CHAPTER 4
Environmental Setting (Affected Environment), Impacts, and Mitigation Measures

Sections	Figures	Tables
4.1.1 Scope of Analysis	4-1 Cumulative Project	4.1-1 Overview of Alternatives Evaluated in Detail
4.1.2 Resources/Issues Not Affected		4.1-2 Cumulative Projects
4.1.3 Baseline Conditions		
4.1.4 Impact Terminology		
4.1.5 Project Consistency Analysis		
4.1.6 Mitigation Measures		
4.1.7 Cumulative Effects		

4.1 Overview

This chapter summarizes the environmental setting ("affected environment") and assesses the environmental impacts or consequences that would result from building the Monterey Peninsula Water Supply Project (MPWSP or proposed project[1]) described in Chapter 3, Description of the Proposed Project, which consists of 10 subsurface slant wells at CEMEX. This chapter provides the CEQA- and NEPA-required analysis of the physical, biological, social, and economic issues associated with implementation of the proposed project. This introductory subsection is followed by issue-specific analyses of the potential effects of the proposed project. CEQA defines "effects" or "impacts" as the "[d]irect or primary effects which are caused by the project and occur at the same time and place" or the "[i]ndirect or secondary effects which are caused by the project and are later in time or farther removed in distance, but are still reasonably foreseeable." (CEQA Guidelines § 15358). Further, under CEQA, the term "significant effect on the environment" means "a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected [directly or indirectly] by the project, including land, air, water, minerals, flora, fauna, ambient noise and objects of historic or aesthetic significance" (CEQA Guidelines § 15382).

[1] The CEQA terminology of "proposed project" is used when referring to the CalAm project and its impacts. When discussing impacts from both the federal action and CalAm project, the term "proposed project" is also used.

Under NEPA, the term effects (or impacts) includes "ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Effects may also include those resulting from actions which may have both beneficial and detrimental effects, even if on balance the agency believes that the effect will be beneficial" (40 Code of Federal Regulations (CFR) § 1508.8).

This chapter documents the Lead Agencies' analysis of the direct, indirect, and cumulative effects that the proposed project might cause. It considers the impacts of short-term uses, such as construction-related truck traffic, air quality and noise. It also considers the impacts that would occur over the longer-term operation and maintenance period or that would persist after an initial occurrence, such as the discharge of brine into MBNMS from the desalination process. Finally, it identifies mitigation measures that could avoid or reduce adverse impacts, and summarizes the residual significant and unavoidable adverse impacts on an issue-by-issue basis.

The sections in this chapter are referred to as issue areas or topics. Each issue area section:

- defines the study area for the specific topic covered in the section;
- describes the regional and local environmental setting (the "affected environment");
- summarizes the applicable laws, regulations, plans, and standards (the "regulatory framework");
- identifies the thresholds and other criteria applied to determine whether a potential change to the environment as a result of the project would be significant;
- summarizes the analytical methodology used;
- analyzes direct, indirect, and cumulative effects;
- identifies mitigation measures to address adverse effects; and
- explains the residual impacts that would remain after the implementation of all recommended mitigation measures.

See Chapter 5, Alternatives Screening and Analysis, for descriptions and analyses of the alternatives. A summary of the alternatives is provided in **Table 4.1-1** for reference.

TABLE 4.1-1
OVERVIEW OF ALTERNATIVES EVALUATED IN DETAIL

Alternative	Components				
	Seawater Intake Facilities	**Brine Discharge/ Outfall Discharge Facilities**	**Desalination Plant**	**Conveyance Pipelines**	**Ground Water Replenishment Project Water Purchase Agreement**
Proposed Project *Described in Chapter 3*	9 new subsurface slant wells at CEMEX and conversion of test slant well to production well (10 total wells)	Existing MRWPCA ocean outfall pipeline and diffuser	New 9.6 mgd desalination plant on 25 acres at Charles Benson Rd. site	Source Water pipeline, Brine Discharge pipeline, Castroville pipeline, Pipeline to CSIP Pond, new Desalinated Water Pipeline, new Transmission Main, ASR facilities, and Highway 68 interconnection improvements. Approximately 21 total miles of pipelines.	Not part of proposed project
No Project Alternative *Described in Section 5.4.2*	No new facilities would be constructed; payback to the Seaside Groundwater Basin would not occur; reliance on existing and planned water conservation and recycling programs; likely implementation of mandatory rationing and conservation measures.				CalAm would purchase and extract 3,500 afy of GWR water from the Seaside Groundwater Basin
Alternative 1 – *Slant Wells at Potrero Road* *Described in Section 5.4.3*	10 new subsurface slant wells at Potrero Rd.	Same as proposed project		Same as proposed project, plus an additional 5.5 miles of source water pipeline. Approximately 26 miles of pipelines.	Not part of alternative
Alternative 2 – *Open-Water Intake at Moss Landing* *Described in Section 5.4.4*	New Screened Open-Water Intake at Moss Landing – one 36" diameter intake pipeline (HDD[1] installation)			Source Water pipeline, Brine Discharge pipeline, new Desalinated Water Pipeline, new Transmission Main, ASR facilities, and Highway 68 interconnection improvements, plus an additional 6.5 miles of source water pipeline. Approximately 21 total miles of pipelines.	
Alternative 3 – *Monterey Bay Regional Water Project (MBRWP or DeepWater Desal Project)* *Described in Section 5.4.5*	New Screened Open-Water Intake at Moss Landing – same location as Alt. 2; ● two 42" diameter intake pipelines (HDD installation) and ● a 110' L x 30' W x 12' tall intake structure	New Outfall at Moss Landing; ● two 36" diameter discharge pipelines (HDD installation) and ● a 140'L x 10' W x 15' tall discharge structure	New 22 mgd desalination plant and co-located data center at 110-acre "East Tank Farm Parcel" off Dolan Road, Moss Landing	New Desalinated Water Pipeline, new Transmission Main, ASR facilities, and Highway 68 interconnection improvements, plus an 8 mi source water pipeline, transfer and brine discharge pipelines, and two new pipelines to serve other areas (Salinas and Santa Cruz Co; approximately 25 miles). Approximately 48 total miles of pipelines.	

TABLE 4.1-1 (Continued)
OVERVIEW OF ALTERNATIVES EVALUATED IN DETAIL

Alternative	Components				
	Seawater Intake Facilities	**Brine Discharge/ Outfall Discharge Facilities**	**Desalination Plant**	**Conveyance Pipelines**	**Ground Water Replenishment Project Water Purchase Agreement**
Alternative 4 – *People's Moss Landing Water Desalination Project (People's Project)* *Described in Section 5.4.6*	New Screened Open-Water Intake at Moss Landing – same general location as Alt. 2, but different installation ● 40" diameter pipeline, combination HDD and laid on seafloor (for 1,100') ● two 96" diameter screened intakes	New Outfall at Moss Landing; extension of existing outfall ● 36" diameter pipeline, combination HDD and laid on seafloor (for 700') ● two 16" diameter diffuser ports	New 12 mgd desalination plant at former National Refractories facility in Moss Landing	New Desalinated Water Pipeline, new Transmission Main, ASR facilities, and Highway 68 interconnection improvements, plus an alternative 8-mile-long source water pipeline. Approximately 20 total miles of pipelines.	
Alternative 5a[2] – *Reduced Project 6.4-mgd Desalination Plant (Intake Slant Wells at CEMEX)* *Described in Section 5.4.7*	Same as proposed project, but fewer slant wells (7) at CEMEX	Same as proposed project except there would be less brine discharged.	New 6.4 mgd desalination plant at Charles Benson Rd site.	Same as proposed project, approximately 21 total miles of pipelines.	CalAm's purchase and extraction 3,500 afy of GWR water from the Seaside Groundwater Basin is considered in the cumulative analysis
Alternative 5b – *Reduced Project 6.4-mgd Desalination Plant (Intake Slant Wells at Potrero Road)* *Described in Section 5.4.8*	Same as Alternative 1, but fewer slant wells (7) at Potrero Road			Same as proposed project, plus an additional 5.5 miles of source water pipeline, approximately 26 miles of pipelines.	

NOTES:

1 Horizontal Directional Drilling (HDD) is described in Section 3.3.4.3 in Chapter 3, Description of the Proposed Project

2 Alternative 5 includes a reduced size desalination plant. The CPUC authorized CalAm to enter into a water purchase agreement for 3,500 afy from the GWR Project, and to build the new Monterey Pipeline and associated pump station needed for the GWR project, in September 2016. As a result, the GWR project is a reasonably foreseeable future project, and the cumulative impact scenario evaluated for Alternatives 5a and 5b includes implementation of the GWR project. The GWR project is not considered for cumulative impacts in conjunction with the proposed project or Alternatives 1, 2, or 4 because if a desalination option is selected that is of a size sufficient to fully satisfy the project objectives in terms of water supply, such choice would presumably mean that the GWR project was not successful in securing funding, completing construction and undertaking operations. The GWR project is conservatively considered for cumulative impacts with Alternative 3 because under that option, CalAm could meet its full project water supply objectives via the DeepWater Desal project, or could obtain water from a combination of the DeepWater Desal project and the GWR Project. See Table 4.1-2 in Section 4.1.

4.1.1 Scope of Analysis

Chapter 4 is organized by issue area or topic, as follows:

Sections			
4.2	Geology, Soils, and Seismicity	4.11	Greenhouse Gas Emissions
4.3	Surface Water Hydrology and Water Quality	4.12	Noise and Vibration*
4.4	Groundwater Resources	4.13	Public Services and Utilities
4.5	Marine Biological Resources	4.14	Aesthetic Resources
4.6	Terrestrial Biological Resources	4.15	Cultural and Paleontological Resources
4.7	Hazards and Hazardous Materials*	4.16	Agricultural Resources*
4.8	Land Use, Land Use Planning, and Recreation*	4.17	Mineral Resources
		4.18	Energy Conservation*
4.9	Traffic and Transportation*	4.19	Population and Housing*
4.10	Air Quality	4.20	Socioeconomics and Environmental Justice

* Issue areas in which MBNMS resources would not be affected.

Each section of Chapter 4 contains the following elements:

- **Table of Contents and Introduction.** This section presents a table listing the subsections, figures, and tables within the resource section. It also briefly introduces the resource topic. During the public scoping process and during the public comment period for the April 2015 Draft EIR, comments received from parties and members of the public raised issues and concerns and made suggestions regarding the scope of the analysis. These scoping and Draft EIR comments were carefully reviewed. To the extent that the issues raised or suggestions made were relevant to the EIR/EIS, they are described in this introductory text and addressed in the analysis.

- **Setting/Affected Environment.** This section presents a description of the existing environmental conditions near the project with respect to each resource topic at a level of detail that allows the reader to understand the impact analysis. This section provides the environmental baseline for the impact analysis. The focus of the affected environment description is on those resources or uses that may be affected by specific proposed project components. The study area for the EIR/EIS varies by topic, but is generally the proposed project area and adjacent properties. In some issue areas, the study area is necessarily larger than the project area because there is potential for impacts to occur beyond the project boundaries. The nature of existing conditions in the study area is interpreted from available literature and site-specific surveys, summarized in the resource sections. Where sufficient location-specific information is available, these data are primarily utilized. Where location-specific data are lacking, general conditions for the study area are utilized with appropriate qualifications.

- **Regulatory Framework.** This section describes the relevant laws and regulations that protect the environmental resources within the project area, and the governmental agencies that enforce those laws and regulations. The discussion of pertinent laws and regulations also evaluates the project's consistency with such regulatory requirements that were enacted for environmental protection purposes. Where a potential inconsistency with such regulations is identified, readers are referred to the discussion of the direct and indirect effects of the project within that topical area for further analysis of the issue.

- **Evaluation Criteria.** This section lists the specific criteria, also known as thresholds of significance, that were applied when evaluating the environmental impacts of the proposed project (10 wells at CEMEX) in Chapter 4, as well as the impacts of the alternatives, which are described and evaluated in Chapter 5, Alternatives Screening and Analysis. The list is based on Appendices G and F of the CEQA Guidelines with some modifications to account for NEPA considerations and to ensure that the criteria correlate to and measure the expected effects of the project. For certain resource topics, the Lead Agencies developed additional criteria to capture the environmental effects of the proposed project or its alternatives, as set forth in Chapter 5.

- **Approach to Analysis.** This section explains how the Lead Agencies applied the significance criteria to evaluate the proposed project (10 wells at CEMEX) in Chapter 4 and to the alternatives in Chapter 5. This section also describes modeling or other methodology used to quantify impacts.

- **Direct and Indirect Effects of the Proposed Project.** This section evaluates the potential for the proposed project (10 wells at CEMEX) to adversely affect the physical and human environment described in the setting, draws impact conclusions, discusses consistency with plans and policies and describes mitigation.

  CEQA and NEPA both require consideration of direct and indirect effects. Under CEQA, direct effects are those caused by the project itself and that occur at the same time and place; indirect impacts are those caused by the project and are later in time or farther removed in distance, but are still reasonably foreseeable (CEQA Guidelines § 15358). The definitions under NEPA are substantially similar (40 CFR § 1508.8). Under NEPA, direct effects “are caused by the action and occur at the same time and place" (40 CFR § 1508.8(a)); indirect effects “are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems” (40 CFR § 1508.8(b)). The overall methodology for each issue area or topic is consistent with Council on Environmental Quality (CEQ) guidance and NOAA NEPA guidelines (NAO 216 6), as well as with the CEQA Guidelines.

  The impact analysis for each issue area includes a description of how the proposed project/action would result in a change in the environment relative to existing conditions, and the current regulatory framework. The analysis within each topic focuses on components of the proposed project that could result in potentially significant effects. Both adverse and beneficial impacts are identified, where relevant. For most resource topics, all construction-related impacts are discussed first, followed by all operations/facility siting impacts. For purposes of CEQA, the conclusion of each impact analysis is expressed in terms of impact significance, which is discussed further in Section 4.1.4, below.

  This section also discusses the proposed project’s (10 wells at CEMEX) consistency with plans, policies, and regulations adopted for the purpose of avoiding or mitigating an environmental effect as well as a discussion of the possible conflicts between the proposed project and the objectives of federal, regional, state, and local land use plans and policies that are imposed for the protection of the environment, and is described in Section 4.1.5, below.

  This section also identifies mitigation measures for all of the impacts considered significant or potentially significant, as well as for some impacts that are less than significant. This is consistent with CEQA and NEPA, as discussed further in Section 4.1.6.

- **Cumulative Effects of the Project.** This section evaluates the cumulative direct and indirect impacts of the construction, operation, and maintenance of the proposed project. Details on CEQA/NEPA requirements and the cumulative effects methodology are provided in Section 4.1.7. If the proposed project/action would have no direct or indirect effects on a resource, then it could not cause or contribute to potential cumulative effects on that resource. In these instances, the Lead Agencies did not perform a cumulative effects analysis. See, for example, Section 4.1.2, Resources/Issues Not Affected.

4.1.2 Resources/Issues Not Affected

Of the issues commonly analyzed in a CEQA or NEPA process, the following list summarizes issues not analyzed in this EIR/EIS and why the proposed project or alternatives would not affect these resources. Resources that are not present on the project site, or resources that the project will not significantly affect, include Forestry Resources and Military and Homeland Security Uses. Neither the proposed project nor any of the alternatives would cause or contribute to any cumulative effects on these resources.

4.1.2.1 Forestry Resources

Implementation of the proposed project would have a significant impact on forestry resources if it:

- Conflicts with existing zoning for, or cause rezoning of, forest land (as defined in Cal. Public Resources Code § 12220(g)), timberland (as defined by Cal. Public Resources Code § 4526), or timberland zoned Timberland Production (as defined by Cal. Government Code § 51104(g));
- Results in the loss of forest land or conversion of forest land to non-forest use; or
- Involves other changes in the existing environment that, due to their location or nature, could result in conversion of forest land to non-forest use.

None of the land in the project area is zoned as forest land, timberland, or included in a Timberland Protection Zone, and no rezoning of any kind would be required to build the proposed project. Cal. Public Resources Code § 12220(g) defines “forest land” as “land that can support 10 percent native tree cover of any species, including hardwoods, under natural conditions, and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits.” Cal. Public Resources Code § 4526 defines “timberland” as “land, other than land owned by the federal government and land designated by the board [of the California Department of Forestry and Fire Protection (CAL FIRE)] as experimental forest land, which is available for, and capable of, growing a crop of trees of a commercial species used to produce lumber and other forest products, including Christmas trees. Commercial species shall be determined by the board on a district basis.”

In Monterey County, CAL FIRE has designated the following as qualifying commercial timber species: coast redwood, Douglas fir, Monterey pine, Coulter pine, Ponderosa pine, Jeffrey pine, white alder, cottonwood, Pacific madrone, California black oak, and tanoak. Timberland includes areas where the qualifying species are now growing naturally or have grown naturally in the

recorded past, even if they are not currently present. Cal. Government Code § 51104(g) defines "Timberland production zone" as "an area which has been zoned pursuant to [Government Code] Section 51112 or 51113 and is devoted to and used for growing and harvesting timber, or for growing and harvesting timber and compatible uses," which include uses that do not "significantly detract from the use of the property for, or inhibit, growing and harvesting timber" (Gov't Code § 51104[g]). Because none of the project area land is zoned for forestry use, and the project needs no forestry-related rezoning, the proposed project would not conflict with such zoning. Similarly, no forest land would be lost or converted to non-forest use as a result of the proposed project, and the project would not involve other changes in the existing environment that, due to their location or nature, could result in conversion of forest land to non-forest use. Therefore, the proposed project would not impact forestry resources.

4.1.2.2 Military and Homeland Security Uses

A portion of the new Transmission Main would be located on military lands and the ASR-5 and ASR-6 Wells would be located in the Fitch Park military housing community. The construction impacts associated with the new Transmission Main and ASR-5 and ASR-6 Wells are analyzed throughout this document. Construction impacts on military and homeland security uses would be temporary and negligible. Furthermore, construction and operation of project components in MBNMS would not interfere with any military or homeland security uses of MBNMS. Therefore, this document does not further discuss military and homeland security uses.

4.1.3 Baseline Conditions

The baseline for this EIR/EIS is the existing condition on or about October 5, 2012, which is when the CPUC issued a Notice of Preparation (NOP) for the proposed project to local, state, and federal agencies, Native American tribal organizations, and other interested parties. Although the Notice of Intent for the NEPA review contained within this document was issued in 2015, use of the 2012 baseline is appropriate and reasonable because (i) 2012 is a very recent point in time; (ii) the CPUC invested considerable resources amassing 2012 background/baseline data for the April 2015 Draft EIR; and (iii) environmental conditions in the study area have been relatively static such that 2012 conditions remain representative of meaningful baseline conditions. The environmental baseline reflects the pre-project environmental conditions to which the potential impacts of the proposed project and all alternatives are compared.

Since the CPUC issued its NOP in 2012, the Lead Agencies have developed or received new data on some of the resource areas, so they have updated the baseline data as appropriate. This document notes those updates in its discussions of the Setting/Affected Environment for the various resource areas and applies them in the pertinent analyses. For instance, in Section 4.6, Terrestrial Biological Resources, updates to survey information for biological resources are described in Section 4.6.1.2, Information Sources and Survey Methodology.

4.1.4 Impact Terminology

CEQA requires agencies to use their best judgment to determine whether an impact is significant; it's not a mechanical process. The agency must base its decision in light of the whole record, and must consider the impact's setting: "For example, an activity which may not be significant in an urban area may be significant in a rural area." (CEQA Guidelines § 15064(a)(1), (b)). Similarly, to determine whether an impact is significant, CEQ regulations (40 CFR § 1508.27) require the consideration of the context and intensity of potential impacts. Context normally refers to the setting, whether local or regional, and intensity refers to the severity of the impact. Also, the analysis includes a discussion of the possible conflicts between the proposed project and the objectives of federal, regional, state, and local land use plans and policies for the area concerned (40 CFR § 1502.16(c)).

Consistent with both CEQA and NEPA requirements and guidance, determinations regarding an impact's significance in this EIR/EIS are made on the basis of high quality, credible scientific information and professional judgment. Where a significant impact is reasonably expected to occur, this analysis discloses that information. All impact determinations are projections based on the expectation that the described impacts, or lack thereof, will occur if the proposed project is approved and implemented. Therefore, the impacts are conditioned upon approval and implementation of the project, and the term "would/would not occur" is used to describe the reasonable expectation of the impacts of the project.

The categories used to designate impact significance are:

- **No Impact (NI).** There would be no impact if there is no potential for impacts, or if the environmental resource does not occur within the project area or the area of potential effect. For example, there would be no impact related to tree removal if no tree removal is proposed in the project area.
- **Less than Significant impact (LS).** This determination applies if there is a potential for some limited impact, but not a substantial adverse effect that qualifies under the applicable significance criterion as a significant impact.
- **Less than Significant impact with Mitigation (LSM).** This determination applies if the project would result in an adverse effect that exceeds/qualifies under the applicable significance criterion, but feasible mitigation is available that would eliminate the impact or reduce it to a less-than-significant level.
- **Significant and Unavoidable impact even with implementation of Mitigation (SU).** This determination applies if the proposed project would result in an adverse effect that exceeds/qualifies under the applicable significance criterion and even with mitigation implemented to lessen the impact, if available, the residual effect would remain significant. Therefore, the impact would be significant and unavoidable.

Within each issue area section in this chapter, there is a table at the beginning of the impact discussion that summarizes the potential impacts and indicates the level of impact significance. Environmental impacts are numbered throughout this EIR/EIS, using the section number followed by sequentially numbered impacts. Mitigation measures are numbered to correspond with the impact numbers; for example, Mitigation Measure 4.3-1 addresses Impact 4.3-1. In some

cases, mitigation measures are used again to address sequentially later impacts. When this occurs, the measures are not renumbered or repeated in full; rather, the reader is directed to review the mitigation measure where it is first introduced.

4.1.5 Project Consistency Analysis

Consistent with CEQA, the EIR/EIS includes a discussion of any inconsistencies between the project and applicable general plans, specific plans, and regional plans and any conflicts between the project and applicable plans, policies, and regulations of agencies with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect (CEQA Guidelines section 15125 and Appendix G). Also, per NEPA, the analysis includes a discussion of the possible conflicts between the proposed project and the objectives of federal, regional, state, and local land use plans and policies for the area concerned that are imposed for the protection of the environment (40 CFR § 1502.16(c) and 40 CFR § 1508.27(b)(10)).

The discussion of project consistency appears within each topical section's Regulatory Framework subsection. Federal and state requirements related to the subject topic are presented in a narrative format, followed by the analysis of project consistency. Owing to their relatively larger number of specific requirements, regional and local plans, policies, and regulations, and the associated consistency analyses, are presented in a table format. The table appears after the discussion of federal and state requirements within each topical section.

Where the consistency analysis concludes the MPWSP would not conflict with the applicable plan, policy, or regulation, the finding is noted and no further discussion is provided. Where the analysis concludes that the MPWSP may conflict with the applicable plan, policy, or regulation, the reader is referred to the respective topic's Direct and Indirect Effects of the Project subsection, where the issue is discussed further. In that subsection, the significance of the potential conflict is evaluated. Where the effect of the potential conflict would be significant, feasible mitigation is identified to resolve or minimize that conflict.

The proposed project's consistency with the full set of MBNMS Desalination Guidelines is addressed separately in Section 6.4 since the Guidelines are relevant to multiple issue areas.

4.1.6 Mitigation Measures

This chapter identifies feasible mitigation measures to avoid, minimize, or compensate for impacts of the proposed project consistent with CEQA and NEPA requirements. Regardless of the effect of the measure – whether to avoid, minimize, or mitigate for an impact – this document uses the term "mitigation measure" to label these measures, consistent with CEQA and NEPA guidance described below.

CEQA Guidelines Section 15126.4(a)(1) states that an EIR "shall describe feasible measures which could minimize significant adverse impacts." Section 15041 describes the authority of a CEQA lead agency to "require feasible changes in any or all activities involved in the project in order to substantially lessen or avoid significant effects on the environment, consistent with applicable

constitutional requirements such as the 'nexus' and 'rough proportionality' standards established by case law (citations omitted)." Section 15092(b)(2) states that a public agency shall not decide to approve or carry out a project for which an EIR was prepared unless the agency has "Eliminated or substantially lessened all significant effects on the environment where feasible" and determined that any remaining significant and unavoidable impacts are acceptable due to overriding considerations. Thus, a CEQA lead agency must describe and adopt all feasible mitigation measures for impacts found to be significant, but is limited to requiring mitigation only for significant impacts and within the limitations of the nexus and rough proportionality standards.

CEQ NEPA guidance for Federal Departments and Agencies on the Appropriate Use of Mitigation (76 Fed. Reg. 3843) clarifies that when an agency premises its environmental analysis on a commitment to mitigate the environmental impacts of a proposed action, it should adhere to those commitments, monitor how they are implemented, and monitor the effectiveness of the mitigation. For example, the agency could impose appropriate conditions on permits or other agency approvals, or could make approvals contingent on implementation of the mitigation commitments. Although NEPA does not impose a similar procedural obligation on federal agencies as CEQA requires, the practice to adopt feasible mitigation whenever possible to reduce a project's significant impact is consistent with NEPA's intent that mitigation be discussed in sufficient detail to ensure that environmental consequences have been fairly evaluated. Consistent with the federal agency's authority and responsibility under NEPA, this chapter identifies some feasible mitigation measures to lessen impacts that are adverse but do not rise to the level of being classified as significant impacts.

Mitigation measures included in this EIS/EIR are considered to be potentially feasible by the authors of the document; however, the ultimate determination of feasibility can be made only by agency decision-makers. This EIS/EIR addresses whether mitigation presented would reduce an impact to a less-than-significant level, based on the thresholds of significance presented in each resource chapter, except in those cases where the NEPA lead agency identifies feasible mitigation for adverse impacts that are not significant.

The Lead Agencies will prepare a Mitigation, Monitoring, Reporting, and Compliance Program (MMRCP)/ Environmental and Construction Compliance Monitoring Plan (ECCMP) if they approve the proposed project or an alternative analyzed in Chapter 5. This will ensure that any mitigation measures are effectively implemented. Such document would be prepared at or after the time that the Final EIR/EIS is completed so as to capture all mitigation measures and would be made available to the public prior to adoption.

4.1.7 Cumulative Effects

Cumulative impacts, as defined in Section 15355 of the CEQA Guidelines, refer to two or more individual effects that, when taken together, are "considerable," or that compound or increase other environmental impacts. Cumulative impacts can result from projects that are individually minor but collectively significant when added to the impacts of other closely related past, present, or reasonably foreseeable future projects. Section 15130 of the CEQA Guidelines states:

- An EIR shall discuss cumulative impacts of a project when the project's incremental effects are "cumulatively considerable" (i.e., the incremental effects of an individual project are considerable when viewed in combination with the effects of past, current, and probable future projects, including those outside the control of the agency, if necessary).
- An EIR should not discuss impacts that do not result in part from implementation of the project being evaluated in the EIR.
- A project's contribution is less than cumulatively considerable, and thus ultimately less than significant, if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact.
- The discussion of cumulative impact severity and likelihood of occurrence need not be as detailed as that presented for effects attributable to the project alone.
- The focus of analysis should be on the cumulative impact to which the identified other projects contribute, rather than on attributes of the other projects that do not contribute to the cumulative impact.

The CEQ's NEPA regulations also require agencies to assess a proposed action's cumulative impacts (40 CFR Parts 1500-1508). Both CEQ regulations and NOAA Administrative Order Series (NAO) 216-6A define a cumulative impact as an "impact on the environment which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR 1508.7, NAO 216-6). Cumulative impacts can result from individually minor but collectively significant actions taking place over time (40 CFR § 1508.7).

The CEQ states that NEPA documents "should compare the cumulative effects of multiple actions with appropriate national, regional, state, or community goals to determine whether the total effect is significant" (CEQ, 1997). Cumulative effects may arise from single or multiple actions and may result in additive or interactive effects. Interactive effects may be countervailing, where the adverse cumulative effect is less than the sum of the individual effects, or synergistic, where the net adverse effect is greater than the sum of the individual effects (CEQ, 1997).

This section presents the methods used to evaluate cumulative impacts, and lists projects that may have cumulative effects when combined with the impacts from the proposed project or alternatives discussed in this EIR/EIS. The MPWSP's cumulative effects analysis is provided by topical section throughout Chapter 4. Where appropriate, additional measures are identified to mitigate potentially significant cumulative impacts. The cumulative effects of project alternatives are analyzed in Chapter 5, Alternatives Screening and Analysis, Sections 5.5 and 5.6.

4.1.7.1 Approach to the Analysis of Cumulative Effects

CEQ's cumulative effects guidance sets out several different assessment methods, such as checklists, modeling, forecasting, and economic impact assessment, that evaluate changes in employment, income and population (CEQ, 1997).

This EIR/EIS uses a variety of methods, depending on the resource area, to determine cumulative effects. Consistent with CEQA and NEPA, this EIR/EIS considers the direct and indirect effects

of the proposed project combined with the effects of the other projects that could combine geographically and temporally (i.e., would be causing similar impacts in the same area at the same time as the proposed project) and, thereby, cause or contribute to a cumulative effect. For each resource or issue considered in this chapter, the cumulative effects analysis identifies the relevant geographic area and time period within which cumulative effects could occur and then considers existing conditions (which are the combination of the natural condition and the effects of past projects) and describes the effects of other past, present and reasonably foreseeable future projects in combination with the effects of the proposed project. Where relevant, the cumulative effects analysis also describes the relationship of the cumulative effects to any established thresholds. A quantitative analysis is provided where possible; where quantification is infeasible, qualitative effects are described. Where the analysis finds that the cumulative effects of past, present and future projects would be significant and adverse, the analysis then identifies whether the proposed project's contribution to the overall adverse effect would be of a considerable nature such that the project's contribution to cumulative effects in that area is deemed significant. If the proposed project would make a meaningful contribution to the adverse cumulative effect so as to be considered a significant effect associated with project implementation, mitigation measures are explored and identified.

4.1.7.2 Cumulative Scenario

CEQA Guidelines Section 15130(b)(1) discusses two approaches to a cumulative effects analysis. First, the analysis can be based on a list of past, present, and probable future projects producing related or cumulative impacts. Second, a summary of projections contained in a general plan or related planning document or in an adopted or certified environmental document that described or evaluated regional or area-wide conditions contributing to the cumulative impact can be used to determine cumulative impacts. This EIR/EIS employs the list-based approach, except where specifically discussed in individual resource sections in Chapter 4, where a summary of projections approach is more appropriate. To determine an appropriate list of projects for the cumulative analyses, the Lead Agencies considered three factors: similar environmental impacts, geographic scope and location, and timing and duration of implementation. The effects of relevant projects (e.g., short-term construction or demolition, or long-term operations) could happen at the same time as the MPWSP's effects.

The projects that could contribute to cumulative impacts are listed in **Table 4.1-2**. The projects in Table 4.1-2 have occurred[2] or are anticipated to occur in the reasonably foreseeable future within the study area. This list was compiled from several sources. Only those projects that might contribute to cumulative impacts are listed. These projects are similar in scope to the proposed project, have similar types of impacts within the study area, affect similar resources, or are large enough to have far-reaching effects on a resource. This approach includes both projects for which detailed descriptions and expected impacts are known, as well as projects that have less defined impacts but may contribute to the regional impacts. The Lead Agencies have considered the

[2] While a cumulative analysis includes past, present and reasonably foreseeable future projects, the category of past projects is captured within the existing setting, or baseline, against which impacts are judged throughout the EIR/EIS, including the cumulative analysis. However, where projects were implemented after 2012 (the baseline year), those projects are set forth within Table 4.1-2 and included in the cumulative analysis.

effects of these projects along with the proposed project's impacts to determine the overall cumulative impact on the resources in the study area. The numbering of projects in Table 4.1-2 provides a key to the locations of the projects shown in **Figure 4-1**; some projects are listed out of numeric order in Table 4.1-2 due to additions throughout the preparation of this EIR/EIS.

Similar Environmental Impacts

Projects that are relevant to the cumulative analysis include those that could incrementally affect the same environmental resources that the MPWSP would directly or indirectly affect. The cumulative impact discussions in the issue area sections of Chapter 4 analyze the cumulative impacts that could occur when the effects of the MPWSP combine with the effects of other past, present, and reasonably foreseeable future projects. Because these other projects are subject to independent environmental review and approval processes, funding constraints, or other challenges, it is possible that some of the projects identified as reasonably foreseeable future projects will not be approved (or if already approved, will not be implemented) or will be modified prior to approval. To assess worst-case cumulative impacts, however, the cumulative impact analysis in this EIR/EIS assumes that all of the reasonably foreseeable projects identified in this analysis will be approved and built.

Geographic Scope and Location

For each affected resource, the geographic scope of the cumulative impacts analysis depends on the natural boundaries and physical conditions relevant to the resource, rather than jurisdictional boundaries. The geographic scope of cumulative effects often extends beyond the scope of the direct impacts, but not beyond the scope of the indirect impacts of the proposed project and alternatives.

Timing and Duration of Implementation

Potential temporary (e.g., construction-related noise and vibration) and permanent (e.g., visible permanent structures) MPWSP impacts are considered in the cumulative impacts analysis if they could combine in space and time with similar impacts of cumulative projects identified in Table 4.1-2.

Because of the limited water supply available in the CalAm Monterey District, many development projects in the service area have been put on hold until supplemental supplies can be secured. As discussed in Chapter 2, Water Demand, Supplies, and Water Rights, there is a moratorium on new water service connections. Because of the moratorium, some of the reasonably foreseeable future projects may not be approved or built until the moratorium is lifted. Therefore, with the moratorium in place, the potential for simultaneous construction-related impacts is less likely. However, because the timing of construction for many cumulative projects is unknown, and because some of the cumulative projects may have water allocations, this analysis conservatively assumes that the incremental impacts of the construction, operation, and maintenance of some of these projects may overlap with those of the MPWSP. As a result, the cumulative impacts analysis and conclusions presented in each section may overstate some potentially cumulatively considerable impacts.

TABLE 4.1-2
CUMULATIVE PROJECTS

No.	Planning Jurisdiction/ Location	Project Description	Estimated Construction Schedule
Monterey County			
1	Salinas River near the City of Marina	**Salinas Valley Water Project Phase II –** The project would allow the Monterey County Water Resources Agency (MCWRA) to further offset groundwater pumping by delivering additional surface water to the Pressure and East Side subareas. The project would divert up to 135,000 acre-feet per year (afy) of water from the Salinas River for municipal, industrial, and/or agricultural uses in the Pressure and East Side subareas. Continued reductions in groundwater pumping through use of the diverted surface water would help combat seawater intrusion in Monterey County. The project proposes two new surface water diversion points and related facilities to capture, convey, and deliver the water. The capture and diversion facilities would consist of either a surface water diversion facility, similar to the Salinas River Diversion Facility, or subsurface collectors, such as radial arm wells. The conveyance facilities would be composed of pipelines and pump stations. The pipeline diameter, length, destination, number and location of turnouts, locations of pump stations, and physical layout of the conveyance facilities have not been determined. The delivery facilities may consist of injection wells for aquifer storage and recovery (ASR), percolation ponds, turnouts for direct use of the water, or other options. The design and location of the delivery facilities would depend on the type of facility, the end-users' intended application of the water (agricultural versus urban), and the need for water treatment (MCWRA, 2014).	Construction anticipated to begin after 2018; Project operation anticipated 2026
2	Former Fort Ord Military Base, East Garrison Area	**East Garrison Specific Plan** – Mixed-use development project comprising residential, commercial, office, institutional, and recreational uses on approximately 244 acres. The project includes the construction of up to 1,470 dwelling units, 75,000 square feet of commercial uses, 11,000 square feet of public and institutional uses, 100,000 square feet of art/cultural/educational uses, and approximately 50 acres of open space. Development under the Specific Plan will be implemented in three phases. (Michael Brandman Associates, 2004; FORA, 2013; East Garrison, 2015).	Ongoing / Full Build-out Scheduled for 2025
3	24491 Citation Court	**Laguna Seca Villas** – Construction of 20,306 square feet of professional office space on the Laguna Seca Office Park subdivision (Monterey County Planning Department, 2015, 2016a).	Unknown. Permit extended for three years in September 2015.
4	5 Corral De Tierra Road at Highway 68	**Omni Enterprises, LLC** – Development of a new 99,970-square-foot shopping center on 11 acres that includes retail and office space. Construction would start following demolition of an existing gas station on the site and cleanup of contaminated soils. (, 2016b; Monterey Herald, 2015).	Construction anticipated to begin in 2017.
5	South side of State Highway 68, between River Road and San Benancio Road	**Ferrini Ranch Subdivision** – Subdivision of an approximately 866-acre property into 212 residential lots, including 146 market rate single-family residential lots, 23 clustered market rate residential lots, and 43 lots for inclusionary housing units; three open space parcels of approximately 600 acres; and one agricultural-industrial parcel (Monterey County Planning Department, 2016e).	Unknown
33	Monterey County Water Resources Agency / Prunedale	**Granite Ridge Water Supply Project** – Includes a new 1,000 gallons per minute groundwater production well and associated backup well near Manzanita Regional Park, both drilled to a depth of up to 635 feet; up to 87,700 linear feet of 6- to 12-inch-diameter water transmission pipelines; two booster pump stations; two water storage tanks (350,000 and 250,000 gallons); and associated facilities. The project would consolidate existing water distribution infrastructure, including up to 119 existing water systems and 500 individual well users (MCWRA, 2010a; 2010b).	Unknown
24	Monterey County Water Resources Agency / southern Monterey County and northern San Luis Obispo County	**Interlake Tunnel -** The MCWRA Interlake Tunnel Project would build an 11,000-foot-long tunnel to divert approximately 50,000 afy of water from Nacimiento Reservoir to San Antonio Reservoir that would have otherwise been spilled at Nacimiento Dam. The Nacimiento River basin produces nearly three times the average annual flow of the San Antonio River basin. During the winter season, the Interlake Tunnel would transfer excess Nacimiento River flows to San Antonio Reservoir, thereby increasing the overall storage capacity of the system (MCWRA, 2016). The water stored in San Antonio Reservoir would then be used for downstream groundwater recharge and abatement of saltwater intrusion in the Salinas Valley Groundwater Basin (RWMG, 2014).	Anticipated to be completed by 2018 (KCBXFM, 2016).

TABLE 4.1-2 (Continued)
CUMULATIVE PROJECTS

No.	Planning Jurisdiction/ Location	Project Description	Estimated Construction Schedule
Monterey County (cont.)			
48	Congress Road and SFB Morse Drive, Pebble Beach	**Pebble Beach Company Inclusionary Housing Project –** The project would involve the construction of 24 affordable housing units, ranging in size from 1,078 square feet to 1,343 square feet (Monterey County Planning Department, 2016g).	Approved August 2016
49	Highway 68 at Corral de Tierra Road	**State Route 68/Corral de Tierra Road Intersection Improvement Project** – The project would widen the approaches to the Highway 68/Corral de Tierra Road intersection to accommodate a second left turn lane from westbound Highway 68 to southbound Corral de Tierra Road by shifting the through lane to the north. A second southbound receiving lane would also be built on Corral de Tierra Road departing the intersection to receive traffic from the second left-turn lane (Caltrans, 2015).	Construction anticipated to start fall of 2017 and be completed 2018
City of Sand City			
6	330 Shasta Street	**City of Sand City Coastal Desalination Plant** – This existing desalination facility can produce 300 afy of potable water supplies. Four seawater extraction wells pump brackish water to the plant, where reverse-osmosis technologies desalinate the water. Brine concentrate is disposed of by injecting the concentrate into a subsurface slant well beneath the coastal bluff (City of Sand City, 2016).	Completed in 2010
19	Former Sand Mine site, near the Fremont / Highway 1 interchange.	**Monterey Bay Shores Resort** – The project consists of a 341-unit "eco-resort" on 39 acres approved. The proposal calls for 161 hotel rooms, 180 condominiums, a restaurant, conference center, spa, and three swimming pools (SNG, 2008).	Unknown
43	Redwood Avenue and John Street	**90-Inch Bay Avenue Outfall Phase 1 –** Improvement project involving: (1) installation of a discharge valve at the Bay Avenue outfall; (2) maintenance and manual breaching of the sand bar to allow gravity flow through the culvert; (3) creation of an infiltration basin at John Street and Redwood Avenue to mitigate flooding; (4) reconstruction of the existing elevated emergency outlet structure, including doubling the size of the box to increase the width of the emergency outlet structure; and (5) building a curb channel along the top of the existing 90-inch-diameter culvert from the emergency outlet to the check valve (MPWMD, 2014).	Unknown
56	Highway 1 between Tioga Avenue and Playa Avenue	**The Collection at Monterey Bay Resort** – Approved 340-room visitor-serving coastal resort on a 26.46-acre site located west of Highway and north of Tioga Avenue, that may be built in two phases. Phase I is a 135 hotel room on a 7.9-acre parcel known as the "Sterling" Site. Phase II is a coastal resort on the 16.25 acre "McDonald" site consisting of 205 visitor rooms, a restaurant with banquet facilities, a health/wellness spa, parking, and other related improvements. Primary access will be via Tioga Avenue for Phase I and Playa Avenue and an extension of Sand Dunes Drive for Phase II access. (Sand City, 2012)	Unknown
City of Marina			
7	Former Fort Ord Military Base Highway 2 / Imjin Parkway	**The Dunes on Monterey Bay** – Mixed-use development project comprising 1,237 residential units, 500 hotel rooms, and retail and office space on 297 acres. Phase 1 (378,000-square-foot retail center) built in 2007-2008. Phase 2 includes the following: (1) South County Housing to develop and build 108 low- and very low-income affordable apartments, many of which were completed by spring/summer 2014; (2) Cinemark multiple screen movie theater completed 2015; (3) Plans approved for two approximately 15,000 square foot retail buildings to be built near the movie theater; (4) Veterans Affairs Monterey Health Care Center located on a 14.31-acre project site within the Dunes on Monterey Bay Specific Plan area completed 2016; and (5) Springhill Suites, a 67,328-square-foot, 4-story hotel with 106 hotel rooms (under construction). The hotel includes a 1,750-square-foot meeting room and guest parking and is scheduled to open in April 2017 (City of Marina, 2015, 2016f; FORA, 2013; FORA, 2015; Marriott, 2016).	Under construction / Full Buildout Scheduled for 2020

TABLE 4.1-2 (Continued)
CUMULATIVE PROJECTS

No.	Planning Jurisdiction/ Location	Project Description	Estimated Construction Schedule
City of Marina (cont.)			
8	Former Fort Ord Military Base 3rd Avenue / Imjin Parkway	**Cypress Knolls Senior Residential Project** – Senior residential community with active-adult housing, care services, senior community center, and supportive amenities and services on 188 acres (City of Marina, 2012; City of Marina, 2016b).	Unknown; project on hold
9	Former Fort Ord Military Base Imjin Parkway / California Avenue	**Marina Heights** – Removal of 828 abandoned residential units and replacement with a combination of 1,050 new townhouse, cottage, estate homes, and single-family residential units. The project also includes 35 acres of parks, greenbelts, and open space (City of Marina, 2010; City of Marina, 2016d).	Phase I Under Construction
10	Reservation Road between Del Monte Boulevard and De Forest Avenue	**Marina Downtown Vitalization Specific Plan** – Redevelopment plan for Marina's 225-acre downtown area comprising mixed-use commercial, residential, educational, and civic uses (City of Marina, 2011b; City of Marina, 2016c).	Unknown / Full Buildout Scheduled for 2040
11	Marina Airport Reservation Road / Blanco Road	**Marina Airport Economic Development Area** – Airport development project aimed at promoting growth of the airport. Individual projects include: • Airfield Electrical System Upgrades • Runway Rehabilitation and Extension • Taxiway Rehabilitation and Extension • Airfield NAVAIDS Improvements (City of Marina, 2011a; City of Marina 2016a).	Completed
39	3012-3032 Lexington Court, Marina (east of Abrams Drive on the former Fort Ord Military Base)	**Rockrose Gardens** – 20 units of permanent, affordable, supportive housing for people with psychiatric disabilities (FORA, 2013; FORA, 2015).	Completed
12	Armstrong Ranch, Marina (Along the northern limits of the city of Marina, on either side of Del Monte Avenue)	**Marina Station** – Development project comprising 1,360 residential units, approximately 60,000 square feet of retail space, 144,000 square feet of office space, and 652,000 square feet of business park/industrial uses. The 1,360 residential units comprise approximately 887 single-family lots and 473 multi-family units (City of Marina, 2011c; City of Marina, 2016e).	Unknown
13	California State University Monterey Bay Campus	**CSUMB North Campus Housing Master Plan** – Includes 583 student housing units, leasing office, community center on 8 acres (more recently known as the Promontory Housing Project) (City of Marina, 2015; FORA, 2013; FORA, 2015).	Competed
40	California State University Monterey Bay Campus (Divarty Street, east of General Jim Moore Boulevard)	**ITCD Academic Building (CSUMB) –** New 58,000-square-foot Information Technology and Communications Design (ITCD) and the School of Business academic building (FORA, 2013; CSUMB, 2016).	Completed
47	CEMEX Sand Mining Facility (east of Highway 1 on Lapis Road)	**CalAm Slant Test Well at CEMEX –** Construction and operation of a test slant well and associated monitoring wells. The project purpose is to develop the geologic, hydrologic, and water quality data needed to confirm the feasibility of using slant wells in the CEMEX active mining area as a Seawater Intake System for the MPWSP Desalination Plant. The test slant well extends diagonally beneath the sea floor through the Dune Sand Aquifer and the 180-Foot Aquifer Equivalent and is permitted to operate until February 2018 (CCC, 2014). As explained in Chapter 3 and where relevant in Chapter 4 cumulative analyses, this test well would be incorporated into the proposed project for long-term operation; if the CPCN and MBNMS approval of the proposed project is denied, the test well would be removed consistent with the terms of the Coastal Development Permit.	2015 Construction completed, pilot program currently underway

TABLE 4.1-2 (Continued)
CUMULATIVE PROJECTS

No.	Planning Jurisdiction/ Location	Project Description	Estimated Construction Schedule
City of Seaside			
14	West of Fremont Boulevard, along Broadway Avenue, Del Monte Boulevard, and Canyon Del Rey Boulevard	**The West Broadway Urban Village Specific Plan** – Mixed-use, transit-oriented development comprising residential with ground-floor retail and commercial uses along Broadway Avenue, with supporting future transit-oriented development along the west side of Del Monte Boulevard. Includes a public library and parking structure on Broadway Boulevard and a hotel/conference center mixed-use development at the southeast corner of Canyon Del Rey and Del Monte Boulevards (City of Seaside, 2016a).	Ongoing construction due to redevelopment plans
15	Broadway Avenue / Fremont Boulevard	**City Center Shopping Center Redevelopment Project** – Approximately 40,000 square feet of retail and restaurant space (City of Seaside, 2016c).	Construction completed in 2012
16	Former Fort Ord Military Base Monterey Road / Coe Avenue	**The Seaside Resort** – The first phase, completed in 2009, involved upgrades to the Bayonet and Black Horse Golf Courses. The next phase of development features a four-star hotel with approximately 275 hotel rooms, 175 timeshare units, and 125 residential units (City of Seaside, 2016c).	Stage 1 2017-2018
17	Former Fort Ord Military Base (East of General Jim Moore Boulevard, south of Inter-Garrison Road and north of Eucalyptus Road)	**Monterey Downs and Horse Park and Central Coast Veteran's Cemetery Specific Plan** – The Specific Plan project would include a 225,000-square-foot horse training facility comprising a track and stabling area, ancillary buildings, and a 6,500-seat sports arena and grandstand; a 330,000-square-foot commercial center; a 15,000-square-foot horse park with a visitors center, office space, veterinary clinic, and horse stables; two affordable extended-stay hotels with a total of 256 units; 1,280 residential units ranging from apartments to single-family residential homes; a 100,000-square-foot office park; a 200-room (100,000-square-foot) hotel; a 5,000-square-foot tennis and swim club; a 73-acre habitat preservation area; and 74 acres dedicated to open space and parks and infrastructure. The Central Coast Veterans Cemetery component of the Specific Plan project includes 13,838 burial sites for 20 years of interments, an administration building, a maintenance yard and building, memorial areas, veterans' hall, cultural history museum, chapel, and a 300-seat amphitheater for special events. An adjacent 45.9-acre parcel is proposed as a habitat restoration area (City of Seaside, 2016d).	Phased construction over a 13-year period; dates unknown
18	Former Fort Ord Military Base Between Highway 1 and 2nd Avenue, and Light Fighter Drive and 1st Street	**Main Gate Specific Plan** – Mixed-use development project featuring approximately 500,000 square feet of retail and entertainment space, and a 250-room hotel/conference center with spa amenities (City of Seaside, 2016b).	Unknown
41	Broadway Avenue between Del Monte Boulevard and Fremont Boulevard, and Del Monte Boulevard between Broadway Avenue and Contra Costa Street	**West Broadway Stormwater Retention** – The project involves construction of a stormwater treatment and diversion system in Broadway Avenue between Del Monte Boulevard and Fremont Boulevard and at Del Monte Boulevard. Treated water would be diverted to retention structures for groundwater recharge (MPWMD, 2014).	Unknown
42	Laguna Grande and Roberts Lake (Near the intersection of Highway 218 [aka Canyon Del Rey Boulevard] and Del Monte Boulevard)	**Dredge Laguna Grande and Roberts Lake**[3] – The project would create additional storage capacity, visitor-serving amenities, and habitat enhancements at Laguna Grande and Roberts Lake (MPWMD, 2014).	Unknown

[3] Laguna Grande and Roberts Lake are collectively referred to as Laguna del Rey throughout this EIR/EIS.

