure to meet them will be an effective incentive. The fact that Cal-Am did meet the more incremental annual reductions each year under WR 2009-0060 provides reason to believe that the incremental approach may be an effective inducement to alternate water supply development. Secondly, in the event that one or more of the proposed projects fails to move forward as envisioned, the step-wise reduction of diversions ensures a staggered approach to ending reliance on unlawful Carmel River diversions through continued conservation, efficiency and smaller supply development. This step-wise reduction approach allows for greater planning for reductions and implementation of alternative projects. As discussed below, this order does make changes to the milestones proposal to better serve the goals described above.

This more diversified approach, in combination with diversion reductions for failure to achieve milestones allows for Cal-Am to reduce its diversions to lawful levels by the end of December 2021, regardless of whether any one of the proposed projects – or any of them at all - are built. Implementation of one or more of these projects in combination with diversion limits for any failure to reach particular milestones provides sufficient assurance that the State Water Board will not again find itself in the same position of again extending the compliance deadlines in the CDO at the end of December 2021.

The proposed annual reporting on milestone progress will give the State Water Board the opportunity to track compliance. This order adopts the annual reporting requirement with minor timeline modifications that better accommodate State Water Board processes. The report gives time for a formal warning should progress towards a milestone be lacking, which will allow Cal-Am and other stakeholders to prepare for step-wise reductions through development of additional supplies, to generate additional credits, or to implement additional conservation

[6] Numerous commenters have asserted that the milestone approach inappropriately burdens ratepayers and water users for Cal-Am's unlawful diversions, and that therefore the CDO should impose monetary fines in-lieu-of requiring diversion reductions. The remedies of issuing a CDO and imposing penalties for unlawful diversions are not mutually exclusive, however, and payment of a penalty does not authorize continuing violations. The penalty addresses past violations; the law still requires elimination of future violations. Moreover, the argument that the State Water Board should impose penalties *in-lieu*-of requiring elimination of unlawful diversions fails to recognize the connection between Cal-Am's diversions and the ratepayers – Cal-Am diverts water only for the purpose of serving it to ratepayers, whose costs have been artificially lowered and expectations of supply have been artificially raised because of diversions in excess of the available lawful supply. California law prohibits both the diversion and the use of water without a lawful right. The State Water Board's concern is not forcing one party or another to bear a burden, but is rather to encourage compliance, and both Cal-Am and its customers have a role in achieving that outcome.

measures. It also provides for the opportunity for the State Water Board to re-assess whether to impose EDL cuts where the anticipated failure to meet a milestone is not reasonably within the control of the Applicants.

The annual report on the state of the fishery gives the State Water Board additional assurance that an extension of the compliance period will not cause undue harm to the fishery. If the restoration measures planned are not undertaken or fail to achieve the improvements that this order relies on in part, then the report will recommend adaptive management measures.

The foreseeable consequences if State Water Board were not to extend the compliance schedule also provide reasons to extend the schedule.

Without amendment of WR 2009-0060's deadline, Cal-Am would need to cease its unlawful diversions from the Carmel River by the end of December 2016. This would mean that Cal-Am's diversions from the Carmel River would be limited to 3,376 afa, plus whatever lawful diversions are available in the diversion seasons under Permit 21330, and Permits 20808A and 20808C for the ASR project, plus any water available under transfers from other rights holders on the Carmel River. Because the Cal-Am service area continues to rely on thousands of acre-feet per year of unlawful diversions, a reduction to lawful levels would require immediate and substantial curtailment of use, and the purchase and importation of additional supplies at costs previously believed to be untenable. Since 2009, the average total reported diversions in the Carmel River basin under other confirmed or claimed rights are approximately 2,000 afa. But, there is no indication that users are willing or able to transfer that amount of water for use in the Cal-Am service area. State Water Board staff have calculated that the annual average residential per-capita usage in the Cal-Am service area from June 2014 through May 2016 was 55 to 57 gallons per person per day, based on reporting required under emergency conservation regulations. This level is in the lowest 12% of urban water users in the state. During this period, such residential use accounted for between 40 and 70% of total usage. Numerous commenters have suggested that additional measures would cause economic harm, and could potentially affect health and safety.

With respect to the claims of potential health and safety impacts, there is no established level of per capita water use required for health and safety in the U.S. or California. The State Water Board has used 50 gallons per person per day as a benchmark for drought evaluation of diversions – just slightly under the amount typically considered for indoor use. Some Coastal California communities have achieved averages of approximately 40 gallons per person per day during the ongoing drought emergency. The standards adopted by the United Nations General Assembly in 2010 to implement a basic human right to water require 50-100 liters per person per day (13-26 gallons).

The State Water Board recognizes that requiring major reductions in water use rates over a relatively short period could cause substantial adverse economic impacts, and even greater inconvenience. Rapid curtailments in water use and implementation of rationing may be necessary, however, to end unlawful diversions on the Carmel River if the area continues to fail to develop alternative supplies. Economic impacts are a consideration in establishing a schedule of compliance, but cannot justify a decision not to require compliance. This order allows for cuts to occur on a predictable schedule, should the planned projects not meet development milestones, and also sets forth a clear method to address health and safety

concerns as the reductions of 1,000 afa for each milestone missed occur. The plans also allow time for and provide incentive for additional innovation in water supply planning should the processes underway fail.

To the extent that additional demand reduction and immediate supply acquisition efforts fail, Cal-Am would face significant fines. Each day of violation of a CDO accrues a potential administrative penalty of $10,000 in certain drought years, or of $1,000 in wetter years. (See Wat. Code, § 1845, subd. (b)(1).)

This administrative penalty is in addition to the potential administrative civil liability penalties for unlawful diversion of water under Water Code section 1052, which may be imposed for all unlawful diversions, not just those which are in excess of the levels set in the CDO. Such penalties are up to $1,000 per day and $2,500 per acre-foot of unlawfully diverted water in certain drought years, and up to $500 per day in wetter years. (See Wat. Code, § 1052, subd. (c).) Thus, in wetter years, Cal-Am would face approximately $550,000 for each year of violation of the CDO. In certain drought years, such as those the state is currently experiencing, Cal-Am could face over $4 million per year of violation in per-diem penalties, in addition to up to $2.5 million in penalties for every 1,000 acre-feet that the company diverts unlawfully. These penalties would be deposited in the Water Rights Fund for the state, rather than being used directly to fund a more stable water supply for the Monterey Peninsula. To the extent that Cal-Am or others dispute the imposition of fines, the process could result in additional expenditures of time and resources on issues related to the peninsula's lack of water supply, but that do not have the potential to provide a long-term solution. The CPUC would determine the question of whether these penalties would ultimately be borne by Cal-Am as a corporation or by the area's ratepayers, or whether the burden of these penalties would be shared. (See Cal. Const., Art XII, 6; Pub. Util. Code, §§ 427, 727.5.)

The result of an immediate reduction in pumping such that Cal-Am is taking only lawful supplies by the end of December 2016 is likely to divert time and resources from building a permanent, lawful supply, and to cause significant hardship to the residents of the Monterey Peninsula and to have broad economic impacts.

An immediate end to unlawful diversions would provide significantly more water for the fishery, and NMFS continues to have serious concerns regarding the impact of diversions on the fishery. However, NMFS supports extension of the CDO for the 6 years requested, under the conditions outlined for fishery protection, habitat restoration and rescue efforts, so long as sufficient monitoring of the fishery occurs.[7] Environmental organizations with longstanding and immediate experience in the area similarly support the limited extension of the compliance period, as conditioned.

[7] Some comments have proposed specific additional measures during the compliance period in order to mitigate impacts to the Carmel River fisheries. The State Water Board does not have before it sufficient information regarding the potential efficacy, need for, and cost of these measures, and is reluctant to re-balance the suite of priorities that NMFS has expressed without this information. This order provides for an annual fisheries report that includes the opportunity for recommendations for any adaptive management measures, including those suggested by commenters.

Amending the existing compliance schedule in WR 2009-0060 is appropriate in light of the fishery agency's support, the substantial mitigation measures that are completed, ongoing and planned for the immediate future, and the substantial hardships in immediately cutting off unlawful diversions where there is no clear alternative supply.

For the reasons discussed above, the Board will extend the CDO in a manner following the application's broad approach. This order does, however, make modifications to the application's proposal, as discussed below.

5.2 Adoption of Initial Effective Diversion Limit

Cal-Am's application proposes a starting Carmel River diversion limit of 8,310 acre-feet per annum, which is approximately 1,000 acre-feet less than the requirement of WR 2009-060 for WY 2015-16, and approximately the five-year average of pumping from WY 2009-2010 until WY 2012-2013. Staff's Preliminary Recommendation had suggested reducing this limit to 7,990, which is the most recent six-year average of diversions with adjustments to reflect modifications to ASR accounting.[8]

A table comparing the various average diversion levels over the past few years is below:

Requested Limit	8,310 af
Unadjusted Averages	
WY 2009/10 to 2013/14	8,348 af
WY 2009/10 to 2014/15	8,162 af
WY 2010/11 to 2014/15	7,836 af
Averages Adjusted - New ASR Accounting	
WY 2009/10 to 2013/14	8,143 af
WY 2009/10 to 2014/15	7,990 af
WY 2010/11 to 2014/15	7,733 af

Applicants submitted a letter in response to the preliminary recommendation requesting again that the State Water Board set the EDL at 8,310.[9] The submittal included additional information on the proposed EDL, demand levels during the historic drought, and the scheduled decreases in pumping from the Seaside Basin[10] under the management plan ordered under the Seaside Groundwater Basin Adjudication, *California American Water v. City of Seaside* (Monterey County Superior Court, Case Number M66343). This information indicates that, because of a scheduled reduction in allowable pumping from the Seaside Groundwater Basin of approximately 400 afa starting in WY 2017-2018, setting the diversion limit at 7,990 afa would require improvement on conservation levels from those achieved during the historic drought.

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[8] As described above, the application proposes counting only the first 600 acre-feet of ASR pumping in any water year towards the EDL.

[9] A number of additional commenters also wrote in support of setting the diversion level at 8,310, either independently or in explicit support of the Applicants' letter.

[10] Cal-Am's major alternative supply to Carmel River water is groundwater extracted from the Seaside Groundwater Basin, an adjudicated basin regulated by a watermaster. Due to a continued negative gradient for seawater intrusion, there is a ten percent reduction every three years in to the production allocations to the Basin users, including Cal-Am. According to the Watermaster Report for WY 2014-15, the watermaster has implemented another ten percent reduction. Cal-Am exceeded its allotments from the Basin in 2014-2015.

Thus, setting the EDL at 7,990 would therefore require immediate efforts to lower demand or cultivate alternate sources, rather than only requiring such efforts if milestones are missed. This would potentially undermine one of the benefits of the milestone structure – namely, allowing parties to focus on development of the primary water supply projects already underway.

The only comments submitted in support of lowering the proposed EDL were submitted by Planning and Conservation League and the Sierra Club, prior to the submittal of Cal-Am's revised application. The two environmental organizations have submitted a new joint letter explaining that they now support the EDL level of 8,310 for two primary reasons: (1) Cal-Am has entered into a forbearance agreement with Rancho Cañada which will increase flows in the river by 300 afa, reducing the fisheries impact of a slightly higher pumping level than that used over the past three years; and (2) the agreements to accelerate the Pure Water Monterey project indicate that it will provide water by 2018, resulting in an EDL after that date of 4,810.

For the reasons discussed above, this order adopts an initial EDL of 8,310, despite the fact that diversions at this level would constitute an actual increase in Carmel River diversions over those in recent years, and would likely result in Cal-Am accruing a significant number of credits prior to implementation of further restrictions on Seaside Groundwater Basin diversions.[11]

5.3 Modifications to Cal-Am's Application

5.3.1 Changes to Proposed Credit Framework

As discussed above, allowing Cal-Am to generate "credits" for reducing unlawful diversions from the Carmel River below the EDL is a worthwhile tool to encourage continued efficiency and conservation measures, as well as to encourage investment by various parties in development of water supply and re-use projects. Any additional reductions in diversions are likely to assist the fishery. However, allowing too generous accrual and use of credits threatens to undermine the basic principle of having a substantial drop in diversions for failure to meet a milestone and of ensuring that the diversion limits are ratcheted down such that unlawful diversions end by December 31, 2021 regardless of whether Cal-Am meets the milestones.