TABLE 4.1-2 (Continued)
CUMULATIVE PROJECTS

No.	Planning Jurisdiction/ Location	Project Description	Estimated Construction Schedule
City of Seaside (cont.)			
44	Broadway Avenue between Del Monte Boulevard and Fremont Boulevard and at Del Monte Boulevard	**Del Monte Blvd Dry Weather Diversion** – The project consists of a dry weather runoff diversion at Del Monte Boulevard to the sanitary sewer system. Diverted water would be treated by the regional treatment plant and reused for existing non-potable and potential future potable uses (MPWMD, 2014).	Unknown
City of Monterey			
20	459 Alvarado Street	**459 Alvarado Street** – Development of 36 residential units and 12,000 square feet of commercial uses (City of Monterey, 2012).	Completed in 2016
21	480 Cannery Row	**Ocean View Plaza** – Approved mixed-use development project comprising 87,362 square feet of commercial space, 30,000 square feet of restaurant space, 8,408 square feet of coastal/community use, 38 market-rate condominiums, and 13 inclusionary housing units (City of Monterey, 2012). As of 2015, the property had gone into default and was listed for sale.	Unknown
50	200 Iris Canyon Road	**Iris Canyon Residential Care Facility for the Elderly** – The project consists of a 110-unit/136-bed residential care facility with studios, one and two bedroom rental units and services with one 114,316 square foot main building and three 2,284 square foot duplex building. The project covers a total of 46,076 square feet and the total floor area is 121,168 square feet (CEQAnet, 2014).	Construction anticipated completion in 2017
51	Throughout the City of Monterey	**Sanitary Sewer System Rehabilitation Program** – The project involves fixing 441 sewer pipes and 516 sewer manholes located in the streets throughout the City of Monterey. Repairs would begin in early 2016 and continue for 18 months (City of Monterey, 2016).	Under construction
52	Highway 68 and 17 Mile Drive	**Holman Highway 68/Highway 1 Roundabout** – The project would build a roundabout at the intersection of Holman Highway 68 and 17 Mile Drive near the entrance to Pebble Beach. (TAMC, 2016b).	Under construction
City of Pacific Grove			
22	Sunset Drive	**Pacific Grove Local Water Project** – Construction of a new local satellite recycled water treatment plant at the former Point Pinos Wastewater Treatment Plant and installation of 1,400 linear feet of conveyance pipeline. Initially, the project would provide 125 afy of non-potable recycled water to serve irrigation needs at the Pacific Grove Golf Links and the El Carmelo Cemetery. Potential expansion could increase output to 600 afy (City of Pacific Grove, 2014; City of Pacific Grove, 2015).	2017
23	Pacific Grove	**Pacific Grove Recycled Water** – Recycled water from the Pebble Beach Community Services District (PBCSD) and raw wastewater from 500 homes in the Del Monte Park area of Pacific Grove would be captured and diverted to the existing Carmel Area Wastewater District (CAWD) reclamation facility for treatment. Recycled water from CAWD would be stored in the Forest Lake Reservoir and returned to the city through existing CAWD and PBCSD recycled water systems to a delivery point near the Spanish Bay Golf Course in Pebble Beach. Approximately 10,000 to 13,500 linear feet of new 12-inch diameter recycled water pipeline would be built to deliver water to the golf links, cemetery and other irrigation demands (CPUC, 2012).	Unknown
City of Carmel			
25	2770 15th Avenue, Carmel	**Carmel Unified School District** – Construction of a 5,070-square-foot building to house six classrooms. The project also includes the removal of five onsite temporary modules and six non-native ornamental landscape trees (Monterey County Planning Department, 2016c).	Construction Complete
26	Del Monte Forest	**Pebble Beach Company Project** – The project builds out and preserves the remaining undeveloped Pebble Beach Company properties located within the Del Monte Forest. The project would renovate and expand visitor-serving uses, create 90 to 100 single-family residential lots, and preserve 635 acres as primarily forested open space. The proposed development would result in new construction at four primary sites: The Lodge at Pebble Beach, The Inn at Spanish Bay, Spyglass Hill, and the Pebble Beach Equestrian Center (Monterey County Planning Department, 2016f).	Unknown

TABLE 4.1-2 (Continued)
CUMULATIVE PROJECTS

No.	Planning Jurisdiction/ Location	Project Description	Estimated Construction Schedule
City of Carmel (cont.)			
27	Carmel Valley Road	**Rancho Cañada Village Specific Plan** –A previous proposal included 281 housing units. A recirculated Draft EIR analyzes a 130-Unit Alternative that would reduce the total number of residential units to fit within the 190-unit housing cap negotiated between the Carmel Valley Association and Monterey County as part of a 2010 general plan lawsuit settlement, The Ranch Canada Village would be built within the current west course of the Rancho Canada Golf Club. (Monterey County Planning Department, 2016h).	Unknown. Recirculated DEIR
28	Carmel Valley Road	**Rancho Cañada Golf Club East Course Closure** – Closure of the Rancho Canada Golf Club's east course and transfer of 140 acres of land to the Monterey Peninsula Regional Park District. Tentative plans for the land include additional parking and access to Palo Corona Regional Park, hiking trails, and restored riparian habitat (The Trust for Public Land, 2016; The Carmel Pine Cone, 2016).	East Course closure to occur in 2017. Restoration work schedule unknown.
Monterey Peninsula Water Management District			
29	Former Fort Ord Military Base General Jim Moore Boulevard/ Eucalyptus Boulevard	**Seaside Groundwater Basin Aquifer Storage and Recovery (Phase 1)** – Water supply project consisting of two injection/extraction wells (ASR-1 and ASR-2 wells), a backwash percolation basin, a chemical/electrical building, and conveyance pipelines. During high-flow periods in the Carmel River, river water is injected into Seaside Groundwater Basin, then extracted during dry periods or periods of high demand (MPWMD, 2005).	Construction completed in 2008
30	Seaside Middle School General Jim Moore Boulevard/ Coe Avenue	**Seaside Groundwater Basin Aquifer Storage and Recovery (Phase 2)** – This phase includes two additional injection/extraction wells (ASR-2 and ASR-3 wells) and a backwash percolation basin (Denise Duffy & Associates, 2012).	Construction completed in 2014
59	(With Monterey Regional Water Pollution Control Agency) MRWPCA Regional Wastewater Treatment Plant	**Pure Water Monterey Groundwater Replenishment (GWR) Project** – The MRWPCA certified the Final EIR and approved the GWR project in October 2015. The project would provide purified recycled water for recharge of groundwater and recycled water to augment the existing Castroville Seawater Intrusion Project's (CSIP) irrigation supply. The GWR facilities would collect a variety of source waters from several locations in Monterey County and convey that water to the MRWPCA Regional Wastewater Treatment Plant for treatment. The GWR project would then purify 3,500 afy of water at a new Advanced Water Treatment Plant located at the existing wastewater treatment plant site, and convey and then inject the purified water into the Seaside Groundwater Basin. The GWR facilities also would provide an average of 4,750 afy of recycled water for agricultural irrigation in northern Monterey County through the CSIP. The new source waters for the GWR project would supplement the existing incoming wastewater flows, and would include the following: 1) water from the City of Salinas agricultural wash water system, 2) stormwater flows from the southern part of Salinas and the Lake El Estero facility in Monterey, 3) surface water and agricultural tile drain water that is captured in the Reclamation Ditch and Tembladero Slough, and 4) surface water and agricultural tile drain water that flows in the Blanco Drain. The GWR project would include new pipelines and injection facilities. In September 2016, the CPUC approved a Water Purchase Agreement that allows CalAm to secure 3,500 afy of water from the GWR project to meet a portion of the project water supply needs. The GWR Project is a cumulative project in the context of Alternatives 5a and 5b, which evaluate a reduced-size (6.4-mgd) desalination plant at the Project and an Alternate site. The GWR Project is not a cumulative project in the context of the proposed project or any alternative that includes a 9.6 mgd desalination plant built and operated by CalAm (i.e., Alternatives 1 and 2), because if the GWR is implemented, CalAm would not need to construct a 9.6 mgd desalination plant (the proposed project); instead, it would construct the 6.4-mgd desalination plant described in Alternatives 5a and 5b. The GWR project is also not a cumulative project with Alternative 4, the Peoples' Project, because the project objectives of that alternative are to provide the full amount of water required to meet the water supply needs of CalAm's Monterey District, and would rely on a water purchase agreement with CalAm to justify that alternative and to secure its funding. Thus, if the GWR project is built, it is not reasonably foreseeable that the Peoples' Project would	Construction anticipated complete in 2018

TABLE 4.1-2 (Continued)
CUMULATIVE PROJECTS

No.	Planning Jurisdiction/ Location	Project Description	Estimated Construction Schedule
Monterey Peninsula Water Management District (cont.)			
59 cont		proceed, so the Peoples' Project is considered as an alternative, but without the GWR project being implemented. The GWR project is a cumulative project with the DeepWater Desal project because that project is sufficiently large and designed to serve customers in myriad geographic locations such that it could proceed even if the GWR project is implemented. As an alternative to the proposed project, if the GWR project supplies water to CalAm, then the DeepWater Desal project could supply the remainder of the project water supply needs and would simply have more water available for other purchasers, than it would if the GWR project were not implemented.	
Other			
32	Carmel River near confluence with San Clemente Creek	**CalAm San Clemente Dam Removal Project** –This project removed the 106-foot-tall San Clemente Dam that used to be on the Carmel River, rerouted the Carmel River into San Clemente Creek, excavated and stabilized sediment that had accumulated in San Clemente Creek, and restored a half-mile reach of San Clemente Creek (San Clemente Dam Removal, 2016).	Construction completed in 2015
34	Moss Landing / Santa Cruz County	**Monterey Bay Regional Water Project (MBRWP or DeepWater Desal)** – This project includes a 23 mgd seawater desalination facility and co-located 1 million-square-foot data center on a 110-acre site in Moss Landing, on Dolan Road, approximately 1,500 feet east of the Moss Landing Power Plant. The project would serve up to 25,000 afy of potable water supply to participating communities in the Monterey Bay region, potentially including the Monterey Peninsula, Castroville, Salinas, and parts of Santa Cruz County (DeepWater Desal, 2015). As proposed by DeepWater Desal, the project would develop supplemental water supplies to serve the customers in CalAm's Monterey District service area. However, if the MPWSP is built, DeepWater Desal can provide water to other areas, as described above. Therefore, this EIR/EIS considers two reasonably foreseeable scenarios that include development of the DeepWater Desal Project: 1) Development of the DeepWater Desal Project as an alternative to the MPWSP, as described in Chapter 5 (serving CalAm's Monterey District service area). This is Alternative 3 described and analyzed in Chapter 5. 2) Development as a separate project in addition to the MPWSP or another alternative that would serve CalAm's Monterey District service area. In this case, the impacts of the DeepWater Desal Project are considered in the cumulative scenario as they relate to the provision of water to Santa Cruz County and the City of Salinas. The DeepWater Desal Project with provision of water to Santa Cruz County and the City of Salinas is a reasonably foreseeable project in the cumulative scenario relevant to the proposed project and Alternatives 1, 2, 4, and 5a and 5b.	Beyond 2017
57	Moss Landing Green Commercial Park/ Santa Cruz County	**Peoples' Moss Landing Water Desal Project** – The project would provide 12,500 afy of desalinated water to customers in CalAm's Monterey District. The project would rehabilitate existing pipelines for an open-water intake and the discharge of effluent, a new pump house, desalination plant, and desalinated water conveyance and storage facilities (The Peoples' Project, 2015). As proposed by its applicant, the Peoples' Project would develop supplemental water supplies to serve customers in CalAm's Monterey District service area. Since the Peoples' Project and the MPWSP would not both be implemented to serve the same customers, this EIR/EIS assumes the Peoples' Moss Landing Project is an alternative to the MPWSP (see Chapter 5). Therefore, it is not a reasonably foreseeable project in the cumulative scenario relevant to the MPWSP. It would also not be a reasonably foreseeable project in the cumulative scenario for any of the alternatives aimed at meeting the objectives of the MPWSP. Therefore, although acknowledged here as a reasonably foreseeable alternative to the proposed project (as described in Chapter 5), this project's contributions to cumulative impacts are not considered as part of the cumulative scenario relevant to the proposed project or another alternative.	Unknown

TABLE 4.1-2 (Continued)
CUMULATIVE PROJECTS

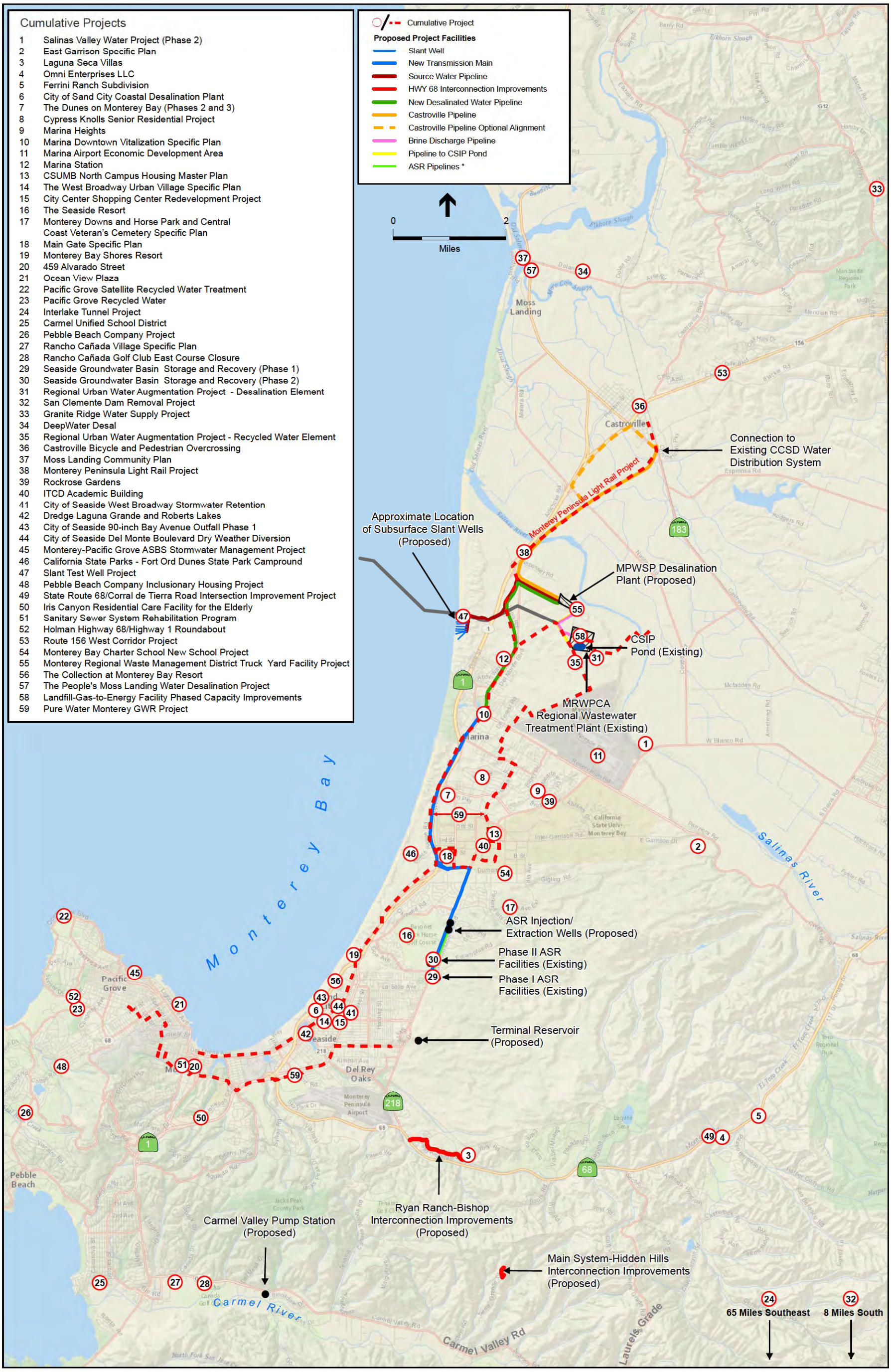
No.	Planning Jurisdiction/ Location	Project Description	Estimated Construction Schedule
Marina Coast Water District			
31	Marina Coast Water District / Salinas Valley Reclamation Plant, Monterey County	**Regional Urban Water Augmentation Project (RUWAP) Desalination Element** – On March 1, 2016, in response to a request for information, MCWD stated that the RUWAP Desalination Plant would produce up to 2,700 acre-feet per year (AFY) of potable water supply; 2,400 AFY would be for the former Fort Ord, as identified in the Fort Ord Reuse Authority (FORA) Base Reuse Plan (BRP) and 300 AFY would be for the District's Central Marina service area, as a replacement for the existing pilot (non-operating) desalination plant (MCWD, 2016). However, MCWD reported that the water source for the proposed desalination project has not yet been determined; it may be seawater-intruded groundwater from the 180-Foot Aquifer, or it may be seawater from shallow wells located along the coast. The location of the wells and pipelines must also be addressed in a feasibility study. The desalination plant site last studied was located in North Marina on a parcel owned by MCWD, adjacent to the MRWPCA Regional Wastewater Treatment Plant. In any event, a feasibility study is needed to determine the actual component sizes and the timing of this project is dependent upon the redevelopment water demands within the former Fort Ord. Subsequent to that March 2016 response, the MCWD Board of Directors adopted by unanimous vote on May 2, 2016, Resolution 2016-26 approving a Memorandum of Understanding regarding Fort Ord water augmentation and a three party effort (MCWD, FORA and MRWPCA) to study alternatives. The resolution was prompted by the MCWD and MRWPCA entering into an agreement dated April 8, 2016 for the joint Pure Water Delivery and Supply Project, which will provide 1,427 AFY, leaving an unmet need for 973 AFY to support the FORA BRP. The three party planning (TPP) effort will explore the most cost effective and technically efficient mix of advanced treated water, conservation, desalination, groundwater recharge and recovery, and other water sources, options, and alternatives to provide the 973 AFY of augmented water, and whether more or less than 1,427 AFY of advanced treated water is necessary to serve the Ord Community. The FORA Board will utilize the TPP study in developing a preferred water augmentation mix and deciding which additional water augmentation project(s) should be developed by MCWD. Based on these current events and actions, it is speculative to assume that MCWD will implement a 2,700 AFY desalination facility, or what the size, timing or configuration of that facility will be. This EIR/EIS thus does not generally include the RUWAP Desalination Plant. Making conservative assumptions, however, Section 4.4, Groundwater Resources, does analyze as a cumulative project the development of a 1,000 AFY desalination plant on MCWD land in the event that such an option is chosen to make up the shortfall needed to provide a total of 2,400 AFY of water augmentation to support the FORA BRP.	Unknown
35	Marina Coast Water District / Salinas Valley Reclamation Plant, Monterey County	**Regional Urban Water Augmentation Project (RUWAP) Recycled Water Project** – The Recycled Water Project includes construction of a recycled water distribution system to provide up to 1,727 afy of recycled water to urban users in the MCWD service areas, including the former Fort Ord. The water would be recycled at the existing Salinas Valley Reclamation Plant. This project includes the following facilities: a new pipeline connection to the Salinas Valley Reclamation Plant; two pump stations; 40,000 linear feet of distribution pipelines; and a 1.5-million-gallon storage tank known as Blackhorse Reservoir. MCWD now proposes to combine conveyance facilities with the approved Pure Water Monterey Project for a shared pipeline (MCWD, 2016a).	Some pipelines constructed; construction of balance unknown.
Moss Landing			
37	Moss Landing	**Moss Landing Community Plan** – Revised draft plan issued May 2015: • Revx-173 LLC – Demolition of an existing facility and construction of a 70,000-square-foot industrial warehouse on 189 acres. • Monterey Bay Aquarium Research Institute – Removal of a finger pier; construction of a 58,655-square-foot research facility; demolition of an existing building and construction of a 34,000-square-foot replacement facility; and construction of a 30-foot dock extension (Monterey County Planning Department, 2013). In addition, construction of a 66,500-square-foot building to support science and engineering research activities. • 30-Unit Hotel	Unknown

TABLE 4.1-2 (Continued)
CUMULATIVE PROJECTS

No.	Planning Jurisdiction/ Location	Project Description	Estimated Construction Schedule
Moss Landing (cont.)			
37 cont		• Pisto Restaurant – Construction of a 6,000-square-foot restaurant • Moss Landing Marine Laboratories – Development of a 36,000-square-foot warehouse and 15,000-square-foot dock/wharf area at 7539 Sandholdt Road. At 7544 and 7722 Sandholdt Road, development of a 2,600-square-foot mixed-use facility, a 7,400-square-foot research building, 8,520-square-foot concrete slab for aquaculture, and a 300-foot pier. • Gregg Drilling – Development of an 8,000- to 9,000-square-foot building for high-tech operations (Monterey County Planning Department, 2015).	
Castroville			
36	Transportation Agency for Monterey County Between Salinas Street and Castroville Boulevard	**Castroville Bicycle and Pedestrian Overcrossing** – The project would build a bicycle and pedestrian path connecting the Community of Castroville to Castroville Boulevard. The project starts on Salinas Street at McDougall and parallels Axtell Street with an overcrossing at the Union Pacific tracks and a Class 1 path to Castroville Boulevard. The overcrossing structure would be approximately 1,400 feet long (TAMC, 2016a)	Construction anticipated to start in 2016
53	Caltrans Highway 156 between Castroville Boulevard and U.S. 101	**Route 156 West Corridor Project** – The project would build a new four-lane highway parallel to the existing Highway 156 with new interchanges built at Castroville Boulevard and at U.S. 101. The current two-lane highway would be converted into a frontage road serving the local community. A supplemental Environmental Impact Report is in preparation (TAMC, 2016c).	Unknown
Other Projects			
45	Cities of Monterey and Pacific Grove (David Avenue Reservoir, Pine Avenue, Ocean View Boulevard, former wastewater treatment plant site)	**Monterey-Pacific Grove Area of Special Biological Significance (ASBS) Stormwater Management Project** – The project includes diverting both wet weather and dry weather flows from the Greenwood Park and Congress Storm Drain Watersheds to the David Avenue Reservoir site, and treating and delivering of recycled water to irrigation sites throughout the city (CPUC, 2012). The project also revises the existing storm drain system in Pacific Grove to retain or treat stormwater flows. These retention facilities will help to meter or treat flows into either treatment facility thereby allowing up to a 90 percent reduction in pollutant loading during storm events. Diverted flows would ultimately be directed to either the rebuilt Pacific Grove Water Treatment Plant or the Monterey Regional Water Pollution Control Agency Regional Water Treatment Plant in Marina (MPWMD, 2014).	2018-2020
38	Cities of Castroville, Marina, Monterey, Seaside, Sand City, and County of Monterey.	**TAMC Monterey Peninsula Light Rail Project** – Construction of commuter light rail service, mostly along the Transportation Agency for Monterey County's (TAMC's) existing Monterey Branch Line right-of-way, from House Plaza in the city of Monterey to Blackie Road in Castroville. This 15.2-mile-long project would involve improvements to existing rail, construction of new rail, and 12 new stops (one in Castroville, five in Marina, three in Seaside and Sand City, and three in the city of Monterey). Approximately 860 new parking spaces would be built at these stations. The project would also include a new maintenance facility; this facility would be located at one of three sites, all of which are near Highway 1 on lands formerly associated with the Fort Ord military base (TAMC, 2011). TAMC has placed this project on hold indefinitely until the agency can secure funding for environmental review, design, and construction.	Unknown
46	Fort Ord Dunes State Park (immediately west of the TAMC rail corridor and State Highway 1, west of the former Fort Ord Military Base)	**Fort Ord Dunes State Park Campground** – Construction and operation of a campground facility and associated infrastructure within Fort Ord Dunes State Park, including 45 RV sites and two host sites with electrical and water hookups, 10 hike/bike sites, and 43 tent sites; parking for 40 vehicles; restrooms with showers; a multi-purpose building; an outdoor campfire center; interpretation/ viewing areas; renovated bunkers; an entrance station near the 1st Street underpass; modular structures; storage yard and maintenance shop; improved beach access/trails; one plumbed restroom with outdoor shower for beach use; a 200-foot wildlife/habitat corridor; internal campground trail network, trail improvements, and roadway improvements; and offsite utilities (Denise Duffy & Associates, 2013).	Unknown

TABLE 4.1-2 (Continued)
CUMULATIVE PROJECTS

No.	Planning Jurisdiction/ Location	Project Description	Estimated Construction Schedule
Other Projects (cont.)			
54	California State University Trustees Colonel Durham Street and 6th Avenue	**Monterey Bay Charter School New School Project** – Phase I includes the construction of 19 K-8 classrooms; work rooms for administrators, teachers and custodians; resource and remedial instruction rooms; and storage. Phase II includes additional support facilities. Phase I is projected to accommodate approximately 430 students; full enrollment of 508 students is expected to be reached by Phase II (Denise Duffy & Associates, 2016).	Phase I construction anticipated 2018. Phase II construction anticipated 2020
55	Monterey Regional Waste Management District 14201 Del Monte Boulevard, Marina	**Monterey Regional Waste Management District Truck Yard Facility Project** – The project would include a 7,200-square-foot office/ administration building, a 11,300-square-foot maintenance building, a 5,000-square-foot truck wash and repair building, as well as collection truck parking and steel bin storage areas, Compressed Natural Gas equipment, and associated employee parking (Denise Duffy & Associates, 2014).	Construction underway
58	Monterey Regional Waste Management District 14201 Del Monte Boulevard, Marina	**Landfill-Gas-to-Energy Facility Phased Capacity Improvements** – Although it is not evaluated in this EIR/EIS, CalAm is actively pursuing a renewable energy source option with Monterey Regional Waste Management District (MRWMD) that would allow CalAm to meet a portion of the MPWSP Desalination Plant operational energy requirements with methane gas from the existing MRWMD landfill-gas-to-energy (LFGTE) facility located adjacent to the MPWSP Desalination Plant site. The MRWMD LFGTE facility produces 5.07 megawatts (MW) of continuous electricity that is sold to PG&E. MRWMD wishes to increase the electric generation capacity of the LFGTE facility by 3.2 MW in two stages, with the first phase of improvements increasing the capacity by 1.6 MW, followed by an additional 1.6 MW increase in 6 to 8 years. Once such an expansion were complete, the total generation capacity of the LFGTE facility would be 8.27 MW (ESI, 2014). If this renewable energy source option were implemented, about half of the MPWSP Desalination Plant operational energy requirements could be met with methane gas from the LFGTE facility; the remainder would come from the local PG&E grid. Overhead powerlines, electrical transformers, metering devices, and switchgear would be needed to connect the MRWMD LFGTE facility with the MPWSP Desalination Plant. Implementation of this option and the construction of the associated interconnection improvements would require separate environmental review. These possible LFGTE improvements have not been proposed and are not actively under environmental review and consideration; for these reasons, they are not evaluated in the cumulative analyses in this EIR/EIS.	Phase 1: Unknown Phase 2: 6 to 8 years after Phase 1
60		**Monterey Pipeline and Pump Station** – The new 5.4-mile-long, 36-inch-diameter Monterey Pipeline would allow for bi-directional flows and would convey potable water supplies from the GWR project's (No. 59) new Transfer Pipeline to the Monterey Peninsula. The Monterey Pipeline would utilize the pressure (called "hydraulic head") provided by CalAm extraction operations to convey water to the Monterey Peninsula cities. The Monterey Pipeline would connect two pressure zones in the CalAm system (one in the area of the City of Pacific Grove and one in the area of the City of Seaside). Water stored in Forest Lake Tanks could flow via gravity to the lower Carmel Valley or be pumped to the upper Carmel Valley. In September 2016, the CPUC approved the Monterey Pipeline and Pump Station along with the Water Purchase Agreement described for the GWR Project (No. 59).	Under construction



NOTE:
*The ASR Pipelines are the ASR Conveyance Pipeline, the ASR Pump-to-Waste Pipeline, and the ASR Recirculation Pipeline. See Figure 3-9a for the individual pipeline alignments.

SOURCE: ESA, 2013

205335.01 Monterey Peninsula Water Supply Project

Figure 4-1
Cumulative Projects

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4.2 Geology, Soils, and Seismicity

Sections

4.2.1 Setting/Affected Environment
4.2.2 Regulatory Framework
4.2.3 Evaluation Criteria
4.2.4 Approach to Analysis
4.2.5 Direct and Indirect Effects of the Proposed Project
4.2.6 Cumulative Effects of the Proposed Project

Figures

4.2-1 Geologic Map of Project Area
4.2-2 Generalized Geologic Cross-Section
4.2-3 Local Geologic Cross-Section
4.2-4 Active and Potentially Active Regional Faults
4.2-5 Liquefaction Potential
4.2-6 Landslide Hazard Map
4.2-7 Representative Profile at Test Slant Well
4.2-8 Representative Profile at Proposed Slant Wells

Tables

4.2-1 Summary of Geologic Units and Project Component Locations
4.2-2 Modified Mercalli Intensity Scale
4.2-3 Active and Potentially Active Faults
4.2-4 Summary of General Soil Properties
4.2-5 Summary of Estimated Peak Ground Accelerations at Proposed Facility Locations
4.2-6 Applicable Regional and Local Plans and Policies Relevant to Geology, Soils, and Seismicity
4.2-7 Summary of impacts – Geology, Soils, and Seismicity
4.2-8 Comparison of Jet Plume and Ambient Ocean Currents at Monterey

This section evaluates the potential for construction and operation of the Monterey Peninsula Water Supply Project (MPWSP or proposed project) to result in adverse impacts associated with geologic, soils, and seismic hazards, including faulting, seismically-induced ground failures (e.g., landslides, liquefaction), erosion, expansive or corrosive soils, and coastal retreat. The analysis is based on review of available geologic and geotechnical maps and reports of the project area and vicinity, including reports and information published by the U.S. Geological Survey (USGS) and the California Geological Survey (CGS), the *Monterey County General Plan*, and site-specific investigations conducted for various project components.

Comments received on the April 2015 Draft EIR requested analysis of the slant wells electrical panel (see Section 4.2.5.2, Impact 4.2-10), and clarifications regarding geologic units and soils (see Section 4.2.1.1), LCPLUP Planning Guidelines (see Section 4.2.2.3, Local Regulations), slant well angles (see Section 3.2.1 in Chapter 3, Description of the Proposed Project, the slant well abandonment mitigation measure (see Section 4.2.5.2, Impact 4.2-10), subsidence (see Section 4.2.5.2, Impact 4.2-8), corrosion prevention measures (see Section 4.2.5.2, Impact 4.2-7), and the Reliz (Blanco Section) fault (see Section 4.2.1.2, Seismicity and Faults).

4.2.1 Setting/Affected Environment

The study area for the evaluation of impacts on geology, soils, and seismicity includes the project components and general vicinity, except for the issue of coastal erosion where the study area extends south from the slant well locations to include the sandy beaches of southern Monterey Bay. The study area includes the submerged lands of MBNMS, as the proposed slant wells would extend under the seabed in MBNMS.

4.2.1.1 Geologic Conditions

Topography

Figures 3-2 through **3-15** in Chapter 3, Description of the Proposed Project, show the locations of the proposed MPWSP components, which extend approximately 18 miles, from the connection to the Castroville Community Services District (CCSD) water distribution system located in unincorporated Monterey County in the north to the unincorporated community of Hidden Hills along Highway 68 in the south. In addition to unincorporated areas, project components are also proposed in the cities of Monterey, Marina, and Seaside. Although the topography of the project area is variable, the majority of the project components would be constructed in coastal dune areas or in low-lying inland areas within 2 miles of the coast.

The northern and coastal dune areas are characterized by gently to moderately rolling dunes with elevations ranging from sea level at the coast to 100 feet above mean sea level (msl) at the proposed MPWSP Desalination Plant. Along the shoreline, the coastal dune slopes can be steep and have a high potential for erosion (Ninyo & Moore, 2005, 2014). East of the coastline, the dune deposits have gentle slopes (0 to 10 percent) with increased stability and vegetation cover. Fill embankments up to approximately 30 feet high are located throughout the area with road cuts up to approximately 20 feet high within the dune sands. West of the coastline, the existing MRWPCA ocean outfall pipeline extends about 2.1 miles into waters of MBNMS to a depth of about 90 to 110 feet below mean sea level. The bathymetry[1] in the vicinity of the MRWPCA outfall structure is relatively flat with an average slope of 1 percent to the west of the diffuser for 5 miles. The rim of the Monterey Submarine Canyon, one of the deepest submarine canyons on the west coast of the United States, is less than 4 miles to the northwest of the proposed location of the slant wells at the CEMEX facility.

The topography of the more urbanized southern coastal portion of the project area ranges from rolling coastal dunes to older, more stable dunes and terrace deposits. The topography in this portion of the project area varies, and elevations range from 0 feet msl at the coast to about 286 feet above msl at the proposed Terminal Reservoir and about 340 feet above msl at the proposed ASR injection/extraction wells (ASR-5 and ASR-6 Wells).

The proposed Ryan Ranch–Bishop Interconnection Improvements and Main System-Hidden Hills Interconnection Improvements would be located 3 and 6 miles southeast of the coastline in a relatively rugged mountainous area with elevations of about 200 and 1,000 feet above msl,

[1] National Oceanic and Atmospheric Administration (2014) refers to bathymetry as the ocean's depth relative to sea level, although it has come to mean "submarine topography," or the depths and shapes of underwater terrain.

respectively. The proposed location for the Carmel Valley Pump Station is on the south side of Carmel Valley Road about 3 miles east and inland of the coastline at an elevation of about 80 feet above msl.

Regional Geology

The study area lies within the geologically complex region of California referred to as the Coast Ranges Geomorphic Province.[2] The Coast Ranges province lies between the Pacific Ocean and the Great Valley Geomorphic Province (Sacramento and San Joaquin Valleys) and stretches from the Oregon border to the Santa Ynez Mountains near Santa Barbara. This province is marked by northwest-trending elongated ranges and narrow valleys that roughly parallel the coast and the San Andreas Fault Zone. Much of the Coast Ranges province is composed of marine sedimentary deposits, metamorphic rocks, and volcanic rocks. The project area is also underlain by the "Salinian Block," a continental fragment of the granitic Sierra Nevada that was pushed northward by tectonic forces along the western side of the San Andreas Fault Zone (Tavarnelli, 1998). The tectonics of the San Andreas Fault and other major faults in the western part of California have played a major role in the geologic history of the area. The drainages south of San Francisco Bay are strongly influenced by tectonic-related faults and folds that typically trend parallel to the coast, although some drainages run perpendicular to the coast. The Salinas River, whose course largely lies within a synclinal trough,[3] exemplifies this pattern.

The Santa Lucia Range, the Salinas Valley, and the Santa Cruz Mountains are the prominent geologic features of the region. The rugged Santa Lucia Range generally runs from the Monterey Peninsula southeast to San Luis Obispo; the proposed Ryan Ranch–Bishop and Main System-Hidden Hills Interconnection Improvements, and the Carmel Valley Pump Station would be located in this area. The Salinas Valley is northeast of the Santa Lucia Range and roughly parallels these northwest-southeast-trending mountains. The geologic development of the Salinas Valley, which runs from Monterey Bay southeast into San Luis Obispo County, is largely the result of folding, although the valley also shows characteristics of stream erosion and faulting. The subsurface slant wells, MPWSP Desalination Plant, improvements to the Seaside Groundwater Basin ASR System and conveyance pipelines would be constructed within the Salinas Valley. The Santa Cruz Mountains extend from the San Francisco Peninsula south to the Pajaro River, near Watsonville, where they merge with the Gabilan Range. These mountains help define the northern end of Monterey Bay.

Geologic Units

The discussion of geologic units is based on the geologic mapping compilation prepared by the CGS (2002b; which is based largely on Clark et al. [1997] and Dupre and Tinsley [1980]); geotechnical field reconnaissance conducted in June and November 2004 during which various geologic units within the project area were observed and described (Ninyo & Moore, 2005); and

[2] A geomorphic province is an area that possesses similar bedrock, structure, history, and age. California has 11 geomorphic provinces (CGS, 2002a).

[3] A syncline or synclinal trough is a geologic feature where stratified bedrock has been folded into a concave upward form.

subsurface investigations consisting of soil borings and analytical testing at the proposed (CEMEX facility) and alternate (Potrero Road parking area) slant well locations (Geoscience, 2016). **Figure 4.2-1** presents the regional surface geology from the CGS's compilation for the project area. **Figure 4.2-2** presents a north to south regional geologic cross-section along the coast (HydroMetrics, 2009). **Figure 4.2-3** presents a west to east local geologic cross section extending from the coastline, through the proposed slant wells, and to about 2 miles inland.

The Salinas Valley extends about 80 miles inland and is filled with recent to Tertiary (65 million years ago [mya] to 1.6 mya) river and estuary deposits of the current and ancestral Salinas River and regional eolian[4] and marine sediments over the Mesozoic Salinian Block granitic basement (Kennedy Jenks, 2004). Based on a review of geologic literature combined with the field observations, it is expected that fill, active and older coastal dune sands, and terrace deposits would be encountered during construction of the project components. Deeper subsurface geologic units that were not encountered at the surface but are known to be present in the project area include the Aromas Sand, Paso Robles Formation, Purisima Formation, Santa Margarita Formation, and Monterey Formation, as well as an underlying, unnamed sandstone and the granodiorite[5] of the Salinian Block.

Table 4.2-1 summarizes the geologic units and the project components, which are discussed below.

TABLE 4.2-1
SUMMARY OF GEOLOGIC UNITS AND PROJECT COMPONENT LOCATIONS

Geologic Unit	Project Component
Fill	Some pipeline segments
Dune Sands	Subsurface slant wells; westernmost portion of Source Water Pipeline
Older Dune Sands	Subsurface slant wells; most pipeline segments; MPWSP Desalination Plant; Castroville Pipeline, all ASR facilities along General Jim Moore Boulevard
Floodplain Deposits	Castroville Pipeline
Terrace Deposits	Subsurface slant wells; portions of the Ryan Ranch–Bishop Interconnection Improvements
Carmel Valley Floodplain	Carmel Valley Pump Station
Aromas Sand	ASR-5 and ASR-6 Wells[a]
Paso Robles Formation	ASR-5 and ASR-6 Wells[a]
Purisima Formation	ASR-5 and ASR-6 Wells[a]
Santa Margarita Formation	ASR-5 and ASR-6 Wells[a]
Monterey Formation	Main System–Hidden Hills Interconnection Improvements

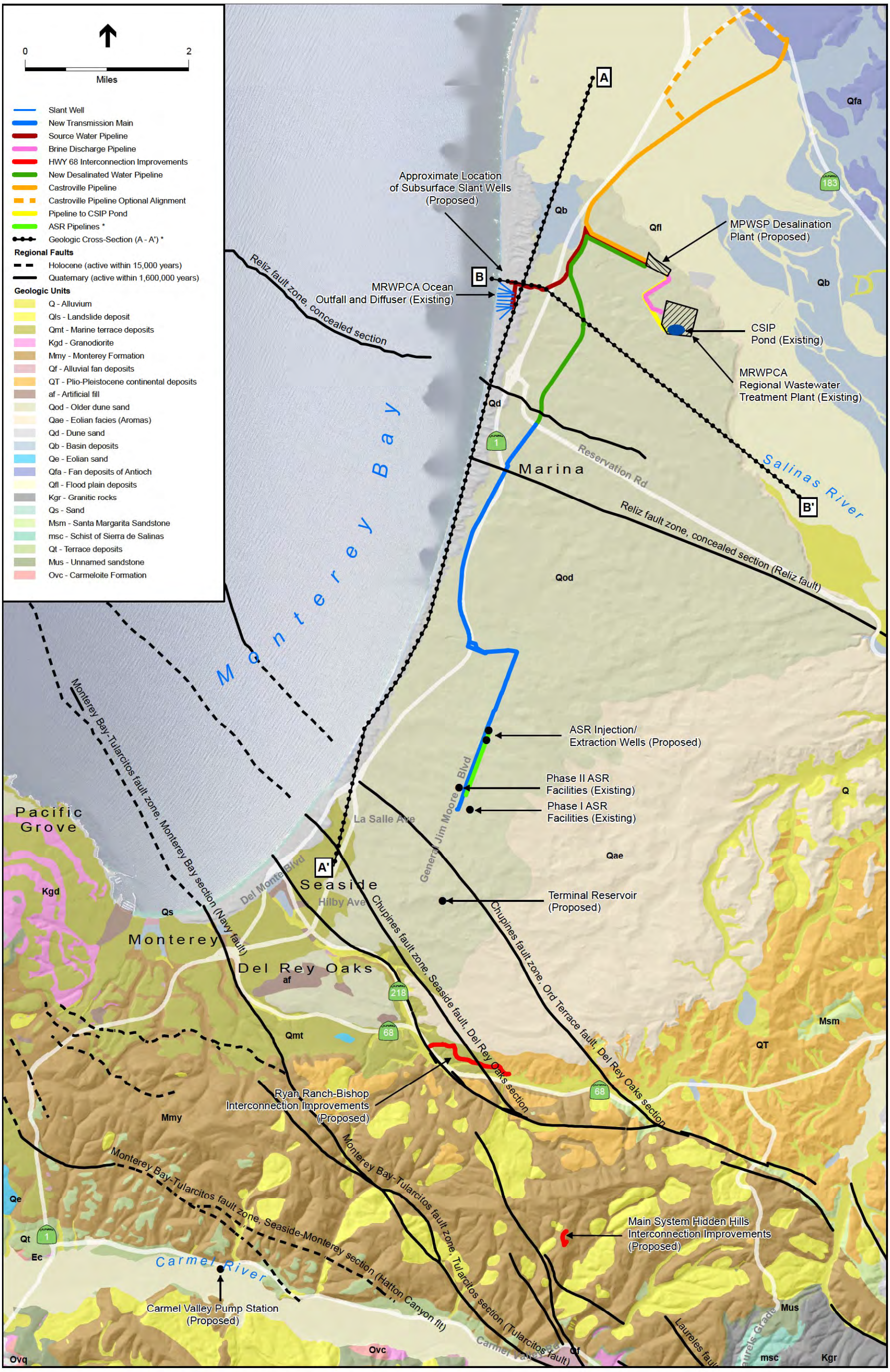
NOTES:

[a] The ASR-5 and ASR-6 Wells would be drilled through the Aromas Sand, Paso Robles, and Purisima Formations, and screened in the Santa Margarita Formation.

SOURCE: CGS, 2002b

[4] Eolian deposits are borne, deposited, produced, or eroded by wind.

[5] Granodiorite is a granular, igneous rock intermediate between granite and quartz-diorite. Igneous rock is produced by fire, great heat, or the action of a volcano, and has been solidified from a molten state.



NOTE.
*Refer to figure 4.2-2 for "A" geologic cross-section information and 4.2-3 for "B" geologic cross-section information.

SOURCE: CGS, 2002

205335.01 Monterey Peninsula Water Supply Project

Figure 4.2-1
Geologic Map of Project Area

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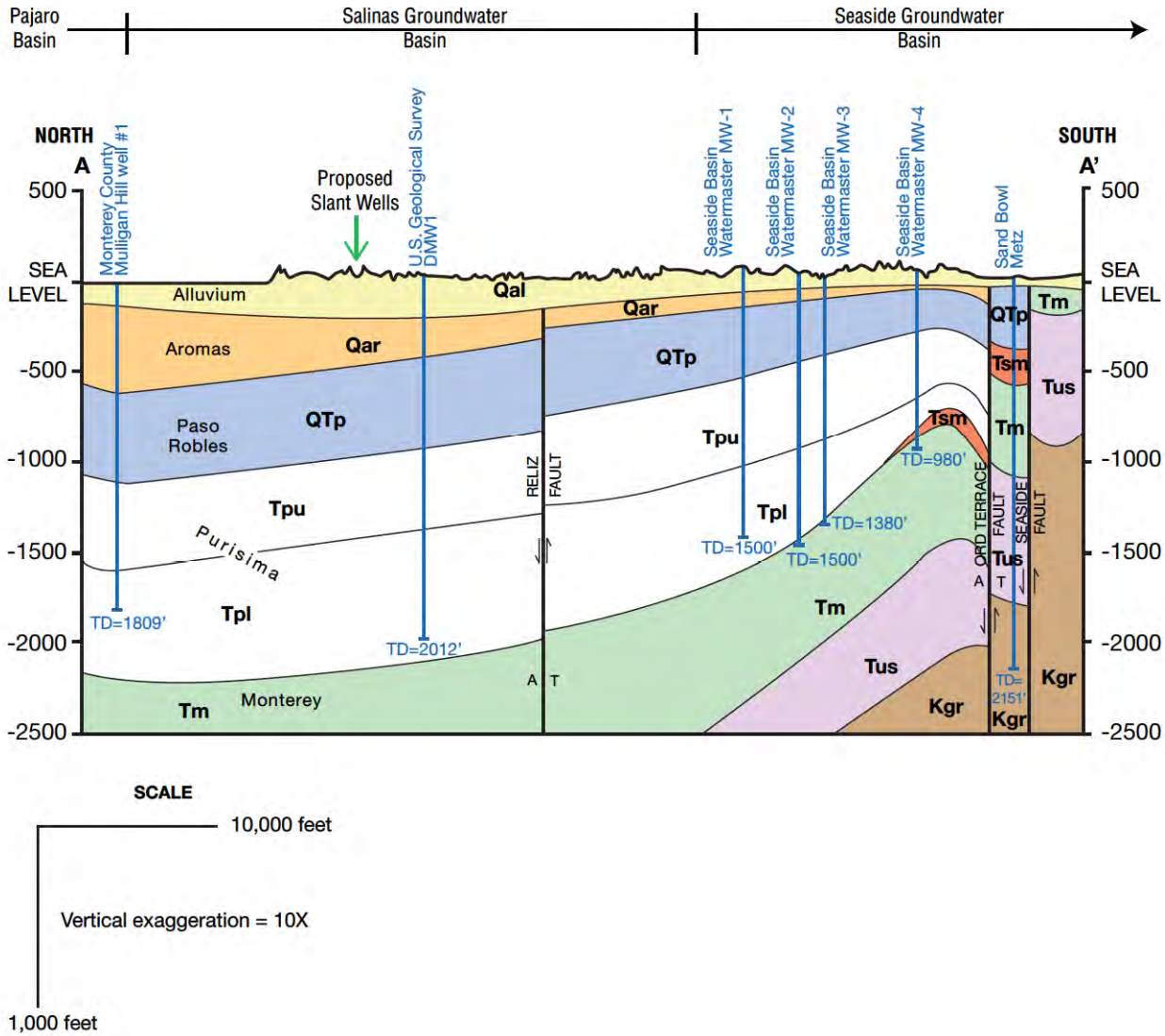

Qal	Alluvium (Holocene)
Qar	Aromas Sand (Pleistocene)
QTp	Paso Robles Formation (Pleistocene-Pliocene?)
Tp	Purisima Formation (Pliocene), subdivided into upper unit (TPu) and lower unit (Tpl)
Tsm	Santa Margarita Sandstone (late Miocene)
Tm	Monterey Formation (middle Miocene)
Tus	Unnamed sandstone (middle Miocene)
Kgr	Granitic rocks (late Cretaceous)
——	Fault, half arrows show direction of vertical separation; A indicates horizontal movement away from viewer, T indicates movement toward viewer

SOURCE: HydroMetrics, 2009

NOTES: TD = Total depth in feet

205335.01 Monterey Peninsula Water Supply Project

Figure 4.2-2

Generalized Geologic Cross-Section

Fill Materials

Fill materials are located throughout the project area (Ninyo and Moore, 2005, 2014). The fill is associated with previous grading for roads, bridges, railroad corridors, agricultural uses, and commercial, residential, and military land developments. The thicknesses of the fill deposits range from relatively shallow fills (a few feet thick) along roadways and railroad alignments in relatively flat, low-lying areas to deeper fills along bridge-approach embankments and in developed hillside areas. Most of the fill materials in the project area were likely derived from local native soils and would be similar in composition to the native soils described in the following sections.

Dune Sand Deposits

Dune sand deposits are present along the coastal areas from the proposed Seawater Intake System in the north to the eastern area of the city of Monterey in the south where the proposed pipeline additions would connect to the existing system (CGS, 2002b). Active, wind-blown dunes generally extend less than 0.5 mile inland, and older, more stabilized dunes extend up to 4 miles inland as well as offshore. Most of the project components would be located on or within dune deposits, except for the deeper portions of the proposed ASR injection/extraction wells, the Ryan Ranch–Bishop and Main System–Hidden Hills Interconnection Improvements, and the Carmel Valley Pump Station. The proposed subsurface slant wells would be partially screened within the dune sand deposits and some of the source water would be pumped from this unit.

The dune areas typically consist of elevated rolling hills composed of loose to moderately consolidated, fine sand (Ninyo & Moore, 2005; PCE, 2014). Younger, sparsely vegetated, active[6] dunes are present along the coastline. Older dune deposits[7] with more established vegetation are present in the inland areas and underlie the locations of most of the proposed project components. During the geologic reconnaissance, dune deposits were observed in existing cut slopes and excavations and ranged from loose to weakly cemented sands. Shallow groundwater is not expected within the elevated dune deposits, except in localized low-lying areas along the coastline.

Terrace Deposits

Pleistocene-age (1.6 mya to 11,000 years ago [ya]) terrace deposits are present beneath the CEMEX mining facility and the sea floor of MBNMS where the proposed slant wells would be constructed (Geoscience, 2016). The deeper portions of the proposed subsurface slant wells would be screened across these terrace deposits and some of the source water would be pumped from this unit. These terrace deposits are former alluvial fan and river floodplain deposits—which may also include marine terrace deposits—that generally consist of sand with some gravels. Uplifted Pleistocene marine terrace deposits are also present within the southern portion of the project area from Sand City to the city of Monterey (CGS, 2002b; Clark et al., 1997; Ninyo & Moore, 2014). These deposits are fine-grained sands and silts with locally thin, discontinuous gravel layers. The terrace deposits are typically dissected by streams and lie on the Aromas Sand. The deposits are variable in thickness, typically from up to 50 feet to a maximum of 200 feet (Muir, 1977). Terrace deposits at the CEMEX mining facility range from about 140 to 170 feet in thickness (Geoscience, 2016).

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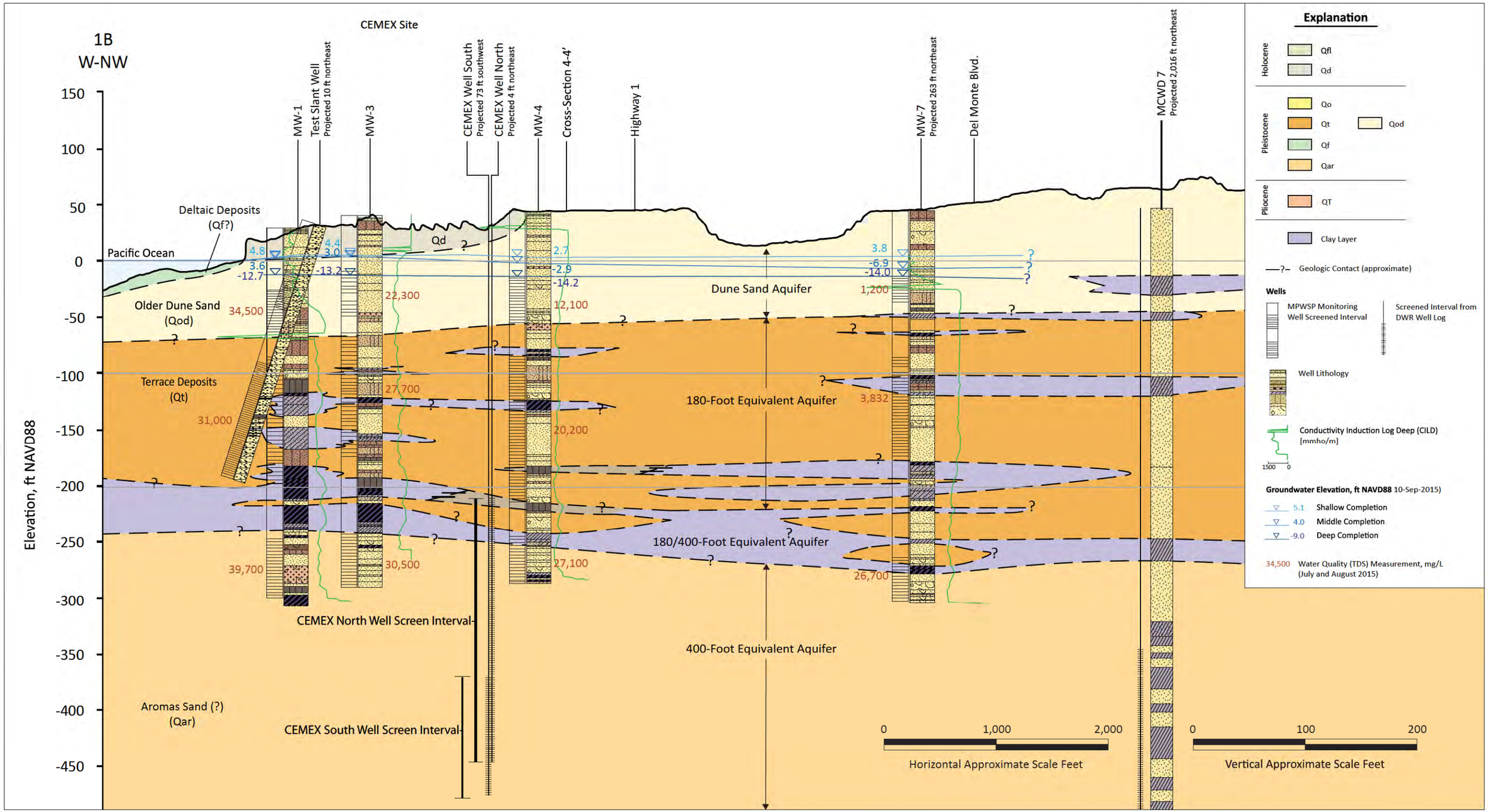
6 Active dunes are composed of loose sand shifting in real time.
7 Older dunes are inactive in that much of the sands have become weakly cemented, limiting active movement.



SOURCE: Geoscience, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.2-3

Local Geologic Cross-Section

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Carmel Valley Floodplain Deposits

At the proposed Carmel Valley Pump Station sites, the Quaternary (1.6 mya to present) floodplain deposits along the Carmel River consist of a mixture of unconsolidated sand and silt deposits, commonly including relatively thin layers of clay (Clark et al., 1997). The older floodplain deposits are nearly flat to gently sloping and fill an irregularly shaped valley beneath the Carmel River. The Monterey Formation underlies these floodplain deposits.

Aromas Sand

The Pleistocene-age (1.6 mya to 11,000 ya) Aromas Sand consist of both older river deposits and younger eolian (windblown) deposits of unconsolidated, brown to red sands with interbeds of clay and poorly sorted gravels (Muir, 1977; Hanson, 2003). 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, 2002b). In addition, the surface outcrops of the Aromas Sand have been mapped about 1 mile east of the CSIP Pond beneath the older dune sands to the west, as shown on **Figure 4.2-1**. The Aromas Sand overlies the Paso Robles Formation north of the east-to-west Ord Terrace Fault in Seaside, but is not present south of the fault (HydroMetrics, 2009). The proposed new ASR injection/extraction wells would be drilled to about 1,000 feet below the surface through the Aromas Sand into the deeper Santa Margarita Sandstone.

Paso Robles Formation

The Plio-Pleistocene-age (about 5.3 mya to 11,000 ya) Paso Robles Formation is a series of fine-grained, oxidized sand and silt beds that contain gravel beds (Clark et al., 1997) interbedded with some less-prevalent calcareous[8] beds (DWR, 2004). The Paso Robles Formation is interfingered[9] with the lower portion of the Aromas Sand and the upper portion of the Purisima Formation (HydroMetrics, 2009). The Paso Robles Formation is present beneath the northern portion of the project area at depths ranging from less than 100 feet to 600 feet (HydroMetrics, 2009). The proposed new ASR injection/extraction wells would be drilled to about 1,000 feet below the ground through the Paso Robles Formation into the deeper Santa Margarita Sandstone.

Purisima Formation

The mostly marine Miocene-age (24 mya to 5.3 mya) to Pliocene-age (5.3 mya to 1.8 mya) Purisima Formation underlies the project area at depths ranging from about 400 feet below the surface in Seaside to as much as 1,100 feet in the northern part of the project area (Powell et al., 2007; HydroMetrics, 2009) and extends westward under Monterey Bay (Muir, 1977). The Purisima Formation consists of 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 (Muir, 1977; HydroMetrics, 2009).

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8 Mostly or partly composed of calcium carbonate i.e. containing lime or being chalky.
9 Pertains to the lateral change from one rock or sediment type to another in a zone where the two types form interpenetrating wedges.

The proposed new ASR injection/extraction wells would be drilled through this unit, into the deeper Santa Margarita Sandstone.

Santa Margarita Formation

The late Miocene-age (24 mya to 5.3 mya) to Pliocene-age (5.3 mya to 1.8 mya) Santa Margarita Sandstone is a marine, coarse-grained sandstone that overlies the Monterey Formation (Clark et al., 1997; MCWRA, 2006). 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 ground surface (bgs) in between the Ord Terrace and Seaside Faults (HydroMetrics, 2009), as shown on **Figure 4.2-2**. The unit has surface outcrops east of the project area (CGS, 2002b) and is up to 400 feet thick in places (Durbin, 2007). The proposed new ASR injection/extraction wells would be drilled to about 1,000 feet below the surface and screened within the Santa Margarita Sandstone.

Monterey Formation

The Tertiary-age (65 mya to 1.6 mya) Monterey Formation is a marine sedimentary unit generally consisting of siliceous and diatomaceous[10] interbedded layers of mudstone, siltstone, sandstone, and claystone (Clark et al., 1997). Seams of the expandable clay bentonite are also present (Ninyo & Moore, 2005, 2014). This unit is present at the proposed Main System–Hidden Hills Interconnection Improvements. The Monterey Formation is at the surface on both sides of the Carmel Valley and underlies the Carmel Valley floodplain deposits beneath the proposed Carmel Valley Pump Station. The unit extends beneath the remainder of the project area to the north, as well as west into Monterey Bay.

4.2.1.2 Seismicity and Faults

This section characterizes the region's existing faults, describes historical earthquakes, estimates the likelihood of future earthquakes, and describes probable groundshaking effects.

Earthquake Terminology and Concepts

Earthquake Mechanisms and Fault Activity

Faults are planar features within the earth's crust that have formed to release strain caused by the dynamic movements of the earth's major tectonic plates. An earthquake on a fault is produced when these strains overcome the inherent strength of the earth's crust, and the rock ruptures. The rupture causes seismic waves that propagate through the earth's crust, producing the groundshaking effect known as an earthquake. The rupture also causes variable amounts of slip along the fault, which may or may not be visible at the earth's surface.

Geologists commonly use the age of offset rocks as evidence of fault activity—the younger the displaced rocks, the more recently earthquakes have occurred. To evaluate the likelihood that a fault would produce an earthquake, geologists examine the magnitude and frequency of recorded

[10] Diatomaceous deposits consist of fossilized amorphous silica remains of diatoms, a type of hard-shelled algae.

earthquakes and evidence of past displacement along a fault. The State of California defines an active fault as one that has had surface displacement within Holocene time (the CGS defines this as within last 11,000 years; the USGS uses 15,000 years). A Quaternary fault is defined as a fault that has shown evidence of surface displacement during the Quaternary period (the last 1.6 million years), unless direct geologic evidence demonstrates inactivity for all of the Holocene or longer. This definition does not mean that a fault lacking evidence of surface displacement is necessarily inactive. The term "sufficiently active" is also used to describe a fault if there is some evidence that Holocene displacement has occurred on one or more of its segments or branches (Hart, 1997).

For the purpose of delineating fault rupture zones, the CGS historically sought to identify faults defined as potentially active, which are faults that have shown evidence of surface displacement during the Quaternary period. Older maps still use the "potentially active" term. However, under the Alquist-Priolo Earthquake Fault Zoning Act, usage of this term was discontinued when it became apparent that the sheer number of Quaternary-age faults in the state made it meaningless to zone all of them (Bryant and Hart, 2007). In late 1975, the state geologist made a policy decision to zone only those faults that had a relatively high potential for ground rupture, determining that a fault should be considered for zoning only if it was sufficiently active and "well defined."[11] Blind faults do not show surface evidence of past earthquakes, even if they occurred in the recent past; and faults that are confined to pre-Quaternary rocks (more than 1.6 million years old) are considered inactive and incapable of generating an earthquake.

Earthquake Magnitude

When an earthquake occurs along a fault, its size can be determined by measuring the energy released during the event. A network of seismographs records the amplitude and frequency of the seismic waves that an earthquake generates. The Richter magnitude (ML) of an earthquake represents the highest amplitude measured by the seismograph at a distance of 100 kilometers from the epicenter. Richter magnitudes vary logarithmically with each whole-number step, representing a tenfold increase in the amplitude of the recorded seismic waves and 32 times the amount of energy released. While Richter magnitude was historically the primary measure of earthquake magnitude, seismologists now use Moment Magnitude (Mw) as the preferred way to express the size of an earthquake. The Moment Magnitude scale is related to the physical characteristics of a fault, including the rigidity of the rock, the size of fault rupture, and the style of movement or displacement across the fault. Although the formulae of the scales are different, they both contain a similar continuum of magnitude values, except that Mw can reliably measure larger earthquakes and do so from greater distances.

Peak Ground Acceleration

A common measure of ground motion at any particular site during an earthquake is the peak ground acceleration (PGA). The PGA for a given component of motion is the largest value of

[11] A fault is considered well defined if its trace is clearly detectable by a trained geologist as a physical feature at or just below the ground surface. The fault may be identified by direct observation or by indirect methods (e.g., geomorphic and geophysical evidence). The critical consideration is that the fault, or some part of it, can be located in the field with sufficient precision and confidence to indicate that the required site-specific investigations would meet with some success.

horizontal acceleration obtained from a seismograph. PGA is expressed as the percentage of the acceleration due to gravity (g), which is approximately 980 centimeters per second squared. In terms of automobile acceleration, one "g" of acceleration is equivalent to the motion of a car traveling 328 feet from rest in 4.5 seconds. For comparison purposes, the maximum PGA value recorded during the Loma Prieta earthquake in the vicinity of the epicenter, near Santa Cruz, was 0.64 g. Unlike measures of magnitude, which provide a single measure of earthquake energy, PGA varies from place to place and is dependent on the distance from the epicenter and the character of the underlying geology (e.g., hard bedrock, soft sediments, or artificial fills).

Modified Mercalli Intensity Scale

The Modified Mercalli Intensity Scale assigns an intensity value based on the observed effects of groundshaking produced by an earthquake. Unlike measures of earthquake magnitude and PGA, the Modified Mercalli Intensity Scale is qualitative in nature in that it is based on actual observed effects rather than measured values. Similar to PGA, Modified Mercalli values for an earthquake at any one place can vary depending on the earthquake's magnitude, the distance from its epicenter, the focus of its energy, and the type of geologic material. The Modified Mercalli values for intensity range from I (earthquake not felt) to XII (damage nearly total), and intensities ranging from IV to X can cause moderate to significant structural damage. Because the Modified Mercalli scale is a measure of groundshaking effects, intensity values can be correlated to a range of average PGA values, as shown in **Table 4.2-2**.

Faults and Historical Earthquake Activity

The project area is located in a seismically active region of California. The Coast Ranges geomorphic province is composed of a series of parallel, northwest-trending mountain ranges and valleys that are generally controlled by faults. These faults juxtapose blocks of geologic units of different origins called belts. The Monterey Bay region is located within the Salinian Block, which is a northwest-trending belt bounded to the east by the San Andreas Fault and to the west by the San Gregorio (Sur) Fault. Major earthquakes have affected the region in the past and are expected to occur in the near future on one of the principal active faults in the San Andreas Fault System.

The Monterey Bay region contains both active and potentially active faults, and is considered a region of high seismic activity. Throughout the project area, there is the potential for damage resulting from movement along any one of a number of the active faults that are oriented generally perpendicular to the coastline. In 2007, the USGS, the CGS, and the Southern California Earthquake Center formed the Working Group on California Earthquake Probabilities (WGCEP) to evaluate the probability of one or more earthquakes of Mw 6.7 or higher occurring in the state of California over the next 30 years. Accounting for the wide range of possible earthquake sources, it is estimated that the San Francisco and Monterey Bay areas as a whole have a 72 percent chance of experiencing an earthquake of Mw 6.7 or higher in the next 30 years; among the various active faults in the region, the San Andreas Fault System is the most likely to cause such an event (WGCEP, 2015a).

TABLE 4.2-2
MODIFIED MERCALLI INTENSITY SCALE

Intensity Value	Intensity Description	Average Peak Ground Acceleration[a]
I	Not felt	< 0.0017 g
II	Felt by people sitting or on upper floors of buildings	0.0017 to 0.014 g
III	Felt by almost all indoors. Hanging objects swing. Vibration like passing of light trucks. May not be recognized as an earthquake.	0.0017 to 0.014 g
IV	Vibration felt like passing of heavy trucks. Stopped cars rock. Hanging objects swing. Windows, dishes, doors rattle. Glasses clink. In the upper range of IV, wooden walls and frames creak.	0.014 to 0.039 g
V (Light)	Felt outdoors. Sleepers wakened. Liquids disturbed, some spilled. Small unstable objects displaced or upset. Doors swing. Pictures move. Pendulum clocks stop.	0.035 to 0.092 g
VI (Moderate)	Felt by all. People walk unsteadily. Many frightened. Windows crack. Dishes, glassware, knickknacks, and books fall off shelves. Pictures off walls. Furniture moved or overturned. Weak plaster, adobe buildings, and some poorly built masonry buildings cracked. Trees and bushes shake visibly.	0.092 to 0.18 g
VII (Strong)	Difficult to stand or walk. Noticed by drivers of cars. Furniture broken. Damage to poorly built masonry buildings. Weak chimneys broken at roof line. Fall of plaster, loose bricks, stones, tiles, cornices, unbraced parapets and porches. Some cracks in better masonry buildings. Waves on ponds.	0.18 to 0.34 g
VIII (Very Strong)	Steering of cars affected. Extensive damage to unreinforced masonry buildings, including partial collapse. Fall of some masonry walls. Twisting, falling of chimneys and monuments. Wood-frame houses moved on foundations if not bolted; loose partition walls thrown out. Tree branches broken.	0.34 to 0.65 g
IX (Violent)	General panic. Damage to masonry buildings ranges from collapse to serious damage unless modern design. Wood-frame structures rack, and, if not bolted, shifted off foundations. Underground pipes broken.	0.65 to 1.24 g
X (Very Violent)	Poorly built structures destroyed with their foundations. Even some well-built wooden structures and bridges heavily damaged and needing replacement. Water thrown on banks of canals, rivers, lakes, etc.	> 1.24 g
XI (Very Violent)	Few, if any, masonry structures remain standing. Bridges destroyed. Rails bent greatly. Underground pipelines completely out of service.	> 1.24 g
XII (Very Violent)	Damage nearly total. Practically all works of construction are damaged greatly or destroyed. Large rock masses displaced. Waves seen on ground surface. Lines of sight and level are distorted. Objects are thrown into the air.	> 1.24 g

NOTES:

[a] Value is expressed as a fraction of the acceleration due to gravity (g). Gravity (g) is 9.8 meters per second squared. 1.0 g of acceleration is a rate of increase in speed equivalent to a car traveling 328 feet from rest in 4.5 seconds.

SOURCES: ABAG, 2016; CGS, 2003.

Several active and potentially active faults have been mapped within or close to the project area. **Figure 4.2-4** shows the approximate locations of the major faults in the region and their geographic relationship and orientation to the project area. **Table 4.2-3** lists the principal active and potentially active faults in the region that could affect the project components; the type of the faults; and the estimated maximum Moment Magnitude of earthquakes that could occur on each fault. The approximate distance to each fault is based on estimated distances from the nearest proposed project component. None of the faults cross, nor are they located near the proposed slant wells or the existing outfall, located within submerged lands and waters of MBNMS.

Regional Faults

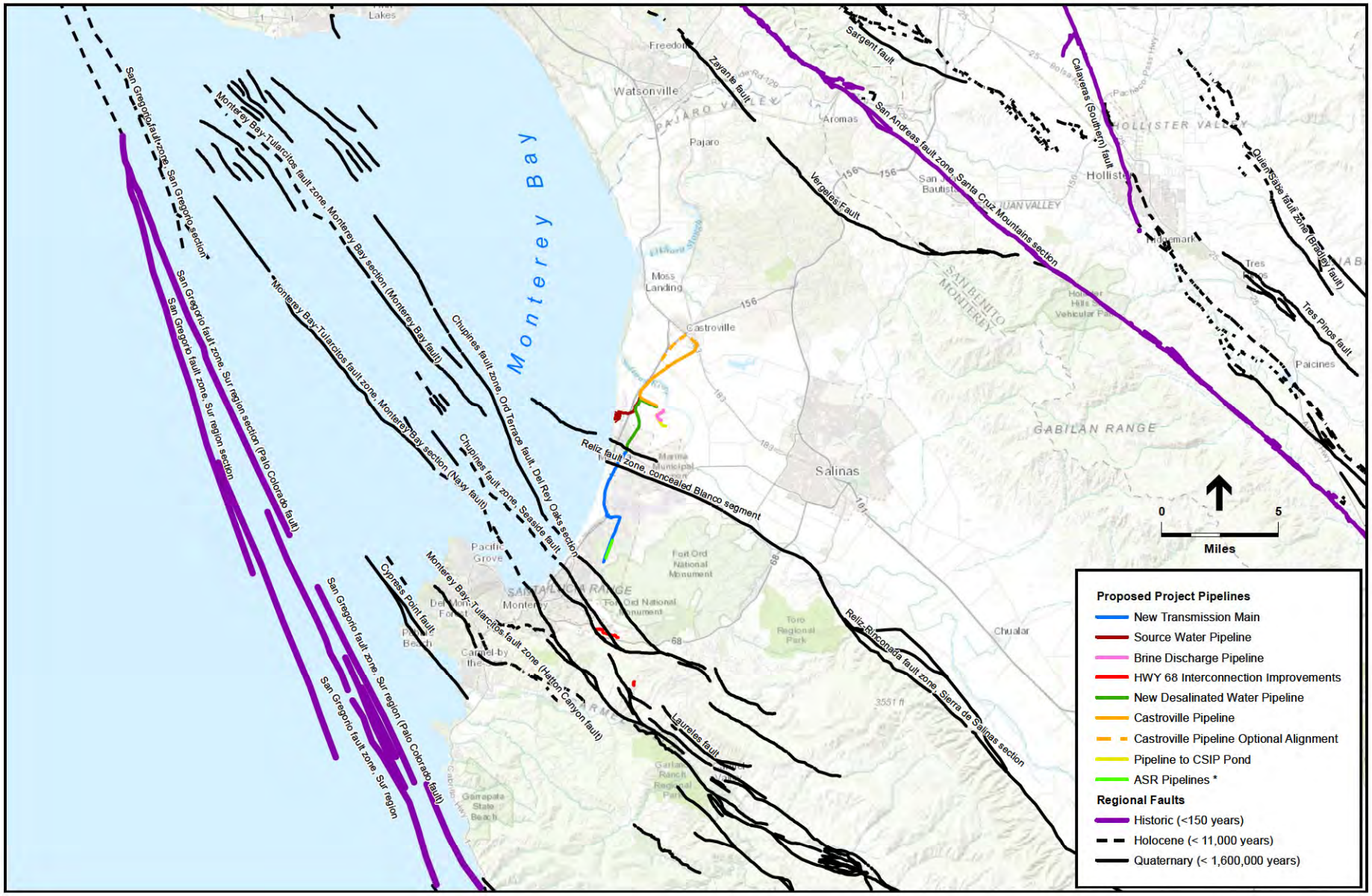
San Andreas Fault Zone

The San Andreas Fault Zone is a major structural feature in the region and forms a boundary between the North American and Pacific tectonic plates (Bryant and Lundberg, 2002). The San Andreas Fault is a major northwest-trending, right-lateral,[12] strike-slip[13] fault. The fault extends for about 600 miles from the Gulf of California in the south to Cape Mendocino in the north. The San Andreas is not a single fault trace but rather a system of active faults that diverges from the main fault south of San Jose. Regional faults that are subparallel to the San Andreas Fault, such as the Hayward, Calaveras, and San Gregorio Faults, are within the broader San Andreas Fault System (see **Figure 4.2-4**).

The San Andreas Fault has produced numerous large earthquakes, including the 1906 San Francisco earthquake. That event had an estimated ML 8.3, or Mw 7.8 (WGCEP, 2008a, 2008b) and was associated with up to 21 feet of displacement and widespread ground failure, including several hundred miles of surface fault rupture (Lawson, 1908). In the Watsonville area and to the east, reports of strong groundshaking, toppled chimneys, ground cracks, broken pipes, and twisted and sunken railroad tracks (Lawson, 1908) indicate that groundshaking intensities reached IX on the Modified Mercalli scale.

Numerous moderate-sized earthquakes (approximately magnitude 5.2) in Watsonville (in 1954 and again in 1964 and 1969) resulted in broken irrigation lines, ruptured water mains, and cracked plaster and stucco (PVWMA, 2001). The magnitude 6.9 Loma Prieta earthquake of October 1989, centered in the Santa Cruz Mountains, caused strong groundshaking and ground failure throughout the San Francisco and Monterey Bay areas. Major damage was experienced in downtown and residential Watsonville, Castroville, Gilroy, and Hollister (McNutt and Toppozada, 1990). In the project area, the Loma Prieta earthquake produced a PGA of 0.39 g and groundshaking with a Modified Mercalli intensity of VIII.

[12] To an observer straddling a right-lateral fault, the right-hand block or plate would move towards the observer.
[13] A strike-slip fault creates vertical (or nearly vertical) fractures (i.e., the blocks primarily move horizontally). If the block opposite an observer looking across the fault moved to the right, the slip style is termed “right lateral;” if the block moved to the left, the motion is termed “left lateral.”



NOTE:
*The ASR Pipelines are the ASR Conveyance Pipeline, the ASR Pump-to-Waste Pipeline, and the ASR Recirculation Pipeline. See Figure 3-9a for the individual pipeline alignments.

SOURCE: USGS/CGS, 2010

205335.01 Monterey Peninsula Water Supply Project

Figure 4.2-4

Active and Potentially Active Regional Faults

TABLE 4.2-3
ACTIVE AND POTENTIALLY ACTIVE FAULTS

Fault or Fault Zone	Location Relative to Project Components	Recency of Faulting	Slip Rate (millimeters/ year)	Maximum Moment Magnitude (Mw)	Historical Seismicity[a]
Monterey Bay – Tularcitos Fault Zone[b]	Beneath Main System–Hidden Hills Interconnection	Late Quaternary with evidence of Holocene activity (Potentially Active)	0.2 to 1.0	7.3	
Reliz–Rinconada Fault Zone (Blanco Section)	Beneath new Transmission Main	Late Quaternary (Potentially Active)	0.2 to 1.0	7.5	
Hatton Canyon Fault	0.5 miles northeast of Carmel Valley Pump Station	Quaternary with evidence of Holocene Activity (Potentially Active)	0.2 to 1	not estimated	
Laureles Fault	1.5 miles southwest of Main System–Hidden Hills Interconnection	Late Quaternary (Potentially Active)	Unknown	5.5	
San Gregorio Fault (Sur Region)	5 miles southwest of Carmel Valley Pump Station	Historical (<200 years ago) (Active)	1 to 7	7.0	6+, 1926
Zayante–Vergeles Fault Zone	12 miles northeast of MPWSP Desalination Plant and 8.5 miles northeast of northern terminus of Castroville Pipeline	Holocene (Active)	0.1	7.0	
San Andreas Fault	16 miles northeast of MPWSP Desalination Plant and 13 miles northeast of northern terminus of Castroville Pipeline	Historical (Active)	13 to 21	6.2 to 7.0	6.9, 1989 7.8, 1906 6.7, 1898 6.5, 1885
Sargent Fault Zone	19 miles northeast of MPWSP Desalination Plant and 16 miles northeast of northern terminus of Castroville Pipeline	Late Quaternary (Potentially Active)	1 to 5	6.8	
Calaveras Fault (southern)	25 miles northeast of MPWSP Desalination Plant and 22 miles northeast of northern terminus of Castroville Pipeline	Historical (Active)	10 to 20	5.8	6.3, 1897 6.5, 1911

NOTES:
[a] Richter Magnitude (M_L) or Moment Magnitude (Mw) and year of recent or large events. References that cite earthquake magnitudes do not always specify whether the measurement used the Richter or Moment Magnitude scale; however, the M_L and Mw values are similar up to about 7.
[b] Includes the Chupines, Seaside, Ord Terrace, and Navy Faults.

SOURCES: CGS, 2003; USGS, 2010; Johnson, 2004; Clark et al., 1997; Field, et.al., 2013

The San Andreas Fault, which has experienced multiple large earthquake events resulting in large surface fault rupture, is a designated earthquake fault zone under the Alquist-Priolo Earthquake Fault Zoning Act (see Section 4.2.2.2, State Regulations). According to the WGCEP, the Northern California portion of the San Andreas Fault has a 16 percent of producing a Mw 6.7 or larger earthquake during the next 30 years (WGCEP, 2015b). The CCSD connection is located about 12.5 miles southwest of the San Andreas Fault.

San Gregorio Fault Zone

The San Gregorio Fault Zone is a complex of faults that skirt the coastline north of Big Sur and run northwestward across Monterey Bay, briefly touching the shoreline of the San Mateo County coastline at Point Año Nuevo and at Seal Cove, just north of Half Moon Bay (Bryant and Cluett, 1999b). This fault is active and was recently recognized as capable of producing large earthquakes. Studies have shown Holocene displacement on the San Gregorio Fault as recently as 1270 AD to 1400 AD (Bryant and Cluett, 1999b). Additionally, a 1926 earthquake with a Richter magnitude above 6.0—previously thought to have occurred on the Monterey Fault—may have actually ruptured an offshore segment of the San Gregorio Fault Zone (Johnson, 2004). According to the WGCEP, the San Gregorio Fault has a 1.34 percent chance of producing a MW 6.7 or larger earthquake in the next 30 years (WGCEP, 2015b). The closest portion of the fault to a proposed project component is approximately 10 miles southwest of the Highway 68 Interconnection Improvement.

Calaveras Fault Zone

The Calaveras Fault Zone, a major right-lateral, strike-slip fault, extends for about 100 miles from Dublin to Hollister, where it merges with the San Andreas Fault (Bryant and Cluett, 1999a). The Calaveras Fault is designated as an earthquake fault zone under the Alquist-Priolo Act. The Calaveras Fault is most active on its southern segment; the magnitude 6.2 Morgan Hill earthquake (April 1984) originated on this fault. Tectonic creep[14] has been documented along the Calaveras Fault in the vicinity of Hollister. According to the WGCEP, the Calaveras Fault has a 17.09 percent chance of producing a MW 6.7 or larger earthquake in the next 30 years (WGCEP, 2015b). The CCSD connection is located about 20 miles west of the Calaveras Fault Zone.

Sargent Fault Zone

The Sargent Fault Zone branches from the San Andreas Fault and extends for about 34 miles, from the Lexington Reservoir in the north to just north of Hollister in the south (Bryant, 2000a). The Sargent Fault is a reverse-oblique,[15] right-lateral, strike-slip fault zone that dips steeply to the west and is seismically active. The fault is considered to be capable of surface rupture and is designated as an Alquist-Priolo earthquake fault zone. According to the WGCEP, the Sargent Fault Zone has a 0.82 percent chance of producing a MW 6.7 or larger earthquake in the next 30 years (WGCEP, 2015b). The CCSD connection is located about 16.25 miles southwest of this fault.

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14 Tectonic creep is the slow, apparently continuous movement on a fault (Bates and Jackson, 1980).

15 In a reverse fault, the block above the fault moves up relative to the block below the fault. This fault motion is caused by compressional forces and results in shortening. Oblique-slip faulting suggests both dip-slip faulting (vertical movement) and strike-slip faulting (horizontal movement).

Zayante-Vergeles Fault Zone

The Zayante-Vergeles Fault Zone is approximately parallel with and about 5 miles west of the San Andreas Fault (Bryant, 2000b). The Zayante Fault is considered to be a late Pleistocene-age (1.6 mya to 11,000 ya), and possibly Holocene, potentially active Quaternary fault. Some portions of the Zayante Fault may be active, and some scientists believe its southern section may be indirectly connected to the San Andreas Fault Zone. Following recent investigations of the Vergeles Fault, the CGS designated portions of the fault as a fault rupture hazard zone USGS Watsonville East and Watsonville West 7.5-minute topographic map). However, other portions of the Vergeles are classified as potentially active and are not designated under the Alquist-Priolo Act. According to the WGCEP, the Zayante-Vergeles Fault Zone has a 0.10 percent chance of producing a MW 6.7 or larger earthquake in the next 30 years (WGCEP, 2015b). The CCSD connection is located about 8.25 miles southwest of this fault.

Local Faults

Several Quaternary faults intersect the project area. Additionally, several potentially active faults cross, or are located in close proximity to components of the proposed project.

Reliz-Rinconada Fault Zone

The Reliz-Rinconada Fault Zone runs parallel to Highway 101 along the Salinas River Valley at the base of the Santa Lucia Mountains. This high-angle, reverse fault offsets Salinian Block basement rocks and locally juxtaposes the Pliocene-Pleistocene-age (5.3 mya to 11,000 ya) Paso Robles Formation against basement rocks (Rosenberg and Bryant, 2003). The Reliz Fault has been projected crossing northwest-southeast through the central portion of the project area in the vicinity of Marina (Ninyo & Moore, 2005). The fault trace in this area is concealed by fluvial deposits of the Salinas River Valley and coastal dunes, causing uncertainty as to the precise location of the fault. Geologic evidence indicates that this fault system has displaced materials that are between 50,000 to 100,000 years old and is considered potentially active (Rosenberg and Bryant, 2003; Rosenberg and Clark, 2009). According to the WGCEP, the Reliz-Rinconada Fault Zone has a 0.31 percent chance of producing a MW 6.7 or larger earthquake in the next 30 years (WGCEP, 2015b). The new Transmission Main would cross this fault; the slant wells at CEMEX would be north of this fault.

Monterey Bay–Tularcitos Fault Zone

The Monterey Bay–Tularcitos Fault Zone extends for about 52 miles, from Santa Cruz to the crest of the Sierra de Salinas. The onshore portion of the fault zone includes the Chupines, Seaside, Tularcitos, Navy, Ord Terrace, and Hatton Canyon Faults (Bryant, 2001). These faults create an approximately 6- to 9-mile-wide zone of short in-echelon, northwest-striking faults that are related. The activity and locations of these faults are not well defined. Data presented by Jennings (2010) show that no active portions of the Monterey Bay–Tularcitos Fault Zone extend onshore into the southern portion of the project area. Jennings classifies the Ord Terrace, Seaside, Chupines, and Tularcitos Faults as Quaternary. However, Bryant (2001), citing Rosenberg and Clark et al. (1997), provides evidence of Holocene displacement along the Hatton Canyon, and Tularcitos Faults, which are located close to the proposed Carmel Valley Pump Station. The

Monterey section of the Monterey Bay-Tularcitos Fault Zone also crosses the route of the new Transmission Main. Additionally, there is evidence of a probable offshore extension of the Chupines Fault displacing Holocene-age (less than 11,000 years old) deposits and sea floor sediments (Ninyo & Moore, 2014). There is evidence for recent (less than 11,000 ya) displacement on the individual faults of the Monterey Bay-Tularcitos Fault Zone and therefore, considering the proximity of these active strands to project components, these faults should be considered active for planning purposes. According to the WGCEP, the Monterey Bay–Tularcitos Fault Zone has a 0.64 percent chance of producing a MW 6.7 or larger earthquake in the next 30 years (WGCEP, 2015b). The Highway 68 Interconnection Improvements would be about 2 miles northwest of this fault zone.

Laureles Fault Zone

The northwest-striking, nearly vertical, reverse[16] Laureles Fault Zone extends approximately 4 miles along the north side of Carmel Valley and is up to 0.2 mile wide (Clark et al., 1997). The northeast side is upthrown and displaces Pleistocene-age (5.3 mya to 11,000 ya) terrace gravels, suggesting the latest movement to be middle to late Pleistocene. The Laureles Fault is about 1.5 miles southwest of Main System–Hidden Hills Interconnection.

4.2.1.3 Geologic Hazards

Based on the geologic data reviewed during preparation of this EIR/EIS, the potential geologic hazards at the proposed project sites include soil erosion, slope instability, and soils hazards. These geologic hazards are discussed below.

Erosion

Erosion is the wearing away of soil and rock by processes such as mechanical or chemical weathering, mass wasting, and the action of waves, wind, and underground water. Excessive soil erosion can eventually damage infrastructure such as pipelines, wellheads, building foundations, and roadways. In general, granular soils with relatively low cohesion and soils located on steep topography have a higher potential for erosion. The *Monterey County General Plan* (Monterey County, 2010) includes a soil erosion hazard map showing relative erosion hazards within the county. Soils are classified based on the soil surveys consolidated for the soil survey geographic database for Monterey County prepared by the National Resources Conservation Service (NRCS, 2014). In the project area, the steep coastal dune slopes have a high potential for erosion. The dune deposits east of the coastline, where the topography is not as steep, are considered to have a moderate potential for erosion. The soil erosion potential is typically reduced or eliminated once the soil is graded and covered with concrete, structures, asphalt, vegetation, or other slope protection measures are implemented.

[16] A geologic fault in which the hanging wall (the upper block) has moved upward relative to the footwall (the lower block). Reverse faults occur where two blocks of rock are forced together by compression.

Sea Level Rise and Coastal Erosion

Monterey Bay is a large, lowland coastal embayment, with rocky headlands at the north and south and a sweeping arc of sandy, dominantly dune- and cliff-backed shoreline in between. The shoreline of south Monterey Bay (from the Salinas River south to Del Monte Beach in the city of Monterey) includes an 11-mile stretch of continuous sandy beach that is wider at the southern end than at the northern end. The morphology of beaches in this region varies from season to season, with beaches generally being wider and gently sloping in summer and narrower and steeper in winter. The dunes at the back edge of the beach have an average height of 34 feet but can be as high as 151 feet. Some of the dune surfaces that are not directly exposed to wave energy are vegetated, indicating that the dunes are stabilized in some areas.

The topographic surface, including the dunes, beach, and undersea nearshore areas, can be affected by coastal retreat in four ways.

1. **Long-term erosion.** Over time, the dunes and surrounding area have been and will continue to erode as a result of rain and wind.

2. **Sea level rise.** As sea level rises, the shoreline area affected by wave action will migrate inland and will erode the sand dunes. As a result, the dunes and the shoreline will also retreat inland. In addition, the surge from storm events, discussed below, would push further inland.

3. **Storm events.** Storm events also erode sand from the coastal dunes and shoreline areas. Typically, a storm event moves sand out to sea during the event. The strongest of these events are referred to as the 100-year storm event. Similar to the 100-year flood event, the 100-year storm event is the storm that has a 1 percent chance of occurring in a given year. After the storm passes and over the following year, some and possibly most of the sand re-accumulates along the shore and dune areas. However, at the time of that storm event, any structures present within that scoured area would be exposed. For example, a winter storm surge in early March 2016 exposed the buried MRWPCA ocean outfall pipe. Up to 15 feet of scour was observed around the exposed section of the outfall. The last time the outfall pipe was exposed was in 1997. The storm surge also broke the discharge pipe from the Test Slant Well to the outfall.

4. **Rip embayments.** Rip embayments are caused by the erosive action of cross-shore rip currents and affect an area from just offshore to the toe of the sand dunes closest to the shoreline. As this sand is removed, sand from the shore area and ultimately the dunes can erode seaward to fill in the void. Rip embayments tend to be stronger in the winter and weaker in the summer. After the rip embayment passes by a particular shoreline location, some of the sand re-accumulates.

The northwestern Marina area, including the proposed location of the subsurface slant wells, is characterized by extensive sand dunes. These dunes vary in height and are composed entirely of unconsolidated, highly erodible sand. The erosion of dunes by waves occurs more often in winter months, when the active beach area is narrow and storms are stronger and more frequent. Erosion in this region is highly episodic, occurring in steps when high tides coincide with large, storm-generated waves. The steep to near-vertical bluffs in the vicinity of the CEMEX active mining area indicate that rapid erosion has taken place in this area.

The existence of wide sandy beaches throughout the area, as well as the flanking sand dunes, indicate that past sand supply was in excess of sand loss. However, the shoreline of southern Monterey Bay has been retreating for a number of years. Dam impoundments have decreased the historical sediment yield of the Salinas River, thus reducing a major source of sediment for the beaches in the Marina area. The Nacimiento Dam (completed in 1961) and the San Antonio Dam (completed in 1965) have impounded about 15 percent of the Salinas River Watershed, thereby trapping sand that would have been delivered to the beach, as well as reducing peak flow rates that transport the bulk of the river sediments. Additionally, sand mining in the region has increased sediment and sand loss and has contributed to disequilibrium, thus increasing the rate of coastal retreat in the southern Monterey Bay south of the Salinas River (Thornton et. al., 2006).

As discussed in the *Analysis of Historic and Future Coastal Erosion with Sea Level Rise* (ESA, 2014), various studies conducted over the period between 1930 to 2006 indicate sea level is rising at a rate of approximately 5.3 to 7.6 inches per century. With sea level rise, the coastline is expected to retreat inland and has the potential to intersect project components if they are constructed within the extent of that retreat.

Corrosive or Expansive Soils

Table 4.2-4 identifies the soil types and soil properties at proposed facility locations. The subsurface slant wells would be constructed in subsurface dune sands, which are not considered soils because the sand lacks sufficient humus; therefore, information regarding soil properties at the subsurface slant well site is not included below. Potential impacts related to problematic soil conditions include corrosivity and expansion (linear extensibility or shrink-swell potential). Drainage pertains to soils that are unable to adequately percolate or shed surface water away from a development site, leading to flooding and water-related damage. Poorly drained soils can increase the risks of corrosion, linear extensibility, differential settlement, and other water-related issues.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical actions that corrode or weaken concrete or uncoated steel. The rate of concrete corrosion is based mainly on the sulfate, sodium, and chloride content, texture, moisture content, and acidity of the soil. The rate of uncoated-steel corrosion is related to such factors as the moisture, particle-size distribution, acidity, and electrical conductivity of the soil. Steel installations that intersect soil boundaries or soil layers are more susceptible to corrosion than the steel installations that are entirely within one kind of soil or within one soil layer. The risk of corrosion is expressed as low, moderate, or high.

Linear extensibility or shrink-swell potential refers to the change in volume of soil as moisture content is increased or decreased between a moist and dry state. The volume change is reported as a percent change for the whole soil. The amount and type of clay minerals in the soil influence changes in soil volume.

The soil properties listed above are general properties for soil types. A site-specific geotechnical investigation was conducted at the proposed desalination plant (PCE, 2014). Soil samples were analyzed for soil resistivity, chloride, sulfate, and pH. The results indicate the soil to be non-corrosive.

TABLE 4.2-4
SUMMARY OF GENERAL SOIL PROPERTIES

Proposed Project Component	Soil	Drainage	Concrete Corrosion Potential	Unprotected Steel Corrosion Potential	Linear Extensibility[a]
MPWSP Desalination Plant, and Most Pipelines[b]	Oceano Loamy[c] Sand (OaD) or similar	Excessively	Moderate	Moderate	Low (1.5%)
Terminal Reservoir and ASR Pump Station	Baywood Sand (BbC)	Somewhat excessively	Moderate	High	Low (1.5%)
Castroville Pipeline	Pacheco Clay Loam	Poorly Drained	Low	High	Moderate (3 to 6%)
ASR Injection/ Extraction Wells and Pipelines[b,d]	Oceano Loamy Sand (OaD)	Excessively	Moderate	Moderate	Low (1.5%)
Carmel Valley Pump Station	Dissected xerorthents[e]	Excessively	Low	Low	Low to moderate (1.5 to 4.5%)
Main System–Hidden Hills Inter-connection Improvements	Santa Ynez Fine Sandy Loam (ShE)	Moderately well	Low	Low	Moderate (4.5%)
Ryan Ranch–Bishop Interconnection Improvements	Santa Ynez Fine Sandy Loam (ShE); Narlon Loamy Fine Sand (NcC); and badland weathered bedrock (Ba)	Moderately well to somewhat poorly	Low (ShE and Ba); High (NcC)	High (NcC); no data for other units	Moderate to high (4.5 to 7%)

NOTES:
[a] Also known as shrink-swell potential or expansion potential.
[b] All pipelines except the ASR Conveyance Pipelines, the ASR Pump-to-Waste Pipeline, and the ASR Recirculation Pipeline.
[c] Loamy soils are composed of sand, silt, and clay in relatively even concentrations (about 40-40-20 percent concentration, respectively). Loam soils generally contain more nutrients and humus than sandy soils, have better drainage and infiltration of water and air than silty soils, and are easier to till than clay soils.
[d] These are the ASR Conveyance Pipelines and the ASR Pump-to-Waste Pipeline.
[e] Dissected xerorthents are deposits located on alluvial fans and terraces with steeper slopes such that the alluvial deposits do not have sufficient time to develop into soils.

SOURCE: NRCS, 2014.

4.2.1.4 Seismic Hazards

Seismic hazards are generally classified into two categories: primary seismic hazards (surface fault rupture and groundshaking) and secondary seismic hazards (liquefaction and other types of seismically induced ground failure, along with seismically induced landslides).

Surface Fault Rupture

Seismically induced ground rupture is defined as the physical displacement of surface deposits in response to an earthquake's seismic waves. The magnitude, sense, and nature of fault rupture can vary for different faults or even along different strands of the same fault. Although future earthquakes could occur anywhere along the length of an active fault, only regional strike-slip earthquakes of magnitude 6.0 or greater are likely to be associated with significant surface fault rupture and offset (CDMG and USGS, 1996). It is also important to note that unmapped

subsurface fault traces could experience unexpected and unpredictable earthquake activity and fault rupture.

Ground rupture is considered more likely along active faults, which are referenced above in **Figure 4.2-4** and **Table 4.2-3** and described in Section 4.2.1.2. The highest potential for surface faulting is along existing fault traces that have had Holocene displacement. The closest known active faults with historical earthquake events are the San Gregorio, Zayante-Vergales, and San Andreas at 5, 11, and 15 miles, respectively, from components of the proposed project. The onshore portions of potentially active faults in the Monterey-Tularcitos and the Reliz-Rinconada Fault Zones pass beneath the proposed new Transmission Main. These potentially active faults or segments of faults are not zoned under the Alquist-Priolo Earthquake Fault Zone (see Section 4.2.2, Regulatory Framework, below).

Seismic Groundshaking

As discussed above (Section 4.2.1.2), the WGCEP estimated that a major earthquake has a 72 percent chance of affecting the project vicinity in the next 30 years and would produce strong groundshaking throughout the region (WGCEP, 2015a, b). Earthquakes on active or potentially active faults, depending on magnitude and distance from the project area, could produce a range of groundshaking intensities at the project area. Historically, earthquakes have caused strong groundshaking and damage in the San Francisco Bay Area. However, disregarding local variations in ground conditions, the intensity of shaking at different locations within the area can generally be expected to decrease with distance from an earthquake source.

The primary tool that seismologists use to describe groundshaking hazard is a probabilistic seismic hazard assessment (PSHA). The PSHA for the State of California takes into consideration the range of possible earthquake sources (including such worst-case scenarios as described above) and estimates their characteristic magnitudes to generate a probability map for groundshaking. The PSHA maps depict PGA value of that have a 10 percent probability of being exceeded in 50 years (i.e., a 1 in 475 chance of occurring each year). Use of this probability level allows engineers to design structures to withstand ground motions that have a 90 percent chance of *not* occurring in the next 50 year interval, thus making buildings safer than if they were designed only for the ground motions that are expected within the next 50 years.

In 2008, the USGS and the CGS updated the model by introducing new parameters and updated fault locations (CGS, 2008a). **Table 4.2-5** summarizes the estimated PGAs (10 percent probability of being exceeded in 50 years) at various project components.

As shown on Figure 4.2-1, the majority of the project components would be constructed on fill or alluvial materials; PGAs for fill and alluvial materials were estimated to range from 0.361 g to 0.418 g. The Main System-Hidden Hills Interconnection Improvements would be located in a largely bedrock area with a PGA of 0.320. Using American Society of Civil Engineers (ASCE) Standard 7-10 design criteria, the geotechnical investigation for the desalination plant estimated the PGA could be as high as 0.562 (Zinn, 2014). As listed in **Table 4.2-2**, the estimated range of PGAs equates to Modified Mercalli groundshaking intensities of VII (strong) to VIII (very strong).

TABLE 4.2-5
SUMMARY OF ESTIMATED PEAK GROUND ACCELERATIONS AT PROPOSED FACILITY LOCATIONS

Proposed Project Component	PGA
Subsurface slant wells	0.390 g
MPWSP Desalination Plant	CGS estimate: 0.398 g Zinn calculation; 0.562 g
Northern terminus of Castroville Pipeline	0.418 g
ASR-5 and ASR-6 Wells	0.371 g
Terminal Reservoir	0.366 g
Ryan Ranch-Bishop Interconnection Improvements	0.362 g
Main System-Hidden Hills Interconnection Improvements	0.320 g
Carmel Valley Pump Station	0.361 g

NOTE: g = percentage of the acceleration due to gravity

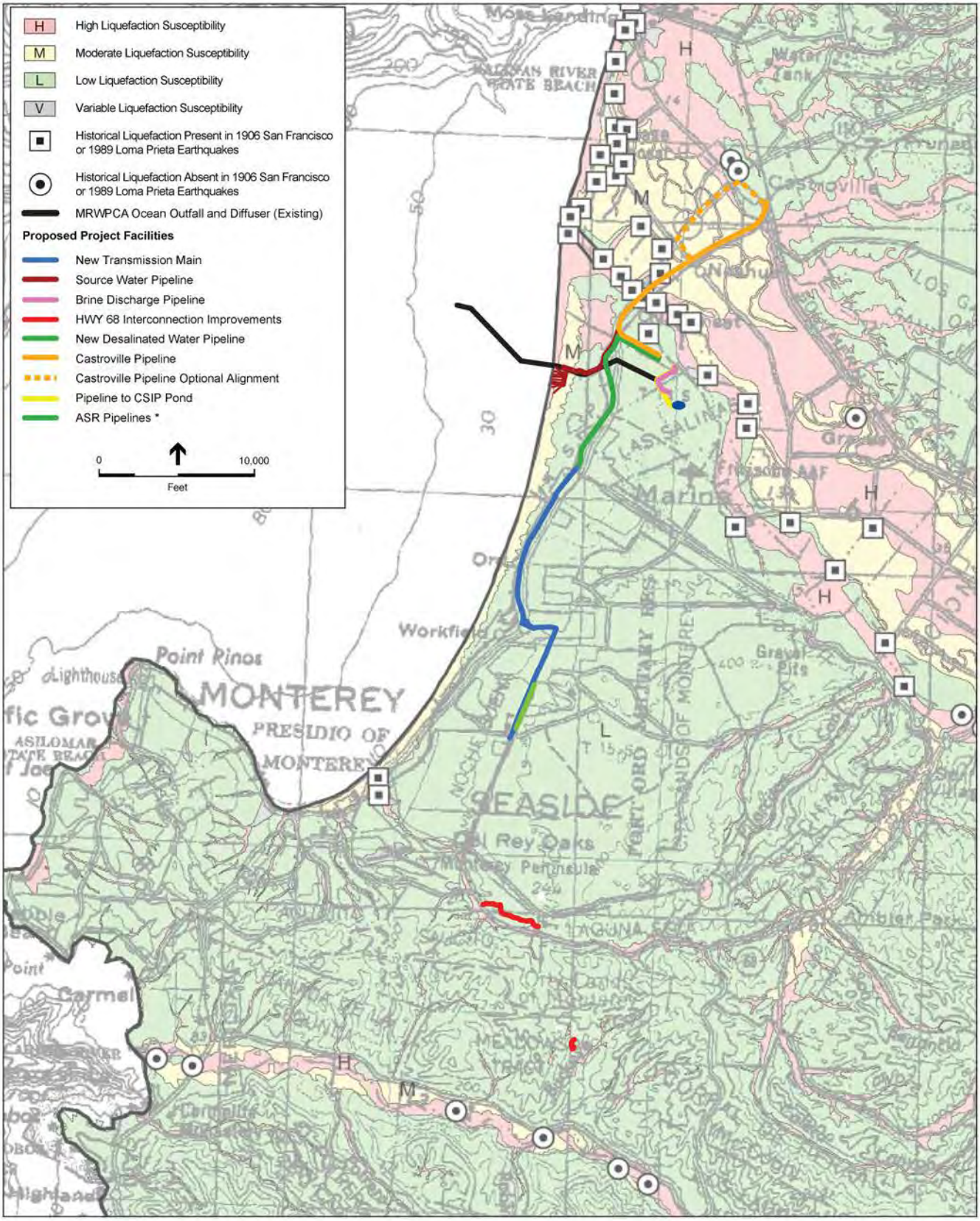
SOURCE: CGS, 2008b; Zinn, 2014

Liquefaction and Lateral Spreading

Liquefaction is the rapid loss of shear strength experienced in saturated, predominantly granular soils below the groundwater level during strong earthquake groundshaking and occurs due to an increase in pore water pressure. Liquefaction-induced lateral spreading is defined as the finite, lateral displacement of gently sloping ground as a result of pore-pressure buildup or liquefaction in a shallow underlying deposit during an earthquake (VT, 2013). The occurrence of this phenomenon is dependent on many complex factors, including the intensity and duration of groundshaking, particle-size distribution, and density of the soil.