Therefore, this order adopts the concept of credits, but makes a minor adjustment to the proposed method of their accrual and use.

The order sets a clear limit to the number of credits that can be used in any year to 750 acre-feet. This 750 acre-foot limit prevents the entire reduction from a missed milestone (and its associated incentive to meet deadlines) from being cancelled out by significant accrual of credits.

Cal-Am also proposes limiting the quantity of credits available for use in any one year, but using a different calculation for this limit. The application proposes limiting carryover credits once the non-ASR total production from the Carmel River plus the amount of ASR water recovered that year exceeds the sum of EDL + 750 acre-feet. Because Cal-Am's pumping from Carmel River to ASR storage typically often exceeds the amount of ASR recovered that year (due to allowable ASR carryover), the value of non-ASR water plus ASR recovery is less than the Carmel River production counted under the EDL in most years. Thus, under the calculation method in the application, Cal-Am could use credit to pump up to 1,350 acre-feet above the

[11] Since the adjusted average for usage in the last six years is 7,990 afa, using an EDL for 8,310 afa is likely to result in accrual of approximately 400 afa of credits in 2015-2016 and in 2016-2017, prior to enactment of the next reductions in Seaside Groundwater Basin pumping.

otherwise-applicable limit, if it had diverted 600 or more acre-feet to storage in that year and had not recovered that amount from storage. In simpler terms, there would potentially be no reduction in diversions for missing a milestone during a year when there is water banking under the ASR, which could undermine the incentives for compliance, and the step-down structure towards ending unlawful diversions by the end of December 2021.

Additionally, it is easier to understand, comply with, and enforce the order when it treats ASR water in the same manner, rather than counting it in different ways for different purposes.

5.3.2 Changes to Proposed EDL Following Late Achievement of Milestones

This order adjusts Cal-Am's proposed accounting system by modifying the requested elimination of step-wise reductions when compliance with a milestone is achieved late. Under the application, Cal-Am proposes that the 1,000 afa reduction in the EDL be eliminated in the water year following late achievement of a milestone. This proposal reduces too greatly the incentive to meet a milestone. Additionally, it does not provide meaningful incentives for stakeholders to adhere as closely as possible to proposed timelines, even in the event of a delay. The order requires that for milestones achieved within the month following the deadline, the continuing reduction shall be 250 afa. For those achieved between one and six months after the deadline, the continuing reduction shall be 500 afa. For milestones achieved between six and nine months after the deadline, the continuing reduction shall be 750 afa. The 1,000 afa reduction to the EDL shall remain for milestones achieved more than nine months after the deadline. This structure provides meaningful incentives for adhering as closely as possible to the timelines proposed. Additionally, as discussed below in the Changes to EDL Accounting section, this order permits the accrual of credits for up to 50 percent of instream flow agreements, upon approval of the Deputy Director for the Division of Water Rights.

5.3.3 Changes to Milestones

5.3.3.1 New Milestones

This order adds two milestones to those proposed. These additions are necessary to track progress towards completion of the Pure Water Monterey recycled water project, even in the face of delays for the review of the desalination project. The first added milestone, for WY 2015-2016, is for CPUC approval of the Water Purchase Agreement for Cal-Am's purchase of water from the Pure Water Monterey Project, and of construction of the Cal-Am components of the Pure Water Monterey facilities. On April 25, 2016, Administrative Law Judge Sandoval ruled that the Pure Water Monterey portions of Cal-Am's pending request for a certificate of public convenience and necessity should be expedited. The order set an accelerated schedule for hearings and a decision on Cal-Am's ability to purchase and convey water from the recycled water project, with a decision anticipated in August 2016. The joint Applicants' letter of June 29, 2016 informed the Board that the CPUC has subsequently issued a ruling, on June 10, 2016, that includes a newly-noticed workshop and public hearing that will address the Pure Water Monterey Project. Cal-Am has filed a motion to the CPUC to confirm whether a decision is still anticipated on August 18, 2016. Absent such confirmation, Applicants have requested that the deadline for meeting this milestone be set for the end of December 2016, rather than the September 30, 2016 date proposed in the preliminary staff recommendation. This order sets December 31, 2016 as the deadline for meeting the milestone, but notes that, should there be additional delay in the decision or a denial, the entire 1,000 afa reduction in use would occur for the 2016-2017 water year, despite the extension of the deadline.

The order also adds a second milestone for start of construction of the Cal-Am portion of Pure Water Monterey Project to track progress on this Pure Water Monterey Project, for WY 2016-2017.

The Applicants have affirmed in their April 2016 application, and in their letter of June 29, 2016, that they anticipate water deliveries to begin under the Pure Water Monterey project in 2018. This timeline is significantly accelerated compared to the timeline in the initial application, and is based on the CPUC's ruling expediting proceedings for this project. In the initial application, the start of construction of the Pure Water Monterey project facilities constituted part of a WY 2017-2018 milestone. However, in the April 2016 application, this milestone was pushed back to 2018-2019 in its entirety, including the Pure Water Monterey portions. This order returns the Pure Water Monterey construction milestone to WY 2017-2018, as there is no indication that such an extension is necessary—acceleration rather than delay of the project is anticipated.

5.3.1.2 New Limit to Milestone Reductions

This order additionally limits the cuts to the EDL for missing a milestone when the diversions from the Carmel River in a particular water year are reduced to lawful levels. This addition is necessary because the Pure Water Monterey Project is anticipated to begin providing 3,500 afa to the Cal-Am service area, with water deliveries beginning in 2018. While this amount of water is insufficient on its own to eliminate the threat of unlawful diversions, implementation of the project followed by a failure to meet milestones related to the desalination project could result in the EDL falling below lawful pumping levels. Implementation of Pure Water Monterey and use of significant ASR water in the same water year could allow Cal-Am to pump lawfully at a level above the EDL if milestones are missed. However, as ASR water is not always available, the CDO would not likely be lifted under this scenario: termination of the CDO requires that Cal-Am have a permanent supply available.

5.3.1.3 Requirement to Revisit Milestones Based On Alternative Supply Projects

In a final change to the proposed milestones, this order adds the requirement that Cal-Am submit revised milestones within 60 days of CPUC approval of any water purchase agreement with Cal-Am for a major water supply project not specified in the milestones receives CPUC approval.

Two competing desalination projects at Moss Landing are currently undergoing environmental review: the People's Moss Landing Water Desalination Project and the Deep Water Desal Project. Proponents of both projects project that they could be permitted and built to begin serving water by 2019. The People's Moss Landing Water Desalination Project is a proposed 13,400 afa project that could serve the North Monterey County and Monterey Peninsula communities. The Moss Landing Harbor District is the lead agency for environmental review. The facility would use existing open ocean intakes that operate under proven technologies, and would be built on a previously-used industrial site. The use of these facilities could significantly reduce the cost of the facilities, and therefore of the water produced.

The Deep Water Desal Project is a proposed 25,000 afa project that could serve from Santa Cruz to the Monterey Peninsula, and east to Salinas. The facility would use open ocean intakes that draw deep ocean water, with the goal of lessening impacts on ocean organisms. It would be run conjunctively with a computer data center, to reduce the energy demand of each

of the two facilities, as compared to separate operation. The District has identified the Deep Water Desal Project as a potential supply project for the service area, should Cal-Am's proposed desalination facility not be built.

Open ocean intakes can cause significant impacts to the ocean. The State Water Board's 2015 amendments to the Ocean Plan require that subsurface intakes be infeasible, including consideration of alternative siting and sizing of facilities, before issuance of a permit for a surface intake of ocean water. (State Water Board Resolution No. 2015-0033, approved by Office of Administrative Law on January 28, 2016.) The Coastal Commission would also need to permit construction of either of these facilities, and The Public Utilities Commission would need to issue a Certificate of Public Convenience and Necessity in order for the facilities to sell water in the Cal-Am Service Area.

Additionally, the Central Coast Regional Water Quality Control Board has suggested that there is significant untapped potential in recycling water from wastewater treatment plants owned by Cal-Am and others in the Salinas area. Discharges that are not currently recycled could be routed through the existing water recycling facilities operated by the Monterey Peninsula Reginal Water Pollution Control Agency.

Cal-Am's application does not include milestones for either of these larger desalination facilities, and neither of the project proponents have submitted usable potential amendments to the existing milestones.[12] Yet, the construction of either Moss Landing facility could provide sufficient water to end unlawful diversions from the Carmel River, were its water approved for sale within the Cal-Am Service Area. Other large projects, such as the wastewater recycling augmentations mentioned above, may emerge as review of the proposed projects continues. The State Water Board's interest is in ending unlawful diversions from the Carmel River, rather than in supporting a particular facility. The specification of the MPSWP desalination and water recycling facilities in the milestones in this order are based on

Cal-Am's application and on evidence suggesting that they have made regulatory progress and are capable of ending unlawful diversions by the end of 2021. Should either of the other large desalination projects, or any other major water supply project, emerge as an alternative to all or part of the MPWSP, the State Water Board should have the opportunity to consider amendment of the proposed milestones.

5.3.1.4 Changes to EDL Accounting

The order adopts some of the new water diversion accounting methods proposed, in order to encourage full development of new water supplies. But it also amends or rejects other proposed changes that undermine the principle that new supplies must offset current unlawful diversions. It also clarifies whether or not various sources of additional supply count towards the EDL, rather than raising the EDL for specific supplies, in order to reduce confusion about what the EDL actually is.

[12] Water Plus has suggested requiring Cal-Am to support the People's Water Supply Project, but as discussed above, the State Water Board supports a more diversified approach at this point, given the track record for large water supply projects in the area.

The order adopts a new method of accounting for lawful winter diversions from the Carmel River to aquifer storage for later recovery, under the ASR. These changes encourage Cal-Am to maximize diversion during the winter months when sufficient water is available to meet bypass flows, and encourage further development of facilities to capture flows when they are available. The ASR permits authorize diversion of 5,326 afa of winter high flows, but the pumping and transportation pipeline facilities have limited the diversions to a maximum of about 1,110 af. Because the fisheries impact of diversions during periods of higher flow in winter, and under specified bypass requirements, are significantly less than the impact of the same amount of diversion in the lower-flow summer months, it makes sense to implement a strong incentive signal in the pumping limits to encourage reliance on this pumping rather than on summer diversions. Because the pumping continues to have some impact on the fishery, the first 600 afa will continue to count towards determination of the EDL. Additional pumping will not be counted in the EDL.

The application recommends that water delivered on an interim basis by the Malpaso Water Company LLC to Cal-Am under State Water Board License 13868A be added to the EDL for the water year. License 13868A requires that all water diverted under the right and provided to Cal-Am for municipal purposes be for the purpose of reducing Cal-Am's unlawful diversions[13] in 2015, that 50 afa be used to reduce unlawful diversion in 2016, and that 25 afa be so used in 2017. Because these amounts are used to offset unlawful diversions rather than increase deliveries, they should not increase the EDL. The order does add clarification, provided in State Water Board Division of Water Rights Decision 2005-0001, regarding the extent to which Condition 2 of WR 2009-0060 applies to water that Cal-Am may wheel on behalf of Malpaso Water Company. Namely, where Cal-Am is the purchaser of the water, Condition 2 applies. Where Malpaso Water Company sells to a customer outside the current service area, however, Condition 2 does not apply. The order also establishes monthly reporting requirements to monitor implementation of this condition.

The application additionally requests that fifty percent of the water from other water supply projects and from forbearance agreements be used to increase the EDL, with the other fifty percent of the water being used for instream use. Increasing the EDL is contrary to the basic premise of the enforcement action that new water supplies must offset current unlawful diversions. However, in the event that a milestone is missed, small projects and instream flow agreements may prove to be the fastest and best way to obtain supplies and river protection in the short term. The credit system as proposed provides incentives for small water supply projects and conservation: it does not, however, provide incentives for instream flow projects, as increasing instream flows does not directly[14] affect water supplies or demand. Therefore, this order adds provisions to incentivize such projects.[15] This order provides that fifty percent of the flows provided through forbearance agreements or other instream water dedications may be accrued as carryover credits, provided that the Deputy Director reviews the agreements to ensure that the agreement provide increased flows in the river as envisioned.

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[13] See Division of Water Rights Decision 2005-0001, Condition 2.

[14] In certain winters, increasing instream flows above the ASR points of diversion may have minor impacts on the number of days that ASR pumping can occur, by affecting whether bypass flows are achieved. However, these changes are likely to be minimal as the bypass flows are set to be triggered only when there are high flows. It is unlikely that flows would remain in the range where an instream flow dedication makes the difference in the ability to pump ASR supplies.

[15] This change did not appear in the preliminary staff recommendations distributed on June 17, 2016.

It is worth noting that the temporary non-diversion of water, and its use instream for fisheries and instream habitat improvement purposes may be considered a reasonable and beneficial use of water in some circumstances. Consistent with state policy and water rights law, the State Water Board encourages appropriately-documented forbearance agreements to improve fisheries flows. Short-term agreements and agreements regarding riparian rights may be structured in such a manner that the subject rights are not prejudiced. The substantive standards of Water Code section 1707, and various decisions approving such instream flow dedication, provide guidance as to the appropriate manner by which to construct forbearance agreements that provide real benefits to instream flow and which do not prejudice the water holder dedicating the flow or the rights of other lawful water users.

The application requests that the State Water Board provide assurances regarding a particular forbearance agreement with Rancho Cañada for a significant amount of water in calendar years 2016-2019. This agreement generates funding for a planned permanent land conservation and restoration project, and for the potential permanent retirement of associated water diversions. This proceeding is not the context to make definitive findings regarding the water rights at issue in the agreement: This is neither a noticed adjudicative proceeding regarding the rights at issue, nor a rulemaking regarding instream fishery needs. However, it is worth noting that a four-year cessation of diversion cannot be the basis for forfeiture, and that the State Water Board has recently approved a water right change petition to add instream beneficial use and use for wetland protection in the vicinity.

5.3.1.5 Changes as to Form

Attachment 1 to the Application recommends embedding the changes proposed in the ordering section of WR 2009-0060. Because WR 2009-0060 was issued after an evidentiary hearing, and is based on the evidence presented therein, the State Water Board has determined that it is clearer to issue a separate order based on the Water Code section 1832 application.

5.3.1.6 Modifications to Reporting

This order generally adopts the reporting provisions requested in the application, but modifies the timelines to better fit State Water Board needs and to give NMFS additional authority over the selection of a contractor to prepare the fisheries report, in the event that NMFS cannot itself prepare the report.

6.0 CONCLUSION

For the reasons discussed above, the State Water Board approves, with modifications, Cal-Am's application to modify the compliance schedule in WR 2009-0060.

ORDER

NOW, THEREFORE, IT IS ORDERED THAT as of the effective date of this Order, Cal-Am shall cease and desist from the unauthorized diversion of water from the Carmel River in accordance with the following schedule and conditions.

1. This Order shall supersede the requirements in State Water Board Orders WR 2009-0060, 95-10 and any other State Water Board orders affecting Cal-Am's diversions from the Carmel River, to the extent stated herein, or to the extent that there is an irreconcilable conflict between the requirements here and those orders. All other requirements in State Water Board orders affecting Cal-Am's diversions from the Carmel River remain in effect until terminated by operation of law or action of the Stat Water Board.

2. Cal-Am shall diligently implement actions to terminate its unlawful diversions from the Carmel River and shall terminate all unlawful diversions from the river no later than December 31, 2021. This date supersedes the December 31, 2016 date in State Water Board Order WR 2009-0060, ordering paragraph 1.

3. At a minimum, Cal-Am shall adjust its diversions from the Carmel River in accordance with the following terms and conditions. These terms and conditions supersede the annual reductions in State Water Board Order 2009-0060, ordering paragraph 3.a.(2), after the effective date of this Order:

a. **Effective Diversion Limit**: The limit set forth in this Condition 3.a., as may be further reduced or increased pursuant to the terms and conditions of this Order, is referred to as the "Effective Diversion Limit."

i. **Immediate Reduction**: Commencing on October 1, 2015 (Water Year 2015-2016) the Effective Diversion Limit shall be 8,310 acre-feet per annum (afa). This Effective Diversion Limit shall not be exceeded through December 31, 2021 except as provided in condition 3.b.ii or 3.c. of this Order. This limit supersedes the reduction limit required under Order 2009-0060 for Water Year 2015-2016.

b. Adjustments to the Effective Diversion Limit:

i. **Pure Water Monterey Groundwater Replenishment Project Offset**: In any year that Cal-Am delivers water stored in the Seaside Groundwater Basin as part of the Pure Water Monterey Groundwater Replenishment Project to its customers for use, the Effective Diversion Limit shall be reduced by one acre foot for every acre foot of Pure Water Monterey Groundwater Replenishment Project Water so delivered. If this reduction will result in the Effective Diversion Limit for that year being lower than Cal-Am's available lawful diversions from the Carmel River in that year, Cal-Am may apply to the Deputy Director for a limitation of this condition such that the provision will not limit lawful diversions.

ii. **Seaside Groundwater Basin Limitations**: The Board may adjust the Effective Diversion Limit if an unexpected reduction in Cal-Am's production allocation from the Seaside Groundwater Basin, or access to water pumped makes the supply unavailable. The Applicants[16] may request such relief whenever they can establish that access to water in the Seaside Groundwater Basin is limited due to unexpected mitigation measures imposed pursuant to the Seaside Basin Watermaster's Seawater Intrusion Response Plan, or by the court pursuant to the Seaside Groundwater Basin Judgment in response to a detection of seawater intrusion within the Seaside Groundwater Basin.

iii. **Carryover**: After October 1, 2015 if Cal-Am's diversions from the Carmel River during a given water year are less than the Effective Diversion Limit for that water year, Cal-Am will accumulate credit for the difference between the Effective Diversion Limit and Cal-Am's actual diversions. Additionally, Cal-Am may generate credits through instream flow agreements, as described in 3.b.xii, below. Any such credit may be carried over to offset an exceedance of the Effective Diversion Limit prior to December 31, 2021, subject to the restriction in Paragraph 3.b.iv below, and subject to the overall cap on diversions in Paragraph 3.a.i., above.

iv. **Cap on Carryover**: The amount of carryover water accumulated under Paragraph 3.b.iii that may be credited in any one water year shall not exceed 750 afa.

v. **Milestones:** For purposes of calculating a reduction to the Effective Diversion Limit, the following Milestones and Deadlines will apply:

Water Year	Milestone[17]	Deadline
2015-2016	CPUC approval of (1) the Water Purchase Agreement for Cal-Am's purchase of Pure Water Monterey water, and of (2) construction of the Cal-Am components of the Pure Water Monterey conveyance facilities,[18] including the Monterey Pipeline and pump station.	December 31, 2016*
2016-2017	Start of construction of the Cal-Am components of the Pure Water Monterey project, meaning commencement of physical work after issuance of required regulatory permits and authorizations to begin work.	September 30, 2017

[16] "Applicants" refers to the joint applicants for the request to modify State Water Board Order WR 2009-0060: Cal-Am, the Monterey Peninsula Regional Water Authority, the Monterey Peninsula Water Management District, the Pebble Beach Company, and the City of Pacific Grove.

[17] If at any point prior to completion of the facilities listed in these Milestones the CPUC authorizes Cal-Am to acquire more than 1,000 afa of water from an alternative source, then the following shall occur. Cal-Am shall submit to the Executive Director within 60 days a revised set of milestones taking this water supply source into account. If the proponents of the alternative project are unable to reach concurrence with Cal-Am on revised milestones to propose, the proponents may also submit revised milestones within that time period. The Executive Director shall determine whether to bring forward a recommendation to the State Water Board regarding amendment of the milestones.

[18] "Cal-Am components" of the Pure Water Monterey Project refers to the pump station and pipeline within or leading to Cal-Am's Service Area needed to transmit water to Cal-Am's service area.

Water Year	Milestone[17]	Deadline
2017-2018	Issuance of a Certificate of Public Convenience and Necessity to Construct the Monterey Peninsula Water Supply Project Desalination Plant ("MPWSP Desalination Plant") by the California Public Utilities Commission.	September 30, 2018
2018-2019	Start of construction for any of the Cal-Am Components of the MSWSP Desalination Plant[19], meaning commencement of physical work after issuance of required regulatory permits and authorizations to begin work.[20]	September 30, 2019
2019-2020	(1) Drilling activity for at least one MPWSP Desalination Plant source water production well[21] complete; (2) foundation and structural framing complete for MPWSP Desalination Plant pretreatment seawater reverse osmosis, and administration buildings at desalination plant; (3) excavation complete for MPWSP Desalination Plant brine and backwash storage basins; and (4) 25% of MPWSP Desalination Plant transmission pipelines installed based on total length, including 100% installation of the "Monterey Pipeline and other ASR related improvements".	September 30, 2020
2020-2021	For MPWSP Desalination Plant: (1) 50% of drilling activity complete for source water production wells based on total number of wells required; (2) mechanical systems for brine and backwash storage basins complete; (3) construction of filtered water tanks and finished water tanks complete; (4) 50% of transmission pipelines installed based on total length.	September 30, 2021
2021-2022 and beyond	Substantial completion of the Cal-Am Components of the MPWSP Desalination Plant, meaning the Cal-Am Components are sufficiently complete and appropriately permitted to allow delivery of MPWSP Desalination Plant produced potable water to Cal-Am's Monterey Main system, eliminating further Cal-Am diversions of Carmel River water without valid basis of right	December 31, 2021

* It is anticipated that this milestone will be achieved during Water Year 2015-2016. The deadline provides a three-month extension in the event that it occurs soon after the end of the water year.

vi. **Reductions to the Effective Diversion Limit Based on Missed Milestones:** The following reductions to the Effective Diversion Limit shall apply if an applicable Milestone Deadline is not met:

[19] For purposes of this proposal the Cal-Am Components of the MPWSP Desalination Plant include: source water production wells; desalination plant; brine disposal system; and transmission pipelines

[20] Such work may include, among other things, any of the following: desalination plant site grading and preparation; electric utility installation; yard piping; subsurface excavation for structural foundations; and transmission pipeline installation.

[21] Not including construction of the MPWSP Desalination Plant Test Well completed in 2015.

Water Year	Milestone Missed	Reduction in Effective Diversion Limit	Date Reduction Assessed
2016- 2017	1	1,000 AFA	Dec. 31, 2016*
2017- 2018	2	1,000 AFA	Oct. 1, 2017
2018- 2019	3	1,000 AFA	Oct. 1, 2018
2019- 2020	4	1,000 AFA	Oct. 1, 2019
2020-2021	5	1,000 AFA	Oct. 1, 2020
Oct. 1, 2021 – Dec 31, 2021	6	1,000 AFA	Oct. 1, 2021

* The entire 1,000 AFA reduction for failure to meet this milestone must occur in the 9 remaining months of WY 2016-2017.

If a Milestone is not achieved by its Deadline but is subsequently achieved, the 1,000 afa reduction to the Effective Diversion Limit shall be amended on the first day of the water year following achievement of the Milestone, as follows. For Milestones achieved within the first month following the deadline, the reduction shall be 250 afa. For Milestones achieved between one and six months after the deadline, the reduction shall be 500 afa. For Milestones achieved between six and nine months after the deadline, the reduction shall be 750 afa. The 1,000 afa reduction to the Effective Diversion Limit shall remain for milestones achieved 9 months after the deadline or later.

If the reductions required under this subparagraph will result in the Effective Diversion Limit for that year being lower than Cal-Am's available lawful diversions from the Carmel River in that year, Cal-Am may apply to the Deputy Director for Water Rights for a limitation of this section such that the provision will not limit lawful diversions.

vii. **Illustration:** The following table illustrates the effect of the reduction in the Effective Diversion Limit over the term of this Order, and assumes no Deadlines have been met and no carryover credits have been applied under Paragraph 3.b.iii, and no additional water rights have been obtained or other adjustments made to the Effective Diversion Limit. The result is an elimination of unauthorized diversions from the Carmel River on October 31, 2020 if no Deadlines are met.