The potential damaging effects of liquefaction include differential settlement, loss of ground support for foundations, ground cracking, heaving and cracking of structure slabs due to sand boiling, and buckling of deep foundations due to ground settlement. Dynamic settlement (i.e., pronounced consolidation and settlement from seismic shaking) may also occur in loose, dry sands above the water table, resulting in settlement of and possible damage to overlying structures. In general, a relatively high potential for liquefaction exists in loose, sandy soils that are within 50 feet of the ground surface and are saturated (below the groundwater table). Lateral spreading can move blocks of soil, placing strain on buried pipelines that can lead to leaks or pipe failure (VT, 2013).

Figure 4.2-5 presents the relative liquefaction hazard potential in Monterey County in the vicinity of the proposed project, with liquefaction susceptibility designations (high, moderate, low, and variable) adapted by Ninyo & Moore (2005) from the *Monterey County General Plan*. Sites with a designation of “low” are considered to have the lowest potential for liquefaction hazards, and sites with a designation of “high” are considered to have the highest potential for liquefaction because of the soil type (sand) and probable groundwater depths.



SOURCE: Ninyo & Moore, 2005

205335.01 Monterey Peninsula Water Supply Project

Figure 4.2-5

Liquefaction Potential

Some locations in the project area, including the floodplain of the Salinas River and other smaller drainage areas, have a moderate to high liquefaction potential. During the 1989 Loma Prieta earthquake, liquefaction caused settlement and ground cracking in the Moss Landing area about 2 miles north of the proposed MPWSP Desalination Plant site, damaging roads and the approach to the bridge linking Moss Landing to the mainland. Over 30 separate locations of historical liquefaction incidents have been documented in the project vicinity, the majority of which were in the northern portion of the project area near the Salinas River. The proposed Castroville Pipeline crosses into the larger Salinas floodplain area, passing through an area of moderate to high potential for liquefaction. The proposed location for the Carmel Valley Pump Station is mapped as having a moderate to high liquefaction potential. The areas mapped with a moderate to high potential for liquefaction are also in drainage areas where the water table could be seasonally higher during the rainy season, which contributes to the increased potential.

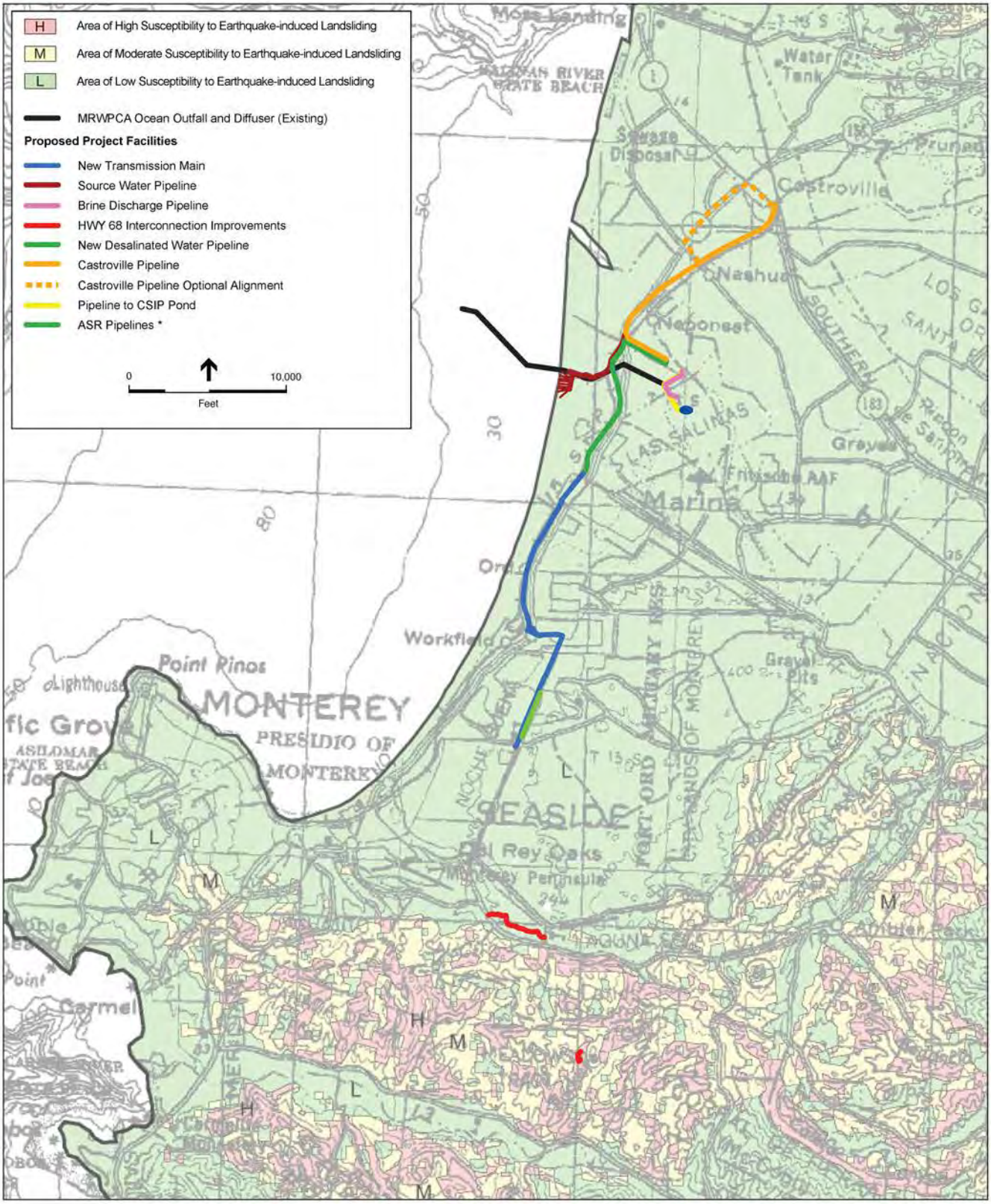
Earthquake-Induced Settlement

Settlement of the ground surface can be accelerated and accentuated by earthquakes. During an earthquake, settlement can occur as a result of the relatively rapid rearrangement, compaction, and settling of subsurface materials, particularly loose, noncompacted, and variable sandy sediments (PCE, 2014). Settlement can occur both uniformly and differentially (i.e., where adjoining areas settle at different rates). Areas are susceptible to differential settlement if underlain by compressible sediments, such as poorly engineered artificial fill. Earthquake-induced settlement could occur in the event of an earthquake and is a potential seismic hazard discussed further in Section 4.2.5, Direct and Indirect Effects of the Proposed Project.

Landslides and Ground Cracking

Earthquake motions can induce substantial stresses on slopes and can cause earthquake-induced landslides or ground cracking if the slope fails. Earthquake-induced landslides can occur in areas with steep slopes that are susceptible to strong ground motion during an earthquake. The 1989 Loma Prieta earthquake on the San Andreas Fault triggered thousands of landslides over an area of 5,400 square miles. **Figure 4.2-6** presents the seismically-induced landslide hazard potential in the project vicinity based on a map from the *Monterey County General Plan*, as adapted by Ninyo & Moore (2005). The figure characterizes landslide susceptibility as high, moderate, and low. Because the steepness of topography is a major factor in the potential for landslides, **Figure 4.2-6** provides insight into areas prone to non-seismically induced landslides. Non-seismically induced landslide can be caused by the force of gravity on steep unstable slopes, by construction activities that disturb soil conditions and create unstable slopes, and by water leaks or breaks in pipelines or pumps.

Potential landslide hazards are present in the hillside terrain on and east of the Monterey Peninsula. All but one of the project components would be located in relatively flat to gently sloping topography and would therefore have a low susceptibility to landslides; the proposed Main System-Hidden Hills Interconnection Improvements are located in an area mapped as having a moderate to high susceptibility to landslides.



SOURCE: Ninyo & Moore, 2005

205335.01 Monterey Peninsula Water Supply Project

Figure 4.2-6

Landslide Hazard Map

4.2.2 Regulatory Framework

This section provides an overview of federal, state, and local environmental laws, policies, plans, regulations, and/or guidelines (hereafter referred to generally as "regulatory requirements") relevant to geology, soils, and seismicity. 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 4.2.5, Direct and Indirect Effects of the Proposed Project, below, where the potential inconsistency is addressed in more detail. Where applicable, the discussion in Section 4.2.5 identifies feasible mitigation that would resolve or minimize the potential inconsistency.

4.2.2.1 Federal Regulations

Federal Occupational Safety and Health Administration Regulations

The Occupational Safety and Health Administration's (OSHA) Excavation and Trenching standard, Title 29 of the Code of Federal Regulations (CFR), Part 1926.650, covers requirements for excavation and trenching operations. OSHA requires that all excavations in which employees could potentially be exposed to cave-ins be protected by sloping or benching the sides of the excavation, supporting the sides of the excavation, or placing a shield between the side of the excavation and the work area. These regulations apply to the project because of the proposed construction and trenching activities. All contractors are required to comply with OSHA regulations, which would make the proposed project consistent with OSHA.

4.2.2.2 State Regulations

California Coastal Act

The California Coastal Act (Public Resources Code Section 30000 et seq.) provides for the long-term management of lands within California's coastal zone boundary. Of primary relevance to geology, soils, and seismicity are Coastal Act policies concerning construction altering natural shorelines and minimizing risk to life and property in areas of high geologic, flood, and fire hazard. A preliminary assessment of project consistency with these priorities is provided below. Final determinations regarding project consistency are reserved for the Coastal Commission. MPWSP subsurface slant wells would be potentially inconsistent with Coastal Act policies. The slant wells would be located along the coast within an area that is subject to erosion which, when considered in the context of sea level rise, will ultimately cause shoreline retreat to the location of the above-ground portions of the MPWSP subsurface slant wells. Exposure of these project components on the beach could alter natural shoreline processes, which would be inconsistent with Coastal Act policies. Similarly, such exposure would subject these project components to increased risk of damage due to flood and wave action, and contribute to beach erosion, which would also be inconsistent with Coastal Act policies. These issues are discussed further in Impact 4.2-10.

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to protect structures for human occupancy from the hazard of surface faulting. In accordance with the Act, the State Geologist has established regulatory zones—called earthquake fault zones—around the surface traces of active faults, and has published maps showing these zones. Buildings for human occupancy cannot be constructed across surface traces of faults that are determined to be active. Because many active faults are complex and consist of more than one branch that may experience ground surface rupture, earthquake fault zones extend approximately 200 to 500 feet on either side of the mapped fault trace. Although a number of faults in the area are known to be active, as discussed above in Section 4.2.1.2, none of the faults passing beneath project components have been formally mapped by the state as being within an Alquist-Priolo Earthquake Fault Zone. The Alquist-Priolo Earthquake Fault Zoning Act does not apply to the proposed project because the State of California has not zoned under the Alquist-Priolo Act, the active and potentially active faults that intersect the project components.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act was passed in 1990 following the Loma Prieta earthquake to reduce threats to public health and safety and to minimize property damage caused by earthquakes. This act requires the State Geologist to delineate various seismic hazard zones, and cities, counties, and other local permitting agencies to regulate certain development projects within these zones. For projects that would locate structures for human occupancy within designated Zones of Required Investigation, the Seismic Hazards Mapping Act requires project applicants to perform a site-specific geotechnical investigation to identify the potential site-specific seismic hazards and corrective measures, as appropriate, prior to receiving building permits. The *CGS Guidelines for Evaluating and Mitigating Seismic Hazards* (Special Publication 117A) provides guidance for evaluating and mitigating seismic hazards (CGS, 2008). The CGS is in the process of producing official maps based on USGS topographic quadrangles, as required by the Act. To date, the CGS has not completed delineations for any of the USGS quadrangles in which project components are proposed.

California Building Code

The California Building Code (CBC), which is codified in Title 24 of the California Code of Regulations, Part 2, was promulgated to safeguard the public health, safety, and general welfare by establishing minimum standards related to structural strength, means of egress to facilities (entering and exiting), and general stability of buildings. The purpose of the CBC is to regulate and control the design, construction, quality of materials, use/occupancy, location, and maintenance of all buildings and structures within its jurisdiction. Title 24 is administered by the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Under State law, all building standards must be centralized in Title 24 or they are not enforceable. The provisions of the CBC apply to the construction, alteration, movement, replacement, location, and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures throughout California.

The 2016 edition of the CBC is based on the 2015 International Building Code (IBC) published by the International Code Council. The code is updated triennially, and the 2016 edition of the CBC was published by the California Building Standards Commission on July 1, 2016, and takes effect starting January 1, 2017. The 2016 CBC contains California amendments based on the American Society of Civil Engineers (ASCE) Minimum Design Standard ASCE/SEI 7-10, *Minimum Design Loads for Buildings and Other Structures*, provides requirements for general structural design and includes means for determining earthquake loads[17] as well as other loads (such as wind loads) for inclusion into building codes. Seismic design provisions of the building code generally prescribe minimum lateral forces applied statically to the structure, combined with the gravity forces of the dead and live loads of the structure, which the structure then must be designed to withstand. The prescribed lateral forces are generally smaller than the actual peak forces that would be associated with a major earthquake. Consequently structures should be able to: (1) resist minor earthquakes without damage, (2) resist moderate earthquakes without structural damage but with some nonstructural damage, and (3) resist major earthquakes without collapse, but with some structural as well as nonstructural damage. Conformance to the current building code recommendations does not constitute any kind of guarantee that significant structural damage would not occur in the event of a maximum magnitude earthquake. However, it is reasonable to expect that a structure designed in-accordance with the seismic requirements of the CBC should not collapse in a major earthquake.

The earthquake design requirements take into account the occupancy category of the structure, site class, soil classifications, and various seismic coefficients, all of which are used to determine a seismic design category (SDC) for a project. The SDC is a classification system that combines the occupancy categories with the level of expected ground motions at the site; SDC ranges from A (very small seismic vulnerability) to E/F (very high seismic vulnerability and near a major fault). Seismic design specifications are determined according to the SDC in accordance with Chapter 16 of the CBC. Chapter 18 of the CBC covers the requirements of geotechnical investigations (Section 1803), excavation, grading, and fills (Section 1804), load-bearing of soils (1806), as well as foundations (Section 1808), shallow foundations (Section 1809), and deep foundations (Section 1810). For Seismic Design Categories D, E, and F, Chapter 18 requires analysis of slope instability, liquefaction, and surface rupture attributable to faulting or lateral spreading, plus an evaluation of lateral pressures on basement and retaining walls, liquefaction and soil strength loss, and lateral movement or reduction in foundation soil-bearing capacity. It also addresses measures to be considered in structural design, which may include ground stabilization, selecting appropriate foundation type and depths, selecting appropriate structural systems to accommodate anticipated displacements, or any combination of these measures. The potential for liquefaction and soil strength loss must be evaluated for site-specific peak ground acceleration magnitudes and source characteristics consistent with the design earthquake ground motions.

[17] A load is the overall force to which a structure is subjected in supporting a weight or mass, or in resisting externally applied forces. Excess load or overloading may cause structural failure.

Chapter 18 also describes analysis of expansive soils and the determination of the depth to groundwater table. Expansive soils are defined in the CBC as follows:

> **1803.5.3 Expansive Soil**. In areas likely to have expansive soil, the building official shall require soil tests to determine where such soils do exist. Soils meeting all four of the following provisions shall be considered expansive, except that tests to show compliance with Items 1,2 and 3 shall not be required if the test prescribed in Item 4 is conducted:
>
> 1. Plasticity index (PI) of 15 or greater, determined in accordance with ASTM D 4318
> 2. More than 10 percent of the soil particles pass a No. 200 sieve (75 micrometers), determined in accordance with ASTM D 422
> 3. More than 10 percent of the soil particles are less than 5 micrometers in size, determined in accordance with ASTM D 422
> 4. Expansion index greater than 20, determined in accordance with ASTM D 4829

The design of the proposed project is required to comply with CBC requirements, which would make the proposed project consistent with the CBC.

California Excavation Notification Requirements

California Code of Regulations Section 4216 requires that construction contractors report a project that involves excavation 48-hours prior to breaking ground. This program allows owners of buried installations to identify and mark the location of its facilities before any nearby excavation projects commence. Adherence to this law by contractors of projects reduces the potential of inadvertent pipeline and utility damage and leaks. All contractors are required to comply with California excavation notification requirements, which would make the proposed project consistent with California excavation notification requirements.

California Occupational Safety and Health Administration Regulations

Occupational safety standards exist in federal and state laws to minimize worker safety risks from both physical and chemical hazards in the workplace. In California, the California Division of Occupational Safety and Health (Cal/OSHA) and the federal OSHA are the agencies responsible for ensuring worker safety in the workplace.

The OSHA Excavation and Trenching standard (29 CFR 1926.650), described above in Section 4.2.2.1, Federal Regulations, covers requirements for excavation and trenching operations, which are among the most hazardous construction activities. OSHA requires that all excavations in which employees could potentially be exposed to cave-ins be protected by sloping or benching the sides of the excavation, supporting the sides of the excavation, or placing a shield between the side of the excavation and the work area. Cal/OSHA is the implementing agency for both state and federal OSHA standards. All contractors are required to comply with OSHA regulations, which would make the proposed project would be consistent with OSHA.

NPDES Construction General Permit

Construction associated with the proposed project would disturb more than one acre of land surface potentially affecting the quality of stormwater discharges into waters of the U.S. The proposed project would therefore be subject to the *NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities* (Order 2009-0009-DWQ, NPDES No. CAS000002, Construction General Permit; as amended by Orders 2010-0014-DWQ and 2012-006-DWQ). The Construction General Permit regulates discharges of pollutants in stormwater associated with construction activity to waters of the U.S. from construction sites that disturb one or more acres of land surface, or that are part of a common plan of development or sale that disturbs more than one acre of land surface. The permit regulates stormwater discharges associated with construction or demolition activities, such as clearing and excavation; construction of buildings; and linear underground projects (LUP), including installation of water pipelines and other utility lines.

Portions of the proposed project would fall under the Type 1 LUP category if the following conditions are met:

a) Construction occurs on unpaved improved roads, including their shoulders or land immediately adjacent to them;

b) The areas disturbed during a single construction day are returned to their preconstruction condition, or to an equivalent condition (i.e., disturbed soils such as those from trench excavation are hauled away, backfilled into the trench, and/or placed in spoils piles and covered with plastic), at the end of that same day;

c) Vegetated areas disturbed by construction activities are stabilized and revegetated at the end of the construction period; and

d) When required, adequate temporary soil stabilization best management practices (BMPs) are installed and maintained until vegetation has reestablished to meet the permit's minimum cover requirements for final stabilization.

The Construction General Permit requires that construction sites be assigned a Risk Level of 1 (low), 2 (medium), or 3 (high), based both on the sediment transport risk at the site and the receiving waters risk during periods of soil exposure (e.g., grading and site stabilization). The sediment risk level reflects the relative amount of sediment that could potentially be discharged to receiving water bodies and is based on the nature of the construction activities and the location of the site relative to receiving water bodies. The receiving waters risk level reflects the risk to the receiving waters from the sediment discharge. The Construction General Permit contains requirements for Risk Levels 1, 2 and 3, and the LUP Type 1, 2, and 3 categories. If a project does not meet any one or more of the aforementioned conditions under the Type 1 LUP category, depending on its location within a sensitive watershed area or floodplain, the level of receiving water risk could be considered low, medium, or high. Depending on the Risk Level, the construction projects could be subject to the following Construction General Permit requirements:

- Effluent standards
- Good site management "housekeeping"
- Non-stormwater management
- Erosion and sediment controls
- Runon and runoff controls
- Inspection, maintenance, and repair
- Monitoring and reporting requirements

The Construction General Permit requires the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP) that includes specific BMPs designed to prevent pollutants from contacting stormwater and keep all products of erosion from moving offsite into receiving waters. The SWPPP BMPs are intended to protect surface water quality by preventing the offsite migration of eroded soil and construction-related pollutants from the construction area. Routine inspection of all BMPs is required under the provisions of the Construction General Permit. In addition, the SWPPP is required to contain a visual monitoring program, a chemical monitoring program for non-visible pollutants, and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment.

The SWPPP must be prepared before the construction begins. The SWPPP must contain a site map(s) that delineates the construction work area, existing and proposed buildings, parcel boundaries, roadways, stormwater collection and discharge points, general topography both before and after construction, and drainage patterns across the project area. The SWPPP must list BMPs and the placement of those BMPs that the applicant would use to protect stormwater runoff. Examples of typical construction BMPs include scheduling or limiting certain activities to dry periods, installing sediment barriers such as silt fence and fiber rolls, and maintaining equipment and vehicles used for construction. Non-stormwater management measures include installing specific discharge controls during certain activities, such as paving operations and vehicle and equipment washing and fueling. The Construction General Permit also sets post-construction standards (i.e., implementation of BMPs to reduce pollutants in stormwater discharges from the site following construction).

In the project area, the Construction General Permit is implemented and enforced by the Central Coast RWQCB, which administers the stormwater permitting program. Dischargers are required to electronically submit a notice of intent (NOI) and permit registration documents (PRDs) in order to obtain coverage under this Construction General Permit. Dischargers are responsible for notifying the RWQCB of violations or incidents of non-compliance, as well as for submitting annual reports identifying deficiencies of the BMPs and how the deficiencies were corrected.

The permit contains several additional compliance items, including: (1) additional mandatory BMPs to reduce erosion and sedimentation, which may include vegetated swales, setbacks and buffers, rooftop and impervious surface disconnection, bioretention cells, rain gardens, rain cisterns, implementation of pollution/sediment/spill control plans, training, and other structural and nonstructural actions; (2) sampling and monitoring for non-visible pollutants; (3) effluent monitoring and annual compliance reports; (4) development and adherence to a Rain Event Action Plan; (5) requirements for post-construction; (6) numeric action levels and effluent limits for pH and turbidity; (7) monitoring of soil characteristics onsite; and (8) mandatory training under a specific curriculum.

The proposed project would be required to comply with the permit requirements to control stormwater discharges from the construction sites. To obtain coverage under the Construction General Permit, CalAm would be required to electronically file the NOI along with the PRDs, the SWPPP, risk assessment, site map, signed certification statement, and other compliance-related documents required by the Construction General Permit using the Stormwater Multiple Applications and Report Tracking Systems, along with the appropriate permit fee to State Water Resources Control Board (SWRCB). The risk assessment and SWPPP must be prepared by a state-qualified SWPPP Developer and implementation of the SWPPP must be overseen by a state-qualified SWPPP Practitioner. The proposed project would be required to obtain coverage under the Construction General Permit and therefore the proposed project would be consistent.

4.2.2.3 Applicable Land Use Plans, Policies, and Regulations

Table 4.2-6 summarizes the pertinent regional and local land use plans, policies, and regulations that were adopted for the purpose of avoiding or mitigating an environmental effect and indicates project consistency with such plans, policies, and regulations. Where the analysis concludes the proposed project is consistent with the applicable plan, policy, or regulation, the finding is noted and no further discussion is provided. Where the analysis concludes the proposed project is potentially inconsistent with the applicable plan, policy, or regulation, the reader is referred to the specific impact discussion in Section 4.2.5, Direct and Indirect Effects of the Project (Proposed Action). In that subsection, the significance of the potential conflict is evaluated. Where the effect of the potential conflict would be significant, feasible mitigation is identified to resolve or minimize that conflict.

TABLE 4.2-6
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO GEOLOGY, SOILS, AND SEISMICITY

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 area)	City of Marina General Plan	Community Design and Development	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 4.99:*** New development shall be permitted in areas of high seismic risk only when adequate engineering and design measures can be implemented in accordance with a geotechnical investigation and report.	This policy is intended to reduce risks to people and property associated with seismic hazards.	Consistent:. As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports. Water conveyance pipelines would be constructed using standards from the American Water Works Association.
City of Marina (coastal zone & inland area)	City of Marina General Plan	Community Design and Development	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 4.102.1:*** Ensure that critical or sensitive facilities, e.g., hospitals, fire and police stations, schools, major transportation links, high-occupancy structures, emergency communication facilities, utility lines, and sites containing or storing hazardous materials, are located, designed and operated to maximize their ability to remain functional after the expected or maximum credible event on any of the local active fault systems. Critical facilities shall not be located in areas of high to very high seismic shaking hazard.	This policy is intended to ensure that emergency or vital public facilities are able to withstand a major seismic event.	Consistent: As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes. Water conveyance pipelines would be constructed using standards from the American Water Works Association.
City of Marina (coastal zone & inland area)	City of Marina General Plan	Community Design and Development	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 4.102.2:*** Require that new development be sited and designed to conform to site topography and to minimize grading wherever possible. Recommendations to developers as to how to mitigate geologic or seismic hazards should include mention of the need to avoid massive grading or excavation or structures that might require substantial alteration of natural landforms.	This policy is intended to minimize topographic alteration that could increase risks of geologic or seismic hazards.	Consistent: As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes. Water conveyance pipelines would be constructed using standards from the American Water Works Association.
City of Marina (coastal zone & inland area)	City of Marina General Plan	Community Design and Development	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 4.102.4:*** Where new development is proposed within 300 feet of active dune fields, require that the geotechnical report include an assessment of dune migration rates and recommend appropriate setbacks.	This policy is intended to ensure that development would neither contribute to dune erosion nor encroach on migrating dunes.	Potentially Inconsistent: The slant wells would be located along the coast within an active dune area that will over time be eroded by sea level rise. This issue is addressed in **Impact 4.2-10**.
City of Marina (coastal zone & inland area)	City of Marina General Plan	Community Design and Development	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 4.124.1:*** The City shall continue to require erosion-control and landscape plans for all new subdivisions or major projects on sites with potentially high erosion potential. Such plans should be prepared by a licensed civil engineer or other appropriately certified professional and approved by the City Public Works Director prior to issuance of a grading permit. All erosion control plans shall incorporate Best Management Practices to protect water quality and minimize water quality impacts and shall include a schedule for the completion of erosion- and sediment-control structures, which ensures that all such erosion-control structures are in place by mid-October of the year that construction begins. Site monitoring by the applicant's erosion-control specialist should be undertaken, and a follow-up report should be prepared that documents the progress and/or completion of required erosion-control measures both during and after construction is completed.	This policy is intended to minimize new development soil erosion and associated water quality impacts.	Consistent: As discussed in the Regulatory Framework, the project would be required to comply with the Construction General Permit that requires the implementation of a SWPPP that would reduce and control erosion, and the project components would be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports.
City of Marina (coastal zone)	City of Marina Local Coastal Program Land Use Plan	Planning Guidelines, Geotechnical	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Geotechnical:*** ● Structural development shall not be allowed on the ocean-side of the dunes, in the area subject to wave erosion in the next 50 years, or in the tsunami run-up zone. The only exception to this would be essential support facilities to a coastally dependent industry, and in these areas the City will not undertake any liability for property damage due to hazards. ● Because of the fragile character of the dune vegetation, new development in this area shall be restricted to already-disturbed areas. Development in areas where the natural dune remains shall not alter the basic configuration of the natural dune landform, and shall provide for site reclamation. ● To reduce wind erosion, disturbed areas not being actively used by coastal dependent industries should be revegetated with native plants. Revegetation will be required of all new development on the dunes. ● Before development is permitted in the Coastal Zone, a geotechnical report appropriate to the specific proposal shall be prepared for that development in the dunes or in the vicinity of any vernal pond. The report shall include at least geologic and seismic stability, liquefaction potential, identification of an appropriate hazard setback to protect the economic life of structures, and specific recommendations on drainage, irrigation and mitigation of identified problems.	This policy is intended to protect life and property from wave erosion, wind erosion, tsunami inundation, and shaking from earthquakes.	Potentially Inconsistent: As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes. However, the construction of the slant wells and Source Water Pipeline could affect dune vegetation. This issue is addressed in Impact 4.2-1. In addition, the slant wells would be located along the coast within an active dune area that will over time be eroded by sea level rise. This issue is addressed in **Impact 4.2-10**.

TABLE 4.2-6 (Continued)
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO GEOLOGY, SOILS, AND SEISMICITY

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 Dunes State Park	Fort Ord Dunes State Park General Plan and Environmental Impact Report	Physical Resources	New Transmission Main	**GEO-1:** Exclude construction of new facilities and permanent structures in areas expected to be subject to coastal erosion within 100 years of construction (a maximum of approximately 700 feet). Exceptions may be allowed for roads, trails, and other facilities that may be considered expendable. Existing facilities may remain in use subject to periodic health and safety inspections.	This policy is intended to protect new development from coastal erosion.	Consistent: The new Transmission Main would not be located within the area anticipated to be subject to coastal erosion over the next 100 years.
City of Seaside (coastal zone & inland area)	Seaside General Plan	Safety	New Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, ASR Pump-to-Waste Pipeline, and Terminal Reservoir	***Policy S.1-1:*** Reduce the risk of impacts from seismic and geologic hazards. *Implementation Plan S-1.1.1: CEQA:* Assess development proposals for potential seismic and geologic hazards pursuant to the California Environmental Quality Act (CEQA). Require studies of soil and geologic conditions by state licensed Engineering Geologists and Civil Engineers where appropriate. When potential geologic impacts are identified, require project applicants to mitigate the impacts per the recommendations contained within the soil and geologic studies. If substantial geologic/seismic hazards cannot be mitigated, require the development to be relocated or redesigned to avoid the significant hazards. *Implementation Plan S-1.1.2: Building Codes.* As new versions of building and construction codes are released, adopt and enforce the most recent codes. Specifically, to minimize damage from earthquakes and other geologic activity, implement the most recent State and seismic requirements for structural design of new development and redevelopment.	This policy is intended to protect people and property from seismic and geologic hazards.	Consistent: The EIR/EIS assesses seismic and geologic hazards and identifies mitigation measures. As discussed in the Regulatory Framework, project components must be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports. Water conveyance pipelines would be constructed using standards from the American Water Works Association.
City of Seaside	Seaside Municipal Code	Title 15 Buildings and Construction	New Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, ASR Pump-to-Waste Pipeline, and Terminal Reservoir	***Chapter 15.32 Standards to Control Excavation, Grading, Clearing and Erosion:*** When required by the city engineer, each application for a permit shall be accompanied by two sets of supporting data consisting of a soil and/or civil engineering report and/or engineering geology report, and/or any other reports necessary. B. The civil engineering report shall include hydrological calculations of runoff for ten-year and one-hundred year storm frequencies; conclusions and recommendations for adequate erosion control and grading procedures, comparison of runoff without and with project; design criteria for corrective measures, including the existing and/or required safe storm drainage capacity outlet of channels both onsite and offsite; and opinions and recommendations covering adequacy of the site to be developed by the proposed grading. The City shall require developers to prepare and implement erosion control plans prepared by a registered civil engineer or an approved erosion controls specialist" means a person who has a certificate of qualifications and is recognized by the city engineer as capable of preparing erosion control and grading plans and shall be subject to the approval of the City Engineer. The erosion component of the plan must at least meet the requirements of Storm Water Pollution Prevention Plans (SWPPPs) required by the California State Water Resources Control Board.	These standards are intended to minimize erosion resulting from excavation, grading, and clearing.	Consistent: As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports.
County of Monterey (coastal zone & inland area)	Monterey County Code	Chapter 16.08 – Grading	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipelines, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Chapter 16.08:*** The Monterey County Grading Ordinance generally regulates grading activities that involve more than 100 cubic yards of excavation and fill. Minor fills and excavations ("cuts") of less than 100 cubic yards that are not intended to provide foundations for structures, or that are very shallow and nearly flat, are typically exempt from the ordinance, as are shallow footings for small structures. Submittal requirements for a County grading permit include site plans, existing contours and proposed contour changes, an estimate of the volume of earth to be moved, and geotechnical (soils) reports. Grading activities that involve over 5,000 cubic yards of soil must include detailed plans signed by a state-licensed civil engineer. Grading is not allowed to obstruct storm drainage or cause siltation of a waterway. All grading requires implementation of temporary and permanent erosion-control measures. Grading within 50 feet of a watercourse, or within 200 feet of a river, is regulated in the Monterey County Zoning Ordinance floodplain regulations. The Monterey County Grading Ordinance requires a soil engineering and engineering geology report (Section 16.08.110: Permit – Soil Engineering and Engineering Geology Reports [Ordinance 4029, 1999; Ordinance 2534, Section 110, 1979], unless waived by the Building Official because information of record is available showing such data is not needed. The soil engineering and engineering geology report must include the following:	This ordinance is intended to minimize soil erosion, and loss of topsoil, and associated environmental effects.	Consistent: As discussed in the Regulatory Framework, project components must be constructed in compliance with the California Building Code, county codes, and city codes, which require soils and geologic reports and grading permits. The Construction General Permit that requires the implementation of a SWPPP that would reduce and control erosion. Water conveyance pipelines would be constructed using standards from the American Water Works Association.

TABLE 4.2-6 (Continued)
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO GEOLOGY, SOILS, AND SEISMICITY

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
County of Monterey (coastal zone & inland area) (cont.)				a. Data regarding the properties, distribution and strength of existing soils b. Recommendations for grading and corrective measures for project design, as appropriate c. An adequate description of the geology of the site and potential hazards. The recommendations from the soil engineering and engineering geology report must be incorporated in the grading plans and construction specifications.		
County of Monterey (coastal zone & inland area)	Monterey County Code	Chapter 16.12 – Erosion Control	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipelines, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Section 16.12:*** The Monterey County Erosion Control Ordinance requires project applicants to implement runoff control measures and avoid creek disturbance; regulates land clearing; and prohibits grading activities during winter. The ordinance generally prohibits development on slopes greater than 30 percent. The Monterey County Director of Building Inspection enforces the ordinance, under which applicants must complete an erosion control plan.	This section is intended to minimize erosion and soil loss, and associated water quality impacts, among other environmental effects.	Consistent: As discussed in the Regulatory Framework, the project would be required to comply with the Construction General Permit that requires the implementation of a SWPPP that would reduce and control erosion.
County of Monterey (coastal zone & inland area)	Monterey County General Plan	Conservation and Open Space	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipelines, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy OS-3.1:*** Best Management Practices (BMPs) to prevent and repair erosion damage shall be established and enforced.	This policy is intended to minimize erosion and soil loss, and associated water quality impacts, among other environmental effects.	Consistent: As discussed in the Regulatory Framework, the project would be required to comply with the Construction General Permit that requires the implementation of a SWPPP that would reduce and control erosion.
County of Monterey (coastal zone & inland area)	Monterey County General Plan	Conservation and Open Space	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipelines, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy OS-3.3:*** Criteria for studies to evaluate and address, through appropriate designs and BMPs, geologic and hydrologic constraints and hazards conditions, such as slope and soil instability, moderate and high erosion hazards, and drainage, water quality, and stream stability problems created by increased stormwater runoff, shall be established for new development and changes in land use designations.	This policy is intended to minimize development-related impacts on people, property, and water quality associated with hydrologic and geologic hazards.	Consistent: As discussed in the Regulatory Framework, project components must be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports. The Construction General Permit that requires the implementation of a SWPPP that would reduce and control erosion. Water conveyance pipelines would be constructed using standards from the American Water Works Association.
County of Monterey (coastal zone & inland area)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipelines, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy S-1.1:*** Land uses shall be sited and measures applied to reduce the potential for loss of life, injury, property damage, and economic and social dislocations resulting from groundshaking, liquefaction, landslides, and other geologic hazards in the high and moderate hazard susceptibility areas.	This policy is intended to protect people and property from seismic and geologic hazards.	Consistent: As discussed in the Regulatory Framework, project components must be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports.
County of Monterey (coastal zone & inland area)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipelines, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy S-1.3:*** Site-specific geologic studies may be used to verify the presence or absence and extent of the hazard on the property proposed for new development and to identify mitigation measures for any development proposed. An ordinance including permit requirements relative to the siting and design of structures and grading relative to seismic hazards shall be established.	This policy is intended to protect people and property from seismic and geologic hazards.	Consistent: As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports.

TABLE 4.2-6 (Continued)
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO GEOLOGY, SOILS, AND SEISMICITY

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
County of Monterey (coastal zone & inland area)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipelines, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy S-1.4:*** The Alquist-Priolo Earthquake Fault Zoning Act shall be enforced.	This policy is intended to protect people and property from seismic hazards, such as those resulting from fault rupture.	Consistent: As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports. Water conveyance pipelines would be constructed using standards from the American Water Works Association.
County of Monterey (coastal zone & inland area)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipelines, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy S-1.5:*** Structures in areas that are at high risk from fault rupture, landslides, or coastal erosion shall not be permitted unless measures recommended by a registered engineering geologist are implemented to reduce the hazard to an acceptable level.	This policy is intended to protect people and property from hazards associated with fault rupture, landslides, or coastal erosion.	Potentially Inconsistent: As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports. However, the slant wells would be located along the coast within an active dune area that will over time be eroded by sea level rise. This issue is addressed in **Impact 4.2-10**.
County of Monterey (coastal zone & inland area)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipelines, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy S-1.6:*** New development shall not be permitted in areas of known geologic or seismic hazards unless measures recommended by a California certified engineering geologist or geotechnical engineer are implemented to reduce the hazard to an acceptable level. Areas of known geologic or seismic hazards include: a. Moderate or high relative landslide susceptibility. b. High relative erosion susceptibility. c. Moderate or high relative liquefaction susceptibility. d. Coastal erosion and sea cliff retreat. e. Tsunami run-up hazards.	This policy is intended to protect people and property from geologic and seismic hazards.	Potentially Inconsistent: As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports. However, the slant wells would be located along the coast within an active dune area that will over time be eroded by sea level rise. This issue is addressed in **Impact 4.2-10**.
County of Monterey (coastal zone & inland area)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipelines, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy S-1.7:*** Site-specific reports addressing geologic hazard and geotechnical conditions shall be required as part of the planning phase and review of discretionary development entitlements and as part of review of ministerial permits in accordance with the California Building Standards Code as follows: a. Geotechnical reports prepared by State of California licensed Registered Geotechnical Engineers are required during building plan review for all habitable structures and habitable additions over 500 square feet in footprint area. Additions less than 500 square feet and non-habitable buildings may require geotechnical reports as determined by the pre-site inspection. b. A Registered Geotechnical Engineer shall be required to review and approve the foundation conditions prior to plan check approval, and if recommended by the report, shall perform a site inspection to verify the foundation prior to approval to pour the footings. Setbacks shall be identified and verified in the field prior to construction. c. All new development and subdivision applications in State- or County designated Earthquake Fault Zones shall provide a geologic report addressing the potential for surface fault rupture and secondary fracturing adjacent to the fault zone before the application is considered complete. The report shall be prepared by a Registered Geologist or a Certified Engineering Geologist and conform to the State of California's most current guidelines for evaluating the hazard of surface fault rupture. d. Geologic reports and supplemental geotechnical reports for foundation design shall be required in areas with moderate or high landslide or liquefaction susceptibility to evaluate the potential on- and offsite impacts on subdivision layouts, grading, or building structures.	This policy is intended protect people and property from geologic hazards, such as fault rupture, secondary fracturing, landslides, or liquefaction.	Consistent: As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports. Water conveyance pipelines would be constructed using standards from the American Water Works Association.

TABLE 4.2-6 (Continued)
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO GEOLOGY, SOILS, AND SEISMICITY

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
County of Monterey (coastal zone & inland area) (cont.)				e. Where geologic reports with supplemental geotechnical reports determine that potential hazards affecting new development do not lead to an unacceptable level of risk to life and property, development in all Land Use Designations may be permissible, so long as all other applicable General Plan policies are complied with. f. Appropriate site-specific mitigation measures and mitigation monitoring to protect public health and safety, including deed restrictions, shall be required.		
County of Monterey (coastal zone & inland area)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipelines, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy S-1.8:*** As part of the planning phase and review of discretionary development entitlements, and as part of review of ministerial permits in accordance with the California Building Standards Code, new development may be approved only if it can be demonstrated that the site is physically suitable and the development would neither create nor significantly contribute to geologic instability or geologic hazards.	This policy is intended to protect people and property from geologic hazards (e.g., liquefaction, landslides).	Consistent: As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports. Water conveyance pipelines would be constructed using standards from the American Water Works Association.
County of Monterey (coastal zone & inland area)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipelines, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy S-1.9:*** A California licensed civil engineer or a California licensed landscape architect can recommend measures to reduce moderate and high erosion hazards in the form of an Erosion Control Plan.	This policy is intended to minimize erosion hazards.	Consistent: As discussed in the Regulatory Framework, the project would be required to comply with the Construction General Permit that requires the implementation of a SWPPP that would reduce and control erosion.
County of Monterey (coastal zone)	North County Land Use Plan	Geologic Hazards	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.8.3.A1:*** All development shall be sited and designed to conform to site topography and to minimize grading and other site preparation activities.	This policy is intended to minimize landform alteration and associated environmental effects.	Consistent: As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports, which would include measures to minimize hazards caused by grading and other site activities. Water conveyance pipelines would be constructed using standards from the American Water Works Association.
County of Monterey (coastal zone)	North County Land Use Plan	Geologic Hazards	Source Water Pipeline and new Desalinated Water Pipeline	**Policy *2.8.3.A2*:** All structures, with the exception of utility lines where no alternative route is feasible, shall be sited a minimum of 50 feet from an active fault or potentially active fault. Greater setbacks may be required where it is warranted by local geologic conditions.	This policy is intended to minimize impacts on utility infrastructure from seismic hazards.	Consistent: The Source Water Pipeline does not cross or come within 50 feet of a potentially active fault. There are no alternative routes for the new Desalinated Water Pipeline that would not cross the trace of a potentially active fault.
County of Monterey (coastal zone)	North County Land Use Plan	Geologic Hazards	Source Water Pipeline, new Desalinated Water Pipeline,	***Policy 2.8.3.A4:*** Soils and geologic reports shall be required for all new land divisions and for construction of structures and roads on slopes exceeding 30 percent or in areas of known or suspected geologic hazards. Evaluations of potential onsite and offsite impacts shall be included in the report.	This policy is intended to protect people and property from geologic hazards.	Consistent: As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports
County of Monterey (coastal zone)	North County Land Use Plan	Geologic Hazards	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.8.3.A5:*** Where soils and geologic reports are required, they should include a description and analysis of the following items: a. geologic conditions, including soil, sediment, and rock types and characteristics in addition to structural features, such as bedding, joints, and faults; b. evidence of past or potential landslide conditions, the implications of such conditions for the proposed development, and the potential effects of the development on landslide activity; c. impact of construction activity on the stability of the site and adjacent area; d. ground and surface water conditions and variations, including hydrologic changes caused by the development (i.e., introduction of sewage effluent and irrigation water to the groundwater system; alterations in surface drainage);	This policy Is intended to protect people and property from geologic hazards.	Consistent: As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports

TABLE 4.2-6 (Continued)
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO GEOLOGY, SOILS, AND SEISMICITY

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
County of Monterey (coastal zone) (cont.)				e. potential erodibility of site and mitigating measures to be used to minimize erosion problems during and after construction (i.e., landscaping and drainage design). f. potential effects of seismic forces resulting from a maximum credible earthquakes; g. any other factors that might affect slope stability.		
Fort Ord Reuse Authority (Seaside)	Fort Ord Reuse Plan	Conservation	New Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, ASR Pump-to-Waste Pipeline, and Terminal Reservoir	***Soils and Geology Policy A-4:*** The City shall continue to enforce the Uniform Building Code to minimize erosion and slope instability problems.	This policy is intended to minimize erosion and slope instability.	Consistent: As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports.
Fort Ord Reuse Authority (Seaside)	Fort Ord Reuse Plan	Conservation	New Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, ASR Pump-to-Waste Pipeline, and Terminal Reservoir	***Soils and Geology Policy A-5:*** Before issuing a grading permit, the City shall require that geotechnical reports be prepared for developments proposed on soils that have limitations as substrates for construction or engineering purposes, including limitations concerning slope and soils that have piping, low-strength, and shrink-swell potential. The City shall require that engineering and design techniques be recommended and implemented to address these limitations.	The policy is intended to protect people and property from geologic hazards, including soil instability.	Consistent: As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports.
Fort Ord Reuse Authority (Seaside)	Fort Ord Reuse Plan	Conservation	New Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, ASR Pump-to-Waste Pipeline, and Terminal Reservoir	***Soils and Geology Policy A-6:*** The City shall require that development of lands having a prevailing slope above 30% include implementation of adequate erosion control measures.	This policy is intended to minimize the erosion impacts of new development.	Consistent: As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports.
Fort Ord Reuse Authority (Seaside)	Fort Ord Reuse Plan	Safety	New Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, ASR Pump-to-Waste Pipeline, and Terminal Reservoir	***Seismic and Geologic Hazards Policy A-2:*** The City shall use the development review process to ensure that potential seismic or geologic hazards are evaluated and mitigated prior to construction of new projects. ***Program A-2.1:*** The City shall require geotechnical reports and seismic safety plans when development projects or other area plans are proposed within zones that involve high or very high seismic risk. Each plan shall be prepared by a certified geotechnical engineer and shall be subject to the approval of the Planning Director for the City of Seaside. ***Program A-2.2:*** Through site monitoring, the City shall ensure that all measures included in the project's geotechnical and seismic safety plans are properly implemented and a report shall be filed and on public record prepared by the Planning Director and/or Building Inspector confirming such. ***Program A-2.3:*** The City shall continue to updated and enforce the Uniform Building Code to minimize seismic hazards impacts from resulting from earthquake induced effects such as groundshaking, ground rupture, liquefaction, and or soils problems.	This policy is intended to protect people and property from seismic and geologic hazards.	Consistent: As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports.
Fort Ord Reuse Authority (Monterey County)	Fort Ord Reuse Plan	Conservation	Ryan Ranch–Bishop Interconnection Improvements	***Soils and Geology Policy A-2:*** The County shall require developers to prepare and implement erosion control and landscape plans for projects that involve high erosion risk. Each plan shall be prepared by a registered civil engineer or certified professional in the field of erosion and sediment control and shall be subject to the approval of the public works director for the City of Marina. The erosion component of the plan must at least meet the requirements of Storm Water Pollution Prevention Plans (SWPPPs) required by the California State Water Resources Control Board.	This policy is intended to minimize erosion resulting from new development.	Consistent: As discussed in the Regulatory Framework, the project would be required to comply with the Construction General Permit that requires the implementation of a SWPPP that would reduce and control erosion.
Fort Ord Reuse Authority (Monterey County)	Fort Ord Reuse Plan	Conservation	Ryan Ranch–Bishop Interconnection Improvements	***Soils and Geology Policy A-3:*** Through site monitoring, the County shall ensure that all measures included in the developer's erosion control and landscape plans are properly implemented.	The policy is intended to minimize erosion resulting from new development.	Consistent: As discussed in the Regulatory Framework, the project would be required to comply with the Construction General Permit that requires the implementation of a SWPPP that would reduce and control erosion.
Fort Ord Reuse Authority (Monterey County)	Fort Ord Reuse Plan	Conservation	Ryan Ranch–Bishop Interconnection Improvements	***Soils and Geology Policy A-4:*** The County shall continue to enforce the Uniform Building Code to minimize erosion and slope instability problems.	This policy is intended to minimize erosion and slope instability.	Consistent: As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes, which are based on the Uniform Building Code.