Water Year	**EDL if All Milestones Missed, No Other EDL Adjustments**
2015-2016	8,310 AFA
2016- 2017	7,310 AFA
2017- 2018	6,310 AFA
2018-2019	5,310 AFA
2019-2020	4,310 AFA

Water Year	EDL if All Milestones Missed, No Other EDL Adjustments
2020–2021	Legal limit
Thereafter	Legal limit

viii. **Joint Annual Report**: Commencing in water year 2016-2017, at least 120 days prior to each Milestone Deadline described in Condition 3.b.v, Cal-Am, in coordination with Applicants, shall submit a joint report to the Deputy Director for Water Rights, describing progress towards that Milestone, whether Applicants expect the Milestone to be achieved by its Deadline and, if not, whether the Milestone will be missed for reasons beyond Applicants' control. Sufficient evidence supporting the reasons that missing a milestone is beyond the control of Applicants shall be included for any further action related to such a claim.

If requested, Cal-Am, in coordination with Applicants, shall present written and/or oral comments on the progress towards Milestones at a regularly scheduled State Water Board meeting that falls at least 60 days after submission of the report. If the report indicates that a Milestone is likely to be missed for reasons beyond Applicants' control, the State Water Board may make a determination during that meeting or at a subsequent meeting whether the cause for delay is beyond Applicants' control. If the State Water Board determines that the cause is beyond Applicants' control, it may suspend any corresponding reductions under Condition 3.b.vi until such time as the Applicants can reasonably control progress towards the Milestone.

ix. **ASR Project**: Commencing for water year 2015-2016, only the first 600 afa of the amount of any water diverted to underground storage under State Water Board Permits 20808A and 20808C as of May 31 of each water year shall be included in determining compliance with the Effective Diversion Limit: Diversions greater than 600 afa in a single water year shall not count as annual production of Carmel River water for the Effective Diversion Limit calculation. This section supersedes State Water Board Order WR 2009-0060, ordering paragraph 3.a.(3).

x. **Sand City Desalination Plant**: Any volume of water that is produced by the Sand City Desalination Plant and not served to persons residing within the City of Sand City shall be subtracted from the Effective Diversion Limit for the water year in which it is produced.

xi. **Pebble Beach**: Pebble Beach Company (PBC) shall continue to annually submit, on September 30, a report to the Deputy Director for Water Rights accounting for any additional water that is diverted from the Carmel River as the result of an increased use of its remaining District water entitlement. Any diversions from the river by Cal-Am to satisfy PBC remaining entitlements from District shall not be considered in calculating compliance with the Effective Diversion Limit. After December 31, 2021, Cal-Am shall not illegally divert water from the river to supply the holders of PBC entitlements. This order supersedes the last sentence of paragraph 3.a.(6) of State Water Board Order WR 2009-0060.

xii. **Supplemental Water Rights and Acquisitions**: Provided Cal-Am is able to identify suitable and willing transacting parties, Cal-Am will acquire supplemental Carmel River water rights, and/or will pursue other Carmel River water acquisitions and water right changes in order to increase flows in the Carmel River and decrease Cal-Am's unauthorized Carmel River diversions ("Carmel River Flow Enhancement Program"). Cal-Am will implement the Carmel River Flow Enhancement Program to the extent it can negotiate agreements with water right holders. Such acquisitions or water right changes may include forbearance agreements, leases and/or purchases of water rights along the Carmel River on a temporary or permanent basis, and may include water right change approvals or permits (permanent or temporary) from the State Water Board. The acquisitions may increase the proportion of Cal-Am's diversions that are made under lawful right, or increase Carmel River instream flows during periods of lower flow on the Carmel River. Instream flow agreements made with other parties can generate carryover credits described in 3.b.iii. at 50% of the amount that the Deputy Director confirms that the agreements have increased Carmel River flows without being diverted by other downstream users. To claim the credits, Cal-Am must first submit the agreement and a monitoring and reporting plan to the Deputy Director for concurrence. After concurrence in the plan, Cal-Am shall implement the monitoring and reporting, and shall annually submit the proposed credit amount for the water year within 2 months of the end of the instream flow agreement or of the water year, whichever comes first. The amount shall become available as credit in the amount approved by the Deputy Director.

xiii. **Malpaso Water Company**: Water provided by the Malpaso Water Company LLC to Cal-Am under water right License 13868A shall not be counted towards calculation of compliance with the Effective Diversion Limit for the water year in which the water is provided to Cal-Am to the extent that Cal-Am is merely transporting the water on behalf of Malpaso Water Company to serve Malpaso Water Company's contracts with water users. To the extent such water is used by Cal-Am to serve its customers, this water will be counted towards calculation of compliance with the EDL, and shall serve to increase the portion of such diversion that are made under lawful rights. Any use of the Malpaso Water Company's diversions shall be consistent with the terms of License 13868A and Division Decision 2015-0001.

c. Either Cal-Am or the District may petition the Deputy Director for Water Rights for relief from reductions imposed under this Order. No relief shall be granted unless all of the following conditions are met: (1) Cal-Am and the District continue the moratorium on new service connections; (2) the demand for potable water by Cal-Am customers meets all applicable conservation standards and requirements; and (3) a showing is made that public health and safety will be threatened if relief is not granted. Any relief granted shall remain in effect only as long as a prohibition on new service connections remains in effect, and compliance with applicable conservation standards and requirements remains in effect. This section supersedes ordering paragraph 3.b. of State Water Board Order WR 2009-0060.

4. Status of Steelhead Fishery Report. During the extension period Cal-Am will provide funding in an amount up to $175,000 per year for the preparation of an annual report that evaluates the status of the threatened South-Central California Coast Steelhead Distinct Population Segment ("SCCC Steelhead DPS") in the Carmel River ("Status of Steelhead Fishery Report"). If possible, the annual Status of the Steelhead Fishery Report will be

prepared by the National Marine Fisheries Science ("NMFS") Southwest Fisheries Science Center ("SWFSC"). If NMFS West Coast Region finds a significant change in the status of the SCCC Steelhead DPS since the previous report (or, in the case of the first report, since the effective date of this Order), NMFS West Coast Region may provide recommendations for additional adaptive management measures to be taken with respect to the SCCC Steelhead DPS in the Carmel River. If SWFSC cannot complete the Status of the Steelhead Fishery Report for any or all years during the extension period, Cal-Am will designate another individual or entity, in consultation with the other Applicants and other stakeholders, with requisite expertise to complete the report. If NMFS objects to the choice, Cal-Am shall designate a different individual or entity. If the NMFS West Coast Region cannot review the Status of the Steelhead Fishery report in any or all years, Applicants and other stakeholders may develop an alternative system for making adaptive management recommendations. Cal-Am will deliver the report in a cost effective and efficient manner, and will work with Applicants, stakeholders, and the preparer of the Status of the Steelhead Fishery Report to share resources, and to avoid duplication of effort to lower the cost of the report to the extent practicable. The Status of the Steelhead Fishery Report and any adaptive management recommendations shall be submitted to the State Water Board by Cal-Am each year with the corresponding joint annual report.

5. Additional Conservation Measures: Cal-Am has stated that it will implement an additional $2.5 million of projects to improve fish passage and habitat during the four years following adoption of this Order, as follows: improvements to the existing upstream fish passage ladder and trap at Los Padres Dam ($0.2 million); installation of a fish screen at the lower outlet pipe on Los Padres Dam ($0.8 million); a pit tagging program ($1.0 million); and a through-reservoir survival study for Los Padres Reservoir ($0.5 million). If the above projects are not implemented according to plans developed in coordination with the California Department of Fish and Wildlife and the National Oceanic and Atmospheric Administration, the State Water Board may revisit this Order to determine whether to make further adjustments to protect public trust resources in the Carmel River.

6. Carmel River Volitional Fish Passage: Cal-Am has substantially completed downstream fish passage facilities at Los Padres Dam. If Cal-Am fails to remove the Old Carmel River Dam and the Sleepy Hollow Ford before September 30, 2017, the State Water Board may reopen this order to determine whether to make further adjustments to improve fish passage in the Carmel River or otherwise restore public trust resources.

7. On June 1 of each year, Cal-Am shall submit an operating plan to the Deputy Director for Water Rights specifying the quantity of water it will supply from the ASR Project for its customers after May 31 of each year. This plan shall provide for use of the water between June 1 and September 30 of the water year the water was pumped from the Carmel River, unless otherwise authorized by the fishery agencies. Cal-Am shall reduce its illegal diversions from the Carmel River at the same rate ASR water is recovered from the groundwater basin. ASR diversions remain subject to State Water Board Order WR 2009-0060, ordering paragraph 3.c. This section supersedes ordering paragraph 4 of WRO 2009-0060.

8. In addition to the reporting required elsewhere in this order or required under WRO 2009-0060 ordering paragraph 6, except as specified, Cal-Am shall provide and post on its website the following information in quarterly reports:

a. Monthly summaries of the total quantity of water produced from the Carmel River, and other separate sources of water used by Cal-Am within the service area.
b. Monthly summaries of the total quantity of ASR project water diverted from the river under water right Permits 20808A and 20808C and stored in the Seaside Groundwater Basin, including the separate accounting of the amounts pumped in excess of 600 afa. The monthly reporting shall also state the quantity of ASR water recovered from aquifer storage and beneficially used, and the current balance of ASR water remaining in storage in the Seaside Groundwater basin. This paragraph supersedes WRO 2009-0060, ordering paragraph 6.(b).
c. Monthly summaries of the quantity of water being supplied by the Malpaso Water Company to Cal-Am and to Malpaso customers supplied using Cal-Am facilities. The reporting shall identify the amount of water used at Cal-Am's existing meter connections and within the Cal-Am service area, and the amounts used at new service connections served by Malpaso Water Company. The monthly reports shall specify the quantity of water used to reduce diversions from the river during the reporting period.
d. Monthly summaries of the quantity of water produced by the City of Pacific Grove, and the quantity of water used to reduce diversions from the river during the reporting period. Cal-Am shall not deliver water produced by the City of Pacific Grove unless such use is consistent with Resolution 2015-0070, paragraph 4.
e. For the final quarter of each water year, the report shall include the quantification and basis of any credits earned and of any amount being carried over for future years.
f. An accounting of the progress towards completion of the Water Supply Project MPWSP Desalination Plant and Pure Water Monterey Project that identifies all progressive steps completed during the previous 12 months and the upcoming 12 month's anticipated progress, and discussion of potential setbacks that may beyond the Applicant's control.

10. Each report submitted by Cal-Am shall be certified under penalty of perjury and shall include the following declaration: "I declare under penalty of perjury, under the laws of the State of California, that all statements contained in this report and any accompanying documents are true and correct, with full knowledge that all statements made in this report are subject to investigation and that any false or dishonest statement may be grounds for prosecution."

11. Cal-Am shall file quarterly reports of its diversions under Paragraph 5 (small project implementation) of State Water Board Order WR 2009-0060. This section corrects an error in State Water Board Order WR 2009-0060 ordering paragraph 7, which incorrectly identified the relevant paragraph as State Water Board Order WR 2009-0060 ordering paragraph 3.

12. The Deputy Director for Water Rights is authorized to modify the timing and the content of the reporting required by all of the provisions of this Order to more effectively carry out the intent of this Order.

13. Cal-Am shall comply with all requirements of State Water Board Order 95-10, except as provided in State Water Board Order WR 2009-0060, ordering paragraph 9, or except as inconsistent with this Order.

14. The Deputy Director for Water Rights is directed to closely monitor Cal-Am's compliance with State Water Board Order 95-10, State Water Board Order WR 2009-0060, and this Order. Appropriate action shall be taken to insure compliance with these Orders including the issuance of additional cease and desist orders under Water Code section 1831, the imposition of administrative civil liability under Water Code section 1055, and referral to the Attorney General under Water Code section 1845 for injunctive relief and for civil liability. If additional enforcement action becomes necessary, the Deputy Director is directed to consider including in such actions all Cal-Am's violations of Water Code section 1052 since the adoption of Order 95-10.

15. The conditions of this Order, State Water Board Order WR 2009-0060 and State Water Board Order 95-10 shall remain in effect until (a) Cal-Am certifies, with supporting documentation, that it has obtained a permanent supply of water that has been substituted for the water illegally diverted from the Carmel River and (b) the Deputy Director for Water Rights concurs, in writing, with the certification.

CERTIFICATION

The undersigned Clerk to the Board does hereby certify that the foregoing is a full, true, and correct copy of an order duly and regularly adopted at a meeting of the State Water Resources Control Board held on July 19, 2016.

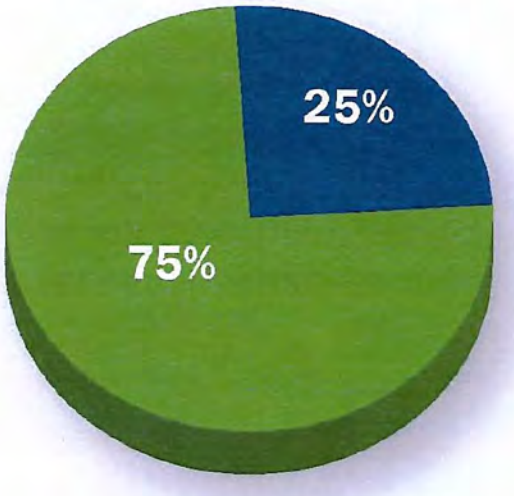
AYE:	Chair Felicia Marcus Vice Chair Frances Spivy-Weber Board Member Tam M. Doduc Board Member Steven Moore Board Member Dorene D'Adamo
NAY:	None
ABSENT:	None
ABSTAIN:	None

Jeanine Townsend

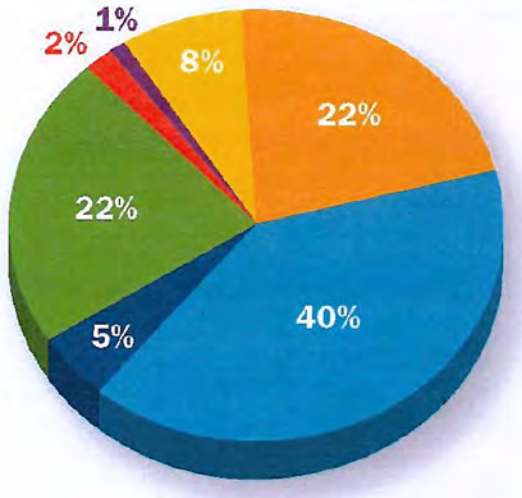
Jeanine Townsend
Clerk to the Board

Changing Sources of Supply on the Monterey Peninsula

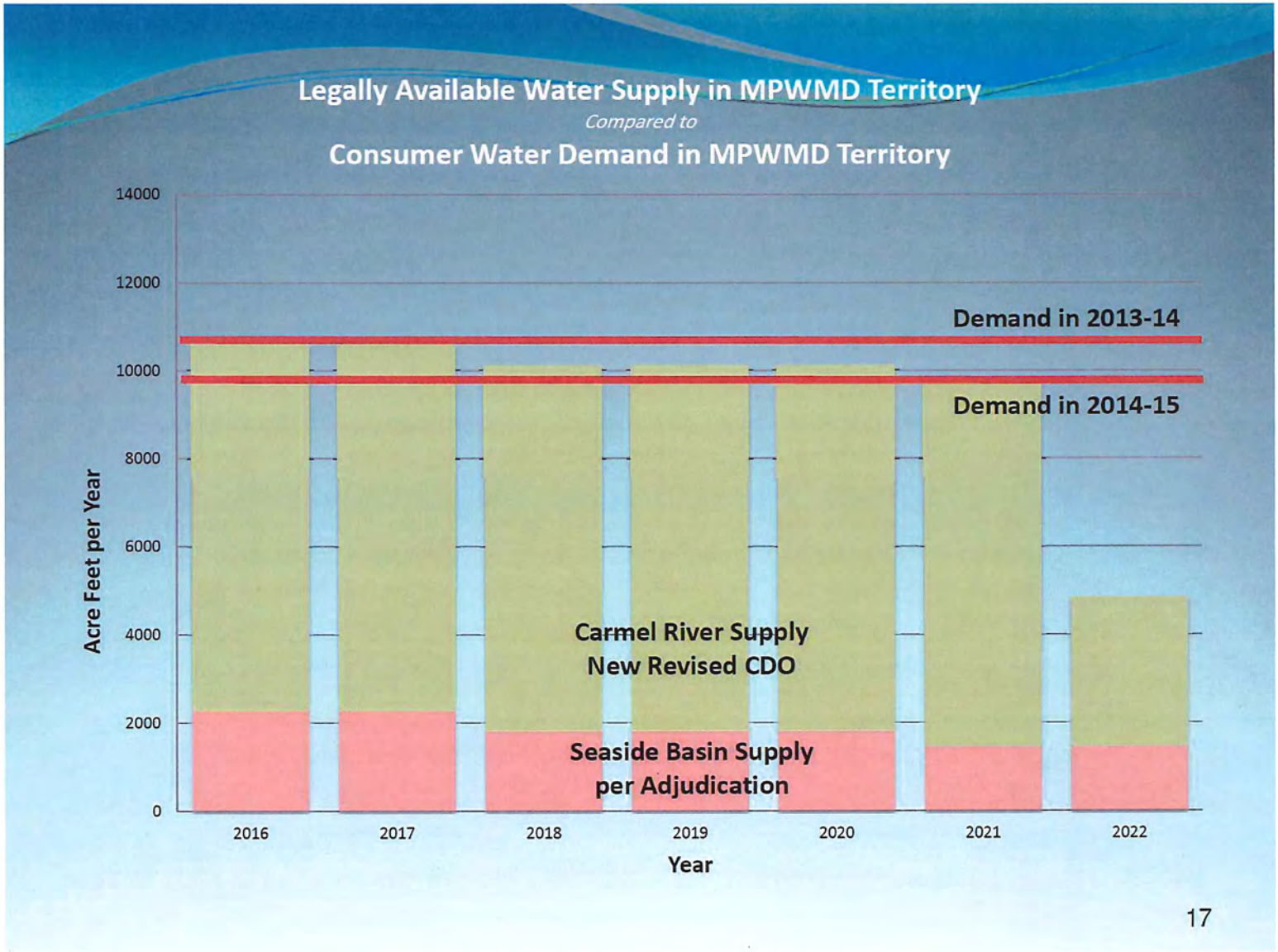
Traditional Sources



Proposed Water Sources



The Water Supply Project will diversify the Monterey Peninsula's water supply portfolio. These new sources of water will be sustainable and help protect against drought while also protecting the natural resources of the Carmel River.


Legally Available Water Supply in MPWMD Territory
Compared to
Consumer Water Demand in MPWMD Territory
14000
12000
10000
8000
6000
4000
2000
0
Acre Feet per Year
Demand in 2013-14
Demand in 2014-15
Carmel River Supply
New Revised CDO
Seaside Basin Supply
per Adjudication
2016
2017
2018
2019
2020
2021
2022
Year
17

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EXEMPT FROM FEES

SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF MONTEREY

CALIFORNIA AMERICAN WATER, Plaintiff, v. CITY OF SEASIDE, et al., Defendants.	Case No. M66343 Assigned for All Purposes to the Honorable Leslie C. Nichols **SEASIDE GROUNDWATER BASIN WATERMASTER'S RESPONSE TO COURT QUESTIONS IN ADVANCE OF MARCH 17, 2017 CASE MANAGEMENT STATEMENT**
MONTEREY PENINSULA WATER MANAGEMENT DISTRICT, Intervenor.	Action Filed: August 14, 2003 Trial Date: December 13, 2005 Post-Judgment Case Management Conference: March 17, 2017
MONTEREY COUNTY WATER RESOURCES AGENCY, Intervenor.	
AND RELATED CROSS-ACTIONS.	

The following information is provided in response to the Court's questions and request for further information sent on March 10, 2017. Watermaster welcomes further comment by any

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party and will be prepared to discuss these subjects in further detail with the Court at the March 17, 2017 Case Management Conference.

1. *Is the capacity of aquifers underlying the Seaside Groundwater Basin known or estimated?*

Response: The storage capacity of the Basin is discussed on pages 2-24 through 2-39 of the *Basin Management Action Plan* ("BMAP"), dated February 2009. That plan is accessible on the Watermaster's website at this link:

http://www.seasidebasinwatermaster.org/Other/BMAP_FINAL_5-Feb-2009.pdf.

Page 2-25 of the BMAP defines the term "Total Usable Storage Space" as follows:

> Total Usable Storage Space refers to the usable portion of the aquifer above the water table that is currently unsaturated and could be used for artificial recharge and storage. It can be thought of as the volume of storage that is currently unused, and therefore available for storage of replenishment water.

The discussion on page 2-34 of the BMAP estimates Total Usable Storage Space in the Basin as follows:

> Total Usable Storage Space in the Coastal and Northern Inland Subareas = 31,770 acre-feet
> Total Usable Storage Space in the Laguna Seca Subarea = 20,260 acre-feet
> Total Usable Storage Space in the entire Basin = 52,030 acre-feet

It should be noted that the Department of Water Resources' California Groundwater Bulletin 118 for the Salinas Valley Groundwater Basin, Seaside Area Subbasin states that the storage capacity of the subbasin was estimated to be 1,000,000 acre-feet based on the storage of 630,000 acre feet of groundwater in the southern half of the subbasin (Muir 1982). However, this is Total Storage Capacity rather than Total Usable Storage Space, which is the more pertinent term with regard to recharging of the Basin. Also, the DWR figure was based on a 1982 report and the more recent work by HydroMetrics (for example the BMAP) provides more current estimates of storage capacity.

2. *Has an optimal level of recharge been established?*

Response: An "optimal" level of recharge has not been established because there insufficient

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water available for recharge. However, Watermaster, through its consultant HydroMetrics, has performed two modeling studies that pertain to recharge (replenishment) of the Basin. The findings and conclusions of these studies were set forth in a report to Watermater, dated April 4, 2013[1] and are summarized below. In these studies the term "protective groundwater elevation" means a groundwater elevation at a specific well location that will prevent seawater intrusion from occurring at that well. Protective groundwater elevations were developed for the Watermaster by HydroMetrics for four of the coastal wells that would likely be the first to experience seawater intrusion coming inland from Monterey Bay. If those wells were protected against seawater intrusion, inland wells would presumably also be protected.

This study was performed to evaluate Basin responses under three scenarios: (1) Scenario 1: Cal-Am's 25-year groundwater overpumping replenishment program by itself without any other replenishment or pumping reductions; (2) Scenario 2: A set of pumping reductions in addition to the Cal-Am replenishment program, if Cal-Am's program alone was unable to achieve protective groundwater levels over a 25-year period; and (3) Scenario 3: Cal-Am's replenishment plan coupled with additional managed aquifer recharge if Cal-Am's program alone was unable to achieve protective groundwater levels in 25 years.

The report explained that:

- Cal-Am's 25-year replenishment repayment program alone (Scenario 1) increases groundwater elevations by 1 to 1.5 feet in the shallow aquifer coastal wells and 3 feet in the deep aquifer coastal wells. However, these increases do not achieve protective groundwater elevations.
- Eliminating all Standard and Alternative Producer pumping for 25 years starting in January 2017 (Scenario 2) would enable protective elevations to be achieved at the end of the 25-year period. However, this would require an overall pumping reduction of just over 2,000 acre-feet per year, so this amount of supplemental water supply from outside of the Basin would need to be provided to supply the users who are currently supplied by Basin wells.

[1] *Technical Memorandum: Groundwater Modeling Results of Replenishment Repayment in the Seaside Basin*

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- When combined with Cal-Am's 25-year replenishment repayment program, protective elevations could be achieved by injecting an additional 1,000 acre-feet per year of water into the existing ASR wells (Scenario 3). This approach requires less water to implement than the pumping reduction approach of Scenario 2.