TABLE 4.2-6 (Continued)
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO GEOLOGY, SOILS, AND SEISMICITY

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 (Monterey County)	Fort Ord Reuse Plan	Conservation	Ryan Ranch–Bishop Interconnection Improvements	***Soils and Geology Policy A-5:*** Before issuing a grading permit, the County shall require that geotechnical reports be prepared for developments proposed on soils that have limitations as substrates for construction or engineering purposes, including limitations concerning slope and soils that have piping, low-strength, and shrink-swell potential. The County shall require that engineering and design techniques be recommended and implemented to address these limitations.	The policy is intended to protect people and property from geologic hazards, including soil instability.	Consistent: As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports.
Fort Ord Reuse Authority (Monterey County)	Fort Ord Reuse Plan	Conservation	Ryan Ranch–Bishop Interconnection Improvements	***Soils and Geology Policy A-6:*** The County shall require that development of lands having a prevailing slope above 30% include implementation of adequate erosion control measures.	This policy is intended to minimize the erosion impacts of new development.	Consistent: As discussed in the Regulatory Framework, the project would be required to comply with the Construction General Permit that requires the implementation of a SWPPP that would reduce and control erosion.
Fort Ord Reuse Authority (Monterey County)	Fort Ord Reuse Plan	Safety	Ryan Ranch–Bishop Interconnection Improvements	***Seismic and Geologic Hazards Policy A-2:*** The County shall use the development review process to ensure that potential seismic or geologic hazards are evaluated and mitigated prior to construction of new projects. ***Program A-2.1:*** The County shall require geotechnical reports and seismic safety plans when development projects or other area plans are proposed within zones that involve high or very high seismic risk. Each plan shall be prepared by a certified geotechnical engineer and shall be subject to the approval of the Planning Director for the County of Monterey. ***Program A-2.2:*** Through site monitoring, the County shall ensure that all measures included in the project's geotechnical and seismic safety plans are properly implemented and a report shall be filed and on public record prepared by the Planning Director and/or Building Inspector confirming such. ***Program A-2.3:*** The County shall continue to update and enforce the Uniform Building Code to minimize seismic hazards impacts from resulting from earthquake induced effects such as groundshaking, ground rupture, liquefaction, and or soils problems.	This policy is intended to protect people and property from seismic and geologic hazards.	Consistent: As discussed in the Regulatory Framework, project components would be constructed in compliance with the California Building Code, county codes, and city codes, which require the preparation of soils and geologic reports, and are based on the Uniform Building Code.

SOURCES: California State Parks, 2004; City of Marina, 2006, 2013; City of Seaside, 2004, 2013; FORA, 1997; Monterey County, 1999, 2010.

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4.2.3 Evaluation Criteria

Implementation of the proposed project would have a significant impact related to geology, soils, and seismicity if it would:

- Expose people or structures to potential substantial adverse effects, including risk of loss, injury, or death involving:
  - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault;
  - Strong seismic groundshaking;
  - Seismic-related ground failure, including liquefaction and lateral spreading;
  - Landslides;
- Result in substantial soil erosion or the loss of topsoil;
- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the MPWSP, and potentially result in onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse;
- Be located on problematic soils such as expansive or corrosive soils;
- Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater;
- Accelerate and/or exacerbate natural rates of coastal erosion, scour, or dune retreat, resulting in damage to adjoining properties or a substantial change in the natural coastal environment; or
- Degrade the physical structure of any geologic resource, or alter any oceanographic process, such as sediment transport, such that it is measurably different from pre-existing conditions.

CEQA requires analysis of a project's effects on the environment; consideration of the potential effects of a site's environment on a project are outside the scope of required CEQA review (*California Building Industry Association v. Bay Area Air Quality Management District* (2015) 62 Cal. 4th 369). As stated in *Ballona Wetlands Land Trust v. City of Los Angeles* (2011) 201 Cal.App.4th 455, 473: "[T]he purpose of an EIR is to identify the significant effects of a project on the environment, not the significant effects of the environment on the project." The impacts discussed in this section related to increased exposure of people or structures to risks associated with seismic occurrences and location of people or structures on unstable geologic units are effects on users of the project and structures in the project of preexisting environmental hazards, and therefore "do not relate to environmental impacts under CEQA and cannot support an argument that the effects of the environment on the project must be analyzed in an EIR." (*Id.* at p. 474.) Nonetheless, an analysis of these impacts is provided for information purposes.

4.2.4 Approach to Analysis

Geologic and seismic information for the project area was derived from various sources and compiled in this chapter to develop a comprehensive understanding of the potential constraints and hazards associated with project construction and operations. Information sources include regional geologic maps prepared by the CGS and USGS, the PSHA of California, and earthquake rupture forecasts developed by the WGCEP, all of which reflect the most up-to-date understanding of the regional geology and seismicity. In addition, geologic and seismic analysis relied on project-specific geotechnical studies and a project-specific coastal erosion study that was designed to evaluate the risk of coastal erosion that would result from future sea level rise and 100-year storm events.

As described in more detail below, the analysis of geologic and seismic impacts in this section takes into account that CalAm would incorporate into their facility designs the engineering recommendations provided by the various geotechnical studies conducted for the proposed project. The analysis also considers the various existing state and local regulations that apply to geotechnical design and construction, which include the CBC and the Monterey County ordinances for building and grading. Through compliance with the existing ordinances, CalAm would be required to demonstrate that the proposed site uses are compatible with the subsurface geology and local seismic conditions; this must occur before building permits are issued. Additionally, CalAm would require its pipeline engineers and construction contractors to adhere to the American Water Works Association (AWWA) standards for pipeline design and construction; this analysis considers that in evaluating potential geologic and seismic impacts.

4.2.4.1 Geotechnical Investigations for Project Facilities

This analysis used geotechnical information and data derived from project-specific geotechnical studies, including geotechnical investigations conducted for the proposed MPWSP Desalination Plant at Charles Benson Road (PCE, 2014; Zinn, 2014) and the conveyance pipelines (AECOM, 2015), as well as a geotechnical investigation conducted to support CalAm's previously proposed Coastal Water Project (Ninyo & Moore, 2005). This analysis also utilized information from the preliminary geotechnical study completed by Ninyo & Moore (2014) for the Groundwater Replenishment Project EIR.

Geotechnical studies are essential for facility and pipeline design because it is the information that informs the structural design of the project components and determines whether the geologic materials underlying the project components are capable of supporting the proposed uses without risk of detrimental effects from potential hazards associated with problematic soils, liquefaction, or excessive seismic shaking. Geotechnical investigations are required under the CBC for most structures intended for human occupancy and by the Monterey County Grading Ordinance. Based on field observation and laboratory testing, the geotechnical engineer can assess whether the soils are adequate to support the structure under static (non-earthquake) or earthquake conditions. If corrective work is necessary to remedy the problem soils or otherwise unstable ground condition, the geotechnical engineer would recommend approaches to correct the condition. Geotechnical engineering recommendations are typically standard engineering practices that have been proven

elsewhere to increase the geotechnical performance of an underlying soil or bedrock material. CalAm would incorporate all geotechnical recommendations set forth by the project geotechnical engineer.

4.2.4.2 American Water Works Association Standards for Proposed Pipelines

Pipelines are constructed to various industry standards. The AWWA is a worldwide nonprofit scientific and educational association that, among its many activities, establishes recommended standards for the construction and operation of public water supply systems, including standards for pipe and water treatment facility materials and sizing, installation, and facility operations. While the AWWA's recommended standards are not enforceable code requirements, they nevertheless can dictate how pipelines for water conveyance are designed and constructed. CalAm has committed to requiring its contractors to incorporate AWWA Standards into the design and construction of the proposed pipelines.

4.2.4.3 Seismic Considerations

In California, an earthquake can cause injury or property damage by: (1) rupturing the ground surface, (2) violently shaking the ground, (3) causing the underlying ground to fail due to liquefaction, or (4) causing enough ground motion to initiate slope failures or landslides, any of which could damage or destroy structures.

State and local code requirements ensure buildings and other structures are designed and constructed to withstand major earthquakes, thereby reducing the risk of collapse and the associated risks to human health and safety and private property. The code requirements have been developed through years of study of earthquake response and the observed performance of structures during significant local earthquakes (e.g., the 1989 Loma Prieta Earthquake) and others around the world. As discussed in Section 4.2.2, Regulatory Framework, the proposed project would be required to comply with federal, state, and local laws regulating construction. The laws ensure that proposed development sites are adequately investigated and that seismic hazards are evaluated and addressed in the project design and construction. These laws include the Seismic Hazards Mapping Act, the California Building Code, and Monterey County ordinances pertaining to excavation, grading, and site development in geologic hazard zones. The *CGS Guidelines for Evaluating and Mitigating Seismic Hazards* (Special Publication 117A) (CGS, 2008b) provides guidance for evaluating and mitigating seismic hazards as required by the Public Resources Code Section 2695(a).

Site-specific geotechnical investigations are conducted to determine the presence of problematic soils and identify seismic hazards on a subject site. These investigations identify the geologic and seismic setting of a subject site and provide feasible engineering recommendations to remedy potentially adverse soil and seismic conditions. For projects whose grading activities would move over 5,000 cubic yards of soil, the Monterey County Grading Ordinance requires that a site-

specific geotechnical investigation (i.e., soil engineering and engineering geology report) be completed prior to final design in order to obtain a building or grading permit.[18]

Site-specific geotechnical investigations also provide the necessary soil information required by structural engineers to ensure structures and buildings are designed appropriately to withstand earthquake ground motion. Grading plans, foundation designs, and structural designs are prepared based on the geotechnical recommendations presented in the site-specific geotechnical investigation and other pertinent requirements of the CBC.

4.2.4.4 Site-Specific Soil Borings and Monitoring Wells

CalAm consultants drilled several exploratory borings at the CEMEX mining facility to depths of 306 to 350 feet below ground surface, logged the subsurface materials encountered, and collected soil and groundwater samples for laboratory testing. The exploratory boring logs, field screening tests results, and laboratory analytical results are presented in *Technical Memorandum (TM 1) - Summary of Results - Exploratory Boreholes* (Geoscience, 2014). The exploratory work, as described in the Setting above and in Section 4.4, Groundwater Resources, further defined the subsurface geology in the CEMEX active mining area (the proposed site for the subsurface slant wells). While this work was intended to refine groundwater modeling parameters, it also benefits the geology impact analysis.

CalAm consultants installed Monitoring Wells MW-1, and MW-3 through MW-7 at the locations shown on **Figure 4.4-9** and presented the results in *Technical Memorandum (TM2) Monitoring Well Completion Report and CEMEX Model Update, Monterey Peninsula Water Supply Project, Hydrogeologic Investigation* (Geoscience, 2016).[19] These are nested wells with screened intervals in the Dune Sand Aquifer, 180-Foot Equivalent Aquifer, and the 400-Foot Aquifer. The exploratory work, as described in detail in Section 4.4, Groundwater Resources, further defined the subsurface geology and aquifers at the proposed site for the subsurface slant wells. While this work was also intended to refine groundwater modeling parameters, it similarly benefits the geology impact analysis.

The pertinent data gathered from the exploratory work is incorporated, where appropriate, into Sections 4.2.5.1 and 4.2.5.2, below.

4.2.4.5 Coastal Retreat Study

The proposed project would place the seawater intake system along the Monterey Bay coastline. Sea level is predicted to rise over the next century and, in response, coastal erosion is expected to accelerate. The rise in sea level and the resultant increased coastal erosion rate would migrate the beach inland. Depending on the rate of coastal erosion and beach migration, the beach could migrate inland to the locations of the well heads for the slant wells within the project lifetime. The well heads and upper portions of the slant wells would then be exposed to wave action, storm

[18] Unless the investigation is deemed unnecessary by the Building Official due to existing information.
[19] The consultant concluded that the planned Monitoring Well MW-2 was unnecessary and not installed.

events, and rip embayments, processes that are described above in Sea Level Rise and Coastal Erosion. The presence of structures on the beach changes the beach dynamics and can result in scour and erosion in the localized area. In turn, these changes can affect the volumes of sand on beaches both at the structure locations and at other beach locations in areas where the coastal drift would otherwise provide sand and maintain sandy beaches. In the case of Monterey Bay, coastal drift is typically to the south and this process provides sand to maintain the sand supply on those beaches.

To evaluate coastal erosion impacts associated with project components proposed in the coastal zone, a project-specific coastal retreat study — *Analysis of Historic and Future Coastal Erosion with Sea Level Rise* — was conducted by a team of licensed coastal engineers and coastal geomorphologists (ESA, 2014). The findings and recommendations of the study inform the analysis of Impact 4.2-10, below. The coastal retreat study is included as **Appendix C1** of this EIR.

The coastal retreat study examined coastal processes to determine the likelihood for the slant wells and their well heads to become exposed before the end of their usable lifespan. The study estimated coastal retreat both laterally and vertically. The lateral extent of erosion was evaluated using coastal erosion hazard zones; the vertical extent was evaluated using coastal profiles. Both of these methods are described in more detail below.

Coastal Erosion Hazard Zones (Lateral Erosion Estimates)

A coastal erosion hazard zone represents an area where erosion (caused by coastal processes) has the potential to occur over a certain time period. Within any area of such a zone, there is a risk of damage due to erosion during a major storm event. Actual locations of erosion during a particular storm depend on the unique characteristics of that storm (e.g. wave direction, surge, rainfall, and coincident tide). The coastal hazard zones are developed from three components: historic erosion, additional erosion due to sea level rise, and the potential erosion impact caused by a large storm wave event (e.g., 100-year storm event). As sea level rises, higher mean sea level will increase the frequency of wave run-up, thereby undercutting the dune toe and increasing erosion.

The most important variables in the coastal erosion model are the historic erosion trend, backshore toe elevation, and the total water level. The historic erosion rate was applied to a planning horizon through 2100 to determine the erosion rates that would occur without the project. The erosion model does not account for shore management actions, such as sand placement, that could potentially mitigate future shore recession. In this region, where beaches are controlled in part by sand mining, the study assumed there would be no changes to existing sand mining practices.

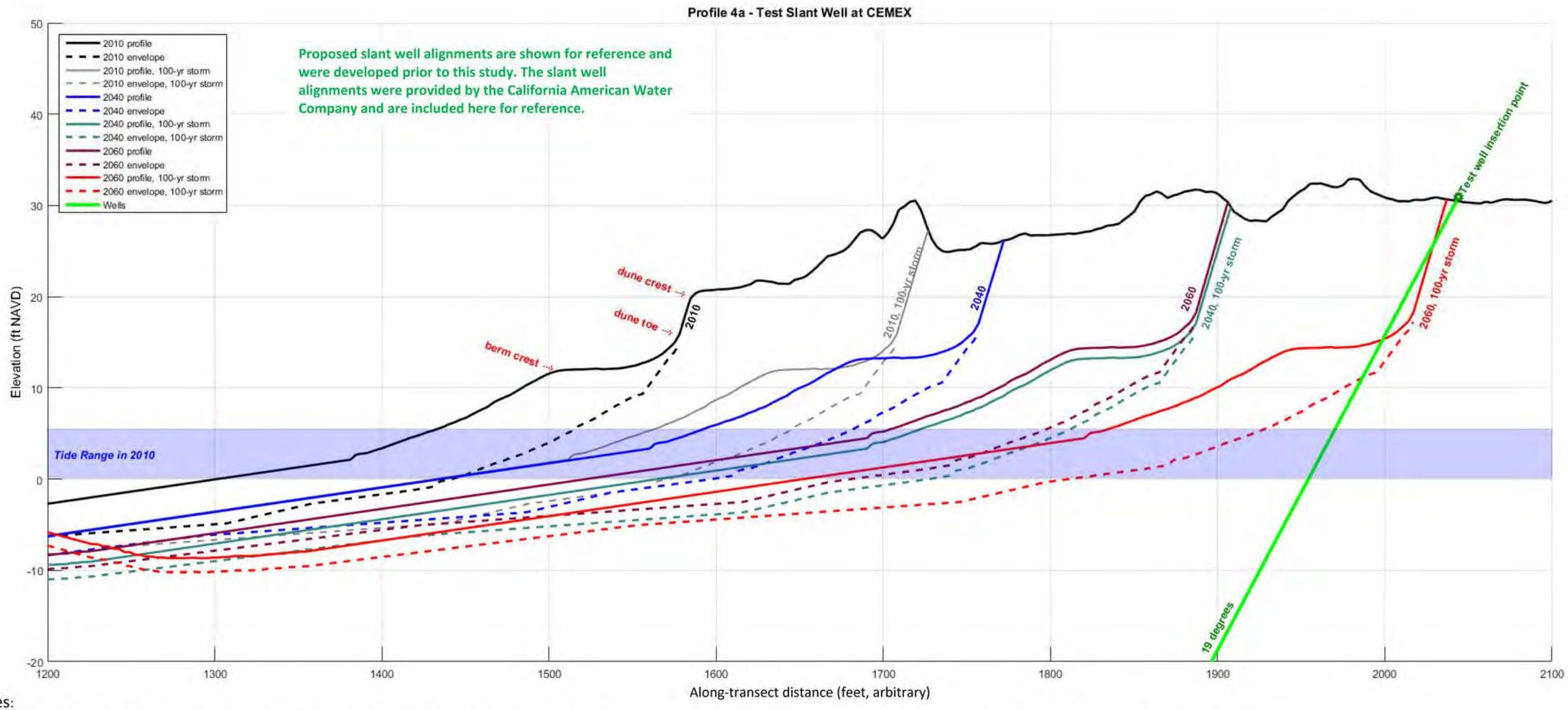
The potential for shoreline retreat caused by sea level rise and the impact from a large storm event was estimated using a geometric model of dune erosion and applied with different slopes to make the model more applicable to sea level rise. This method is consistent with the Federal Emergency Management Agency (FEMA) Pacific Coast Flood Guidelines. The potential

shoreline retreat estimates account for uncertainty in the duration of future storm events. Instead of predicting storm-specific characteristics and response, the method assumes that the coast would erode or retreat to a maximum storm wave event with unlimited duration. This is a conservative approach to estimating the impact of a 100-year storm event.

Coastal Profile (Vertical Erosion Estimates)

The coastal profile analysis developed a set of representative profiles that show how the shoreline is likely to evolve from the present to 2040 and 2060, and shows the locations of selected project components relative to those profiles. As previously discussed, the Monterey Bay shoreline is affected by seasonal changes, localized erosion (rip currents), long-term erosion, and sea level rise. Each of these factors is important in defining the profile shape and location at a given time. For this reason, the analysis identified a projected future profile and an extremely eroded profile (lower envelope) for each future time horizon. The future profile is the current profile eroded at the historic rate, with added erosion caused by sea level rise. The lower profile envelope represents a highly eroded condition, which could occur from a combination of localized erosion (rip currents), a large winter storm, and seasonal changes. The upper envelope (a highly accreted profile) was not analyzed because the key concern for the project is that buried or inland project components would become exposed over time. There are two profile/envelope combinations for each time step: one to represent long term profile evolution (historic erosion and accelerated erosion from sea level rise) and another that adds potential erosion from a 100-year storm event, which could be as high as much as 100 feet.

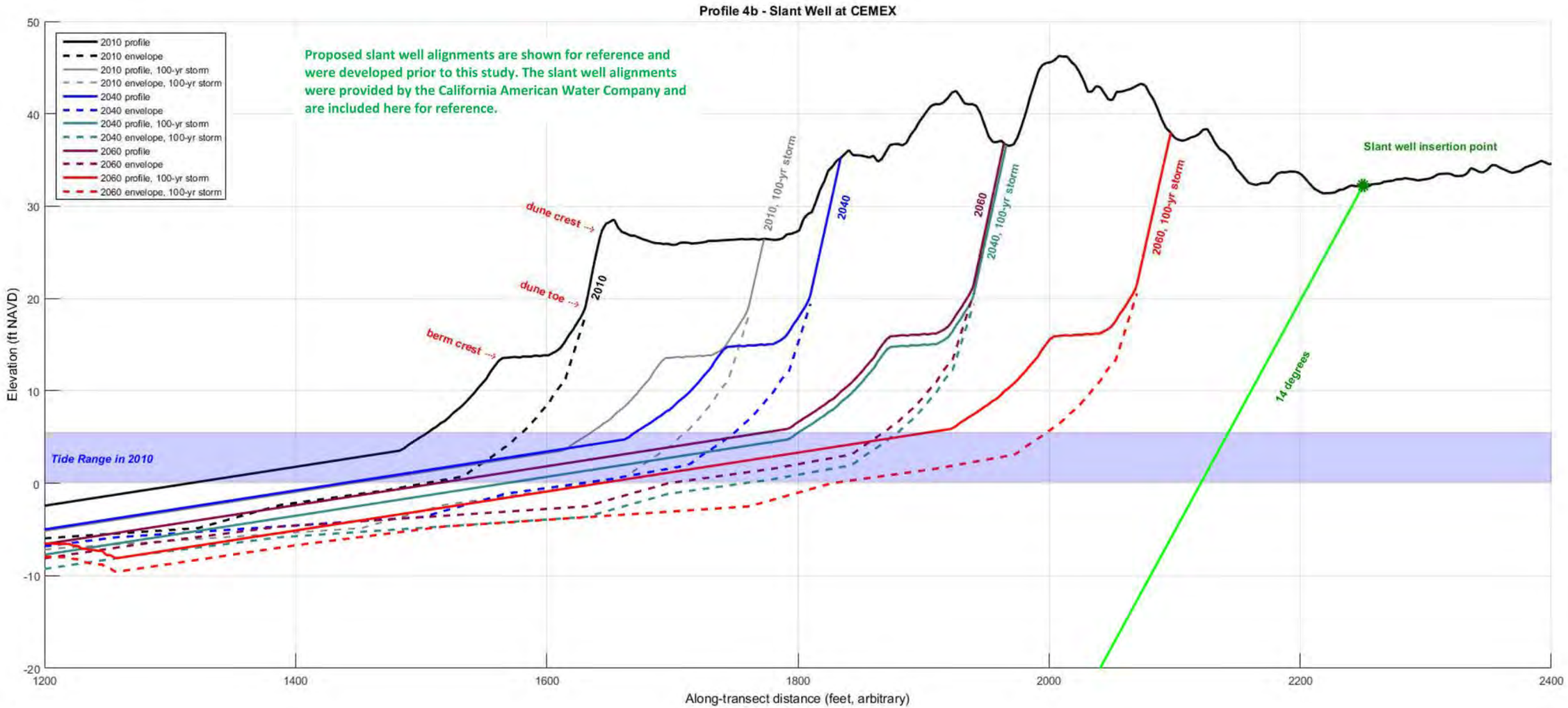
The high and low rates of sea level rise were estimated for each year from 2012 to 2073, the time period for which input data was needed by the groundwater modeling efforts discussed in Section 4.4, Groundwater Resources. The coastal erosion hazard zones maps delineate the estimated areas along the coast expected to be at or below sea level by the years 2030, 2040, 2050, 2060, and 2100, and thus subject to erosive wave action. Coastal profiles were then prepared at various locations to show the current (2010) profile and estimate the coastal profiles in 2040 and 2060, where project components would be close to the coastline and potentially subject to the damage that would be the result of coastal retreat. The test slant well would be exposed as a result of the 100-year storm event in the year 2060, as shown on **Figure 4.2-7**. The initially-proposed locations for the other nine slant wells would have been about the same distance from MHW and would have been within the anticipated extent of coastal retreat. To avoid this condition, the well heads for the other nine slant wells were relocated to a line south of the existing test slant well, so that the proposed new slant wells would be located inland of the effects of the 100-year storm event in the year 2060, as shown on **Figure 4.2-8**.



Notes:

1. These envelopes of erosion consider seasonal changes in beach width, localized erosion (rip currents), long-term erosion, and accelerated erosion caused by sea level rise.
2. The profile shape is linearly interpolated between the bathymetry data and the topography data (between x = 919 ft and x = 1385).
3. This profile is located immediately south of the CEMEX Pacifica Lapis sand mining plant. No data is available to quantify the uncertainty in adjacent beach and dune erosion related to sand mining activities. The potential for fluctuations in beach width associated with sand mining were not considered in this analysis.
4. Slant well location and angle are based on the "Geological Cross Section through Test Slant Well" drawing provided by Geoscience on January 7 2016.

Figure 4.2-7
Representative Profile at Test Slant Well



Notes:

1. These envelopes of erosion consider seasonal changes in beach width, localized erosion (rip currents), long-term erosion, and accelerated erosion caused by sea level rise.
2. The profile shape is linearly interpolated between the bathymetry data and the topography data (between x = 820 ft and x = 1480).
3. This profile is located immediately south of the CEMEX Pacifica Lapis sand mining plant. No data is available to quantify the uncertainty in adjacent beach and dune erosion related to sand mining activities. The potential for fluctuations in beach width associated with sand mining were not considered in this analysis.
4. Slant well location and angle are based on the "Cross-Section SW-3" drawing provided by Geoscience on January 7, 2016.

Monterey Peninsula Water Supply Project. 205335.01

Figure 4.2-8

Representative Profile at Proposed Slant Wells

4.2.5 Direct and Indirect Effects of the Proposed Project

Table 4.2-7 summarizes the impacts and significance determinations related to geology, soils and seismicity that could result from implementation of the proposed project (10 slant wells at CEMEX). Due to the nature of the proposed project, the following criterion is not addressed in the impact analysis sections for the reasons described below:

> ***Degrade the physical structure of any geologic resource or alter any oceanographic process, such as sediment transport, such that it is measurably different from pre-existing conditions.*** Construction, operations, and maintenance of the components of the proposed project (10 wells at CEMEX) would not affect onshore or offshore geologic resources, and would not alter oceanographic processes because construction would be below the seabed; the seabed would not be altered and would not be disturbed during operations or maintenance activities.

TABLE 4.2-7
SUMMARY OF IMPACTS – GEOLOGY, SOILS, AND SEISMICITY

Impacts	Significance Determinations
Impact 4.2-1: Substantial soil erosion or loss of topsoil during construction.	LSM
Impact 4.2-2: Exposure of people or structures to substantial adverse effects related to fault rupture.	LS
Impact 4.2-3: Exposure of people or structures to substantial adverse effects related to seismically-induced groundshaking.	LS
Impact 4.2-**4**: Exposure of people or structures to substantial adverse effects related to seismically-induced ground failure, including liquefaction, lateral spreading, or settlement.	LS
Impact 4.2-5: Exposure of people or structures to substantial adverse effects related to landslides or other slope failures.	LS
Impact 4.2-6: Exposure of people or structures to substantial adverse effects related to expansive soils.	LS
Impact 4.2-7: Exposure of structures to substantial adverse effects related to corrosive soils.	LS
Impact 4.2-8: Exposure of people or structures to substantial adverse effects related to land subsidence.	NI
Impact 4.2-9: Exposure of people or structures to substantial adverse effects related to alternative wastewater disposal systems.	LS
Impact 4.2-10: Accelerate and/or exacerbate natural rates of coastal erosion, scour, or dune retreat, resulting in damage to adjoining properties or a substantial change in the natural coastal environment.	LSM
Impact 4.2-C: Cumulative impacts related to geology, soils, and seismicity.	LSM

NOTES:
NI = No Impact
LS = Less than Significant impact, no mitigation required
LSM = Less than Significant impact with Mitigation

4.2.5.1 Construction Impacts

Impact 4.2-1: Substantial soil erosion or loss of topsoil during construction. (*Less than Significant with Mitigation*)

Soil Erosion

All Proposed Project Components

Project construction would involve localized ground disturbance activities (e.g., grading, excavation, drilling, and the construction of structures and pipelines) associated with drilling of the subsurface slant wells and ASR injection/extraction wells, installation of pipelines, and construction of buildings and structures. These activities could result in substantial soil erosion.

The construction activities would involve short-term ground disturbance. As described above in Section 4.2.1, Setting/Affected Environment, many of the project facilities and all conveyance pipelines would be constructed in relatively flat areas with little topographic relief. The gentle topographic relief would minimize the potential for soil erosion during construction.

Because the overall footprint of construction activities would exceed 1 acre, the proposed project would be required to comply with the *NPDES General Permit for Discharges of Storm Water Runoff Associated with Construction and Land Disturbance Activities* (Order 2009-0009-DWQ, NPDES No. CAS000002; as amended by Orders 2010-0014-DWQ and 2012-006-DWQ) (Construction General Permit), the Monterey County Grading Ordinance, and Monterey County Erosion Control Ordinance, all of which are described in Section 4.2.2, Regulatory Framework. These state and local requirements were developed to ensure that stormwater is managed and erosion is controlled on construction sites. The Construction General Permit requires preparation and implementation of a SWPPP, also described in Section 4.2.2, which requires applications of BMPs to control run-on and runoff from construction work sites. The BMPs would include, but would not be limited to, physical barriers to prevent erosion and sedimentation, construction of sedimentation basins, limitations on work periods during storm events, use of bioinfiltration swales, protection of stockpiled materials, and a variety of other measures that would substantially reduce or prevent erosion from occurring during construction. The Monterey County Grading Ordinance, as well as similar city grading and erosion ordinances, requires implementation of temporary construction and permanent post-construction erosion control measures. The applicable erosion control ordinances restrict grading activities during winter months and require preparation of an erosion control plan prior to issuance of building permits.

Because project construction activities would be subject to the numerous requirements noted above and in Section 4.2.2, impacts associated with substantial increases in soil erosion during construction would be less than significant for all project components.

Loss of Topsoil

Source Water Pipeline, new Desalinated Water Pipeline, and Castroville Pipeline, Terminal Reservoir, ASR-5 and ASR-6 Wells, and the Carmel Valley Pump Station

Several of the project-related construction activities would disturb vegetated areas, including sensitive natural vegetation communities. Grading, excavation, and backfill activities in these areas could result in the loss of topsoil (a fertile soil horizon that typically contains a seed base) if there is a well-developed topsoil horizon and it is mixed with other soil horizons or otherwise lost during excavation and backfilling. Impacts related to the loss of topsoil during construction of these components would be significant. However, the impact associated with loss of topsoil in sensitive natural communities would be reduced to a less-than-significant level with implementation of **Mitigation Measure 4.6-2b (Avoid, Minimize, and Compensate for Direct Construction Impacts on Sensitive Communities)**. The impact associated with loss of topsoil on agricultural lands would be reduced to a less-than-significant level with implementation of **Mitigation Measure 4.16-1 (Minimize Disturbance to Farmland)**. These measures require that topsoil be salvaged, stockpiled separately from subsoils, and returned to its appropriate location in the soil profile during backfilling activities.

Subsurface slant wells, MPWSP Desalination Plant, Pipeline to CSIP Pond, Brine Discharge Pipeline, pipelines south of Reservation Road, Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements

Surface soils at the subsurface slant wells and MPWSP Desalination Plant site are sandy and do not have a well-developed soil horizon. The site is covered in ruderal and disturbed habitat and does not support sensitive natural communities or crop production. The pipelines and interconnection improvements south of Reservation Road would be constructed within existing roadways and highly disturbed areas and would have no effect related to the loss of topsoil. Therefore, construction of the subsurface slant wells, MPWSP Desalination Plant and pipelines and interconnection improvements south of Reservation Road would have no impact related to loss of topsoil and no mitigation is necessary.

Consistency with Plans & Policies

As discussed above, the construction of the project has the potential to result in the loss of topsoil. This results in a potential inconsistency with the City of Marina Local Coastal Program Land Use Plan, as discussed above in Table 4.2-6. However, with implementation of **Mitigation Measure 4.6-2b (Avoid, Minimize, and Compensate for Direct Construction Impacts on Sensitive Communities)** and **Mitigation Measure 4.16-1 (Minimize Disturbance to Farmland)**, and through compliance with applicable laws and regulations, the potential for loss of topsoil during construction would be reduced to a less-than-significant level and the MPWSP would be brought into conformance with the above-noted plan.

Impact Conclusion

Impacts associated with soil erosion during construction would be less than significant for all project facilities. Impacts associated with loss of topsoil during construction would be significant for the Source Water Pipeline, new Desalinated Water Pipeline, and Castroville Pipeline,

Terminal Reservoir, ASR-5 and ASR-6 Wells, and the Carmel Valley Pump Station. Implementation of **Mitigation Measures 4.6-2b (Avoid, Minimize, and Compensate for Direct Construction Impacts on Sensitive Communities)** and **4.16-1 (Minimize Disturbance on Farmland)** would reduce this impact to a less-than-significant level. No impact related to the loss of topsoil would result from construction of the subsurface slant wells, the MPWSP Desalination Plant or pipelines south of Reservation Road.

Mitigation Measures

Mitigation Measure 4.6-2b applies to the Source Water Pipeline, new Desalinated Water Pipeline, and Castroville Pipeline, Terminal Reservoir, ASR-5 and ASR-6 Wells, and the Carmel Valley Pump Station.

> **Mitigation Measure 4.6-2b: Avoid, Minimize, and Compensate for Direct Construction Impacts on Sensitive Communities.**
>
> (See Impact 4.6-2 in Section 4.6, Terrestrial Biological Resources, for the description.)

Mitigation Measure 4.16-1 applies to the Source Water Pipeline, new Desalinated Water Pipeline, and Castroville Pipeline.

> **Mitigation Measure 4.16-1: Minimize Disturbance to Farmland.**
>
> (See Impact 4.16-1 in Section 4.16, Agriculture and Forestry Resources, for the description.)

4.2.5.2 Operational and Facility Siting Impacts

The proposed project would not result in erosion-causing activities such as stormwater discharges to vegetated areas during project operations and maintenance because the project operations would be conducted entirely within the areas previously disturbed by construction of the project facilities and would not disturb any new areas. Therefore, project operations and maintenance would have no effect on erosion and topsoil.

Impact 4.2-2: Exposure of people or structures to substantial adverse effects related to fault rupture. (*Less than Significant*)

New Transmission Main, and Main Ryan Ranch-Bishop Interconnection Improvements

The proposed project would not alter the seismic environment or increase the risk of fault rupture. None of the proposed facilities are located within an Alquist-Priolo Earthquake Fault Zone (i.e., on a State-recognized active fault trace). Although there is evidence of Holocene movement along some of the faults that cross the project area, these faults are unlikely to generate an earthquake or result in surface fault rupture because the segments with Holocene movement are concealed, do not exhibit any surface expression of fault movement, and/or are comparatively short (i.e., in comparison to an active fault such as the San Andreas Fault).

As shown on **Figures 4.2-1** and **4.2-4** and discussed in Section 4.2.1.2, the Monterey Bay–Tularcitos Fault Zone passes through the project area in Monterey, Del Rey Oaks, and Seaside. This fault zone creates a 6- to 9-mile wide zone of short in-echelon, northwest striking faults. These faults are not zoned under the Alquist-Priolo Earthquake Fault Zoning Act (see Regulatory Framework, Section 4.2.2) because they do not exhibit surface displacement that is younger than 11,000 years and are not considered sufficiently active or well defined. This distinction is discussed in more detail above in Section 4.2.1.2. From east to west, the individual faults in the Monterey Bay–Tularcitos Fault Zone are referred to as the:

- Chupines Fault Zone, Ord Terrace Fault, Del Rey Oaks section
- Chupines Fault Zone, Seaside Fault, Del Rey Oaks section
- Monterey Bay-Tularcitos Fault Zone, Monterey Bay section (Navy Fault)
- Monterey Bay-Tularcitos Fault Zone, Monterey Bay section (Hatton Canyon Fault)

Although these faults are not zoned by the State of California as active and the Fault Activity Map of California (Jennings, 2010) identifies these faults as older Quaternary-age faults (i.e. displacement between 1.6 mya to 11,000 ya or older), there has been evidence (Bryant, 2001) of Holocene displacement along the Hatton Canyon and Tularcitos Faults. Additionally, there is evidence of a probable offshore extension of the Chupines Fault displacing Holocene-age (less than 11,000 years old) deposits and sea floor sediments (Ninyo & Moore, 2014). Therefore, because there is evidence of Holocene–age displacement on certain segments of these otherwise Quaternary-aged and older faults, the potential for earthquake activity and possible ground surface displacement (ground rupture) cannot be dismissed. However, because the majority of these faults have not exhibited Holocene displacement and are not considered sufficiently active or well-defined, the potential is very low that the individual traces of these faults could generate an earthquake and result in surface fault rupture.

New Transmission Main

The proposed new Transmission Main would cross over the Reliz Fault Zone (Blanco Segment). The Reliz Fault Zone, Blanco Segment, is concealed and covered with dune sands along the coast and there is no reported evidence of Holocene-age fault displacement in this area.

In the event of an earthquake along the Reliz Fault Zone, groundshaking could occur, but because there has not been historic (less than 200 years) or Holocene (less than 11,000 years) activity on this fault, the active trace would be buried beneath sand and marine terrace deposits. In addition, because the fault segments are comparatively short (i.e., in comparison to an active fault such as the San Andreas Fault), any surface expression of fault movement would be minor if it would occur at all. In the unlikely event that the Reliz Fault Zone, Blanco Segment, generated earthquake activity or surface fault displacement along the New Transmission Pipeline, the pipeline would likely accommodate the lateral movement and not be damaged. If damage did occur, it would amount to a pipe break and possibly leakage that would be readily repaired, as previously explained. This impact is considered less than significant.

Ryan Ranch-Bishop Interconnection Improvements

The Ryan Ranch-Bishop Interconnection Improvements across the southern portion of the Chupines Fault Zone, Seaside Fault, and Del Rey Oaks section. The Chupines Fault in this area is mapped as a Quaternary fault with no evidence of recent or Holocene displacement. Considering its age and lack of recent activity, the potential for this fault to generate a damaging earthquake or rupture at the surface is considered low. In the unlikely event that the Hatton Canyon Fault generated earthquake activity or surface fault displacement, the pump station and pipeline would likely accommodate the lateral movement and not be damaged. If damage did occur, it would amount to a pipe break and possibly leakage that would be readily repaired, as previously explained. This impact is considered less than significant.

All Other Proposed Components

None of the other project components, including the subsurface slant wells and desalination plant, are close enough to known active faults to be vulnerable to surface fault rupture. Therefore, no impact would occur from implementation of the other project components.

Impact Conclusion

Mapped faults intersect the proposed new Transmission Main, and the Ryan Ranch-Bishop Interconnection Improvements. These faults are not mapped as active by the State of California because they do not display evidence of recent displacement. However, past studies have identified that certain segments of these faults do exhibit Holocene-age displacement leading to the conclusion that certain segments could be considered active. While it is possible that these faults could generate an earthquake and rupture at the surface, the potential for such an occurrence to expose people or structures to substantial adverse effects related to fault rupture is low because the faults are either concealed beneath sediments or at a sufficient distance from the project components. In the unlikely event that one of the faults crossing the project components did generate an earthquake and cause surface rupture, the rupture area would be localized, resulting in a minor offset associated with a low level groundshaking. Damage could include localized pipeline leaks that would be immediately repaired. Considering the low potential for fault rupture on the project area faults, this impact is considered less than significant for the new Transmission Main, and Ryan Ranch-Bishop Interconnection Improvements. For all other components of the proposed project, no impact would result because mapped faults do not occur at or near to the locations of the other components.

Mitigation Measures

None proposed.

Impact 4.2-3: Exposure of people or structures to substantial adverse effects related to seismically-induced groundshaking. (*Less than Significant*)

All Proposed Project Components

As discussed in Section 4.2.1, Setting, Monterey County will likely experience a large regional earthquake within the operational life of the MPWSP. There is a potential for high-intensity groundshaking associated with a characteristic earthquake in this region. The intensity of such an event would depend on the causative fault and the distance to the epicenter, the moment magnitude, the duration of shaking, and the nature of the geologic materials on which the MPWSP components would be constructed. Intense groundshaking and high ground accelerations would affect the entire area around the proposed facilities and associated pipelines. The primary and secondary effects of groundshaking could damage structural foundations, distort or break pipelines and other water conveyance structures, and cause structural failure.

The MPWSP Desalination Plant would be staffed full-time, and the Carmel Valley Pump Station would be staffed on an as-needed maintenance schedule. During operations, intense groundshaking could cause damage to these facilities, facility outages, and temporary water service disruptions in the CalAm Monterey District service area. Pumps could be rendered inoperable. Broken pipelines could result in soil washout and sinkholes that could damage nearby non-project facilities or the environment. Locating and repairing damaged pipelines and the pumps could require a cessation of operation of the facilities for a period of time. The 1989 Loma Prieta earthquake reportedly caused more than 60 water pipeline breaks in Santa Cruz, the nearest urbanized area to the epicenter (McNutt and Toppozada, 1990). As the proposed project would be part of an essential public utility (public water supply), repairs would be made promptly.

The structural elements of the proposed project would undergo appropriate design-level geotechnical evaluations prior to final design and construction. Implementing the regulatory requirements in the CBC and County ordinances and ensuring that all buildings and structures constructed in compliance with the law is the responsibility of the project engineers and building officials. The geotechnical engineer, as a registered professional with the State of California, is required to comply with the CBC and local codes while applying standard engineering practice and the appropriate standard of care for the particular region in California, which, in the case of the proposed MPWSP, is the Monterey Bay area.[20] The California Professional Engineers Act (Building and Professions Code Sections 6700-6799), and the Codes of Professional Conduct, as administered by the California Board of Professional Engineers and Land Surveyors, provides the basis for regulating and enforcing engineering practice in California. The local Building Officials are typically with the local jurisdiction (i.e. Monterey County) and are responsible for inspections and ensuring CBC and local code compliance prior to approval of the building permit.

[20] A geotechnical engineer (GE) specializes in structural behavior of soil and rocks. GEs conduct soil investigations, determine soil and rock characteristics, provide input to structural engineers, and provide recommendations to address problematic soils.

Impact Conclusion

It is likely that the structural elements of the proposed project would be subjected to a moderate to strong earthquake at least once during their operational life. Damage from an earthquake could result in temporary water service disruptions. However, because of the location of project facilities relative to the faults and the limited potential for ground surface rupture associated with these faults, there is a low potential for the groundshaking associated with an earthquake to cause injury, loss of life, or substantial property damage. Completion of a comprehensive design-level geotechnical investigation, adherence to the current CBC and local ordinances regulating construction, and the application of proven seismic design criteria that are standard engineering practice would ensure that structures are designed to withstand seismic events without sustaining substantial damage or collapsing. Therefore, this impact is considered less than significant.

Mitigation Measures

None proposed.

Impact 4.2-4: Exposure of people or structures to substantial adverse effects related to seismically-induced ground failure, including liquefaction, lateral spreading, or settlement. (*Less than Significant*)

Castroville Pipeline, Source Water Pipeline, and Carmel Valley Pump Station

The potential for liquefaction is higher in areas composed of granular soils with a shallow depth to groundwater. The potential damaging effects of liquefaction include differential settlement, loss of ground support for foundations, ground cracking, heaving and cracking of structure slabs due to sand boiling, and buckling of deep foundations due to liquefaction-induced ground settlement. The placement of structures on such soils could place the public at risk of injury or structures at risk of damage. Lateral spreading is the movement of blocks of soil on liquefiable soils.

Figure 4.2-5 shows the liquefaction hazard potential in Monterey County. As shown on the figure, most of the project components would be located in areas with a low susceptibility. However, the Castroville Pipeline would be constructed in areas of the Salinas River floodplain that have experienced documented historic liquefaction during the 1906 San Francisco and 1989 Loma Prieta earthquakes and are mapped with a moderate to high potential for liquefaction. The Source Water Pipeline is partially located on soils with a moderate to high potential for liquefaction. The Carmel Valley Pump Station is located on soils with a moderate liquefaction potential. Those project components located on or in soils with a moderate to high potential for liquefaction that could experience damage or failure as a result of liquefaction are discussed below.

The water conveyance pipelines would consist of 6- to 42-inch diameter pipelines buried from about 4 to 8 feet below the ground surface. Most of the conveyance pipelines would be underlain by deposits and fill materials consisting of dune sand and most of these deposits are anticipated to

consist of dry sand and silt mixtures (Ninyo and Moore, 2005, 2014; AECOM, 2015). Fill materials likely consist of compacted mixtures of sand and silt generated locally from the natural dune deposits. Portions of the Source Water Pipeline close to and under the coastal areas could have shallow depths to groundwater; in this case seawater intruded from the ocean, and thus could be susceptible to liquefaction damage. Although not located in the coastal zone, the Carmel Valley Pump Station would be located on similarly sandy deposits near enough to the Carmel River to seasonally have shallow groundwater conditions.

As discussed above in the Section 4.2.3, Approach to Analysis, the proposed project components would undergo a final geotechnical investigation and be designed to resist damage from seismic shaking. CalAm would implement all geotechnical recommendations provided by the project geotechnical engineer if liquefiable soils are identified. Solutions to rectify liquefaction are modern engineering approaches used throughout California and are considered standard industry practice. Methods to correct liquefiable soils include removal and replacement of problematic soils, the use of pile foundations, and drainage columns to reduce saturated conditions. The geotechnical investigation and corrective actions for potential liquefiable soils, where needed, would be based on the CGS Special Publication 117A (see Section 4.2.2).

In comparison to aboveground structures, underground pipelines, and buried structures are generally less susceptible to liquefaction damage because they are embedded in compacted backfill that can tolerate more seismic wave motion. While this practice would not completely eliminate the potential for damage to the facilities, it would ensure that the resultant improvements would have the structural fortitude to withstand anticipated groundshaking and seismically induced ground failures without significant damage.

All Other Project Components

The potential for liquefaction is higher in areas composed of granular soils with a shallow depth to groundwater. As shown on Figure 4.2-5, the other project components would not be located in areas susceptible to liquefaction-induced ground settlement.

Impact Conclusion

With implementation of standard engineering practices, compliance with Monterey County requirements for geotechnical study, implementation of the design recommendations from the geotechnical engineer, and standard construction methods, this impact would be less than significant for all components of the proposed project.

Mitigation Measures

None proposed.

Impact 4.2-5: Exposure of people or structures to substantial adverse effects related to landslides or other slope failures. (*Less than Significant*)

Figure 4.2-6 shows the locations of the proposed project components and the potential slope stability hazards associated with seismically-induced landslides. The designation of a given area as having high landslide susceptibility does not necessarily mean that an active landslide is present at that location, only that the steepness of the topography and soil type renders that location more susceptible to landslides. Because steep topography increases landslide risk, the map also shows areas prone to non-seismically induced landslides. Non-seismic slope movement can be caused by the force of gravity on steeper unstable slopes, construction activities that change the existing surface water drainage and create unstable slopes, or the addition of water into the slope material through leaks or breaks in pipelines in steeper landslide prone areas.

Main System-Hidden Hills Interconnection Improvements

The steep hillside terrain on and east of the Monterey Peninsula has an elevated susceptibility to landslides. All but one of the project components would be located in relatively flat to gently-sloping topography and would therefore have a low susceptibility to landslides. Only the Main System-Hidden Hills Interconnection Improvements would be located in an area characterized as having a moderate to high susceptibility to earthquake-induced landslides.

The Main System-Hidden Hills Interconnection Improvements consist of a 100-foot long, 6-inch-diameter pipeline to connect the Hidden Hills section of the system with the main distribution system. The entire pipeline section would be buried from about 4 to 8 feet below the surface in the Tierra Grande Drive road right-of-way, as shown in Chapter 3, Description of the Proposed Project, Figure 3-10b. Upon the completion of construction activities, the surface would be restored to the original existing paved condition. This existing road would continue to be maintained with curbs and gutters to collect and control surface water runoff. Although the Main System-Hidden Hills Interconnection Improvements would be placed in an area with a moderate to high landslide susceptibility, there are no existing active landslides in the area and the project does not include activities that would exacerbate an otherwise unstable slope condition. Furthermore, this area would be evaluated during the project geotechnical evaluation and if potentially unstable slope conditions exist, the geotechnical recommendations that would be developed through that study would be implemented by CalAm to diminish the potential for slope failure. Therefore, the potential impact related to landslide susceptibility is considered less than significant.

All Other Project Components

All other project components would be located in relatively flat to gently-sloping topography and would therefore have a low to no susceptibility to landslides. Therefore, there would be no impact for all other project components.

Impact Conclusion

Impacts associated with landslides would be less than significant for the Main System–Hidden Hills Interconnection Improvement. For all other project components, no impact would occur.

Mitigation Measures

None proposed.

Impact 4.2-6: Exposure of people or structures to substantial adverse effects related to expansive soils. (*Less than Significant*)

Unless properly removed or reconditioned during construction, expansive soils could exert additional pressures on foundations and below-grade facilities, producing shrinkage cracks that allow water infiltration and compromise the integrity of backfill material. Depending on the depth of buried pipelines, soil in expansion or contraction could lead to lateral pipeline stress and stress of structural joints. Lateral stresses could, over time, lead to pipeline rupture or leaks in the coupling joints. Shrinkage cracks could form in native soils adjacent to the pipeline trench or in backfill material if expansive soils are used. If shrinkage cracks extend to sufficient depths, groundwater can infiltrate into the trench, causing piping (progressive erosion of soil particles along flow paths) or settlement failure of the backfill materials. Settlement failure can also occur if expansive soils are used in backfill and undergo continued expansion and contraction. Over time these soils could settle, resulting in misalignment or damage to buried facilities.

The effects of expansive soils could damage foundations of aboveground structures, paved service roads, and concrete slabs. Surface structures with foundations constructed in expansive soils would experience expansion and contraction depending on the season and the amount of surface water infiltration. The expansion and contraction, also referred to as linear extensibility, could exert enough pressure on the structures to result in cracking, settlement, and uplift.

Castroville Pipeline, Carmel Valley Pump Station, Main System–Hidden Hills Interconnection Improvements, and Ryan Ranch–Bishop Interconnection Improvements

Table 4.2-4 lists the properties of all of the soil units on or within which project components would be constructed. Proposed components that would be placed on or in soils with moderate to high expansion or linear extensibility potential include the Castroville Pipeline, Carmel Valley Pump Station, the Main System-Hidden Hills Interconnection Improvements, and the Ryan Ranch–Bishop Interconnection Improvements.