Another study was undertaken to determine whether coastal injection could achieve protective groundwater elevations more quickly than inland locations, and whether less imported water could be used to reach protective elevations.[2] Seven coastal injection model scenarios were compared with an inland injection scenario. The inland injection scenario is the one (Scenario 3) that was modeled, and is described in, the April 4, 2013 report. That scenario represented inland injection using existing ASR wells. The July 19, 2013 study found that:

- Coastal groundwater levels reach protective elevations faster in response to coastal injection than in response to injection at existing inland ASR sites. Depending on the well, protective groundwater elevation monitoring wells in the deep Santa Margarita aquifer reach protective elevations one to ten years sooner in response to coastal injection compared to their response to inland injection. The shallow protective groundwater elevation monitoring wells reach protective elevations at similar times with both coastal and inland injection.
- Approximately 850 AFY of coastal injection is needed to achieve results similar to injecting 1,000 AFY at the inland location over a 25-year injection period.
- Protective elevations can be achieved within five years if 1,900 AFY is injected at the coastal location.
- Injection rates of 1,000 AFY and 1,900 AFY at the coast were evaluated and it was found that once protective groundwater elevations have been achieved injection of 850 AFY on an ongoing basis would be needed to maintain groundwater levels above protective elevations.
- While coastal injection appears to have some small benefits compared to inland injection, there would be substantial additional land acquisition and infrastructure costs to install coastal injection wells compared to using the inland injection wells which are already included in Cal Am's Monterey Peninsula Water Supply Project.
- While the injection of large amounts of water can achieve protective elevations relatively rapidly the cost to purchase this water would likely be substantial.

3. What is the latest available information concerning the amount of water in the aquifers?

Response: Estimates of the Total Stored Groundwater in the Basin are provided and discussed in

[2] *July 19, 2013 Groundwater Modeling Results of Coastal Injection in the Seaside Basin*

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the BMAP on pages 2-26 through 2-27. That discussion concluded that the estimates of Total Stored Groundwater ranged from 439,000 to 730,000 acre feet, depending on which assumptions, parameters, and geographic areas were used in the various investigations that have been performed to arrive at these values. The high end of these values comes from a 1982 investigation by Muir and the lower end of these values comes from a 2004 CH2M-HILL investigation. The BMAP notes that the greatest discrepancy among the estimates stems from the use of different geographic areas for the analyses. This is due in part to differing estimates of the actual boundaries of the Basin, most of which differ from the boundary used in the Amended Decision.

It is important to note, however, that the BMAP clarifies that much of the Total Stored Groundwater is not easily extracted due to the clustered location of wells in the Basin. Consequently, a more useful value is the Useable Stored Groundwater. The BMAP defines these two terms as follows:

> Total Stored Groundwater in a basin is the total volume of groundwater below the water table and above the impermeable geologic materials that form the bottom of the basin
>
> Usable Stored Groundwater is a subset of total stored groundwater and reflects limitations imposed by well depths, well locations, seawater intrusion threats, aquifer layering, etc. Some of these limitations are fixed characteristics of the natural system that are difficult to change. Others are manmade characteristics such as well locations and land use that could be changed to optimize the amount of usable stored groundwater.

Usable Stored Groundwater is the portion of the Total Stored Groundwater that would actually be feasible to extract due to the limitations described above. The BMAP estimated that the Usable Stored Groundwater in 2007 was 72,199 acre feet, with 27,530 acre-feet in the Coastal and Northern Inland Subareas (the subareas as defined in the Adjudication Decision) and 44,669 acre-feet in the Laguna Seca Subarea.

This is the most recent data the Watermaster is aware of regarding Total Stored Groundwater in the Basin.

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4. What is the number of percolation ponds within the basin?

Response: As far as the Watermaster is aware there are only two storm water percolation ponds, and one ASR backwash water percolation pond located within the adjudicated boundaries of the Basin. The two storm water percolation ponds are within the City of Seaside, one referred to as "The Frog Pond" near the boundary of the City of Seaside and the City of Del Rey Oaks, and one in the Seaside Highlands housing development in the northern portion of the City of Seaside. The ASR backwash pond is located near the intersection of General Jim Moore Boulevard and Eucalyptus Road in the former Fort Ord area.

There are numerous other storm water percolation ponds that impact groundwater within the Basin, but these are located to the north of the adjudication boundary. They are within the jurisdictions of the City of Marina, the Fort Ord Reuse Authority, or California State University Monterey Bay.

The Watermaster's groundwater model of the Basin includes the storm water ponds as sources of groundwater recharge. The model does not include the ASR backwash water pond as a recharge source since the backwash water is pumped out of the Basin and does not constitute a new water source.

The figure in Attachment 2 shows the locations of the storm water and ASR backwash water ponds.

It should also be noted that artificial recharge of the Basin is primarily made through injection wells rather than via percolation ponds. In lieu replenishment (i.e., use of imported surface water in lieu of groundwater) will also be a substantial means of replenishing the Basin once additional imported water from the MPWSP becomes available. Use of recycled water for turf irrigation in lieu of groundwater use could also be a future method of in lieu replenishment.

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5. Who is responsible for maintenance of the percolation ponds?

Response: It is the Watermaster's understanding that each of the entities listed in Response No. 4 maintains their storm water ponds in operational condition so they can serve their intended purpose. The ASR back wash pond is maintained by the Monterey Peninsula Water Management District.

6. Are all percolation ponds maintained and fully operational?

Response: See response number 4.

7. During above average rainfall seasons, have aquifers been recharged at a rate exceeding recharge in a 'normal' or 'average' rainfall year?

Response: Yes. The Watermaster's groundwater model includes varying amounts of annual recharge based on historical annual climatic and precipitation data. For purposes of modeling future groundwater conditions, historical climatological and precipitation patterns were assumed to repeat themselves into the future.

8. Are the parties presently in compliance with the amended judgment?

Response: At present all parties are in compliance with the amended judgement. However, there have been some prior non-compliance events, as discussed in response number 9 below.

9. Have there been any past departures from adherence from the requirements of the judgment, and if so, what actions have been undertaken to bring the parties into full compliance?

Response: There have been some non-compliance events as described in the Watermaster's Annual Reports from prior years as follows:

Annual Report Year	Non-Compliance Event
2008	The City of Seaside exceeded its Alternative Production allocation by 53.0 acre-feet.
2009	The City of Seaside exceeded its Operating Yield ("OY") allocation by 21.7 acre-feet and also exceeded its Alternative Production NSY by 22.9 acre-feet.

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2010	The City of Seaside exceeded its OY allocation by 29.77 acre-feet.
2012	Cal-Am and the City of Seaside exceeded their OY allocations by 222.97 and 2.43 acre-feet, respectively.
2013	Cal-Am and the City of Seaside exceeded their OY allocations by 260.51 and 38.86 acre-feet, respectively.
2014	Cal-Am and the City of Seaside exceeded their OY allocations by 416.01 and 4.77 acre-feet, respectively.
2015	Cal-Am and the City of Seaside exceeded their OY allocations by 462.03 and 0.06 acre-feet, respectively.

As a penalty in response to past production by Cal-Am and Seaside in excess of their respective OY allocations, Watermaster has assessed higher replenishment assessments on the production in excess of OY at a rate of 125 percent of the replenishment assessment charged on production in excess of Native Safe Yield allocation but within the party's OY allocation. In 2016, total pumping did not exceed the Native Safe Yield or OY allocations of the Basin. This is a significant accomplishment. It is the first time this has been achieved since the creation of the Watermaster and reflects the beneficial effects of conservation efforts within the Basin.

10. Are the two major steps in accomplishing the objectives set forth in the amended judgment the following: (1) implementation of Monterey Peninsula Water Supply Project; (2) timely formation of the Groundwater Sustainability Agency for the adjoining Monterey Subbasin, which includes the Corral de Tierra Subarea, and the timely implementation of a Groundwater Sustainability Plan?

Response: Yes. In addition, Watermaster will need to determine and implement a long-term program to achieve protective water levels to prevent the future risk of seawater intrusion into the portions of the coastal subareas where low groundwater levels will still exist after the Monterey Peninsula Water Supply Project and Cal-Am's over-pumping repayment program have been completed.

11. How will Watermaster engage efforts with the GSA for the Monterey Subbasin to coordinate management for the Corral de Tierra Subarea and the Laguna Seca Subarea of the Seaside Basin to arrest long-term water declines in both areas?

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Response: The Salinas Valley Basin Groundwater Authority was recently formed to act as the GSA for most of the Salinas Basin. The Marina Coast Water District also elected to be the GSA for a portion of the Monterey Subbasin of the Salinas Valley Basin that is adjacent to the adjudicated Seaside Basin. It is anticipated that efforts to develop groundwater sustainability plans ("GSP") for the Salinas Valley Basin will commence later this year. DWR's regulations require that a GSP must be function constructively with management in adjoining subbasins to achieve sustainability throughout the connected groundwater supplies. DWR will not approve a GSP that does not account for this necessary coordination. Relying on this requirement, Watermaster will engage the Salinas Valley Basin GSA (and Marina Coast Water District if needed) to ensure that management of the Corral de Tierra Subarea and the Seaside Basin are coordinated to address the falling groundwater levels in both areas. This engagement may include participation in technical committee meetings concerning GSP development, letters and presentations to the GSA's governing board, comments on draft GSP sections and other technical documents, and meetings with affected pumpers in both areas.

Dated: March 13, 2017

BROWNSTEIN HYATT FARBER SCHRECK, LLP

By:

RUSSELL M. McGLOTHLIN
Attorneys for Seaside Groundwater Basin Watermaster

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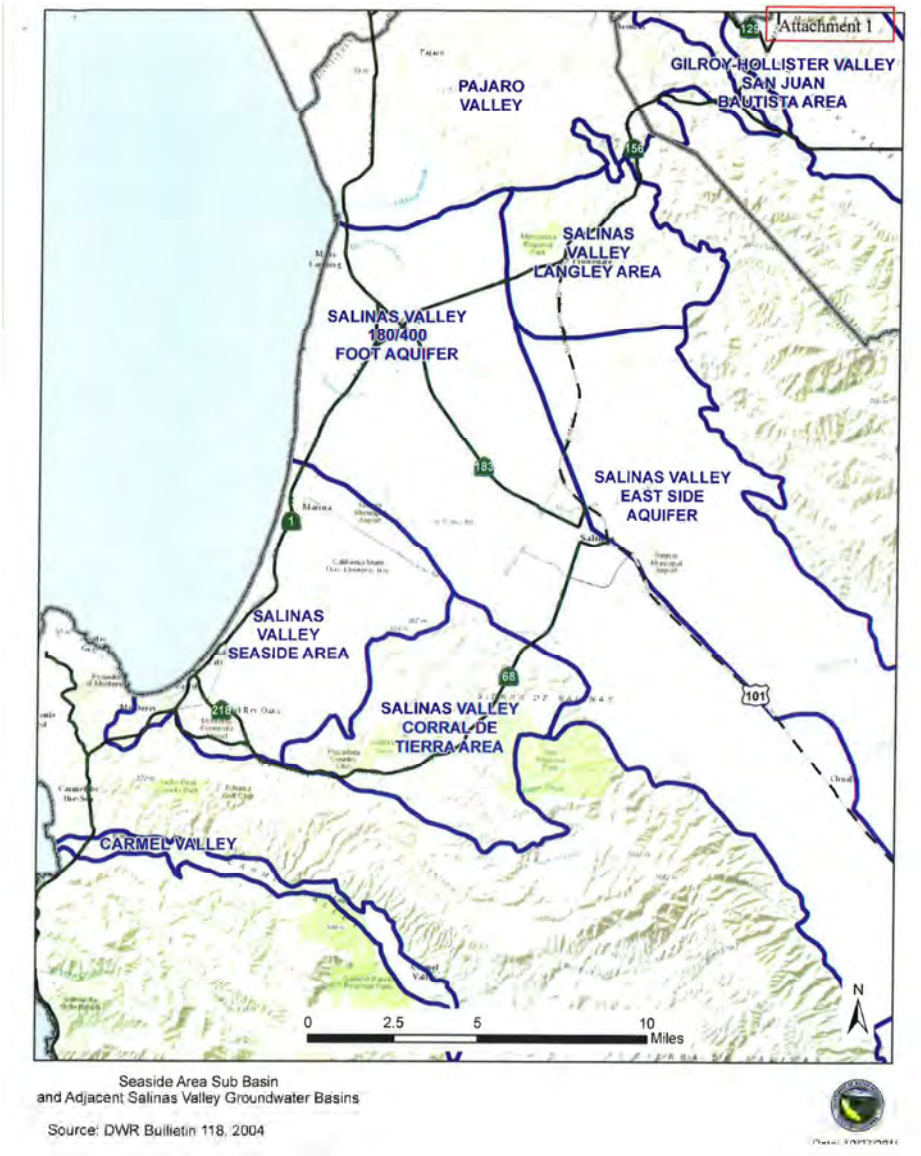
Attachment 1: Maps of Seaside Basin and Monterey Subbasin with delineation of former Corral de Tierra Subbasin and areas of concern.