As discussed in Section 4.2.3, Approach to Analysis, the project geotechnical engineer for CalAm has completed a preliminary geotechnical assessment of the pipeline route and project facility sites and would complete a final geotechnical design investigation prior to project construction. The geotechnical evaluation of the project sites includes field sampling and testing of surface soils to determine the presence of expansive soils. The investigation of and treatment for expansive soils is considered standard engineering practice for most development projects. Completion of a geotechnical evaluation and implementation of its recommendations reduces the likelihood that expansive soils could impact project components. In addition, all project elements and pipeline facilities would be designed consistent with AWWA standards for pipelines

(discussed in the Approach to Analysis, Section 4.2.3), which account for problematic soils and require remedies for adverse soils in order to adhere to specific standards for pipeline trench excavation, pipe bed material, and backfill. Methods to address expansive soils include removal of the expansive soils or treating the expansive soils by mixing the soil with lime or other additives that reduce the potential for expansion. Given all of these requirements and compliance with standards, the potential for expansive soils to adversely impact project components is low and therefore this impact is less than significant.

All Other Project Components

All other project components would be located in soils with a low linear extensibility potential. Therefore, there would be no impact.

Impact Conclusion

With compliance with applicable construction requirements and design criteria, this impact would be less than significant for the Castroville Pipeline, Carmel Valley Pump Station, Main System–Hidden Hills Interconnection Improvements, and Ryan Ranch–Bishop Interconnection Improvements. There would be no impact for the other project components.

Mitigation Measures

None proposed.

Impact 4.2-7: Exposure of structures to substantial adverse effects related to corrosive soils. (*Less than Significant*)

Soils with a high conductivity can corrode unprotected underground metal pipes and electrical conduits. Over time, pipe corrosion could lead to pipeline failure, resulting in localized surface flooding of water or localized settlement of surface soils at the location of the failure. Failed subsurface electrical conduits could result in electrical short-circuiting. Soils with an acidic pH can corrode unprotected concrete. Over time, concrete corrosion could lead to the degradation of concrete resulting in the cracking and failure of concrete foundations and other support structures. Failed foundations and support structures could result in the breakage of equipment or pipelines and possibly result in temporary shutdown of operations interrupting the public water supply.

MPWSP Desalination Plant, Terminal Reservoir, ASR-5 and ASR-6 Wells, ASR Pipelines, and Ryan Ranch–Bishop Interconnection Improvements

Table 4.2-4 lists the properties of all of the soil units within which project components would be constructed. Clayey soils are potentially corrosive. Project components that would be located on or in soils with moderate to high concrete and unprotected steel corrosion potential include the MPWSP Desalination Plant, Terminal Reservoir, ASR-5 and ASR-6 Wells, ASR Pipelines, and the Ryan Ranch–Bishop Interconnection Improvements.

As discussed in Section 4.2.3, Approach to Analysis, the project geotechnical engineer for CalAm has completed a preliminary geotechnical assessment of the pipeline route and would complete a final geotechnical design investigation prior to project construction. The geotechnical evaluation of the project area boundaries includes an evaluation for the presence of corrosive soils. Managing corrosive soils is standard engineering practice especially for pipeline projects. If corrosive soils are identified during the final geotechnical design study, the project geotechnical engineer would recommend remedies to eliminate damage from corrosive soils, and those recommendations would be implemented by CalAm. Methods to reduce corrosion of metal and concrete caused by soils include avoidance and removal or the use of cathodic protection. In addition, all project elements and pipeline facilities would be designed consistent with AWWA standards for pipelines (discussed in the Approach to Analysis, Section 4.2.3), which account for problematic soils and require remedies for adverse soils in order to adhere to specific standards for pipeline trench excavation, pipe bed material, and backfill.

All Other Project Components

All other project components would be located in sandy soils with a low corrosivity potential. Therefore, there would be no impact.

Impact Conclusion

The presence of corrosive soils would be evaluated and addressed through the final geotechnical investigation prior to project construction. As previously discussed, the CBC and local permitting regulations require a geotechnical investigation. If the investigation finds corrosive soils, the geotechnical engineer would recommend avoidance, removal, or cathodic protection, and CalAm would be required to implement those recommendations. Therefore, the impact of corrosive soils is considered less than significant for the MPWSP Desalination Plant, Terminal Reservoir, ASR-5 and ASR-6 Wells, ASR Pipelines, and the Ryan Ranch–Bishop Interconnection Improvements. There would be no impact for the other project components.

Mitigation Measures

None proposed.

Impact 4.2-8: Exposure of people or structures to substantial adverse effects related to land subsidence. (*No Impact*)

When groundwater is extracted from a confined aquifer, subsidence of the overlying land surface can occur. This type of subsidence is usually associated with severe, long-term withdrawal in excess of recharge that eventually leads to overdraft of the aquifer. As groundwater is pumped out, water is removed from the soil pore spaces leading to a reduction in soil strength. The subsurface conditions more conducive to subsidence include clay or organic-rich soils. Sand- and gravel-rich soils are less prone to subsidence because the larger grains comprise a skeleton less dependent on water pressure

for support. The subsidence can result in damage to infrastructure such as buildings or pipelines, or can result in a decrease in the volume of available aquifer storage.

Subsurface Slant Wells

Overdrafting of the Salinas Valley Groundwater Basin has taken place over an extended time, and saltwater has replaced the freshwater in those affected areas, thereby preventing subsidence (Monterey County, 2010). According to the *Monterey County General Plan*, subsidence is not a critical hazard in the county. As described in Section 3.2.1.1 of Chapter 3, Description of the Proposed Project, the subsurface slant wells would be 900 to 1,000 feet long and extend offshore. The slant wells would be screened at depths corresponding to both the Dune Sand Aquifer and the underlying 180-Foot-Equivalent Aquifer of the Salinas Valley Groundwater Basin. These aquifer units are composed predominantly of sand and gravel. Geologic units composed of sands and gravels are less prone to subsidence because the granular structure is better able to support the overlying weight of soil. In addition, because the subsurface slant wells would draw water from the offshore coastal aquifers, seawater would replace the water pumped from the slant wells, as discussed in Section 4.4, Groundwater Resources. The continuous replacement of water would keep the pore spaces between the grains filled with water, further supporting the granular structure. Consequently, the soil structure above the slant wells would be unable to subside as a result of pumping and there would be no impact from subsidence impacts associated with the subsurface slant wells.

ASR-5 and ASR-6 Wells

The screened sections of the proposed ASR-5 and ASR-6 Wells would be located about 1,000 feet bgs in the sandstone portions of the Santa Margarita Formation in the Seaside Groundwater Basin. The sandstone structure of the geologic unit would be expected to support the granular structure during groundwater pumping, especially considering the depth. In addition, the proposed project would typically extract water injected and stored in the ASR system in the same water year. Therefore, the water pumped into the system during the winter and spring would be extracted during the following summer or fall. Furthermore, for the first 25 years of the proposed project, 700 acre-feet annually would be left in the Seaside Groundwater Basin to restore water extracted in years prior to this project. This means that the overall groundwater levels in the Seaside Groundwater Basin would increase as a result of the proposed project. This would result in a decreased potential for surface ground subsidence and there would be no subsidence impacts associated with the ASR-5 and ASR-6 Wells.

All Other Project Components

None of the other project components would extract groundwater. Therefore, there would be no impact for all other project components.

Impact Conclusion

Given the existing lack of clay in the aquifer units to be pumped and the management of groundwater levels to reduce overdraft, there would be no impacts related to subsidence caused

by the ASR injection/extraction wells. Given the continuous recharge of seawater to the slant wells, there would be no impact related to subsidence caused by the slant wells. For all other project components, there would be no impacts.

Mitigation Measures

None proposed.

Impact 4.2-9: Exposure of people or structures to substantial adverse effects related to alternative wastewater disposal systems. (*Less than Significant*)

This impact analyzes alternate wastewater locations relative to the physical suitability of the proposed locations to infiltrate water. The potential impacts relative to water quality are discussed in Section 4.3, Surface Water Hydrology and Water Quality.

Subsurface Slant Wells

After completing the construction of the subsurface slant wells, the wells would be developed to remove sand, silt, and clay from the well and clean out the well screen and sand pack[21] around the well screen. As described in Section 3.2.1.1, subsurface slant wells, the development water would be discharged to pump-to-waste vaults located at the well heads for the percolation of turbid water back into the sand (see **Figure 3-3**) or conveying it to the existing discharge pipeline for the test slant well and discharging it to the ocean via the MRWPCA ocean pipeline and outfall. The pump-to-waste vault would be a precast 12-foot-long, 8-foot-wide, and 1-foot-tall concrete vault covered with a metal grate and underlain by clean gravel and permeable geotextile fabric. The sand, silt and clay would remain in the pit; the water would infiltrate back down to groundwater. If the materials at and beneath were to have low permeability, the water would not be able to infiltrate back into the underlying aquifer.

The area where the water would be placed is composed of Oceano Loamy Sand (see **Table 4.2-4**). However, in the specific area of the slant wells, the materials are dune sands with little to no fine-grained components (silt and clay) or soil components (organic materials) that would impede infiltration. The high permeability of the dune sand would be suitable for the infiltration of water.

ASR-5 and ASR-6 Wells

After completing the construction of the ASR wells, the wells would be developed to remove sand, silt, and clay from the well and clean out the well screen and sand pack around the well screen. The development water would be discharged to the natural depression shown on **Figure 3-9b**. The sand, silt and clay would remain in the depression; the water would infiltrate

[21] Sand or gravel packs are sand or gravel installed between the well casing and the surrounding native materials and filters out finer-grained materials from entering the well.

back down to groundwater. If the materials at and beneath were to have low permeability, the water would not be able to infiltrate back into the underlying aquifer.

The area where the water would be placed is composed of Baywood Sand (see **Table 4.2-4**). The materials are predominantly sands with little fine-grained components (silt and clay) or soil components (organic materials) that would impede infiltration. The high permeability of the sandy materials would be suitable for the infiltration of water.

All Other Project Components

None of the other project components would require the disposal of wastewater. Therefore, there would be no impact for all other project components.

Impact Conclusion

The alternate wastewater disposal locations for the subsurface slant wells and the ASR wells are sandy areas that would be suitable for the infiltration of water and potential impacts related to the suitability of the locations for wastewater disposal would be less than significant. For all other project components, there would be no impacts. The potential impacts relative to water quality are discussed in Section 4.3, Surface Water Hydrology and Water Quality.

Mitigation Measures

None proposed.

Impact 4.2-10: Accelerate and/or exacerbate natural rates of coastal erosion, scour, or dune retreat, resulting in damage to adjoining properties or a substantial change in the natural coastal environment. (*Less than Significant with Mitigation*)

The sea level in Monterey Bay has been rising for years and is expected to continue rising over the next several decades (ESA, 2013). The Monterey Bay coastline is expected to retreat inland due to the rising sea level and the resulting erosion (ESA, 2014). Erosion and bluff retreat would result in a beach and surf zone that is inland of its current location. The primary concern associated with the proposed project is that coastal retreat could migrate the beach inland such that the subsurface slant well casings, concrete well head vaults, electrical panels, and certain sections of conveyance pipelines would become located on the beach within the project lifetime. As discussed above in the Coastal Retreat Study section, the exposure of the project components to wave action, storm events, and rip embayments could alter the existing natural beach dynamics and the coastal environment, resulting in an increase in beach erosion and/or an interruption in the sand supply to other beaches along the Monterey Bay that would be considered an impact of the proposed project. In addition, beach erosion and bluff retreat caused by the rise in sea level would be a predicted environmental condition that could adversely affect certain components of the project sometime in the future.

The project components that could become located on the beach due to coastal retreat are the subsurface slant wells and associated infrastructure (e.g., well heads, pipelines, and electrical control panels) in the CEMEX active mining area. The area of the slant wells is within the coastal erosion hazard zones that were delineated in the coastal retreat study prepared to evaluate potential coastal erosion hazards associated with the proposed project. The assumptions and methodologies used in the coastal retreat study are discussed above in Section 4.2.3, Approach to Analysis.

Subsurface Slant Wells

The coastal retreat study (ESA, 2014) anticipated that the subsurface slant wells in the CEMEX active mining area could become located on the beach within the project lifetime. It is important to note that predicting the future rate of coastal retreat is an approximation based on anticipated future climate conditions that may vary substantially from actual climate conditions. The coastal retreat study assumes a worst case scenario for planning purposes; the actual amount or rate of coastal retreat could be less.

As described in Sections 3.2.1.1, the seawater intake system would include 10 subsurface slant wells: the existing test slant well, which would be converted to a production well, and the 9 additional new slant wells that would be constructed as part of the proposed project. The subsurface slant wells would originate at an above-ground well head vault behind the beach and radiate out a distance of between 900 and 1,000 feet at an angle of 19 degrees off the horizontal for the existing test slant well and about 14 degrees for all other slant wells off the horizontal toward the Monterey Bay. As shown in **Figure 3-3**, some wells would radiate out in clusters and other wells would be single wells. However, all of the slant wells to be installed would originate from a line about 800 feet back from the shoreline. The wells would extend to the west beneath the sea floor and be screened in the Dune Sand Aquifer and the 180-Foot Equivalent Aquifer.

Figures 4.2-7 and **4.2-8** are coastal profiles developed from the coastal retreat study that show the predicted cross-sectional profile of the coastal bluffs at the CEMEX mining facility through 2060. The methodology and assumptions applied to developing these erosion profiles are discussed above in Section 4.2.3, Approach to Analysis, and in the coastal retreat study (see **Appendices C1 and C2**). The cross-sectional profiles in **Figures 4.2-7** and **4.2-8** show a projected future profile (solid line) and an extremely eroded profile or “lower profile envelope” (dashed line) for the time horizons of 2010, 2040, and 2060. These modeled erosion profile envelopes account for long-term erosion and sea level rise, additional seasonal scour from rip embayments that would predominantly occur in winter, and the additional erosion that would occur from a 100-year storm event.

As originally proposed by CalAm, some slant well clusters were considered in preliminary locations that the coastal retreat study conservatively indicated could either be undermined or exposed, or undergo damage during a large storm event. Consequently, the final design locations for these wells were relocated approximately 400 feet further inland from the originally proposed locations to the locations shown on **Figures 4.2-7**, **4.2-8**, and **3-3**.

Based on the profile, the proposed slant wells would now be located behind the predicted 2060, 100-year lower profile envelope. The coastal retreat study determined that under a conservative predicted erosion rate and considering the additional scour caused by a 100-year storm event in that time horizon, the proposed slant wells would remain buried in the dunes and would not become exposed on the beach until sometime after 2060. The rate of bluff retreat used in the coastal retreat study is conservative in that it may not account for natural accretion of sand on the beach and bluffs that could occur during years of below normal storm activity. As a result, it is possible that the 2060 bluff retreat envelope shown on the profile may not be realized until years after 2060. According to the evaluation criteria for coastal erosion (see Section 4.2.4, Evaluation Criteria, above), the proposed project would cause a significant impact if it accelerated and/or exacerbated natural rates of coastal erosion, scour, or dune retreat resulting in a substantial adverse change in the coastal environment. The proposed slant wells would not be exposed during the operational life of the slant production wells (anticipated to be 20 to 25 years) and would not contribute to further coastal erosion or changes in the beach environment. Therefore, the proposed location of the proposed slant wells would not represent a potential erosion hazard and would not contribute to a significant impact of the proposed project.

Based on the profile, the well head and insertion point for the existing test slant well is about 300 feet closer to the ocean than the nine proposed subsurface slant wells. The test slant well is anticipated to be within the 2060 future 100-year storm coastal erosion profile and lower profile envelope. As noted above, the modeled coastal retreat rate is conservative and the actual rate of coastal retreat may be less.

The coastal erosion modeling anticipates that the beach could migrate inland to the location of the test slant well by the year 2060. Assuming the pilot program being conducted for the test slant well confirms the CEMEX active mining area to be a viable location for the Seawater Intake System, the test slant well would be converted into a permanent well and incorporated into the seawater intake system with a well head vault. Given the test slant well's forward location on the beach at the estimated 2060 future 100-year storm coastal erosion profile and lower profile envelope, it is possible that the well casings and concrete wellhead vault might become exposed on the beach sometime during the operational life of the project. If exposed, the subsurface slant well could contribute to accelerated and/or exacerbated natural rates of coastal erosion, scour, and dune retreat that could alter the natural coastal environment. In addition, exposure of these structures could adversely affect scenic resources and recreational uses on the beach.

All Other Proposed Facilities

None of the other project components are close enough to the coast to be vulnerable to coastal retreat. Therefore, there would be no impact on coastal erosion. But the brine generated by the desalination plant could scour the sea floor as it is released from the existing outfall diffuser. A comparison of the jet plume velocity with oceanic current measurements and estimates based on ocean circulation models at Monterey Bay, indicate that the currents produced by the jet plumes are on the same order of magnitude and similar to the ambient ocean currents for average values and considerably smaller when compared to the maximum currents estimated and observed in Monterey Bay and at the outfall location. **Table 4.2-8** summarizes the ambient ocean currents at

Monterey Bay at a 30m depth and the estimated current velocities of the jet plume at the moment it touches the sea floor for the worst case scenario discussed Section 4.3, Surface Water Hydrology and Water Quality. This impact would be less than significant.

TABLE 4.2-8
COMPARISON OF JET PLUME AND AMBIENT OCEAN CURRENTS AT MONTEREY

	Mean (ft/s)	Maximum (ft/s)
Ocean Currents – ROMS[a]	0.13	0.76
Ocean Currents – ADCP[b]	0.16	
Wave Induced Currents[c]	0.3	1.87
Jet Plume Centerline[d]		0.4
Jet Plume - 3 ft from centerline[e]		0.02

NOTES:
a Ocean currents from ROMS model from January 2011 to March 2012 at the outfall location 30 m depth
b ADCP measurements of Tenera (2014) at a depth of 30 m near the mouth of Monterey Cannon
c Wave induced currents at 30 m depth based on 5 years of wave measurements from January 2007 to December 2012 (NDBC, 2013, ID buoy 46236).
d Visual plume results for scenario P2 at the centerline.
e From Phillip Roberts Appendix D1. The entrained velocity of the jet plume decreases rapidly with distance from the jets in inverse proportion to the distance r. So at a distance of 3 ft from the jet centerline, the velocity will fall to about 0.02 ft/s

Consistency with Plans & Policies

In addition to the physical impacts described above, as noted in **Table 4.2-6**, the MPWSP could conflict with applicable land use plans, policies, or ordinances related to coastal erosion that were adopted for the purpose of avoiding or mitigating an environmental effect. Specifically, coastal-erosion-induced exposure of the subsurface slant wells would conflict with California Coastal Act Sections 30235 and 30253; Marina General Plan Policy 4.102.4; Marina Local Coastal Land Use Plan Geotechnical Guidelines; Monterey Harbor Land Use Plan Policies 3.b, 3.c, and 3.d; Del Monte Beach Land Use Plan Policies 3.1, 3.3, 3.4, 3.7, and 3.11; and Monterey County General Plan Policy S-1.6. As discussed in the subsequent paragraphs, **Mitigation Measure 4.2-9 (Slant Well Abandonment Plan)** would require abandonment of the subsurface slant wells before coastal retreat migrates the beach inland to the test slant well. With these measures implemented, the MPWSP would be brought into conformance with the above-noted policies.

Impact Conclusion

The anticipated future presence of the test slant well on the beach due to coastal retreat would result in a significant impact. **Mitigation Measure 4.2-9 (Slant Well Abandonment Plan)** would reduce the impact to a less-than-significant level by requiring CalAm to monitor coastal retreat rates and initiate well decommissioning before the beach migrates inland to the location of the subsurface slant wells. As previously discussed, the proposed new slant wells would be located inland of the modeled anticipated inland extent of coastal retreat. However, the rate of

coastal retreat may vary due to unforeseen changes in climate change. Therefore, this mitigation measure shall also apply to all of the slant wells.

Mitigation Measures

Mitigation Measure 4.2-9 applies to all slant wells.

Mitigation Measure 4.2-9: Slant Well Abandonment Plan.

CalAm shall monitor the rate of coastal retreat and implement the following corrective measure:

1. CalAm shall conduct annual monitoring of the rate of coastal retreat relative to the slant wells at the CEMEX site. The data shall be used to estimate the year at which the wells and associated pipelines have 5 years before exposure.

2. Beginning 5 years prior to the anticipated exposure of the slant wells, CalAm shall implement the planning and permitting necessary to abandon the slant wells in accordance with state well destruction standards.

3. Once an estimated exposure window is established through annual monitoring and a removal date is identified, CalAm shall remove the slant wells from service prior to their exposure.

4. The slant well casing shall be pressure grouted such that the screened section is sealed. The section of well casing and pipelines at risk of exposure shall be cut and removed to a depth of five feet below the 2060, 100-year lower profile envelope as determined by the 2014 Coastal Erosion Study (ESA, 2014) or as directed by any permit condition.

4.2.6 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 4.2-C: Cumulative impacts related to geology, soils, and seismicity. (*Less than Significant with Mitigation*)

Although the Monterey Bay area is located within a seismically active region with a wide range of geologic and soil conditions, these conditions can vary greatly within a short distance. Accordingly, geologic, soils, and seismic impacts tend to be site-specific and depend on the local geology and soil conditions. For these reasons, the geographic scope for potential cumulative geologic and seismic impacts consists of the project component locations and the immediate vicinity. The timeframe during which the MPWSP could contribute to cumulative geology, soils, and seismicity effects includes the construction and operations phases.

Cumulative Impacts during Project Construction

As described in Impact 4.2-1, construction activities have the potential to cause soil erosion and loss of topsoil. Two of the MPWSP's water conveyance pipelines (Castroville and New Desalinated Water Pipelines) and TAMC's Monterey Peninsula Light Rail Project (No. 38 in Table 4.1-2 in Section 4.1) would be constructed adjacent to each other and within the same alignment. The alignments may cross each other at the northern end of the Castroville Pipeline. The Marina Station project (No. 12) would be constructed on either side of Del Monte Boulevard where the new Desalinated Water Pipeline would be constructed. The new Transmission Main would cross through the southwest portion of the area that may be redeveloped as part of the Main Gate Specific Plan (No. 18).

If the projects are constructed at the same time, the erosion effects could be cumulatively significant. However, the state Construction General Permit would require each project to prepare and implement a SWPPP. The SWPPPs would describe BMPs to control runoff and prevent erosion for each project. Through compliance with this requirement, the potential for erosion impacts would be reduced. The Construction General Permit has been developed to address cumulative conditions arising from construction throughout the state, and is intended to maintain cumulative effects of projects subject to this requirement below levels that would be considered significant. For example, two adjacent construction sites would be required to implement BMPs to reduce and control the release of sediment and/or other pollutants in any runoff leaving their respective sites. The runoff water from both sites would be required to achieve the same action levels, measured as a maximum amount of sediment or pollutant allowed per unit volume of runoff water. Thus, even if the runoff waters were to combine after leaving the sites, the sediments and/or pollutants in the combined runoff would still be at concentrations (amount of sediment or pollutants per volume of runoff water) below action levels and would not be cumulatively considerable (less than significant). Similarly, the impacts of the MPWSP water conveyance pipelines combined with TAMC's Monterey Peninsula Light Rail Project, the Marina Station, the Main Gate Specific Plan, and/or Sanitary Sewer System Rehabilitation Program would not cause a significant cumulative impact related to soil erosion (Impact 4.2-1) and the proposed project's contribution to cumulative impacts on soil erosion would not be cumulatively considerable (*less than significant*).

Two of the MPWSP's water conveyance pipelines (Castroville and New Desalinated Water Pipelines) and TAMC's Monterey Peninsula Light Rail Project (No. 38) would be constructed adjacent to each other and within the same alignment adjacent to active farmland and potentially in areas of sensitive natural communities dependent on the topsoil. If the projects are constructed at the same time, the loss of topsoil impacts could be cumulatively significant, and the proposed project would have a cumulatively considerable contribution to this significant cumulative loss of topsoil. The proposed project's contribution to this impact would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.6-2b (Avoid, Minimize, and Compensate for Direct Construction Impacts on Sensitive Communities** and **Measure 4.16-1 (Minimize Disturbance on Farmland**) because these measures require that topsoil be salvaged, stockpiled separately from subsoils, and returned to its appropriate location in the soil profile during backfilling activities. Thus, after mitigation, topsoil would be replaced and there would be no substantial residual contribution to a cumulative impact. It is unknown whether the TAMC's

Monterey Peninsula Light Rail Project would implement similar mitigation measures, although it is likely that existing regulations would require mitigation measures for sensitive natural communities. In any case, with implementation of the mitigation measures for the proposed project, the proposed project's contribution to a significant cumulative impact would be reduced to a level that is not cumulatively considerable (*less than significant with mitigation*).

Cumulative Impacts during Project Operations

With the exception of the existing Slant Test Well project (No. 47), which if proven viable would become a component of the proposed project, and TAMC's Monterey Peninsula Light Rail Project (No. 38), none of the other projects listed in **Table 4.1-2** would have a footprint that overlaps with that of a proposed project component. The Test Slant Well and TAMC's Monterey Peninsula Light Rail Project are not located on known active faults. The Test Slant Well is not located on expansive soils. Because of the localized nature of the anticipated project impacts, the other projects listed in **Table 4.1-2** would not combine with those of the proposed project to cause or contribute to potential cumulative geologic, soil, or seismic impacts associated with fault rupture (Impact 4.2-2) or expansive soils (Impact 4.2-6) (*no impact*).

As described in Impacts 4.2-3, 4.2-4, and 4.2-7, seismically induced groundshaking, liquefaction and lateral spreading, and corrosive soils could cause pipeline leaks or ruptures. State and local building regulations and standards, described in Section 4.2.2, Regulatory Framework, have been established to address and reduce the potential for such impacts to occur. The proposed project and cumulative projects identified in **Table 4.1-2** would be required to comply with applicable provisions of these laws and regulations. Through compliance with these requirements, the potential for impacts such as pipeline leaks or ruptures would be reduced. As explained in Section 4.2.2, the purpose of the CBC is to regulate and control the design, construction, quality of materials, use/occupancy, location, and maintenance of all buildings and structures within its jurisdiction; by design, it is intended to reduce the cumulative risks from buildings and structures. Therefore, based on compliance with these requirements, the incremental impacts of the proposed project combined with impacts of other projects in the area would not cause a significant cumulative impact related to seismically induced groundshaking (Impact 4.2-3), liquefaction and lateral spreading (Impact 4.2-4), or corrosive soils (Impact 4.2-7) and the proposed project's contribution to cumulative effects would not be cumulatively considerable (*less than significant*).

As discussed in Impact 4.2-5, the Main System-Hidden Hills Interconnection Improvements are proposed for an area with high to moderate landslide susceptibility. As indicated on **Figure 4-1**, there are no cumulative projects in the vicinity of the Main System-Hidden Hills Interconnections Improvements site. Moreover, as discussed in Impact 4.2-5, upon completion of construction activities, the pipeline would be buried below the street, the surface would be restored to the approximate pre-construction paved condition (e.g., slope and drainage), and the risk of the proposed project initiating ground movement would be the same as pre-construction conditions. As a result, the proposed project would not cause or contribute to any potential cumulative effect related to landslide (Impact 4.2-5) (*no impact*).

As discussed in Impact 4.2-8, the proposed project would have no impact related to subsidence caused by the ASR injection/extraction wells or the subsurface slant wells. Because the Slant Test Well would become permanent and operated as part of the MPWSP seawater intake system during proposed project operations, its operational extraction of water is considered as part of the impact analysis for the proposed project and is not an additional extraction within the cumulative scenario. Therefore, the proposed project would not cause or contribute to a cumulative subsidence impact (*no impact*).

As discussed in Impact 4.2-9, the proposed project would have no impact related to exposing people or structures to substantial adverse effects related to alternative wastewater disposal systems. Therefore, the use of alternate wastewater disposal would not cause or contribute to a cumulative alternate wastewater disposal impact (*no impact*).

As discussed in Impact 4.2-10, coastal retreat due to sea level rise is anticipated to result in coastal erosion and bluff retreat. Over time, coastal retreat is anticipated to migrate beaches inland, and structures located within the areas of coastal retreat could become located on beaches. The presence of structures on beaches could exacerbate shoreline erosion and scour and/or be subject to damage or failure associated with severe storm events. Several cumulative projects are located at the coast, particularly the sandy beach areas of Monterey Bay: Fort Ord Dunes State Park Campground (No. 46), Monterey Bay Shores Resort (No. 19), The Collection at Monterey Bay Resort (No. 56), City of Seaside 90-inch Bay Avenue Outfall Phase 1 (No. 43), and City of Sand City Coastal Desalination Plant (No. 6). The exposure of structures on the beach from one or more of these sites could result in increased scour and erosion that could be cumulatively significant. Because over the project lifetime, the subsurface slant well casings, concrete well head vaults, electrical panels, and certain sections of conveyance pipelines could become located on the beach and therefore could exacerbate shoreline erosion and scour, the proposed project would have a cumulatively considerable contribution to this significant cumulative impact. The proposed project's contribution would impact would be reduced to a less-than-significant level through implementation of **Mitigation Measure 4.2-9 (Slant Well Abandonment Plan)**, which would require CalAm to monitor coastal retreat rates and initiate well decommissioning before the subsurface slant wells become located on the active beach. Thus, after mitigation, no project structures would become located on the active beach, and the residual contribution to a cumulative impact related to coastal erosion would be negligible. It is unknown whether the listed cumulative projects also have plans to remove structures from the beach prior to exposure or install protective structures in the event that coastal retreat reaches their structures. In any case, with implementation of the mitigation measure, the proposed project's contribution to a significant cumulative impact related to coastal erosion would be reduced to a level that is not cumulatively considerable (*less than significant with mitigation*).

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4.3 Surface Water Hydrology and Water Quality

Sections

4.3.1 Setting/Affected Environment
4.3.2 Regulatory Framework
4.3.3 Evaluation Criteria
4.3.4 Approach to Analysis
4.3.5 Direct and Indirect Effects of the Proposed Project
4.3.6 Cumulative Effects of the Proposed Project

Figures

4.3-1 Surface Water Resources in the Project Area
4.3-2 Flood Hazards in the Project Area
4.3-3 Areas Subject to Sea Level Rise in the Project Area
4.3-4 Illustrations of Trajectory and Behavior of a Plume Discharge
4.3-5 Illustrations of the Trajectory of a Dense Brine Discharge Plume
4.3-6 Typical Graphics Output of Jet Trajectory from VP Method: Brine Only Discharge Scenario
4.3-7 Brine Mixing Zone (BMZ) and Diffuser Overview
4.3-8 Non-merging Dense Discharge Plumes from Diffuser Ports (Near Field)
4.3-9 3DLIF Image of Horizontal Dense Jet
4.3-10 UM3 Graphical Output for Scenario 2 (Pure Brine at 13.98 mgd)
4.3-11 Summary of Approach to Analysis for Determining Ocean Plan Compliance

Tables

4.3-1 Seasonal Average Temperature, Salinity, and Density Properties at MRWPCA Outfall Diffuser
4.3-2 303(d) List of Impaired Water Bodies in the Project Vicinity
4.3-3 Designated Beneficial Uses of Surface Water Bodies in the Project Vicinity
4.3-4 Water Quality Objectives in the 2016 Ocean Plan
4.3-5 Water Quality in Monterey Bay (Constituent Concentrations Reported Under CCLEAN 2008-2015)
4.3-6 Overview of Post-Construction Requirements for Stormwater Management
4.3-7 Applicable Regional and Local Land Use Plans, Policies, and Regulations Pertaining to Surface Water Hydrology and Water Quality
4.3-8 Summary of Impacts of Proposed Project – MPWSP, 10 Slant Wells at CEMEX Surface Water Hydrology and Water Quality
4.3-9 Monthly Average Flows of Secondary-Treated Wastewater from the MRWPCA Regional Wastewater Treatment Plant (1998–2012) and of the Estimated Brine Stream under the MPWSP
4.3-10 Proposed Project (MPWSP, 10 Slant Wells at CEMEX) Discharge Scenarios Modeled
4.3-11 Effluent Water Quality Characteristics Assumed for All Modeled Scenarios
4.3-12 Operational Discharge Flow, Salinity, and Density
4.3-15 MPWSP Operational Discharge Scenarios: Estimated Concentrations at the Edge of the ZID for Ocean Plan Constituents
4.3-16 MPWSP Operational Discharge Scenarios: Estimated Concentrations at the Edge of the ZID Expressed as Percentage of Ocean Plan Objective for Ocean Plan Constituents

This section analyzes the potential for the Monterey Peninsula Water Supply Project (MPWSP or proposed project) which includes 10 slant wells at CEMEX, to adversely affect surface water hydrology and water quality in inland freshwater bodies and in Monterey Bay National Marine Sanctuary (MBNMS) ocean waters in the southern portion of Monterey Bay. Impacts on groundwater resources are evaluated in Section 4.4, Groundwater Resources. The secondary

effects of potential project-related changes in ocean water quality on marine biological resources are evaluated in Section 4.5, Marine Biological Resources. Impacts related to coastal erosion are evaluated in Section 4.2, Geology, Soils, and Seismicity.

Comments received on the April 2015 Draft EIR expressed concerns over the potential for hypoxia[1] to occur near the seabed as a result of proposed MPWSP operational discharges. Specifically, there was concern that high salinity discharges from the MRWPCA outfall would restrict oxygen supply near the seabed and result in stress or mortality to benthic organisms and other marine resources. Additionally, comments raised concerns regarding the adequacy of model analyses related to salinity and water quality; the travel path of the operational discharge plume; salinity levels within and beyond the area of initial dilution following discharge; and the potential for a dense operational discharge plume to travel along the sea floor and result in impacts on marine resources as a result of elevated salinity and associated toxic effects to habitat and wildlife. These issues are addressed in Section 4.3.5.2 under Impact 4.3-4 and Impact 4.3-5. Comments related to impacts on marine biological resources resulting from operational discharges are addressed in Section 4.5, Marine Biological Resources and are based, in part, on the water quality analyses presented in Impacts 4.3-4 and 4.3-5. Additional sampling and modeling were conducted to address many of these concerns and are addressed in Section 4.3.5.2.

4.3.1 Setting/Affected Environment

The study area for evaluation of surface water hydrology and water quality impacts is the Salinas River watershed, Carmel River watershed, and the southern portion of Monterey Bay south of Elkhorn Slough within MBNMS.

4.3.1.1 Climate and Topography

The climate in the study area is moderate throughout the year with warm, dry summers and cool, moist winters. The average temperature is approximately 60 degrees Fahrenheit (°F) (Monterey County, 2008). Rainfall occurs primarily between November and April. Average annual rainfall in the county is approximately 18 inches.

The study area lies within the southern portion of the Coast Ranges province. The topography in the study area is dominated by a rugged coastline and the Diablo, Gabilan, and Santa Lucia mountain ranges with peaks of up to 5,844 feet above mean sea level (msl). Elevations in the project area range from approximately 10 feet above msl in the CEMEX active mining area to roughly 300 feet above msl along General Jim Moore Boulevard in Seaside. The topography of the project area results in part from the gently to moderately rolling sand dunes that are present along the coastal areas in the north to the city of Monterey in the south. Active, wind-blown dunes generally extend less than a 0.5-mile inland, and older, more stabilized dunes extend up to 4 miles inland.

[1] Hypoxia, or oxygen depletion, is an environmental phenomenon where the concentration of dissolved oxygen in the water column decreases to a level that can no longer support living aquatic organisms. The impacts of hypoxia are often described as creating a so-called “dead zone” in the marine environment.

4.3.1.2 Regional Surface Water Hydrology

The project area is located in the Salinas River and Carmel River watersheds (see **Figure 4.3-1**), which are discussed below. The headwaters of the Salinas and Carmel Rivers, the primary watercourses in the region, originate in the Santa Lucia and Gabilan Mountains (Monterey County, 2008). In general, the overall drainage pattern in the county is from southeast to northwest. The Salinas River drains into Monterey Bay and the Carmel River drains into Carmel Bay both of which are within MBNMS. A third major watershed in the region, the Pajaro River watershed, lies north of the project area and includes the Elkhorn Slough subwatershed. The Pajaro River enters Monterey Bay at the northern tip of Monterey County. The Pajaro River Watershed lies north of and outside of the project area and is not discussed further.

Salinas River Watershed

With the exception of the Main System-Hidden Hills Interconnection Improvements and the Carmel Valley Pump Station, all of the proposed project facilities would be located in the Salinas River watershed. The Salinas River drains approximately 3,950 square miles and has the largest drainage area in Monterey County. The Salinas River watershed is bounded by the Santa Lucia Mountains to the west and the Gabilan Mountains to the east (Monterey County, 2008). Historically, the Salinas River joined with Elkhorn Slough in Moss Landing prior to discharging into Monterey Bay; this river segment is now referred to as the Old Salinas River. Today, the Salinas River drains directly into Monterey Bay approximately 4 miles south of Moss Landing (CCoWS, 2006). In the project area, within the Salinas River watershed, the Canyon del Rey subwatershed extends east of Monterey and Seaside (see **Figure 4.3-1**). The Canyon del Rey subwatershed covers approximately 13.8 square miles and is located along the Seaside/Del Rey Oaks/Highway 68 corridor (Monterey County, 2010b). Canyon Del Rey Creek discharges seasonally to Monterey Bay via Laguna del Rey.

Average annual flows to the ocean from the Salinas River are around 282,000 acre-feet per year, most of which occurs from November through March. This period corresponds to the months of peak seasonal rainfall and coincides with a seasonal drop in irrigation in the valley (Monterey County, 2008). The Salinas River hydrology during the dry season is largely determined by water releases from the Nacimiento and San Antonio reservoirs. During spring and summer, operation of the two reservoirs regulates flow to minimize ocean outflow and maximize groundwater recharge through the Salinas River bed (Kozlowski et al., 2004). Water from the reservoirs[2] is used for groundwater recharge and managed so that the flows reach the lower Salinas River and percolate without being lost to the ocean (Kozlowski et al., 2004).

Carmel River Watershed

The Carmel River watershed covers an area of 255 square miles. From its headwaters in the Santa Lucia Mountains, the Carmel River flows for 36 miles, draining into Carmel Bay just south of the city of Carmel-by-the-Sea (Monterey County, 2010b). The larger tributaries of the Carmel River

[2] This does not include the modifications to the Nacimiento Dam spillway and operation of the rubber dam associated with the Salinas Valley Water Project.

include Garzas Creek, San Clemente Creek, Tularcitos Creek, Pine Creek, Danish Creek, Cachagua Creek, and Miller Fork. The Main System-Hidden Hills Interconnection Improvements and the Carmel Valley Pump Station would lie within the Carmel River watershed.

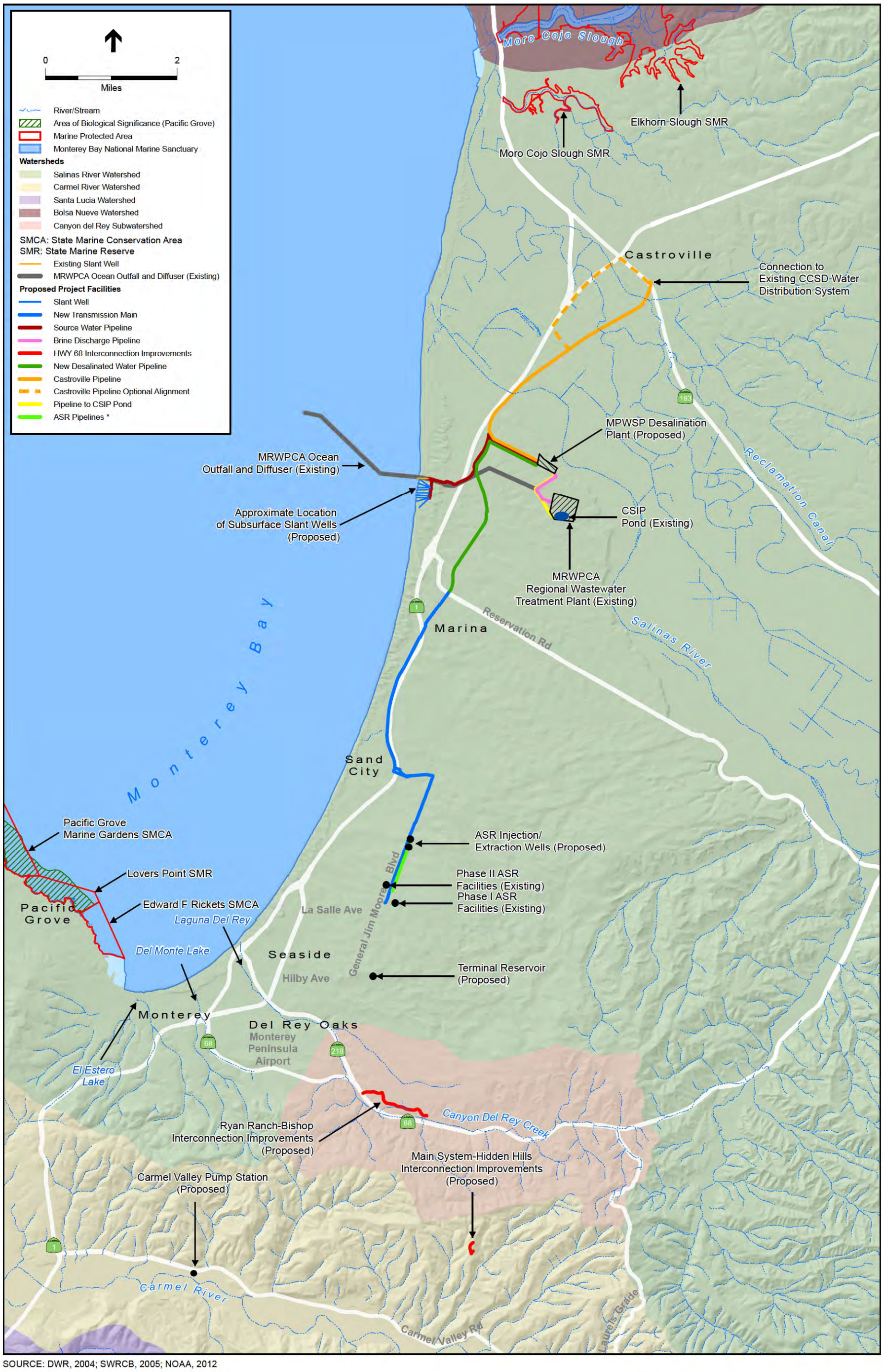
Monterey Bay

Monterey Bay is a bay of the Pacific Ocean on California's Central Coast within MBNMS. The bay extends between the city of Santa Cruz and the Monterey Peninsula. MBNMS was designated in 1992 as a federally protected marine area off of California's Central Coast. It stretches from Marin to Cambria, encompasses a shoreline length of 276 miles and 4,601 square nautical miles of ocean, and extends an average distance of 30 miles from shore. The shoreline of Monterey Bay is composed primarily of less resistant sand dune and sedimentary deposits that form the ancient sand dune terraces and provide the opportunity for farmland around the communities of Watsonville, Castroville, Marina, Sand City, and Seaside. The primary freshwater inputs to Monterey Bay are through the San Lorenzo, Pajaro, Salinas and Carmel Rivers but other water bodies such as the Moro Cojo Slough feed into the Monterey Bay (see **Figure 4.3-1**). Beneath Monterey Bay is the Monterey Submarine Canyon, one of the deepest submarine canyons on the west coast of the United States (MBARI, 2016). The canyon head lies just offshore of Moss Landing. From there, the main channel meanders 470 kilometers (292 miles) seaward and is approximately 12 kilometers at its widest point, with a maximum rim to floor relief of 1,700 meters (5,577 feet) (MBNMS, 2016a). The Monterey Canyon system includes two additional canyon heads, Soquel Canyon and Carmel Canyon, which flank Monterey Canyon to the north and south, respectively.

The oceanographic features primarily affecting waters of Monterey Bay are seasonal upwelling and the California Current System, which consists of the California Current, the California Undercurrent, and the Davidson Current. The California Current is a large scale upper ocean current that transports cold, subarctic water with lower salinity from the North Pacific south along the North American coast where it mixes with warm, saltier equatorial water (ESA, 2015). Beneath this near-surface current and relatively close inshore (within 100 kilometers or 62 miles), is the California Undercurrent that transports warm subtropical water northward. During winter months the California Undercurrent becomes the inshore countercurrent or Davidson current (Flow Science Inc., 2014). Seasonal upwelling and the California Current System and its influence on Monterey Bay water quality is discussed further in Section 4.3.1.3 (below).

4.3.1.3 Surface Water Quality

The quality of surface water is primarily a function of land uses in the project area. Pollutants and sediments are transported in watersheds by stormwater runoff that reaches streams, rivers, storm drains, and reservoirs. Local land uses influence the quality of the surface water through point source discharges (i.e., discrete discharge from a wastewater treatment plant) and nonpoint source discharges (e.g., storm runoff). Some of the most prominent water quality problems in the project area are erosion and sedimentation, pollutants in urban runoff, nitrate contamination, and inorganic constituents (Monterey County, 2010b). Surface water quality for the two primary watersheds in the project area and Monterey Bay is described below.



SOURCE: DWR, 2004; SWRCB, 2005; NOAA, 2012

NOTE:
*The ASR Pipelines are the ASR Conveyance Pipeline, the ASR Pump-to-Waste Pipeline, and the ASR Recirculation Pipeline. See Figure 3-9a for the individual pipeline alignments.

205335.01 Monterey Peninsula Water Supply Project

Figure 4.3-1

Surface Water Resources in the Project Area

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Salinas River and Carmel River Watersheds

Urban runoff has the potential to directly affect water quality in the Salinas River and in Monterey Bay (Monterey County, 2008). As further discussed in Section 4.3.2.1, below, the lower Salinas River water quality is impaired by pesticides and nutrients. Relatively less urbanization has occurred in the Carmel River watershed as compared to the Salinas River watershed. However, because most of the urban uses are close to the river, they present the potential for direct impacts on surface water quality. According to a Carmel River Watershed Conservancy[3] monitoring report (2004), excess sediment in the Carmel River occurs due to various land uses and road designs.

Monterey Bay

This section characterizes baseline water quality conditions in Monterey Bay/MBNMS with a focus on salinity and temperature (which can affect ocean water density and receiving water mixing dynamics) as well as water quality constituents that are regulated by the State Water Resources Control Board (SWRCB) and the Central Coast Regional Water Quality Control Board (RWQCB) (see Section 4.3.2, Regulatory Framework, below, for additional information regarding water quality regulations). Ocean climate, a physical driver that affects water quality in Monterey Bay, is also described here. When turbulence associated with ocean currents or surface waves exceed the threshold required for initiating motion of seabed materials, the resuspension of bottom sediments, which occurs naturally, can affect water quality by producing short-term and localized increases in suspended sediment concentrations and turbidity levels in near bottom waters. Suspended sediments also occur in surface waters following storm events that result in discharges from coastal rivers. Ocean currents may transport these river-derived sediments substantial distances alongshore or offshore from the origin. For additional details related to sediment dynamics and physical processes in Monterey Bay, see Section 4.5, Marine Biological Resources.

Salinity and Temperature

The seawater in Monterey Bay is a mixture of water masses from different parts of the Pacific Ocean with warmer, saltier water from the equatorial zone and colder, fresher water from the arctic regions. Near-shore surface temperatures vary from 8°C (46.4°F) during winter and early spring to 17°C (62.6°F) during fall. Near-shore surface salinities vary from 33.2 practical salinity units (psu) to 34.0 psu[4] when upwelling[5] is strong. Streams and rivers can locally affect salinity, but even during flood conditions, when freshwater inputs to Monterey Bay peak, the salinity of Monterey Bay surface waters does not fall below 31 psu (MBNMS, 2013b). Salinity tolerances of organisms present in Monterey Bay are discussed in detail in Section 4.5, Marine Biological Resources. In general, as discussed in detail in Section 4.5.5.2, the species present in the study

[3] The Carmel River Watershed Conservancy monitors the health of the Carmel River watershed resources including creeks, streams, and wildlife habitat.

[4] Unit used to measure salinity in terms of the concentration of dissolved salts in water. Equivalent to parts per thousand (ppt).

[5] Upwelling is the process by which the warmer water at the ocean surface is pushed away by wind and replaced by colder, denser water that rises up from the subsurface.

area are tolerant of differing ranges of salinities depending on the organism and the life-stage in question. As an example, most cephalopods (e.g. squid) have an ideal range of salinity of 32 to 38 ppt, and are tolerant of salinities at levels outside this range. For general context, marine organisms in the study area have been demonstrated to tolerate salinities up to 36 ppt with no adverse effects on survival, growth, and behavior (see Table 4.5-9).

Bograd and Lynn (2003) compared nearshore salinity and temperatures in Monterey Bay during two periods: 1950-1976 and 1977-1999 and found very little variation. The difference in nearshore salinities between the periods was approximately 0.2 parts per thousand (ppt) or psu[6] and the difference in nearshore temperatures was approximately 1.4 °F. As such, the reported seasonal salinity and temperature is provided here as representative of baseline conditions. Additional temperature and salinity data is presented below as part of the characterization of ocean climate, seasonal ocean water density and physical processes (such as waves and currents) that influence water quality.

Dissolved Oxygen

Dissolved Oxygen (DO) is typically used as a general index for the health of receiving waters (such as in the *Water Quality Control Plan for Ocean Waters of California* or Ocean Plan, discussed below in Section 4.3.2.2). Adequate DO is vital for aquatic life and higher concentrations are generally considered to be desirable. Dissolved oxygen content in water is, in part, a function of water temperature and salinity (discussed above). The ability of oxygen to dissolve in water decreases as the temperature and salinity of water increases. As the temperature and/or salinity of water increases, water loses the ability to hold dissolved oxygen and the concentration goes down. Salinity also has properties that can facilitate the creation of hypoxic[7] zones. Because salt water is more dense than fresh water, under certain conditions (typically observed in estuaries and coastal lagoons), a less dense layer of fresh or low salinity water can form on top of a denser layer of high salinity water on the bottom. Such a scenario can prevent adequate mixing of the water column and prevent oxygenated water from getting to the lower depths, resulting in the heavier, saltier layer at the bottom to become oxygen-depleted. However, DO varies according to many other factors, including photosynthesis and biological and chemical oxygen demand associated with decomposition of organic material. Monterey Bay is a dynamic environment that includes variable concentrations of DO. Ambient DO levels in Monterey Bay at a depth of approximately 100 feet have ranged from 4.25 milligrams per liter (mg/L) to 8.00 mg/L (KLI, 1998; KLI, 1999); typically, DO in the range of 5 to 8 mg/L is considered protective of fish and marine biota depending on the species and life-stage.