As discussed in the Case Management Statement, the concern for Costal Subarea is that so long as water levels are below sea level, seawater intrusion remains a potential threat to the Basin. In the Laguna Seca Subarea, the concern is that in a natural state (pre-development) subsurface groundwater flowed generally from the Corral de Tierra Subarea and into the Laguna Seca Subarea. Overpumping within the Corral de Tierra Subarea lowers the groundwater levels there and causes two adverse impacts to the Laguna Seca Subarea: (1) it reduces the amount of natural recharge of groundwater into the Laguna Seca Subarea and (2) it changes the direction of the subsurface hydraulic gradient so that water starts to flow easterly out of the Laguna Seca Subarea and into the Corral de Tierra Subarea. The result of this is a continuing lowering of groundwater levels within the central and eastern portions of the Laguna Seca Subarea such that those levels will eventually fall below the levels of the well pumps in some locations.

Map A: Bulletin 118 boundaries within the Salinas Valley Basin before the modification request was approved.



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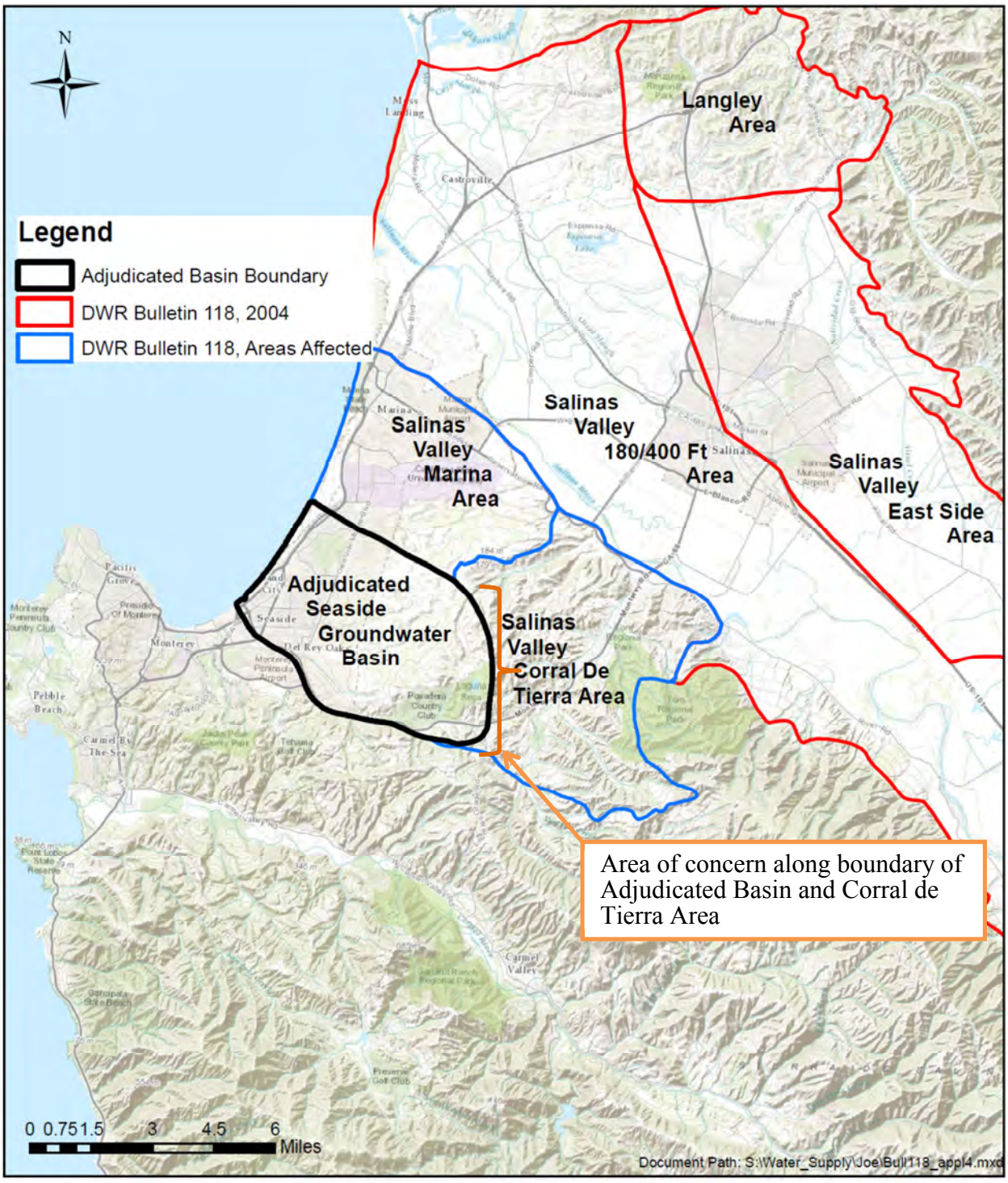
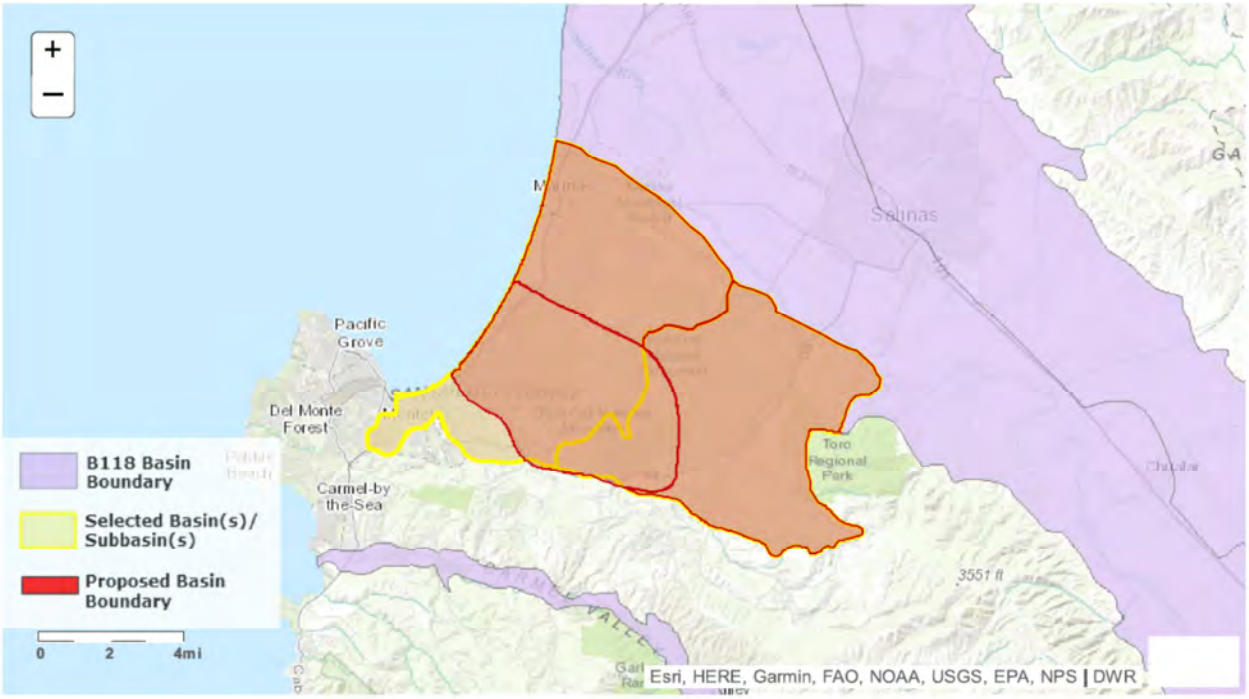
Map B: Requested change in Bulletin 118 boundaries to correctly show boundaries of the adjudicated Seaside Basin, with area of concern along boundaries highlighted.



Map C: Revised 2016 Bulletin 118 boundaries corrected to show boundaries of the adjudicated Seaside Basin



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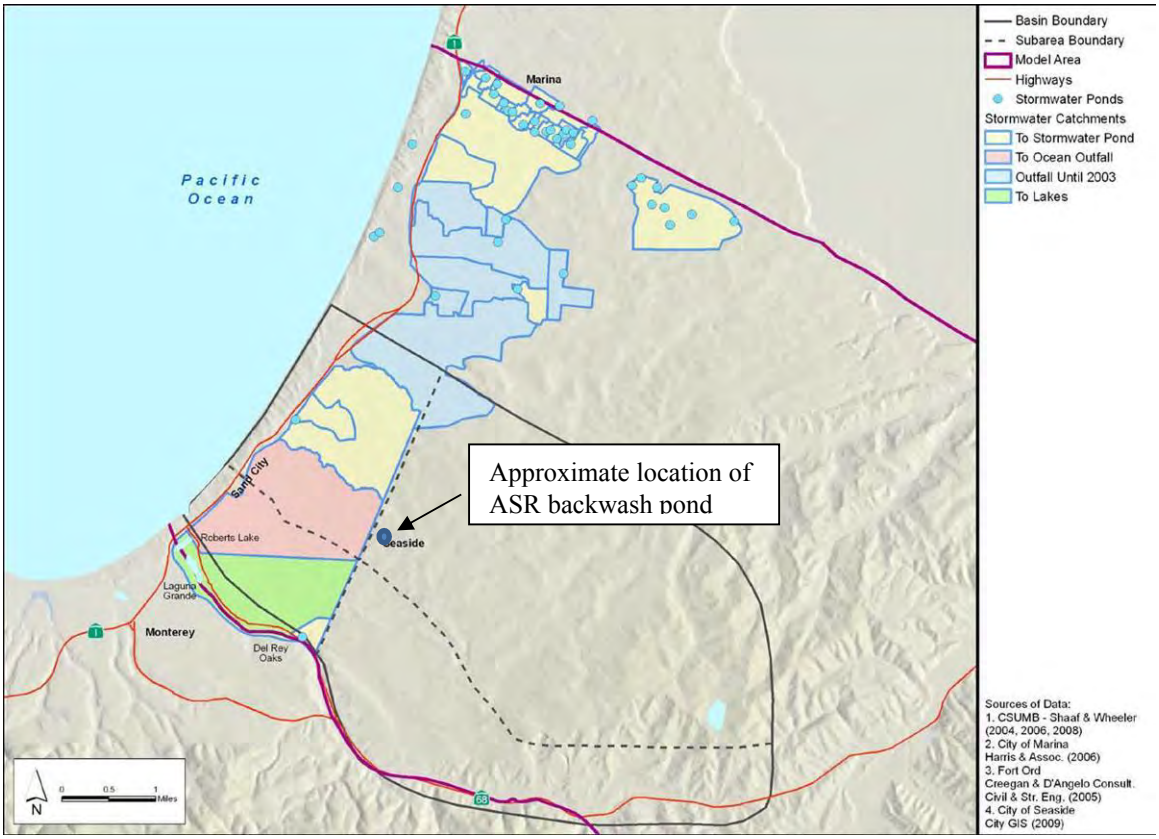
Attachment 2
Locations of Storm Water Percolation Ponds



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FIRM NAME: Law Office of Christina Trujillo
STREET ADDRESS: 700 Cass Street, Ste 202
CITY: Monterey STATE: CA ZIP CODE: 93940
TELEPHONE NO.: 831-920-0652 FAX NO.: 831-401-3197
E-MAIL ADDRESS: Attorneytrujillo@yahoo.com
ATTORNEY FOR (name): City of Del Rey Oaks

FOR COURT USE ONLY

SUPERIOR COURT OF CALIFORNIA, COUNTY OF Monterey
STREET ADDRESS: 1200 Aguajito Road
MAILING ADDRESS: 1200 Agaujito Road
CITY AND ZIP CODE: Monterey, CA 93940
BRANCH NAME: Monterey Division

CASE NUMBER: M66343

Plaintiff/Petitioner: California American Water

Defendant/Respondent: City of Del Rey Oaks

JUDICIAL OFFICER: Leslie C. Nichols

DEPARTMENT: 14

CONSENT TO ELECTRONIC SERVICE AND NOTICE OF ELECTRONIC SERVICE ADDRESS

1. ☐ The following party or ☒ the attorney for:
   a. ☐ plaintiff *(name):*
   b. ☒ defendant *(name): City of Del Rey Oaks*
   c. ☐ petitioner *(name):*
   d. ☐ respondent *(name):*
   e. ☐ other *(describe):*

   consents to electronic service of notices and documents in the above-captioned action.

2. The electronic service address of the person identified in item 1 is *(specify):* Attorneytrujillo@yahoo.com

Date: 3/2/17

Christina Trujillo
TYPE OR PRINT NAME

(SIGNATURE OF PARTY OR ATTORNEY)

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EFS-005

ATTORNEY OR PARTY WITHOUT ATTORNEY (Name, State Bar number, and address):	FOR COURT USE ONLY
Lori Girard, SBN 188370 511 Forest Lodge Rd, Ste 100 Pacific Grove, CA 93950 TELEPHONE NO.: 831-646-3240 FAX NO. (Optional): E-MAIL ADDRESS (Optional): lori.girard@amwater.com ATTORNEY FOR (Name): California American Water	
SUPERIOR COURT OF CALIFORNIA, COUNTY OF Monterey STREET ADDRESS: 1200 Aguajito Road MAILING ADDRESS: 1200 Aguajito Road CITY AND ZIP CODE: Monterey, CA 93940 BRANCH NAME: Monterey Courthouse	
PLAINTIFF/PETITIONER: California American Water DEFENDANT/RESPONDENT: City of Seaside et. al.	CASE NUMBER: M66343 JUDICIAL OFFICER: Hon. Leslie C. Nichols (Ret)
CONSENT TO ELECTRONIC SERVICE AND NOTICE OF ELECTRONIC SERVICE ADDRESS	DEPT.:

1. ☐ The following party or ☑ the attorney for:

   a. ☑ plaintiff *(name)*: California American Water
   b. ☐ defendant *(name)*:
   c. ☐ petitioner *(name)*:
   d. ☐ respondent *(name)*:
   e. ☐ other *(describe)*:

   consents to electronic service of notices and documents in the above-captioned action.

2. The electronic service address of the person identified in item 1 is *(specify)*: lori.girard@amwater.com

Date: June 20, 2016

Lori Girard
(TYPE OR PRINT NAME)

Lori Girard
(SIGNATURE OF PARTY OR ATTORNEY)

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EFS-005

ATTORNEY OR PARTY WITHOUT ATTORNEY (Name, State Bar number, and address):	FOR COURT USE ONLY
Steve Saxton (SBN 116943) Downey Brand LLP 621 Capitol Mall, 18th Floor Sacramento, CA 95814 TELEPHONE NO.: 916-444-1000 FAX NO. (Optional): 916-444-2100 E-MAIL ADDRESS (Optional): ssaxton@downeybrand.com ATTORNEY FOR (Name): Monterey County Water Resources Agency	
SUPERIOR COURT OF CALIFORNIA, COUNTY OF Monterey STREET ADDRESS: 1200 Aguajito Rd Fl 2 MAILING ADDRESS: 1200 Aguajito Rd Fl 2 CITY AND ZIP CODE: Monterey, CA 93940 BRANCH NAME:	
PLAINTIFF/PETITIONER: California American Water	CASE NUMBER: M66343
DEFENDANT/RESPONDENT: City of Seaside	JUDICIAL OFFICER: Leslie C. Nichols
CONSENT TO ELECTRONIC SERVICE AND NOTICE OF ELECTRONIC SERVICE ADDRESS	DEPT.: 13

1. ☐ The following party or ☑ the attorney for:

   a. ☐ plaintiff *(name):*
   b. ☐ defendant *(name):*
   c. ☐ petitioner *(name):*
   d. ☐ respondent *(name):*
   e. ☑ other *(describe):* Intervenor, Monterey County Water Resources Agency

consents to electronic service of notices and documents in the above-captioned action.

2. The electronic service address of the person identified in item 1 is *(specify):* ssaxton@downeybrand.com

Date: 6/22/16

Steve Saxton
(TYPE OR PRINT NAME)

(SIGNATURE OF PARTY OR ATTORNEY)

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ATTORNEY OR PARTY WITHOUT ATTORNEY: STATE BAR NO: 166427 NAME: Sheri L. Damon FIRM NAME: Damon Law Offices STREET ADDRESS: 618 Swanton Road CITY: Davenport STATE: CA ZIP CODE: 95017 TELEPHONE NO.: 8313453610 FAX NO.: 8313375212 E-MAIL ADDRESS: damonlawoffices@comcast.net ATTORNEY FOR (name): Security National Guaranty	FOR COURT USE ONLY
SUPERIOR COURT OF CALIFORNIA, COUNTY OF Monterey STREET ADDRESS: 1200 Aqualito Road MAILING ADDRESS: 1200 Aqualito Road CITY AND ZIP CODE: Monterey CA 93940 BRANCH NAME: Monterey	
Plaintiff/Petitioner: California American Water Company Defendant/Respondent: City of Seaside, et al.	CASE NUMBER: M66343
CONSENT TO ELECTRONIC SERVICE AND NOTICE OF ELECTRONIC SERVICE ADDRESS	JUDICIAL OFFICER: DEPARTMENT:

1. [X] The following party or [X] the attorney for:
   a. [ ] plaintiff *(name):*
   b. [X] defendant *(name): Security National Guaranty, Inc.*
   c. [ ] petitioner *(name):*
   d. [ ] respondent *(name):*
   e. [ ] other *(describe):*

   consents to electronic service of notices and documents in the above-captioned action.

2. The electronic service address of the person identified in item 1 is *(specify):*
   damonlawoffices@comcast.net
   edg.sng@equus-capital.com

Date: 2/28/17

Sheri L. Damon
TYPE OR PRINT NAME

(SIGNATURE OF PARTY OR ATTORNEY)

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ATTORNEY OR PARTY WITHOUT ATTORNEY: STATE BAR NO:
NAME: John M. Garrick SB # 108321
FIRM NAME: LARSON, GARRICK & LIGHTFTOOT LLP
STREET ADDRESS: 801 South Figueroa Street, Suite 1750
CITY: Los Angeles STATE: CA ZIP CODE: 90017
TELEPHONE NO.: 213-404-4100 FAX NO.: 213-404-4123
E-MAIL ADDRESS: jgarrick@lgl-law.com
ATTORNEY FOR (name): ALDERWOODS GROUP (CALIFORNIA), INC. dba MISSION MEMORIAL PARK (erroneously sued as MISSION MEMORIAL PARK)

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SUPERIOR COURT OF CALIFORNIA, COUNTY OF MONTEREY
STREET ADDRESS: 1200 Aguajito Road
MAILING ADDRESS:
CITY AND ZIP CODE: Monterey, CA 93940
BRANCH NAME: Monterey Courthouse

Plaintiff/Petitioner: California American Water
Defendant/Respondent: City of Seaside, et al.

CASE NUMBER: M66343

JUDICIAL OFFICER: Hon. Thomas W. Wills

DEPARTMENT: 14

CONSENT TO ELECTRONIC SERVICE AND NOTICE OF ELECTRONIC SERVICE ADDRESS

1. [ ] The following party or [X] the attorney for:
   a. [ ] plaintiff *(name):*
   b. [X] defendant *(name):* ALDERWOODS GROUP (CALIFORNIA), INC. dba MISSION MEMORIAL PARK (erroneously sued as MISSION MEMORIAL PARK)
   c. [ ] petitioner *(name):*
   d. [ ] respondent *(name):*
   e. [ ] other *(describe):*

   consents to electronic service of notices and documents in the above-captioned action.

2. The electronic service address of the person identified in item 1 is *(specify):*
   John M. Garrick jgarrick@lgl-law.com

Date: March 2, 2017

JOHN M. GARRICK
TYPE OR PRINT NAME

(SIGNATURE OF PARTY OR ATTORNEY)

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ATTORNEY OR PARTY WITHOUT ATTORNEY:	STATE BAR NO:	FOR COURT USE ONLY
NAME: M. Christine Davi FIRM NAME: City Of Monterey STREET ADDRESS: 512 Pierce Street CITY: Monterey STATE: CA ZIP CODE: 93940 TELEPHONE NO.: (831) 646-3915 FAX NO.: (831) 373-1634 E-MAIL ADDRESS: davi@monterey.org ATTORNEY FOR (name): City of Monterey		
SUPERIOR COURT OF CALIFORNIA, COUNTY OF MONTEREY STREET ADDRESS: 1200 Aguajito Road MAILING ADDRESS: 1200 Aguajito Road CITY AND ZIP CODE: Monterey, 93940 BRANCH NAME: Monterey Courthouse - Civil		
Plaintiff/Petitioner: California American Water Defendant/Respondent: City of Seaside, et al.		CASE NUMBER: M66343
CONSENT TO ELECTRONIC SERVICE AND NOTICE OF ELECTRONIC SERVICE ADDRESS		JUDICIAL OFFICER: Hon. Leslie Nichols (Retired) DEPARTMENT: 13

1. ☐ The following party or ☒ the attorney for:
   a. ☐ plaintiff *(name):*
   b. ☐ defendant *(name):*
   c. ☐ petitioner *(name):*
   d. ☐ respondent *(name):*
   e. ☒ other *(describe): Attorney for the City of Monterey*

   consents to electronic service of notices and documents in the above-captioned action.

2. The electronic service address of the person identified in item 1 is *(specify):* davi@monterey.org

Date: March 02, 2017

M. Christine Davi
TYPE OR PRINT NAME

▶ Christine Davi
(SIGNATURE OF PARTY OR ATTORNEY)

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PROOF OF SERVICE

STATE OF CALIFORNIA)
)
COUNTY OF SANTA BARBARA)

I am employed by Brownstein Hyatt Farber Schreck in the County of Santa Barbara, State of California. I am over the age of 18 and not a party to the within action; my business address is: 1020 State Street, Santa Barbara, California 93101. On March 2, 2017, I served the within document:

- CONSENTS TO ELECTRONIC SERVICE AND NOTICE OF ELECTRONIC SERVICE ADDRESS

☐ **BY OVERNIGHT DELIVERY.** By placing with an overnight mail company for delivery a true copy thereof, enclosed in a sealed package, delivery fees prepaid addressed as shown on the Service List below.

☒ **BY MAIL.** By placing each envelope (with postage affixed thereto) in the U.S. Mail addressed as shown below.

☒ By personally sending a true copy via e-mail to the parties at the e-mail addresses listed on the attached Service List, on the date below.

☐ By sending a true copy of the above document to the parties as set forth on the service list at the fax numbers indicated. The facsimile machine used complied with CRC Rule 2003(3), and the transmission was reported as complete and without error. Pursuant to CRC Rule 2005(i), a transmission confirmation report was properly issued by the transmitting facsimile machine, stating the time and date of such transmission.

SEE ATTACHED SERVICE LIST

I am readily familiar with the firm's practice of collection and processing correspondence for mailing. Under that practice it would be deposited with the U.S. Postal Service on that same day with postage thereon fully prepaid in the ordinary course of business. I am aware that on motion of the party served, service is presumed invalid if postal cancellation date or postage meter date is more than on day after the date of deposit for mailing in affidavit.

I declare under penalty of perjury under the laws of the State of California that the above is true and correct. Executed on March 2, 2017, at Santa Barbara, California.

Caitlin Malone

California American Water v. City of Seaside
Monterey County Superior Court Case No. M66343

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