Other Constituents

The water quality of Monterey Bay is a function, in part, of different constituents present in the water, as well as the seasonal ocean climate (discussed below) in the Bay that affects the concentration of the constituents present. The waters of Monterey Bay contain numerous legacy

6 The unit ppt is equivalent to psu.
7 Hypoxia occurs when the amount of dissolved oxygen in water becomes too low to support most aquatic life (typically below 2 mg/l).

pesticides[8] such as organochlorine pesticides, Dieldrin and dichloro-diphenyl-trichloroethane (DDT), as well as chemical products in current use such as organophosphate pesticides, polynuclear aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs).[9] The largest source of contaminants is agricultural runoff into the Pajaro and Salinas Rivers. Seasonal data collected by the Central Coast Long-term Environmental Assessment Network[10] (CCLEAN) between 2001 and 2013 indicate numerous instances where water quality objectives and human health alert levels in Monterey Bay were exceeded due to the presence of contaminants (CCLEAN, 2011 and 2014). Nearshore waters of Monterey Bay have failed to meet the Ocean Plan water quality objective for the protection of human health (i.e., concentrations are higher than numeric water quality objectives) for PCBs, Dieldrin, chlordanes, and DDTs. PCBs in the northern portion of Monterey Bay have increased significantly since 2006 and annual average concentrations across all samples have increased exponentially (CCLEAN, 2014). Annual data reported indicate that waters of Monterey Bay exceeded the Ocean Plan 30-day average PCB water quality objective of 1.9×10^{-5} micrograms per liter (µg/L)[11] for most of the years between 2004 and 2013. Additional details related to water quality objectives and Monterey Bay water quality is provided in Section 4.3.2.2, below, under the subsection California Ocean Plan Water Quality Objectives.

Monterey Bay also receives point source discharges from pipelines and other structures. These permitted discharges are subject to prohibitions and water quality requirements established by the Central Coast RWQCB such as effluent limitations, periodic monitoring, annual reporting, and other requirements designed to protect the overall water quality of Monterey Bay. In the project area, some of these permitted discharges include stormwater discharges from the cities of Sand City, Seaside, Monterey, Del Rey Oaks, and Pacific Grove, and unincorporated portions of Monterey County, and treated wastewater from the Monterey Regional Water Pollution Control Agency (MRWPCA) Regional Wastewater Treatment Plant located on Charles Benson Road in Marina. Another permitted point discharge in Monterey Bay is located 7 miles north of the project area in Moss Landing associated with a natural gas power plant operated by Dynegy, whose cooling water is discharged.[12]

Monterey Bay Ocean Climate

Ocean climate refers to oceanographic conditions, including temperature, salinity, current, and wave patterns prevailing over a period of time. An understanding of the ocean climate in Monterey Bay is important because the climatic conditions within the Bay influences the seasonal density of Bay receiving waters. The seasonal density of receiving waters is an important

8 Legacy pesticides are persistent pesticides that have been banned from use but are still commonly found in the environment.

9 PCBs are also legacy contaminants.

10 CCLEAN is a long-term water quality monitoring program designed to help municipal agencies and resource managers protect the quality of the nearshore marine waters in the Monterey Bay. CCLEAN is a collaborative program between the cities of Watsonville and Santa Cruz, MRWPCA, Carmel Area Wastewater District, Dynegy Moss Landing Power Plant, and Central Coast Regional Water Quality Control Board (CCLEAN, 2013).

11 This objective for protection of human health is listed in the Ocean Plan and is discussed further in Section 4.3.2.1, State Regulatory Framework, below.

12 Based on *Waste Discharge Requirements Order No. 00-041 NPDES No. CA0006254* issued to Duke Energy North America Moss Landing Power Plant (RWQCB, 2000).

consideration related to the proposed operational discharges of the MPWSP and the mixing and dilution mechanics associated with such discharges that can influence receiving water quality. There are three known ocean climate seasons in Monterey Bay (Roberts, 2016):

- Upwelling Period: a wind-induced upwelling period that is characterized by strong currents, high salinities and cooler surface waters. Typically occurs March to September when steady northwesterly/westerly winds cause offshore transport of surface waters, resulting in deep, colder, nutrient-rich water to rise to the surface (upwelling).
- Oceanic or California Current Period: characterized by average currents, low salinity and warmer water. Typically occurs September to November when winds relax and upwelling ceases, allowing previously upwelled water to sink and be replaced by warm oceanic waters from offshore.
- Davidson Current Period (also called the "low thermal gradient phase"): characterized by slow currents and freshwater inputs (lower salinity). Typically occurs November to March when winter storm conditions prevail, causing downwelling in Monterey Bay and lower currents in the nearshore area.

These three individual seasons overlap extensively and do not recur with exact consistency. For more information on ocean climate seasons as they relate to water quality in Monterey Bay, see **Appendix D1** (Roberts, 2016) **and D2** (Flow Science Inc., 2014). Besides the ocean climate seasons, the physical mixing of the ocean water is influenced by the ocean water density, physical processes such as waves and currents, and physical features on the ocean floor. Baseline conditions characterizing each of these factors are described below.

As described above, the salinity and temperature of the ambient receiving ocean water determines its density, which in turn affects the mixing and dilution dynamics of discharges or surface waters (such as rivers, streams and stormwater) flowing into the ocean. Monthly measurements of conductivity-temperature-depth (CTD) were collected at four locations proximate to the MRWPCA outfall (see Figure 1 in **Appendix D1**) between February 2014 and December 2015 to document baseline ocean conditions. The profiles were averaged by ocean climate season (described above) to obtain representative water column densities, as well as salinity and temperature conditions near the seabed where the existing MRWPCA diffuser is located (**Table 4.3-1**).

TABLE 4.3-1
SEASONAL AVERAGE TEMPERATURE, SALINITY, AND DENSITY PROPERTIES AT MRWPCA OUTFALL DIFFUSER

Ocean Season	Temperature (°C)	Salinity (ppt)	Density (kg/m3)
Davidson	14.46	33.34	1024.8
Upwelling	11.48	33.89	1025.8
Oceanic	13.68	33.57	1025.1

SOURCE: Roberts, 2016.

The processes influencing the physical mixing of Bay receiving waters with inputs from other sources is enhanced by turbulence induced by currents and waves. Current velocities can be different throughout the water column. Tidally-driven currents can cause large pulses of water movement along the Monterey Submarine Canyon. Wave action, particularly during stormy periods, can vertically stir the water. The ocean water density and the physical processes (waves and currents) vary as a result of seasonal weather cycles and can also be severely modified by global ocean climate events, such as the Pacific Decadal Oscillation (SWRCB, 2012a).

Physical features on the ocean floor, such as regional bathymetry[13] and structures such as pipelines (which can influence localized mixing and dilution) also influence mixing and dilution dynamics. The bathymetry in the vicinity of the MRWPCA outfall structure is relatively flat with an average slope of 1 percent to the west of the diffuser for 5 miles. The rim of Monterey Submarine Canyon is less than 4 miles to the northwest of the project area.

4.3.1.4 Flooding

Flooding can occur when excessive precipitation generates stormwater runoff that exceeds the carrying capacity of the drainage system. Flooding can also occur due to dam or levee failure, tsunamis, especially high tides, coastal storms, and/or sea level rise.

Flood Hazard Zones

The Federal Emergency Management Agency (FEMA) delineates regional flooding hazard areas in Monterey County as part of the National Flood Insurance Program. Official Flood Insurance Rate Maps (FIRMs) for the project area indicate areas that have a 1 percent chance of flooding in any given year (100-year flood hazard zone). The 100-year flood hazard zones along the coast experience flooding coincident with high tide events typically combined with a wintertime storm surge. Significant flood events occurred in Monterey County in January 1995, March 1995, and February 1998 (MCWRA, 2013). During these events, major water bodies, including the Salinas River and Carmel River, experienced flooding and Monterey County was declared a federal disaster area.

The FEMA 100-year flood hazard zone in the project vicinity is shown in **Figure 4.3-2**. Portions of the proposed Source Water Pipeline and new Transmission Main in Marina; most of the Castroville Pipeline and Castroville Pipeline Optional Alignment 1 located north of the Salinas River, and the Carmel Valley Pump Station in unincorporated Monterey County are sited within a FEMA 100-year flood hazard zone. None of the other proposed facilities would be located within designated flood hazard areas.

Dam or Levee Failures

Dams located within the project vicinity include Los Padres Dam on the Carmel River; and Nacimiento and San Antonio Dams on the Salinas River. Historically, CalAm diverted surface

[13] National Oceanic and Atmospheric Administration (2014) refers to bathymetry as the ocean's depth relative to sea level, although it has come to mean "submarine topography," or the depths and shapes of underwater terrain.

water supplies from the Carmel River at Los Padres and San Clemente Dams to serve CalAm's Monterey District service area (Monterey District). However, the storage capacity of both dams was reduced to less than 2 percent by the gradual accumulation of sediment over the years of operation (CCoWS, 2009; DWR, 2012). Removal of San Clemente Dam was completed in summer of 2015 (CalAm, 2016). Nacimiento and San Antonio Dams are owned and operated by the Monterey County Water Resources Agency (MCWRA).

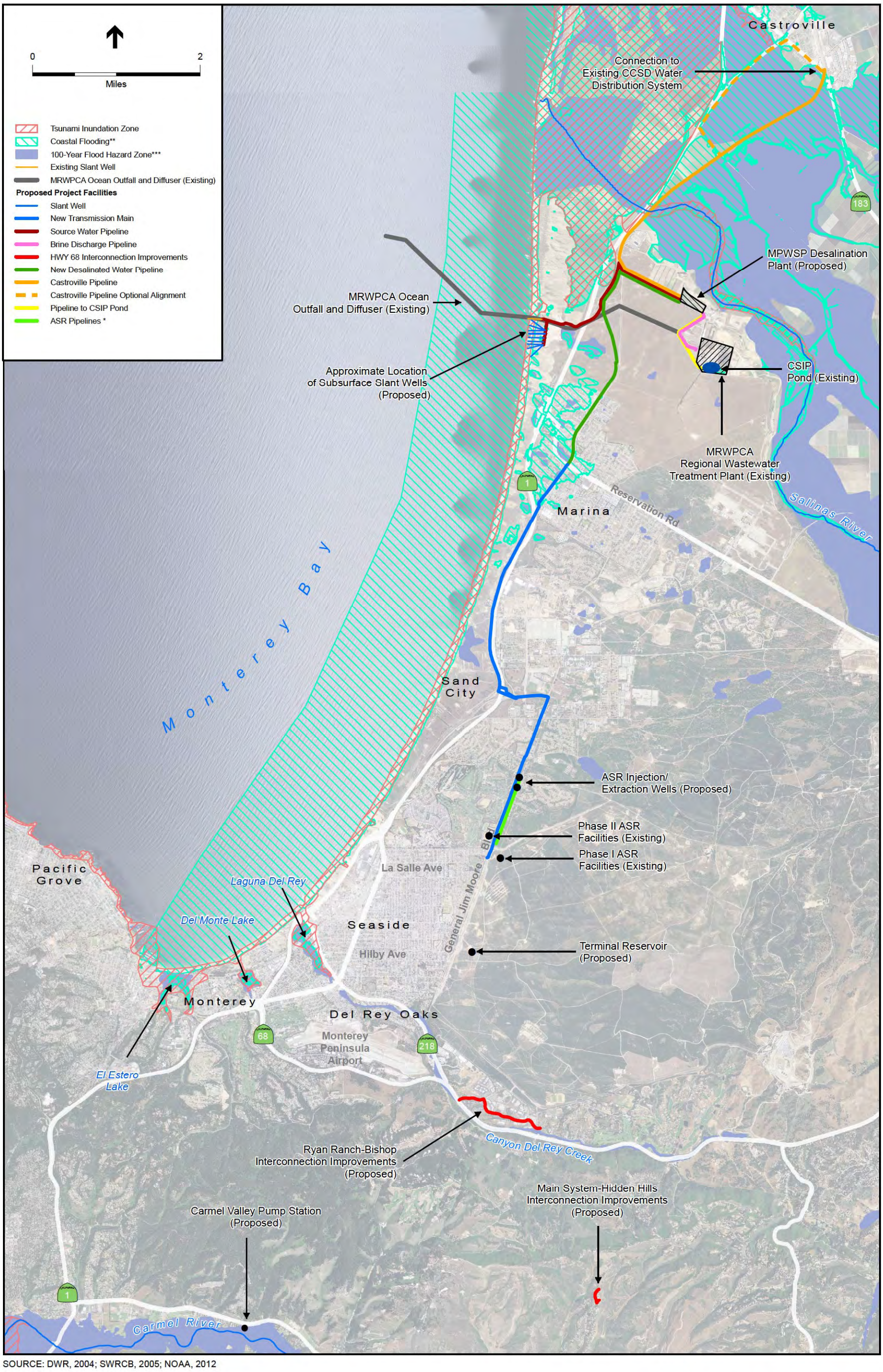
The three remaining dams—Los Padres, Nacimiento, and San Antonio Dams—are regulated by the design and operational requirements established by the California Division of Safety of Dams (DSOD) and are administered by Monterey County. California Water Code Section 6000, et seq. and 23 California Code of Regulations (CCR) 301, et seq. establish the authority and responsibility of the DSOD, including periodic safety inspections of dams, completion of studies that predict the flood zones created by sudden dam failure, and development of emergency response plans in the advent of pending dam failure, including a program for emergency warning and evacuation prepared by the Monterey County Office of Emergency Services (Monterey County, 2007). The DSOD requires the determination of a dam inundation area, which is an area downstream of a dam that would be inundated or otherwise affected by the failure of the dam and accompanying large flood flows (California Office of Emergency Services, 2011). Based on the County-wide dam inundation map, the Castroville Pipeline and Castroville Pipeline Optional Alignment 1 would be located within the dam inundation zone for Nacimiento and San Antonio Dams (Monterey County, 2010b).

In Monterey County, levees along portions of the Salinas and Carmel Rivers were constructed as part of U.S. Army Corps of Engineers or U.S. Department of Agriculture flood control projects, or by local flood control programs administered by the MCWRA and other stakeholders. All of these levees and floodwalls are required to undergo periodic inspections for safety and performance as part of routine maintenance plans (Monterey County, 2007).

Tsunami Hazards

A tsunami is a large wave or series of waves generated by an earthquake, volcanic eruption, or coastal landslide. Tsunami damage is typically confined to low-lying coastal areas. The United States Geologic Survey (USGS) evaluated the potential community exposure to tsunami hazards along the California coastline, including Monterey Bay (Wood et. al., 2013). The report estimated the maximum onshore wave run-up[14] from a tsunami would reach an elevation of 18.37 feet[15] in the city of Monterey. This degree of run-up would inundate a large portion of the city. Seaside and the unincorporated areas near the mouth of the Salinas River could also be subject to large areas of inundation (see **Figure 4.3-2**). Following the tsunami in Japan in 2011, the maximum wave height at Monterey Harbor was recorded at 2.4 feet (Monterey County, 2014).

[14] *Wave run-up* refers to the maximum vertical extent of a wave up rush on a beach or a structure.
[15] The maximum onshore run-up elevation presented in the 2013 USGS report (Wood et. al., 2013) is based on modeled scenarios (for distant sources) and past events (for local sources).



SOURCE: DWR, 2004; SWRCB, 2005; NOAA, 2012

NOTE:
*The ASR Pipelines are the ASR Conveyance Pipeline, the ASR Pump-to-Waste Pipeline, and the ASR Recirculation Pipeline. See Figure 3-9a for the individual pipeline alignments.

**Represents the extent of a 100-year coastal flood under current projections (year 2010) from Monterey Bay SLR study (ESA PWA 2014).

***Represents the 100-year FEMA floodplain.

205335.01 Monterey Peninsula Water Supply Project

Figure 4.3-2
Flood Hazards in the Project Area

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The Monterey County Office of Emergency Services (OES) is responsible for developing and maintaining a state of readiness in preparation of any emergency, including tsunamis that could adversely affect any part of Monterey County (OES, 2010). According to the *Tsunami Incident Response Plan* prepared by the Monterey County OES and incorporated cities in the county, a locally generated tsunami may occur if a large enough earthquake occurs in or near Monterey Bay (OES, 2007). Such an earthquake could produce a tsunami that reaches shore in a matter of minutes. The plan states that within Monterey County, there is a low likelihood of experiencing a tsunami. The most likely tsunami, though still relatively unlikely compared to other hazards, is from a distant event, where there would be more than one hour to respond to a tsunami warning. The Tsunami Incident Response Plan lists individual response areas along the Monterey County and outlines the response agencies, evacuation routes, routes to avoid, safe areas, and special considerations for neighboring areas.

Coastal Flooding and Sea Level Rise

Coastal flooding can occur when there is a short- or long-duration increase in sea level during a period of extreme precipitation and runoff. Wave run-up along the coastal areas of Monterey County also contributes to coastal flooding. Wave run-up may cause coastal erosion by directly impacting coastal bluffs, dislodging material, and redistributing it to the foreshore and nearshore. Storms in the Pacific Ocean in the months of November through February, in conjunction with high tides and strong winds, can cause significant wave run-up.

Coastal flooding can be exacerbated by the physical characteristics of the continental shelf and shoreline. As part of the California Coastal Analysis and Mapping Project, FEMA is performing the Open Pacific Coast Study, a detailed coastal engineering analysis and mapping of the Pacific Coast of California. The results of the study will be used to remap the coastal flood risk and wave hazards for the California coastline, including Monterey County (FEMA, 2016).

Sea level rise at a global level is a phenomenon generally attributed to global climate change. Climate change is expected to result in more extreme weather events, both heavier precipitation events that can lead to flooding as well as more extended drought periods. According to a report by the Intergovernmental Panel on Climate Change (IPCC), the global average sea level rose at an average rate of 1.8 millimeters (0.07 inch) per year from 1961 to 2003 and at an average rate of about 3.1 millimeters (0.12 inch) per year from 1993 to 2003 (IPCC, 2007). The more recent Assessment Report predicts mean sea level to rise by 7 meters (23 feet) globally by 2099 (IPCC, 2014).[16]

The National Research Council estimates sea level in California to rise by 4.6 to 24 inches by 2050 and 17 to 66 inches by 2100 (NRC, 2012). The Pacific Institute report (2009) predicts that sea level rise along the California coast could increase by 55 inches by 2100. This projection may be an underestimation because the climate models used did not account for ice-melt from Antarctica and Greenland (Pacific Institute, 2009). Based on monthly mean sea level data from 1973 to 2006, the

[16] Assuming near-complete loss of the Greenland ice sheet would occur over a millennium or more (IPCC, 2014; p.12).

mean sea level in Monterey Bay is increasing by approximately 1.35 millimeters (0.053 inches) per year (NOAA, 2013a). Sea level rise will likely increase the rate of coastal erosion and related coastal hazards (see Section 4.2, Geology, Soils, and Seismicity for more information regarding coastal erosion and coastal hazards). As shown in **Figure 4.3-3**, within the project area, portions of the subsurface slant wells and Source Water Pipeline in Marina and the Castroville Pipeline in unincorporated Monterey County would lie in areas that would be subject to coastal flooding and sea level rise.

4.3.2 Regulatory Framework

This section provides an overview of federal, state, and local environmental laws, policies, plans, regulations, and/or guidelines (hereafter referred to generally as "regulatory requirements") relevant to surface water hydrology and water quality. 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 4.3.5, Direct and Indirect Effects of the Proposed Project, below, where the potential inconsistency is addressed in more detail. Where applicable, the discussion in Section 4.3.5 identifies feasible mitigation that would resolve or minimize the potential inconsistency.

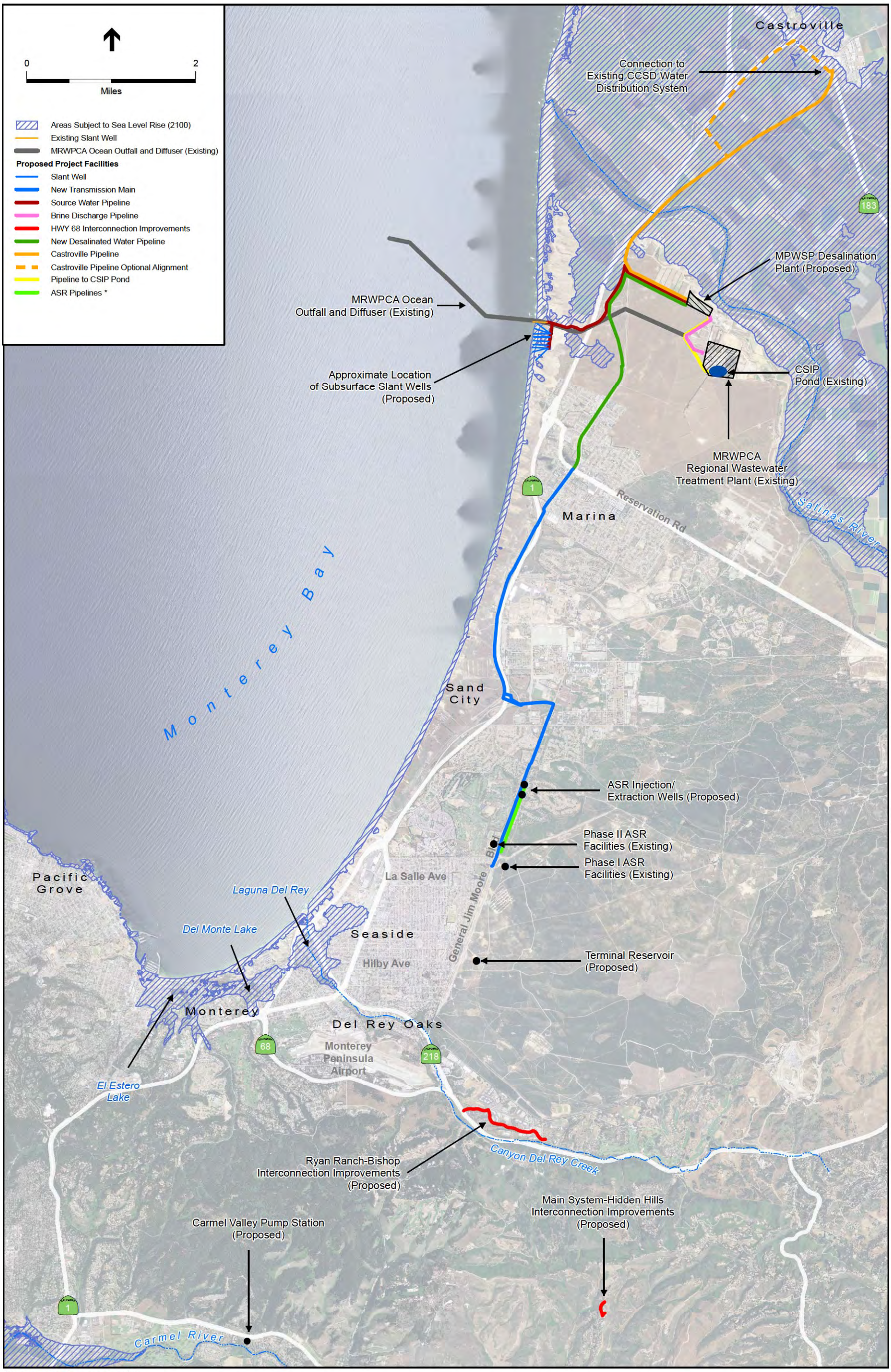
4.3.2.1 Federal Regulations

Clean Water Act

Under the Clean Water Act (CWA) of 1977, the United States Environmental Protection Agency (USEPA) seeks to restore and maintain the chemical, physical, and biological integrity of the nation's waters by implementing water quality regulations. The National Pollutant Discharge Elimination System (NPDES) permit program under section 402 of the CWA controls water pollution by regulating sources that discharge pollutants into waters of the United States. The USEPA has delegated authority of issuing NPDES permits in California to the California State Water Resources Control Board (SWRCB), which has nine regional boards. The Central Coast RWQCB regulates water quality in the project area (further discussion of the NPDES program and permits in California relevant to the proposed project is provided in Section 4.3.2.2, below). Additionally, determinations of consistency of the proposed MPWSP with specific applicable SWRCB regulations, plans and policies are provided in Section 4.3.2.2, below.

Section 303(d) List of Impaired Water Bodies and Total Maximum Daily Loads

Section 303(d) of the CWA requires that each State identify water bodies or segments of water bodies that are "impaired" (i.e., do not meet one or more of the water quality standards established by the state, even after point sources of pollution have been equipped with the minimum required levels of pollution control technology). Inclusion of a water body on the Section 303(d) List of



SOURCE: Pacific Institute, 2009

NOTE:
*The ASR Pipelines are the ASR Conveyance Pipeline, the ASR Pump-to-Waste Pipeline, and the ASR Recirculation Pipeline. See Figure 3-9a for the individual pipeline alignments.

205335.01 Monterey Peninsula Water Supply Project

Figure 4.3-3
Areas Subject to Sea Level Rise in the Project Area

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Impaired Water Bodies triggers development of a Total Maximum Daily Load (TMDL) for that water body and a plan to control the associated pollutant/stressor on the list. The TMDL is the maximum amount of a pollutant/stressor that a waterbody can assimilate and still meet the water quality standards. Typically, a TMDL is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources.

Table 4.3-2 lists the impaired water bodies in the project area, including the pollutants that cause the impairments, and the potential sources of the pollutants.

TABLE 4.3-2
303(D) LIST OF IMPAIRED WATER BODIES IN THE PROJECT VICINITY

Water Body	Impairments/Pollutants
Salinas River	
Old Salinas River Estuary	Pesticides, Nutrients
Salinas Reclamation Canal	Ammonia (unionized), Chlorpyrifos, Copper, Diazinon, E. coli, Fecal Coliform, Low Dissolved Oxygen, Nitrate, Pesticides, pH, Priority Organics, Sediment Toxicity, Turbidity, Unknown Toxicity
Salinas River (Lower estuary to Gonzales Road crossing)	Chlordane, Chloride, Chlorpyrifos, DDD (Dichlorodiphenyldichloroethane), Diazinon, Dieldrin, Electrical Conductivity, E. coli, Fecal Coliform, Nitrate, PCBs, Pesticides, pH, Sodium, Total Dissolved Solids, Toxaphene, Turbidity, Unknown Toxicity
Salinas River Lagoon (North)	Nutrients, Pesticides
Tembladero Slough	Chlorophyll-a, Chlorpyrifos, Diazinon, Enterococcus, E. coli, Fecal Coliform, Nitrate, Nutrients, Pesticides, pH, Sediment Toxicity, Total Coliform, Turbidity, Unknown Toxicity
Carmel River	None
Lake El Estero	None
Del Monte Lake	None
Laguna del Rey	None
Monterey Bay	
Monterey Bay South (Coastline)	None
Monterey Harbor	None

SOURCE: RWQCB, 2015.

National Marine Sanctuaries Act, MBNMS Regulations and Desalination Guidelines

Pursuant to the National Marine Sanctuaries Act (NMSA or Act), originally referred to as the Marine Protection, Research, and Sanctuaries Act of 1972, the primary purpose of the NMSA is to identify, designate and manage areas of the marine environment of special national significance due to their conservation, recreational, ecological, historical, research, educational, or aesthetic qualities. Under the NMSA, it is unlawful for any person to destroy, cause the loss of, or injure any sanctuary resource managed under law or regulations for that sanctuary. NMSA general regulations define sanctuary resource as any living or nonliving resource that contributes

to the conservation, recreational, ecological, historical, research, educational or aesthetic value of the sanctuary, including any algae and other marine plants, marine invertebrates, brine-seep biota, phytoplankton, zooplankton, fish, seabirds, sea turtles, and marine mammals.

MBNMS was designated in 1992 in recognition that the area provides a highly productive ecosystem and a wide variety of marine habitat, including outstanding concentrations of pinnipeds, whales, otters, and seabirds, abundant fish stocks, a variety of crustaceans, and invertebrates.

In addition to the statute, each sanctuary has unique regulatory prohibitions codified within a separate subpart of 15 CFR Part 922. Subpart M contains the regulations specific to MBNMS. The importance of sanctuary resources relevant to water quality is emphasized among the MBNMS statutory, regulatory, and management priorities. The importance of water quality to sanctuary resources is further emphasized in the 2008 MBNMS *Final Management Plan*, which includes a desalination action plan (MBNMS 2008). The desalination action plan details numerous strategies for the protection of MBNMS resources, including one to develop specific guidelines for desalination projects to be sited in MBNMS (discussed below).

MBNMS regulations that are relevant to the construction and operation of desalination plants include a prohibition on discharging material or other matter into the sanctuary and a prohibition on activities that alter the submerged lands (aka seabed) as a result of the installation of desalination facility structures on or beneath the ocean floor (e.g. an intake or outfall pipeline). In particular, MPWSP activities that would be subject to MBNMS approval include the seawater intake from aquifers below the ocean floor, and the discharge of brine into sanctuary ocean waters from an existing ocean outfall, approximately two miles off shore and 90-110 feet below sea level. Any actions that have the potential to alter the seabed would require an MBNMS Authorization of a Coastal Development Permit issued by the CCC. Operational discharges into sanctuary waters would require MBNMS authorization of an NPDES permit issued by the RWQCB (see Section 1.3.2 for additional information). NOAA may also issue Special Use Permits to establish conditions of access to, and use of, any sanctuary resource or to promote public use and understanding of a sanctuary resource. Special Use Permits may only be authorized if that activity is compatible with the purposes for which the sanctuary is designated and with protection of sanctuary resources; and that activities carried out under the permit be conducted in a manner that does not destroy, cause the loss of, or injure sanctuary resources. (See Section 1.3.2 for additional information.)

Guidelines for Desalination Plants in MBNMS

In 2010, MBNMS in collaboration with the California Coastal Commission, California Central Coast Regional Water Quality Control Board, and NOAA Fisheries, published a report titled *Guidelines for Desalination Plants in Monterey Bay National Marine Sanctuary* (MBNMS 2010), which implements the desalination action plan included in the MBNMS *Final Management Plan* (described above). These include non-regulatory guidelines that were developed to help ensure that any future desalination plants in the sanctuary would be sited, designed, and operated in a manner that results in minimal impacts on the marine environment.

The Guidelines address numerous issues associated with desalination including site selection, construction and operational impacts, monitoring and reporting, plant discharges, and intake systems.

The following guidelines are pertinent to the analysis of impacts presented in Section 4.3.5:

- All desalination plants should be designed to minimize impacts from the discharge. Desalination project proponents should investigate the feasibility of diluting brine effluent by blending it with other existing discharges. The proponent should evaluate the use of measures to minimize the impacts from desalination plant discharges including discharging to an area with greater circulation or at a greater depth, increasing in the number of diffusers, increasing the velocity while minimizing the volume at each outlet, diluting the brine with seawater or another discharge, or use of a subsurface discharge structure. The project proponent should provide a detailed evaluation of the projected short-term and long-term impacts of the brine plume on marine organisms based on a variety of operational scenarios and oceanographic conditions. Modeling should address different types of seasonal ocean circulation patterns, including consideration of "worst case scenarios."
- Results of accepted plume models should be included, to illustrate how the plume will behave during variable oceanographic conditions. The plume model should estimate salinity concentrations at the discharge point, as well as where and when it would reach ambient ocean concentrations. The extent, location, and duration of the plume where the salinity is 10 percent above ambient salinity should also be provided.
- The project proponent should provide information on the physical and chemical parameters of the brine plume including salinity, temperature, metal concentrations, pH, and oxygen levels. These water quality characteristics of the discharge should conform to California Ocean Plan requirements and should be as close to ambient conditions of the receiving water as feasible.
- A continuous monitoring program should be implemented to verify the actual extent of the brine plume, when deemed necessary (see Monitoring on page 4.3-13) and to determine if the plume is impacting EFH, critical habitat, or sanctuary resources. If it is, then mitigation for the EFH impact will be required.

The issues discussed in the Guidelines relating to siting, constructing, and operating a desalination facility within MBNMS and the recommendations for reducing, avoiding, and minimizing impacts on sanctuary resources are reflected in the requirements of the California Ocean Plan (described in detail under State Regulations in Section 4.3.2.2, below). The Ocean Plan was recently amended (effective January, 2016) to specifically control potential adverse impacts on marine life associated with desalination facility intakes using seawater as source water and brine discharges. Further, the Ocean Plan includes specific enforceable numeric water quality objectives and other requirements pertaining to siting, constructing, and operating a desalination facility that are consistent with the Guidelines. The requirements set forth in the Ocean Plan were informed by the SWRCB collaborating with the Southern California Coastal Water Research Project to evaluate methods of brine disposal and monitoring strategies. Additionally, the amendments to the Ocean Plan were assessed in a SWRCB staff report analyzing desalination facility intakes and brine discharges which provides the rationale for how implementing such

measures reduce potential environmental impacts from desalination facilities (SWRCB, 2015). To reflect this evolution of regulatory requirements supported by evidence based research, the Ocean Plan requirements are used, in part, as key thresholds of significance in the evaluation criteria for assessing impacts. The Ocean Plan requirements are generally more stringent and have more specificity regarding assessment and monitoring requirements than the Guidelines. As such, the Ocean Plan requirements are substantially consistent with the Guidelines. Impacts on sanctuary resources from brine discharges are discussed in detail in **Impact 4.3-4** and **Impact 4.3-5** as well as in Section 4.5, Marine Biological Resources. Section 6.4 includes a comprehensive list of Guideline recommendations and summarizes the proposed project's consistency with those guidelines.

As proposed, the MPWSP would involve water quality and marine biological resource impacts that could indirectly affect Sanctuary managed resources in a manner that would be potentially inconsistent with the provisions of the National Marine Sanctuaries Act as well as the guidelines (MBNMS, 2010) that relate to water quality and associated MBNMS managed resources for desalination plants in MBNMS.

NOAA (MBNMS) Memorandum of Agreement with State and Federal Agencies

NOAA (MBNMS) entered into a Memorandum of Agreement (MBNMS, 2016e) with the State of California, USEPA, and the Association of Monterey Bay Area Governments, which addresses the process for implementing the following water quality regulations applicable to State waters within MBNMS (MBNMS, 2013a):

- NPDES permits issued by the State of California under Section 13377 of the California Water Code; and
- Waste Discharge Requirements issued by the State of California under Section 13263 of the California Water Code.

The Memorandum of Agreement specifies how the review process for applications for leases, licenses, permits, approvals, or other authorizations will be administered within State waters in MBNMS in coordination between the State and the Sanctuary's permit programs. The MBNMS Superintendent develops and follows a management plan that ensures protection of these resources, provides for research and education, and facilitates recreational and commercial uses that are compatible with the primary goal of resource protection. MBNMS also implements the Water Quality Protection Program to enhance and protect the chemical, physical, and biological integrity of the sanctuary. The program is a partnership of many local, state, and federal government agencies and calls for education, funding, monitoring, and development of treatment facilities and assessment programs to protect water quality (MBNMS, 2016c). The MPWSP would be consistent with the requirements outlined above because, prior to issuance of any permits or licenses, a review and authorization process by MBNMS is required to ensure such permits and licenses are protective of MBNMS resources and are consistent with relevant plans, policies, and guidelines.

Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) of 1972 provides for management of the nation's coastal resources, including the Great Lakes, and balances economic development with environmental conservation. In 1990, Congress passed the Coastal Zone Act Reauthorization Amendments (CZARA) to address nonpoint source pollution problems in coastal waters. The California Coastal Commission has jurisdiction for CZMA implementation throughout the state.[17]

Section 6217 of CZARA and Section 319 of the CWA require California and 28 other states to develop coastal nonpoint source pollution control programs that incorporate required management measures to reduce or prevent polluted runoff to coastal waters from specific sources. Management measures are defined in Section 6217 of the CZARA as economically achievable measures to control the addition of pollutants to coastal waters, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives. These management measures are incorporated by states into their coastal nonpoint source pollution programs (USEPA, 1993) and coastal management programs. (See Section 4.3.2.2, below, for additional discussion of how the CZMA is regulated at the state level.)

The California Coastal Act contains numerous enforceable policies that are directed at protecting and, where feasible, restoring coastal water quality. The California Coastal Commission applies the Coastal Act's water quality policies when reviewing applications for coastal development permits in California state waters. The Coastal Commission also applies the water quality policies when reviewing federally licensed and permitted activities to ensure they are consistent with the State's coastal management program in accordance with the CZMA federal consistency provision.

The Coastal Commission considers an application for a coastal development permit to cover the requirement for an applicant submitting a consistency certification to the Coastal Commission if the activity is located in state waters. Typically, the Coastal Commission will provide its response (concurrence, conditional concurrence, or objection) in its staff report for the coastal development permit.

Executive Order 11988 and National Flood Insurance Program

Under Executive Order 11988, FEMA is responsible for management of floodplain areas defined as the lowland and relatively flat areas adjoining inland and coastal waters subject to a one percent or greater chance of flooding in any given year. Also, FEMA administers the National Flood Insurance Program, which requires that local governments covered by federal flood insurance enforce a floodplain management ordinance that specifies minimum requirements for any construction within the 100-year flood zone (one percent chance of occurring in a given year). FEMA prepares Flood Insurance Rate Maps (FIRMs) that that indicate areas prone to flooding. MCWRA is responsible for issuing permits within designated flood zones in the project area and would ensure consistency

[17] Except within the San Francisco Bay-Delta where the Bay Conservation and Development Commission has authority for implementation of CZMA within its jurisdictional area.

with requirements for development within a floodplain. Local municipalities are responsible for permitting development on floodplains within their jurisdictions.

4.3.2.2 State Regulations

Porter-Cologne Water Quality Control Act

The Porter-Cologne 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 that are established for reasonable protection of beneficial uses. The Porter-Cologne Act allows the California SWRCB to adopt statewide water quality control plans (such as "Basin Plans" as well as the California Ocean Plan) which serve as the legal, technical, and programmatic basis of water quality regulation for a region or along the coast. The Act also authorizes the NPDES program under the CWA, which establishes effluent limitations and water quality requirements for discharges to waters of the state. The California Ocean Plan, Basin Plan for the Central Coast and the NPDES permits relevant to the proposed MPWSP are discussed further below, as well as determinations of consistency of the MPWSP with these regulatory requirements.

California Toxics Rule

Under the California Toxics Rule (CTR), the USEPA has proposed water quality criteria for priority toxic pollutants for inland surface waters, enclosed bays, and estuaries. These federally promulgated criteria create water quality standards for California waters. The CTR satisfies CWA requirements and protects public health and the environment. The USEPA and the SWRCB have the authority to enforce these standards, which are incorporated into the NPDES permits (discussed below) that regulate existing discharges in the project area. The MPWSP would be consistent with the CTR requirements because such requirements would be incorporated into NPDES permits applicable to construction and operation of the MPWSP and CalAm would be required to comply with the permit requirements.

California Coastal Act

The California Coastal Act (Public Resources Code Section 30000 et seq.) provides for the long-term management of lands within California's coastal zone boundary. The Coastal Act includes specific policies for management of natural resources and public access within the coastal zone. Of primary relevance to surface water hydrology and water quality are Coastal Act policies concerning protection of the biological productivity and quality of coastal waters. A preliminary assessment of project consistency with these priorities is provided here. Final determinations regarding project consistency are reserved for the Coastal Commission. Operational discharges of the MPWSP under certain scenarios may exceed Ocean Plan water quality objective thresholds. Exceedances of these thresholds would be potentially inconsistent with Coastal Act policies. This issue is discussed further in Impact 4.3-5.

State Marine Protected Areas

Within Monterey Bay, there are three conservation areas relevant to the study area (shown in **Figure 4.3-1**): Pacific Grove State Marine Conservation Area, Edward F. Ricketts State Marine Conservation Area, and Lovers Point State Marine Reserve, designated as such under the Marine Life Protection Act and administered by the California Department of Fish and Wildlife. These designated areas are further discussed in Section 4.5, Marine Biological Resources.

California Ocean Plan

The *Water Quality Control Plan for Ocean Waters of California* (or Ocean Plan; SWRCB, 2016), adopted by the SWRCB in May 2015 and effective January 2016, establishes water quality objectives and beneficial uses for waters of the Pacific Ocean adjacent to the California Coast outside of estuaries, coastal lagoons, and enclosed bays. The Ocean Plan establishes effluent quality requirements and management principles for specific waste discharges. The Ocean Plan was recently amended to establish a receiving water limitation for brine discharges from desalination facilities (discussed in detail under Salinity, below), and to ensure the protection of beneficial uses by establishing a consistent statewide analytic framework for new desalination facilities for the best available site, design, technology, and mitigation measures feasible in order to minimize intake and mortality of all forms of marine life. The water quality requirements and objectives of the Ocean Plan are incorporated into NPDES permits for ocean discharges, such as the *Waste Discharge Requirements for the Monterey Regional Water Pollution Control Agency Treatment Plant* (Order No. R3-2014-0013, NPDES Permit No. CA0048551) for discharges of treated wastewater from the MPWPCA Regional Wastewater Treatment Plant to Monterey Bay (MRWPCA's NPDES permit is discussed in more detail below).

The 2016 Ocean Plan includes the following provisions that are applicable to the proposed project:

- Waste management systems that discharge into the ocean must be designed and operated in a manner that will maintain the indigenous marine life and a healthy and diverse marine community.
- Waste discharged to the ocean must be essentially free of substances that will accumulate to toxic levels in marine waters, sediments or biota.
- Waste effluents must be discharged in a manner which provides sufficient initial dilution to minimize the concentrations of substances not removed in treatment.

The Ocean Plan prohibits discharges into Areas of Special Biological Significance (ASBS), except with an approved exception. ASBS are designated by the SWRCB (**Figure 4.3-1**) and require protection of species or biological communities to the extent that alteration of natural water quality is undesirable. In the Monterey region, Old Salinas River Estuary, Pacific Grove, Carmel Bay, and Point Lobos are designated as ASBS and are located near Monterey Bay within the boundaries of MBNMS (SWRCB, 2013a). **Table 4.3-3** below lists the water bodies in the project area described above along with beneficial uses identified by the Central Coast RWQCB.

TABLE 4.3-3
DESIGNATED BENEFICIAL USES OF SURFACE WATER BODIES IN THE PROJECT VICINITY

	Beneficial Uses																			
Water Bodies	**MUN**	**AGR**	**GWR**	**IND**	**COMM**	**SHELL**	**COLD**	**EST**	**MIGR**	**RARE**	**SPWN**	**BIOL**	**WARM**	**WILD**	**REC-1**	**REC-2**	**NAV**	**MAR**	**FRSH**	**ASBS**
Salinas Reclamation Canal					X								X	X	X	X				
Tembladero Slough					X	X		X		X	X		X	X	X	X				
Old Salinas River Estuary					X	X	X	X	X	X	X	X	X	X	X	X				
Salinas River Lagoon (North)					X	X	X	X	X	X	X	X	X	X	X	X				
Pacific Ocean (Monterey Bay)				X	X	X			X	X	X			X	X	X	X	X		X
Carmel River	X	X	X	X	X		X		X	X	X	X	X	X	X	X			X	
Carmel River Estuary			X		X	X	X	X	X	X	X	X		X	X	X				
Carmel Bay				X	X	X				X					X	X		X		X

ACRONYMS:

MUN – Municipal and Domestic Supply
IND – Industrial Service Supply
COLD – Cold Freshwater Habitat
REC-2 – Non-Contact Water Recreation
FRSH – Freshwater Replenishment
REC-1 – Water Contact Recreation
SPWN – Spawning, Reproduction, and/or Early Development
BIOL – Preservation of biological Habitats of Special Significance
AGR – Agricultural Supply
COMM – Ocean, Commercial, and Sport Fishing
MIGR – Migration of Aquatic Organisms,
RARE – Preservation of Rare and Endangered Species
ASBS – Areas of Special Biological Significance
WARM – Warm Freshwater Habitat
GWR – Groundwater Recharge
SHELL – Shellfish Harvesting
EST – Estuarine Habitat
WILD – Wildlife Habitat
NAV – Navigation

SOURCE: RWQCB, 2011b; 2014.

The recently amended Ocean Plan also contains the following four primary components intended to control potential adverse impacts on marine life associated with desalination facility intakes using seawater as source water and brine discharges (SWRCB, 2015; 2016):

1. Clarify SWRCB's authority over desalination facility intakes and discharges;
2. Provide guidance to the regional water boards regarding the determination required by Water Code section 13142.5 (b) for the evaluations of the best available site, design, technology, and mitigation measures to minimize the intake and mortality of marine life at new or expanded desalination facilities.
3. A narrative receiving water limitation for salinity applicable to all desalination facilities to ensure that brine discharges to marine waters meet the biological characteristics' narrative water quality objective[18] and do not cause adverse effects to aquatic life beneficial uses.
4. Monitoring and reporting requirements that include effluent monitoring, as well as monitoring of the water column bottom sediments and benthic community health to ensure that the effluent plume is not harming aquatic life beyond the brine mixing zone (BMZ).

[18] The 2016 Ocean Plan Section II. E (biological characteristics water quality objective) requires that, "marine communities, including vertebrate, invertebrate, and plant species, shall not be degraded."

To inform the recent amendments to the Ocean Plan, the SWRCB contracted with the Southern California Coastal Water Research Project to evaluate methods of brine disposal and monitoring strategies, which resulted in a technical report on *Management of Brine Discharges to Coastal Waters* (SWRCB, 2012a). Additionally, the amendments to the Ocean Plan were assessed in a SWRCB staff report analyzing desalination facility intakes and brine discharges (SWRCB, 2015). The SWRCB (2015) staff report assessed the proposed Ocean Plan amendments and provides the rationale for how implementing such measures reduce potential environmental impacts from desalination facilities. As discussed in Section 4.3.2.1, above, the Ocean Plan requirements pertaining to desalination facilities are substantially consistent with the recommendations described in the *Guidelines for Desalination Plants in Monterey Bay National Marine Sanctuary* (MBNMS 2010) for siting and operating a desalination facility within MBNMS to reduce, avoid, and minimize impacts on sanctuary resources.

The SWRCB (2015) states, "subsurface intakes extract marine water from beneath the ground, filtering the seawater through the geological features of the sea floor. Because the water is naturally filtered as it moves through sediments, it generally contains lower levels of contaminants such as suspended solids, silts, organic contaminants, oil, and grease. Similarly, subsurface intakes provide a natural barrier to suspended sediments … dissolved or suspended organic compounds …debris, or oil or chemical spills…. This gives subsurface intakes a significant environmental advantage over surface water intakes because mitigation for surface intake entrainment has to occur throughout the operational lifetime of the facility." Such findings are also relevant to the water quality or the constituent concentrations found in Monterey Bay where the seawater extracted from the bay through the subsurface intakes would be used as source water for the MPWSP Desalination Plant. The SWRCB acknowledges that slant wells also minimize aboveground shoreline structures and can provide substantially greater length of well screen in the target aquifer, an important advantage when there is limited aquifer thickness (SWRCB, 2015). The SWRCB recommends the option of using subsurface intakes as its preferred technology and allowing surface water intakes where subsurface intakes are found infeasible (SWRCB, 2015). These recommendations are reflected in the current requirements of the 2016 Ocean Plan for new desalination facilities along the California coast (discussed below).

Concerning brine discharge from a desalination plant, the Ocean Plan requires an owner or operator to first evaluate the availability and feasibility of diluting brine by commingling it with wastewater. If wastewater is unavailable, then multiport diffusers are the next preferred method of brine disposal (SWRCB, 2016). Consistent with such measures, the brine discharge from the MPWSP Desalination Plant is proposed to be discharged through a multiport diffuser of an existing outfall and commingled with the MRWPCA wastewater that is currently discharged through the outfall whenever the wastewater is available (see the water quality impact related to the brine discharge in Section 4.3.5 Direct and Indirect Effects of the Proposed Project).

Ocean Plan Water Quality Objectives

To protect the beneficial uses of the surface water bodies shown in **Table 4.3-3**, the Ocean Plan establishes water quality objectives for bacterial, physical, chemical, biological, and radioactive constituents (**Table 4.3-4**). The Ocean Plan water quality objectives are to be met after the initial

dilution of a discharge into the ocean. The Ocean Plan defines initial dilution as the process which results in the rapid and irreversible turbulent mixing of wastewater with ocean water around the point of discharge. Initial dilution occurs in an area known as the zone of initial dilution (ZID), within which the density of the discharge is substantially different from that of the receiving water. Typically, constituent concentrations are permitted to exceed water quality objectives within the ZID, which is limited in size. Thus, in the case of MPWSP, the Ocean Plan water quality objectives would apply to the edge of the ZID (Flow Science, Inc., 2014 in **Appendix D2**). Dilution occurring within the ZID from an operational discharge is conservatively calculated as the minimum probable initial dilution (Dm). The water quality objectives established in the Ocean Plan are considered in the context of the calculated Dm to derive the NPDES effluent limits for a wastewater discharge in-pipe (i.e., prior to ocean dilution).

For typical wastewater discharges, the ZID is the zone adjacent to the discharge point where momentum and buoyancy-driven mixing produces rapid dilution of the discharged effluent (Flow Science, Inc., 2014; SWRCB, 2012a). Municipal wastewater effluent, being effectively freshwater, is less dense than seawater and thus rises (due to buoyancy) while it mixes with ocean water, whereas desalination brine, when discharged directly, is more dense than seawater and thus sinks while it mixes with ocean water. The mixing and dilution are also affected by the density of the effluent being discharged. **Figure 4.3-4** illustrates the likely trajectories of positively and negatively buoyant effluent plumes from a horizontal discharge (such as that proposed as part of the MPWSP) for illustrative purposes. As effluent travels away from the discharge port, it entrains ambient seawater, which increases the diameter of the plume and decreases the plume concentration. Thus, the edge of the ZID depends, in part, on the discharge plume density. If the effluent density is lower than the ambient salinity, it rises and becomes a buoyant plume (see **Figure 4.3-4a**). Here, the edge of the ZID is located at the point where the effluent plume reaches the water surface or attains a depth level where the density of the diluted effluent plume becomes the same as the density of ambient water (i.e., the "trap" level). The effluent plume spreads within and beyond the trap level and forms a rising plume. If the effluent density is greater than the ambient salinity, it produces a negatively buoyant plume that sinks toward the seabed (see **Figure 4.3-4b**). In this case, the edge of the ZID is located at the point where the discharge plume contacts the sea floor.

In addition to establishing water quality objectives, the Ocean Plan lays out the implementation provisions with an equation to derive constituent concentrations that are compared with the water quality objectives. The constituent concentrations are calculated using the background concentrations of the constituents as one of the factors.[19] The background concentrations are provided for only five constituents: arsenic, copper, mercury, silver, and zinc; and for other constituents it is assumed to be zero (SWRCB, 2016).

[19] The calculation also uses the constituent concentrations and dilution factor estimated for the discharge that is studied.

TABLE 4.3-4
WATER QUALITY OBJECTIVES IN THE 2016 OCEAN PLAN

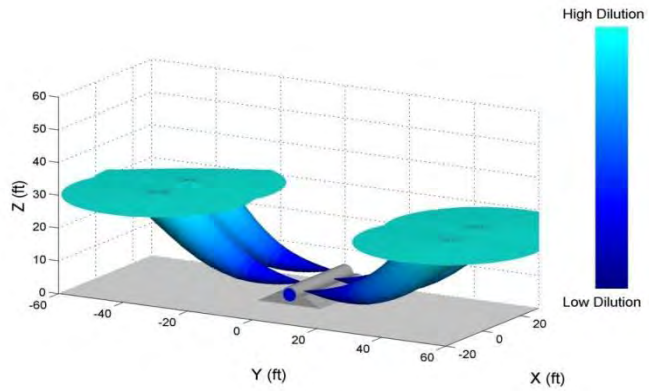
Water Quality Objectives for Protection of Marine Life				
	Units of Measurement	**Limiting Concentrations**		
		6-month Median	**Daily Maximum**	**Instantaneous Maximum**
Arsenic	µg/L	8	32	80
Cadmium	µg/L	1	4	10
Chromium (Hexavalent)	µg/L	2	8	20
Copper	µg/L	3	12	30
Lead	µg/L	2	8	20
Mercury	µg/L	0.04	0.16	0.4
Nickel	µg/L	5	20	50
Selenium	µg/L	15	60	150.
Silver	µg/L	0.7	2.8	7
Zinc	µg/L	20	80	200
Cyanide	µg/L	1	4	10
Total Chlorine Residual	µg/L	2	8.0	60
Ammonia (expressed as Nitrogen)	µg/L	600	2400	6000
Acute Toxicity	TUa	N/A	0.3	N/A
Chronic Toxicity	TUc	N/A	1	N/A
Phenolic Compounds (non-chlorinated)	µg/L	30	120	300
Chlorinated Phenolics	µg/L	1	4	10
Endosulfan	µg/L	0.009	0.018	0.027
Endrin	µg/L	0.002	0.004	0.006
HCH	µg/L	0.004	0.008	0.012
Radioactivity	Not to exceed limits specified in Tile 17, Division 1, Chapter 5, Subchapter 4, Group 3, Article 3, Section 30253 of the California Code of Regulations.			

Water Quality Objectives for Protection of Human Health-Noncarcinogens		
Chemical	**30-day Average (micrograms per liter or µg/L)**	
	Decimal Notation	**Scientific Notation**
acrolein	220	2.2×10^{2}
antimony	1,200	1.2×10^{3}
bis(2-chloroethoxy) methane	4.4	4.4×10^{0}
bis(2-chloroisopropyl) ether	1,200	1.2×10^{3}
chlorobenzene	570	5.7×10^{2}
chromium (III)	190,000	1.9×10^{5}
di-n-butyl phthalate	3,500	3.5×10^{3}
dichlorobenzenes	5,100	5.1×10^{3}
diethyl phthalate	33,000	3.3×10^{4}
dimethyl phthalate	820,000	8.2×10^{5}
4,6-dinitro-2-methylphenol	220	2.2×10^{2}
2,4-dinitrophenol	4.0	4.0×10^{0}
ethylbenzene	4,100	4.1×10^{3}
fluoranthene	15	1.5×10^{1}
hexachlorocyclopentadiene	58	5.8×10^{1}
nitrobenzene	4.9	4.9×10^{0}
thallium	2	$2. \times 10^{0}$
toluene	85,000	8.5×10^{4}
tributyltin	0.0014	1.4×10^{-3}
1,1,1-trichloroethane	540,000	5.4×10^{5}

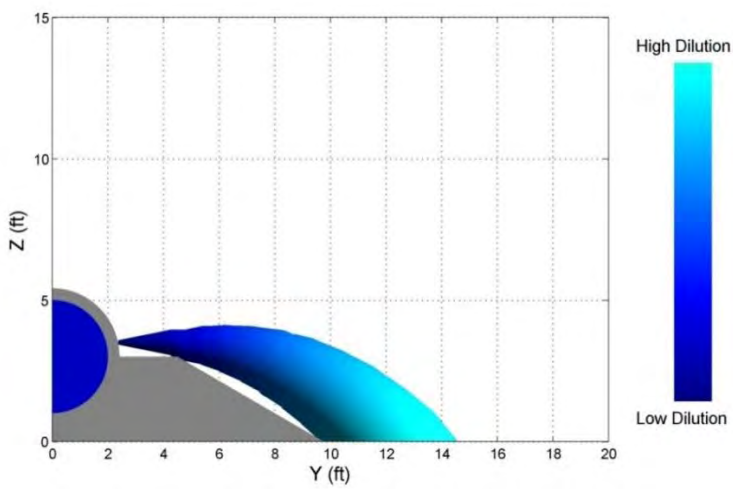
TABLE 4.3-4 (Continued)
WATER QUALITY OBJECTIVES IN THE 2016 OCEAN PLAN

Water Quality Objectives for Protection of Human Health-Carcinogens		
Chemical	**30-day Average (micrograms per liter or µg/L)**	
	Decimal Notation	**Scientific Notation**
acrylonitrile	0.10	1.0×10^{-1}
aldrin	0.000022	2.2×10^{-5}
benzene	5.9	5.9×10^{0}
benzidine	0.000069	6.9×10^{-5}
beryllium	0.033	3.3×10^{-2}
bis(2-chloroethyl) ether	0.045	4.5×10^{-2}
bis(2-ethylhexyl) phthalate	3.5	3.5×10^{0}
carbon tetrachloride	0.90	9.0×10^{-1}
chlordane	0.000023	2.3×10^{-5}
chlorodibromomethane	8.6	8.6×10^{0}
chloroform	130	1.3×10^{2}
DDT	0.00017	1.7×10^{-4}
1,4-dichlorobenzene	18	1.8×10^{1}
3.3'-dichlorobenzidine	0.0081	8.1×10^{-3}
1,2-dichloroethane	28	2.8×10^{1}
1,1-dichlorethylene	0.9	9×10^{-1}
dichlorobromomethane	6.2	6.2×10^{0}
dichloromethane	450	4.5×10^{2}
1,3-dichloropropene	8.9	8.9×10^{0}
dieldrin	0.00004	4.0×10^{-5}
2,4-dinitrotoluene	2.6	2.6×10^{0}
1,2-diphenylhydrazine	0.16	1.6×10^{-1}
halomethanes	130	1.3×10^{2}
heptachlor	0.00005	5×10^{-5}
heptachlor epoxide	0.00002	2×10^{-5}
hexachlorobenzene	0.00021	2.1×10^{-4}
hexachlorobutadiene	14	1.4×10^{1}
hexachloroethane	2.5	2.5×10^{0}
isophorone	730	7.3×10^{2}
N-nitrosodimethylamine	7.3	7.3×10^{0}
N-nitrosodi-N-propylamine	0.38	3.8×10^{-1}
N-nitrosodiphenylamine	2.5	2.5×10^{0}
Polyaromatic hydrocarbons (PAHs)	0.0088	8.8×10^{-3}
Polychlorinated biphenyls (PCBs)	0.000019	1.9×10^{-5}
TCDD equivalents	0.0000000039	3.9×10^{-9}
1,1,2,2-tetrachloroethane	2.3	2.3×10^{0}
tetrachloroethylene	2.0	2.0×10^{0}
toxaphene	0.00021	2.1×10^{-4}
trichloroethylene	27	2.7×10^{1}
1,1,2-trichloroethane	9.4	9.4×10^{0}
2,4,6-trichlorophenol	0.29	2.9×10^{-1}
vinyl chloride	36	3.6×10^{1}

SOURCE: SWRCB, 2016.



(a) Illustration of a Rising Plume



(b) Illustration of a Sinking Plume

SOURCE: Flow Science, Inc., 2014 (see Appendix D2)

Figure 4.3-4
Illustrations of the Trajectory and Behavior of a Brine Discharge Plume

As discussed under Other Constituents in Section 4.3.1.3, Surface Water Quality, above, near-shore water quality in Monterey Bay is monitored by the Central Coast Long-term Environmental Assessment Network (CCLEAN). The CCLEAN program design includes some, but not all constituents that are regulated by the Ocean Plan (listed in **Table 4.3-4**). A review of the most recent monitoring data reported under CCLEAN for the past 8 years (2008-2015) indicates exceedances of maximum concentrations of several constituents over the water quality objectives listed in **Table 4.3-4**. **Table 4.3-5** below summarizes exceedances (denoted in bold) of Ocean Plan water quality objectives listed in **Table 4.3-4** documented under baseline conditions under CCLEAN. Aldrin was not detected.

TABLE 4.3-5
WATER QUALITY IN MONTEREY BAY
(CONSTITUENT CONCENTRATIONS REPORTED UNDER CCLEAN 2008-2015)

Constituent	Reported Average Concentration (µg/L)	Reported Maximum Concentration (µg/L)	Ocean Plan Water Quality Objectives (µg/L)
Endosulfan	0.0000039	0.0000390	0.009 (6-month median)
Endrin	0.0000006	0.0000160***	0.002 (6-month median)
HCH	0.0001679	0.0003930	0.004 (6-month median)
Fluoranthene	0.0003068	0.0010800	15 (6-month median)
Aldrin**	0.0000000	0.0000000**	0.000022 (30-day average)
Chlordane	0.0000155	**0.0001140**	0.000023 (30-day average)
DDT	0.0000548	**0.0003190**	0.00017 (30-day average)
Dieldrin	0.0000168	**0.0000510**	0.00004 (30-day average)
Heptachlor	0.0000003	0.0000050	0.00005 (30-day average)
Polyaromatic hydrocarbons (PAHs)	0.0000007	0.0000050	0.0088 (30-day average)
Polychlorinated biphenyls (PCBs)	**0.0023236**	**0.0069071**	0.000019 (30-day average)
Toxaphene**	0.0001414	**0.0012139***	0.00021 (30-day average)

NOTES:
* Concentrations higher than the Ocean Plan water quality objectives in Table 4.3-4, above, are shown in bold.
** Aldrin was not detected.
*** Endrin and Toxaphene were detected in 1 and 2 samples, respectively.

SOURCE: CCLEAN, 2016.

As shown in **Table 4.3-5**, maximum concentrations detected in Monterey Bay for chlordane, dieldrin, DDT, and both average and maximum concentrations of PCBs currently exceed the Ocean Plan water quality objectives. In the case of endrin, aldrin, and toxaphene, the actual average and maximum concentrations are shown. In the case of toxaphene, the average value of the range of reporting limits used also exceeded the water quality objectives. In summary, the background concentrations or ambient levels of constituents in Monterey Bay vary with time. The exceedances in **Table 4.3-5** are used as a conservative estimate using representative data and are considered as baseline or existing water quality conditions in the bay in the impact analysis discussed in Section 4.3.5 Direct and Indirect Effects of the Proposed Project, below. Operational discharges of the MPWSP under certain scenarios would be potentially inconsistent with the provisions of the Ocean Plan water quality objectives because, in the absence of mitigation measures, the brine may exceed water quality objective thresholds at the edge of the ZID. This issue is discussed further in Impact 4.3-5.

Ocean Plan Salinity Requirements

The current Ocean Plan includes new requirements to address brine discharges from desalination facilities along the California coast. The most relevant of these to the proposed MPWSP is contained in Section III.M.3, “Receiving Water Limitation for Salinity”. The receiving water

limitation for salinity requires that discharges not exceed a daily maximum of two (2) parts per thousand (ppt) above natural background salinity measured no further than 100 meters (328 ft) horizontally from each discharge point, representing the Brine Mixing Zone (BMZ)[20] the actual shape of which is determined by the diffuser. The value of 2 ppt represents the maximum incremental increase above natural background salinity allowed at the edge of the BMZ. There is no vertical limit to this zone and to determine the effluent limit necessary to meet the receiving water limitation, the Ocean Plan includes a required methodology for brine discharges. In addition, the owner or operator of a desalination facility must meet the dilution standard at the edge of the BMZ or minimum initial dilution (Dm; discussed above), whichever is smaller. Dilution must be determined using applicable water quality models that have been approved by the regional water boards in consultation with State Water Board staff. Operational discharges of the MPWSP would be consistent with the provisions of the Ocean Plan salinity requirements because all operational discharge scenarios would be below the specified maximum incremental increase of 2 ppt above natural background salinity allowed at the edge of the BMZ (see **Impact 4.3-4** for details).

Ocean Plan Monitoring Requirements

Included in the recent amendments to the Ocean Plan is the requirement for a monitoring and reporting program (Section III.M.4, "Monitoring and Reporting Program"; SWRCB, 2016). The monitoring requirements for operation of a new desalination facility are such that the owner or operator of a desalination facility must submit a Monitoring and Reporting Program to the regional water board for approval. The Monitoring and Reporting Program must include provisions for monitoring of effluent and receiving water characteristics and impacts on all forms of marine life. The Monitoring and Reporting Program must, at a minimum, include monitoring for benthic community health, aquatic life toxicity, hypoxia, and receiving water characteristics. Further, the Monitoring and Reporting Program must be consistent with the standard monitoring procedures detailed in Appendix III of the Ocean Plan, which specifies monitoring plan framework, scope, and methodological design and additional details for determining compliance with the receiving water limitation in chapter III.M.3. Additionally, receiving water monitoring for salinity must be conducted at times when the monitoring locations detailed in the Monitoring and Reporting Program are most likely affected by the discharge.

Monitoring requirements in the Ocean Plan that are relevant to the operation of the MPWSP also require an owner or operator to perform facility-specific monitoring to demonstrate compliance with the receiving water limitation for salinity (described above), and to evaluate the potential effects of the discharge within the water column, bottom sediments, and the benthic communities. Baseline biological conditions must be established at the discharge location as well as at a reference location outside the influence of the discharge prior to commencement of construction. To achieve this requirement, the owner or operator is required to conduct biological surveys (e.g.,

[20] At the time of publication of the April 2015 Draft EIR the Ocean Plan did not include a water quality objective for elevated salinity levels from operation of a desalination facility. As such, the analysis of salinity related water quality impacts was based on determining salinity increases at the edge of the ZID, as is done for other water quality constituents. Subsequent to the publication of the April 2015 Draft EIR, the Ocean Plan was amended to include a salinity standard, compliance with which is determined at the edge of the BMZ.

Before-After Control-Impact studies) that evaluate the differences between biological communities at a reference site and at the discharge location before and after the discharge commences. The pertinent regional water board uses the data and results from the surveys and any other applicable data for evaluating and renewing the requirements set forth in a facility's NPDES permit (in the case of the proposed project, the MRWPCA's outfall). Such monitoring is required to continue until the RWQCB and MBNMS determines that a regional monitoring program is adequate to ensure compliance with the receiving water limitation. The Monitoring and Reporting Plan would require review and approval by the RWQCB and MBNMS prior to implementation of the MPWSP, and revised if necessary, as part of the NPDES permit process. The MPWSP would be consistent with the Monitoring and Reporting Plan requirements of the Ocean Plan because such requirements form a part of the NPDES permit process and, further, CalAm would submit and, once approved by the RWQCB and MBNMS, execute a facility-specific Monitoring and Reporting Plan.

Thermal Plan

The *Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California* (or Thermal Plan) adopted by the SWRCB in 1995 establishes temperature requirements for existing and new discharges in California coastal waters, interstate waters, enclosed bays, and estuaries. Water quality objectives for existing discharges into coastal waters require that wastes with elevated temperature comply with limitations necessary to assure protection of the beneficial uses and ASBSs (see also the discussion of the Waste Discharge Requirements for the Monterey Regional Water Pollution Control Agency Treatment Plant [Order No. R3-2014-0013, NPDES Permit No. CA0048551], below, for discharges of treated wastewater from the Regional Wastewater Treatment Plant to Monterey Bay). The Thermal Plan defines new discharges as "discharges that are not presently taking place" and elevated-temperature wastes as "liquid, solid, or gaseous material including thermal waste[21] discharged at a temperature higher than the natural temperature of receiving water". The Thermal Plan establishes the following standards for all new discharges (SWRCB, 1995):

- The maximum temperature of thermal waste discharges shall not exceed the natural temperature of receiving waters by more than 20°F.
- The discharge of elevated temperature wastes shall not result in increases in the natural water temperature exceeding 4°F at the shoreline, the surface of any ocean substrate, or the ocean surface beyond 1,000 feet from the discharge system. The surface temperature limitation shall be maintained at least 50 percent of the duration of any complete tidal cycle.

During the non-irrigation season, the brine from the MPWSP Desalination Plant could be blended with treated wastewater from the MRWPCA's Regional Wastewater Treatment Plant, if available, prior to discharge via the MRWPCA outfall into Monterey Bay. The temperature requirements above are included in the MRWPCA's NPDES Permit (R3-2014-0013), discussed below, and would apply to brine-only discharges from the MPWSP Desalination Plant (during

[21] Cooling water and industrial process water used for the purpose of transporting waste heat.

periods when there is no wastewater available for blending), as well as combined discharges (when the brine would be blended with the treated wastewater). Operational discharges of the MPWSP would be consistent with the provisions of the thermal plan because MPWSP operational discharges would not operate in combination with a power plant or other operation requiring use of ocean waters for cooling for thermal control. As such, there would be no heating mechanism or any process that would increase the temperature of the source water as it passes through the treatment units.

Anti-Degradation Policy

The SWRCB Anti-Degradation Policy, formally known as the Statement of Policy with Respect to Maintaining High Quality Water in California (SWRCB Resolution No. 68-16), restricts degradation of surface and ground waters. Specifically, this policy protects water bodies where existing quality is higher than necessary for the protection of beneficial uses and requires that existing high quality be maintained to the maximum extent possible.

Under the Anti-Degradation Policy, any actions that can adversely affect water quality in all surface and ground waters must: (1) be consistent with maximum benefit to the people of California; (2) not unreasonably affect present and anticipated beneficial use of the water; and (3) not result in water quality less than that prescribed in water quality plans and policies. Furthermore, any actions that can adversely affect surface waters are also subject to the federal Anti-Degradation Policy (40 CFR Section 131.12) developed under the CWA. Operational discharges of the MPWSP would be consistent with the provisions of the SWRCB Anti-Degradation Policy because discharges from the proposed project that could affect surface water quality would be required to comply with the Anti-Degradation Policy, which is included as part of the NPDES permit requirements for point discharges (discussed below).

Nonpoint Source Pollution Control Program

In accordance with Section 319 of the Clean Water Act and Section 6217 of the CZARA of 1990, SWRCB and the California Coastal Commission jointly submitted the Plan for California's Nonpoint Source (NPS) Pollution Control Program to the USEPA and NOAA on February 4, 2000. The NPS Pollution Control Program provides a single unified, coordinated statewide approach to address nonpoint source pollution (USEPA, 2012). A total of 28 state agencies are working collaboratively through the Interagency Coordinating Committee to implement the NPS Pollution Control Program. California's Critical Coastal Areas (CCA) Program is a non-regulatory planning tool to foster collaboration among local stakeholders and government agencies, to better coordinate resources and focus efforts on coastal-zone watershed areas in critical need of protection from polluted runoff. A coastal area is designated as a CCA if it: has a 1998 303(d)-listed impaired coastal water body that flows into a Marine Managed Areas; flows into a Wildlife Refuge or Waterfront Park/Beach; flows into an Area of Special Biological Significance;[22] or was on the original 1995 CCA list, which is comprised of watersheds that flow into an 1994 303(d)-listed

[22] There are 34 ASBS ocean areas along the California coast monitored and maintained for water quality under the regulatory authority of the SWRCB.

impaired bay or estuary. The CCAs in the project area and vicinity include the Old Salinas River Estuary, Salinas River, Carmel Bay, Point Lobos, and Pacific Grove (CCC, 2012).

Central Coast Water Quality Control Plan (Basin Plan)

The *Water Quality Control Plan for the Central Coast* (or Basin Plan) prepared by the Central Coast RWQCB (2011b) identifies the designated beneficial uses of surface waters in the Central Coast region (see **Table 4.3-3**). The Basin Plan establishes quantitative and qualitative water quality objectives for protection of the beneficial uses, and establishes policies to guide the implementation of these water quality objectives. In addition to the water quality objectives in the Ocean Plan (see **Table 4.3-4**, above), the following objectives of the Basin Plan apply to all ocean waters, including Monterey Bay and Carmel Bay:

- **Dissolved Oxygen:** The mean annual dissolved oxygen concentration shall not be less than 7.0 mg/L, nor shall the minimum dissolved oxygen concentration be reduced below 5.0 mg/L at any time.
- **pH:** The pH value shall not be depressed below 7.0, nor raised above 8.5.
- **Radioactivity:** Radionuclides shall not be present in concentrations that are deleterious to human, plant, animal, or aquatic life; or result in the accumulation of radionuclides in the food web to an extent which presents a hazard to human, plant, animal, or aquatic life.

The water quality objectives are incorporated in the individual NPDES permits. For example, the MRWPCA's NPDES Permit No. CA0048551 (Order No. R3-2014-0013) for discharges of treated wastewater from the Regional Wastewater Treatment Plant to Monterey Bay would be amended to include the brine discharge resulting from the proposed project.

NPDES Waste Discharge Program

In California, administration of the NPDES program has been delegated by the US EPA to the State Board. Through the RWQCBs, point source dischargers are required to obtain NPDES permits (or, in California under authority of Porter-Cologne, Waste Discharge Requirements). Point sources include municipal and industrial wastewater facilities and stormwater discharges. There are two types of NPDES permits: individual permits tailored to an individual facility and general permits that cover multiple facilities within a specific category. Effluent limitations serve as the primary mechanism in NPDES permits for controlling discharges of pollutants to receiving waters. When developing effluent limitations for an NPDES permit, a permit applicant must consider limits based on both the technology available to control the pollutants (i.e., technology-based effluent limits) and limits that are protective of the water quality standards of the receiving water (i.e., water quality-based effluent limits if technology-based limits are not sufficient to protect the water body). For inland surface waters and enclosed bays and estuaries, the water-quality-based effluent limitations are based on criteria in the National Toxics Rule and the California Toxics Rule, and objectives and beneficial uses in the Basin Plan. For ocean discharges, the Ocean Plan contains beneficial uses, water quality objectives, and effluent limitations (described in detail above). NPDES permits for discharges into Monterey Bay must be authorized by MBNMS.

NPDES Construction General Permit

The State of California adopted a revised Construction General Permit on September 2, 2009 (Order No. 2009-0009-DWQ as amended by 2010-0014-DWQ and 2012-0006-DWQ) (General Construction NPDES Permit). The General Construction NPDES Permit regulates construction site storm water management. Dischargers whose projects disturb one or more acres of soil, or whose projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres, are required to obtain coverage under the general permit for discharges of stormwater associated with construction activity. The proposed project would be required to comply with the permit requirements to control stormwater discharges from the construction sites. Construction activity subject to this permit includes clearing, grading, and disturbances to the ground, such as stockpiling or excavation, as well as construction of buildings and linear underground projects (LUP), including installation of water pipelines and other utility lines. Portions of the proposed project would fall under the Type 1 LUP category if the following conditions are met:

a) Construction occurs on unpaved improved roads, including their shoulders or land adjacent to them;

b) The areas disturbed during a single construction day are returned to their preconstruction condition, or to an equivalent condition (i.e., disturbed soils such as those from trench excavation are hauled away, backfilled into the trench, and/or placed in spoils piles and covered with plastic), at the end of that same day;

c) Vegetated areas disturbed by construction activities are stabilized and revegetated at the end of the construction period; and

d) When required, adequate temporary soil stabilization best management practices (BMPs) are installed and maintained until vegetation has reestablished to meet the permit's minimum cover requirements for final stabilization.

In the project area, the Construction General Permit is implemented and enforced by the Central Coast RWQCB, which administers the stormwater permitting program. To obtain coverage under this permit, project operators must electronically file Permit Registration Documents, which include a Notice of Intent, a Stormwater Pollution Prevention Plan (SWPPP), and other compliance-related documents. An appropriate permit fee must also be mailed to SWRCB. The SWPPP identifies BMPs that must be implemented to reduce construction effects on receiving water quality based on potential pollutants. The BMPs identified are directed at implementing both sediment and erosion control measures and other measures to control potential chemical contaminants. In addition, the SWPPP is required to contain a visual monitoring program and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment. Examples of typical construction BMPs include scheduling or limiting certain activities to dry periods, installing sediment barriers such as silt fence and fiber rolls, and maintaining equipment and vehicles used for construction. Non-stormwater management measures include installing specific discharge controls during certain activities, such as paving operations, vehicle and equipment washing and fueling. The SWPPP also includes descriptions of the BMPs to reduce pollutants in stormwater discharges after all construction phases have been

completed at the site (post-construction BMPs). Dischargers are responsible for notifying the RWQCB of violations or incidents of non-compliance, as well as for submitting annual reports identifying deficiencies of the BMPs and how the deficiencies were corrected.

The Construction General permit includes several new requirements (as compared to the previous Construction General Permit, 99-08-DWQ), including risk-level assessment for construction sites, an active storm water effluent monitoring and reporting program during construction (for Risk Level II and III sites), rain event action plans for certain higher risk sites, and numeric effluent limitations (NELs) for pH and turbidity as well as requirements for qualified professionals that prepare and implement the plan. The risk assessment and SWPPP must be prepared by a state-qualified SWPPP Developer and implementation of the SWPPP must be overseen by a state-qualified SWPPP Practitioner.

RWQCB Dewatering Requirements

NPDES General Permit for Discharges with Low Threat to Water Quality

Construction of the proposed facilities would require excavation and trenching activities. Such activities in areas with shallow groundwater or that are located adjacent to surface water bodies could require dewatering to create a dry area. Discharges of dewatering effluent to the local stormwater drainage system or to vegetated upland areas are conditionally exempt provided they meet the water quality criteria in the General Waste Discharge Requirements (General WDRs). The RWQCB requires that the dewatering effluent be tested for possible pollutants; the analytical constituents for these tests are generally determined based on the source of the water, the land use history of the construction site, and the potential for the effluent to impact the quality of the receiving water body.

The *General WDRs NPDES General Permit for Discharges with Low Threat to Water Quality* (Order No. R3-2011-0223, NPDES No. CAG993001) (RWQCB, 2011a) applies to low-threat discharges, which are defined as discharges containing minimal amounts of pollutants and posing little or no threat to water quality and the environment. Discharges that meet the following criteria are covered under this permit:

a) Pollutant concentrations in the discharge do not: (1) cause, (2) have a reasonable potential to cause, or (3) contribute to an excursion above any applicable water quality objectives, including prohibitions of discharge;

b) The discharge does not include water added for the purpose of diluting pollutant concentrations;

c) Pollutant concentrations in the discharge will not cause or contribute to degradation of water quality or impair beneficial uses of receiving waters;

d) Pollutant concentrations in the discharge do not exceed the limits in the permit unless the Executive Officer determines that the applicable water quality control plan (i.e., Ocean Plan and/or State Implementation Policy) does not require effluent limits;

e) The discharge does not cause acute or chronic toxicity in receiving waters; and

f) The discharger demonstrates the ability to comply with the requirements of this General Permit.

The project-related discharges that could fall under the General WDRs include: discharges of dewatering effluent; water produced from one-time draining of existing pipelines to construct new connections; and disinfection water from these same existing pipelines and newly constructed pipelines before being put into service, all of which could be discharged to vegetated upland areas or to the local stormwater drainage system. These discharges may be treated and discharged on a continuous or a batch basis. For discharges from construction sites smaller than one acre that are part of a larger common plan of development or that may cause significant water quality impacts, the discharge may require coverage under the construction stormwater permit or an individual NPDES permit.

Waiver of Waste Discharge Requirements

California Water Code Section 13269 authorizes the Central Coast RWQCB to waive WDRs for specific discharges or specific types of discharges where such a waiver is consistent with any applicable state or regional water quality control plan and is in the public interest. The *General Waiver of WDRs for Specific Types of Discharges* (Resolution R3-2014-0041) (General Waiver) (RWQCB, 2014) contains specific conditions for the specific discharges and is consistent with the Central Coast Basin Plan. Waivers may be granted for discharges to land and may not be granted for discharges to surface waters or conveyances there to that are subject to the federal CWA requirements for NPDES permits.

Under the MPWSP, drilling fluids, such as water, bentonite mud, or environmentally inert biodegradable additives, would be used for well construction. The threat to water quality of such materials depends primarily on the additives used. If the drilling fluids are free of appreciable additives (additive quantities in conformance with industry standards), the used slurry may be spread on pastures or fields, provided that contact with surface water is avoided and runoff is prevented (RWQCB, 2014). The muds and clay slurry generated during the drilling and development of the subsurface slant wells and the proposed ASR-5 and ASR-6 Wells in the Fitch Park military housing area would fall under the category of "Water Supply Well Drilling Muds" in the General Waiver.

The water extracted during well development falls under the category of "water supply discharges" in the General Waiver (RWQCB, 2014). Water supply discharges that would occur under the proposed project include all water produced during drilling and development of the subsurface slant wells and ASR-5 and ASR-6 Wells. Under the General Waiver, these discharges would be waived from WDRs and from the requirement of submitting a waste discharge report; however, they would be subject to the following conditions (RWQCB, 2014).

Water Supply Well Drilling Muds:

a) The discharge shall be spread off-site of Army property over an undisturbed, vegetated area capable of absorbing the top-hole water and filtering solids in the discharge, and spread in a manner that prevents a direct discharge to surface waters.

b) The pH of the discharge shall be between 6.5 and 8.3.

c) The discharge shall not contain oil or grease.

d) The discharge area shall not be within 100 feet of a stream, body of water, or wetland, nor within streamside riparian corridors.

Water Supply Discharges:

a) The discharger shall implement appropriate management practices to dissipate energy and prevent erosion.

b) The discharger shall implement appropriate management practices to preclude discharge to surface waters and surface water drainage courses. The discharger shall immediately notify the Central Coast RWQCB staff of any discharge to surface waters or surface water drainage courses.

c) The discharge shall not have chlorine or bromine concentrations that could impact groundwater quality.

d) The discharge area shall not be located within 100 feet of a stream, body of water, or wetland, nor within streamside riparian corridors.

However, the MPWSP would not be inconsistent with such requirements as all drilling fluids would be recirculated into and out of the borings using a mud tank located next to the drill rig. Drill cuttings would be removed from the drilling mud using a shaker table and then the drilling mud would be re-used. Once the drill bit reaches groundwater, the construction contractor would pump out all of the drilling fluid slurry and put it in a storage container for offsite hauling and disposal.

NPDES Municipal Stormwater Permit

The NPDES General Permit for (WDRs for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4s) (Order No. 2013-0001-DWQ, NPDES No. CAS000004) regulates stormwater discharges from small Municipal Separate Storm Sewer Systems (MS4) into waters of the U.S. (SWRCB, 2013b). An “MS4” is defined as a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains): (i) designed or used for collecting or conveying stormwater; (ii) which is not a combined sewer; and (iii) which is not part of a Publicly Owned Treatment Works as defined at Title 40 of the Code of Federal Regulations (CFR) Section 122.2 (MRSWMP, 2011).

The Phase II Municipal General Permit requires regulated small MS4s to develop and implement BMPs, measurable goals, and timetables for implementation, designed to reduce the discharge of pollutants to the maximum extent practicable and to protect water quality.[23] The permittees under

[23] Phase I stormwater permits provide permit coverage for medium (serving between 100,000 and 250,000 people) and large (serving 250,000 people) municipalities.

the small MS4 (Phase II) General Permit[24] in the project area include Monterey County and cities therein. Each permittee is required to prepare and implement a stormwater management plan (SWMP) and regulate stormwater runoff from development and redevelopment projects through post-construction stormwater management requirements (RWQCB, 2013).

Several of the proposed facilities such as the subsurface slant wells at CEMEX, the MPWSP Desalination Plant in unincorporated Monterey County, and the Terminal Reservoir (aboveground tanks option) in Seaside would be subject to the stormwater control requirements in the respective local jurisdictions.

A Memorandum of Agreement for the Monterey Regional Stormwater Pollution Prevention Program was prepared and executed by MRWPCA and by the entities in the southern Monterey Bay area (Monterey County and cities of Carmel-by-the-Sea, Del Rey Oaks, Monterey, Pacific Grove, Sand City, and Seaside) to form the Monterey Regional Stormwater Management Program (MRSWMP). MRWPCA acts as the administrative agent for the MRSWMP. The purpose of the MRSWMP is to implement and enforce a series of BMPs to reduce the discharge of pollutants from the MS4s to the "maximum extent practicable," to protect water quality, and to satisfy the appropriate water quality requirements of the CWA (City of Monterey, 2011). The Phase II Program contains six Minimum Control Measures (MRSWMP, 2011):

- Public Education and Outreach;
- Public Participation/Involvement;
- Illicit Discharge Detection and Elimination;
- Construction Site Runoff Control;
- Post-Construction Runoff Control; and
- Pollution Prevention/Good Housekeeping.

The MRSWMP lists BMPs and associated Measurable Goals for the six Minimum Control Measures. The Measurable Goals must include, as appropriate, the months and years for scheduled actions, including interim milestones and frequency of the action. It is through the implementation and evaluation of these BMPs and Measurable Goals that the permittees ensure that the objectives of the Phase II NPDES Program are met (MRSWMP, 2011).

In July 2013, the Central Coast RWQCB adopted Resolution No. R3-2013-0032, which prescribes new Post-Construction Requirements for projects that create or replace 2,500 square feet or more of impervious area and receive their first discretionary approval for design elements after March 6, 2014. **Table 4.3-6** summarizes the new post-construction requirements for different categories of projects, which would include the MPWSP.

[24] Phase II stormwater permits provide permit coverage for smaller municipalities (populations less than 100,000), including non-traditional Small MS4s, which are facilities such as military bases, public campuses, prisons, and hospital complexes.

TABLE 4.3-6
OVERVIEW OF POST-CONSTRUCTION REQUIREMENTS FOR STORMWATER MANAGEMENT

Project Categories	Performance Requirements
Tier 1 Projects Projects that create or replace 2,500 square feet or more of impervious surface.	**Implement One or More Low Impact Design (LID) Measures:** Limit disturbance of natural drainage features. Limit clearing, grading, and soil compaction. Minimize impervious surfaces. Minimize runoff by dispersing runoff to landscape or using permeable pavements.
Tier 2 Projects Projects that create or replace 5,000 square feet or more net impervious surface.	**Tier 1 requirements, plus treat site runoff:** Treat runoff generated by the 85th percentile 24-hour storm event with an approved and appropriately sized LID treatment system prior to discharge from the site.
Tier 3 Projects Projects that create or replace 15,000 square feet or more of impervious surface.	**Tier 2 requirements, plus:** Prevent offsite discharge from events up to the 95th percentile rainfall event using Stormwater Control Measures.
Tier 4 Projects Projects that create or replace 22,500 square feet of impervious surface.	**Tier 3 requirements, plus:** Control peak flows to not exceed pre-project flows for the 2-year through 10-year events.

SOURCE: MRSWMP, 2014.

NPDES Permit for MRWPCA Regional Wastewater Treatment Plant

MRWPCA provides wastewater treatment, disposal, and reclamation services for the cities of Monterey, Pacific Grove, Del Rey Oaks, Sand City, Marina, and Salinas; the Seaside Sanitation District; Castroville, Moss Landing, and Boronda Community Service Districts; and the former Fort Ord military base. Residential, commercial, and industrial wastewater is conveyed to the MRWPCA Regional Wastewater Treatment Plant in Monterey County located 2 miles north of Marina. The MRWPCA Regional Wastewater Treatment Plant has an average dry weather design treatment capacity of 29.6 million gallons per day (mgd) and peak wet weather design capacity of 75.6 mgd (RWQCB, 2014).

In winter months, secondary treated wastewater from the MRWPCA Regional Wastewater Treatment Plant is discharged to Monterey Bay through a diffuser positioned 11,260 feet offshore at a depth of approximately 100 feet. The diffuser is designed to convey ultimate wet weather flows of 81.2 mgd, which is the permitted rate of discharge through the outfall. The treated wastewater discharge is regulated by the RWQCB (2014) under the *Waste Discharge Requirements for the Monterey Regional Water Pollution Control Agency Treatment Plant* (Order No. R3-2014-0013, NPDES Permit No. CA0048551). The minimum initial dilution (Dm) established in the NPDES permit at the point of discharge for operations by the MRWPCA is 1:145 (parts effluent to seawater). The Dm is used by the RWQCB to determine compliance with the water quality effluent limitations established in the NPDES permit for in-pipe water quality (i.e., prior to discharge) that are based on water quality objectives contained in the Ocean Plan.

The effluent limitations in the permit are based on and are consistent with the water quality objectives contained in the Ocean Plan.

In the summer months, up to 29.6 mgd of the secondary treated wastewater from the Regional Wastewater Treatment Plant is conveyed to the Salinas Valley Reclamation Project (SVRP) recycled water plant, where it is tertiary treated[25] and subsequently used for irrigation of 12,000 acres of farmland in the northern Salinas Valley. This reclaimed water is distributed to farmland via the Castroville Seawater Intrusion Project (CSIP) distribution system. The SVRP and CSIP reduce the region's dependence on local groundwater, thereby controlling saltwater intrusion.

The NDPES permit incorporates the Ocean Plan water quality objectives established by the SWRCB in order to ensure the protection of the beneficial uses of Monterey Bay. An amendment to the MRWPCA NPDES Permit to include discharges of brine would be required prior to the implementation of the MPWSP and operation of the MPWSP Desalination Plant. The amendment process for the NPDES Permit would require an extensive water quality assessment, which would involve MRWPCA (as the discharger defined in the current NPDES Permit) and/or CalAm (as a contributor of a new discharge) to perform testing and monitoring of the water quality of the discharges, including the testing of the source water drawn from the subsurface water intake wells and piped to the MPWSP Desalination Plant and assessing the resulting water quality of the discharges from the MPWSP Desalination Plant. Any discharge from the operation of the MPWSP Desalination Plant to Monterey Bay through the MRWPCA outfall would be subject to the Amended NPDES Permit.

As per Section 2c of the NPDES Permit, "prior to increasing the volume of brine waste discharged through the ocean outfall beyond 375,000 gallons average daily flow, the Discharger [i.e., MRWPCA] shall submit a brine waste disposal study to the Executive Officer for approval. The study shall include, at a minimum, the following elements: (1) a projection of the brine volume and characteristics, (2) an assessment of the impact of the increased brine volume on permit compliance, (3) an assessment of the impact of the increased brine volume on the minimum probable initial dilution at the point of discharge, (4) a detailed description of the brine waste disposal facilities which are proposed to accommodate the increased brine volume and facilitate blended secondary effluent and brine wastes flow metering and sampling, and (5) a schedule for the design and construction of the new brine disposal facilities."

Section VII B.1 of the NPDES Permit includes the "Reopener Provisions" which state that the [NPDES Permit] Order may be modified in accordance with the requirements set forth at 40 C.F.R. parts 122 and 124, to include appropriate conditions or limits based on newly available information, or to implement any, new State water quality objectives that are approved by the USEPA. As effluent is further characterized through additional monitoring, and if a need for additional effluent limitations becomes apparent after additional effluent characterization, the Order will be reopened to incorporate such limitations."

[25] Tertiary treatment is an advanced level of treatment provided to secondary treated wastewater prior to use for irrigation under Title 22 regulations.

Further, the NPDES Permit accounts for a potential exceedance of any constituent over the effluent limitation. "An existing effluent limitation for the pollutant shall remain in the permit, otherwise the permit shall include a reopener clause to allow for subsequent modification of the permit to include an effluent limitation if the monitoring establishes that the discharge causes, has the reasonable potential to cause, or contribute to an excursion above a Table 1 water quality objective" (RWQCB, 2014).

4.3.2.3 Applicable Regional and Local Land Use Plans and Policies

Table 4.3-7 presents the regional and local land use plans, policies, and regulations pertaining to surface water hydrology and water quality that are relevant to the MPWSP and that were adopted for the purpose of avoiding or mitigating an environmental effect. Project consistency with such plans, policies, and regulations is also indicated in the table. Where the analysis concludes the proposed project would be consistent with the applicable plan, policy, or regulation, the finding is noted and no further discussion is provided. Where the analysis concludes the proposed project would be potentially inconsistent with the applicable plan, policy, or regulation, the reader is referred to Section 4.3.5 Direct and Indirect Effects of the Proposed Project, for additional discussion. In that subsection, the significance of the potential conflict is evaluated. Where the effect of the potential conflict would be significant, feasible mitigation is identified to resolve or minimize that conflict.

TABLE 4.3-7
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS, POLICIES, AND REGULATIONS PERTAINING TO SURFACE WATER HYDROLOGY AND WATER QUALITY

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 and inland areas)	City of Marina General Plan	Community Design and Development	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 4.125:*** Approval of all future uses and construction within the Marina Planning Area shall be contingent upon compliance with the following policies and conditions intended to protect the quality of the area's water resources, avoid unnecessary consumption of water, and ensure that adequate water resources are available for new development.	This policy is intended to protect water quality, minimize unnecessary consumption, and provide for future resource needs.	Consistent: The project would be constructed in conformance with the State Construction General Permit and WDRs, which require specific construction-related BMPs to prevent concentrated stormwater run-on/runoff, soil erosion, and release of construction site contaminants. The project would be operated in conformance with State WDRs under the NPDES Phase II Permit (Order No. 2013-0001-DWQ, NPDES No. CAS000004), which regulates stormwater discharge into storm sewer systems. Mandatory compliance with these permits would protect water quality during construction and operation. The project would not increase water consumption and would develop supplemental water supplies for the Monterey Peninsula.
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Storm Drainage	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 3.57 (1):*** All storm water runoff shall continue to be retained onsite and accommodated by localized retention basins. Retention basins associated with a particular project shall be landscaped with appropriate plant materials and shall be designed wherever possible as integral parts of a development project's common open space or parks, or to create new or enhance existing habitat. All onsite drainage facilities shall be designed to convey runoff from a 10-year frequency storm at minimum. In areas of the City where recycled water will not be readily available, the City encourages the provision of storm water reuse facilities of sufficient size to provide for landscape irrigation of development in proximity to retention basins. The adequacy of onsite and offsite drainage facilities shall be determined through the preparation of storm drainage reports and plans, approved by the City Public Works Director; such reports and plans shall be required for all new subdivisions and new commercial/industrial development proposed in Marina.	This policy is intended to minimize adverse effects of uncontrolled stormwater runoff.	Consistent: The project would conform to the State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-0001-DWQ, NPDES No. CAS000004) which require specific BMPs and measures to manage stormwater. The project would be subject to MRSWMP, which requires stormwater control requirements under the MS4 permit and implementation of erosion and stormwater control measures. The State requirements are incorporated in the municipal stormwater permit.
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Storm Drainage	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 3.57 (2):*** Pretreatment of stormwater runoff from roads, large parking areas, and other extensive paved areas used by vehicles shall be provided using appropriate means such as primary settlement structures, routing through settlement ponds, or routing through adequately long natural swales or slopes. In addition, all development plans shall conform to the requirements of the City's National Pollution Discharge Elimination System permit and City ordinances, and all subdivisions and new commercial/industrial development shall identify Best City of Marina General Plan 74 Management Practices (BMP's) appropriate or applicable to uses conducted onsite to effectively prevent the discharge of pollutants in stormwater runoff. 3. Stormwater systems shall be constructed in a manner which prevents soil erosion. Appropriate measures to avoid such impacts include the dispersal of runoff, installation of energy dissipaters where dispersal is not practical and concentration of runoff water is necessary, and retention of vegetation or revegetation of affected surfaces.	This policy is intended to minimize adverse effects of uncontrolled stormwater runoff.	Consistent: The project would conform to the State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-0001-DWQ, NPDES No. CAS000004) which require specific BMPs and measures to manage stormwater. The State requirements are incorporated in the municipal stormwater permit. The project would be subject to the MRSWMP requirements under the MS4 permit and would be required to implement erosion and stormwater control measures.

TABLE 4.3-7 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS, POLICIES, AND REGULATIONS PERTAINING TO SURFACE WATER HYDROLOGY AND WATER QUALITY

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 and inland areas)	Marina Municipal Code	Chapter 15.48 – Flood Damage Prevention	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Chapter 15.48 - Flood Damage Prevention*** states provisions for flood prevention and reduction of flood hazards. A special flood hazard area is an area that is subject to one percent or greater change of flooding in a given year, which is the FEMA 100-year floodplain. The code also sets requirements for new storm drainage facilities.	This section is intended to prevent and reduce damage from floods.	Consistent: Within the city of Marina, portions of the Source Water Pipeline and new Transmission Main would be constructed in a 100-year flood hazard area. However, these underground pipelines would not impede or redirect flood flows. None of the aboveground facilities in the city of Marina would be located in the 100-year floodplain.
City of Marina (coastal zone and inland areas)	Marina Municipal Code	Chapter 16.08 – Design Requirement by Type of Subdivision	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main Pipeline	***Section 16.08.080 (F) Erosion Control.*** [Implement] silt basins, structures, planting or other forms of erosion control when necessary in the opinion of the Planning Commission.	This section is intended to control erosion.	Consistent: The project conforms to the State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-0001-DWQ, NPDES No. CAS000004) which require specific BMPs and measures to manage stormwater and control erosion. The State requirements are incorporated in the municipal stormwater permit. The project would be subject to the MRSWMP, which requires stormwater control requirements under the MS4 permit and implementation of erosion control measures.
City of Marina (coastal zone & inland area)	Marina Municipal Code	Title 8 - Health and Safety	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Section 8.46.130 Requirement to prevent, control, and reduce storm water pollutants (b) Responsibility to Implement Best Management Practices.*** Notwithstanding the presence or absence of BMP requirements promulgated pursuant to subparagraphs (a), (b), (c), and (d) of this section, each person engaged in activities or operations, or owning facilities or property which will or may result in pollutants entering storm water, the storm drain system, or waters of the U.S. shall implement best management practices to the extent they are technologically achievable to prevent and reduce such pollutants. The owner or operator of each commercial or industrial establishment shall provide reasonable protection from accidental discharge of prohibited materials or other wastes into the city storm drain system and/or watercourses. Facilities to prevent accidental discharge of prohibited materials or other wastes shall be provided and maintained at expense of the owner or operator.	This section is intended to protect water quality by preventing, controlling, and reducing pollutants (including sediment) from entering stormwater, the storm drain system, and waters of the U.S.	Consistent: The project would conform to the State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-0001-DWQ, NPDES No. CAS000004) that require specific BMPs and measures to manage stormwater. The State requirements are incorporated in the municipal stormwater permit. The project would be subject to the MRSWMP, which requires stormwater control requirements under the MS4 permit and implementation of erosion and stormwater control measures to protect water quality.
City of Marina (coastal zone & inland area)	Marina Municipal Code	Title 8 - Health and Safety	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Section 8.46.130 Requirement to prevent, control, and reduce storm water pollutants (c) Construction Sites.*** The city's BMP Guidance Series will include appropriate best management practices to reduce pollutants in any storm water runoff from construction activities. The city shall incorporate such requirements in any land use entitlement and construction or building-related permit to be issued relative to such development or redevelopment. The owner and developer shall comply with the terms, provisions, and conditions of such land use entitlements and building permits as required in this chapter and the city storm water utility ordinance. Construction activities subject to BMP requirements shall continuously employ measures to control waste such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site that may cause adverse impacts on water quality, contamination, or unauthorized discharge of pollutants.	This section is intended to protect water quality by preventing, controlling, and reducing pollutants (including sediment) from entering stormwater, the storm drain system, and waters of the U.S.	Consistent: The project would conform to the State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-0001-DWQ, NPDES No. CAS000004) that require specific BMPs and measures to manage stormwater. The proposed project would be subject to the MRSWMP, which requires stormwater control requirements under the MS4 permit and implementation of erosion and water quality control measures.
City of Marina (coastal zone)	Marina Local Coastal Program Land Use Plan	Policy	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	**Policy 17.** To insure protection and restoration of ocean's water quality and biological productivity.	This policy is intended to protect ocean water quality and biological productivity.	Consistent: The project would conform to the State Construction General Permit and WDRs (the NPDES Phase II Permit, Order No. 2013-0001-DWQ, NPDES No. CAS000004), which require i specific construction-related BMPs to prevent concentrated stormwater run-on/runoff, soil erosion, and release of construction site contaminants to protect water quality.

TABLE 4.3-7 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS, POLICIES, AND REGULATIONS PERTAINING TO SURFACE WATER HYDROLOGY AND WATER QUALITY

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 Monterey (inland area)	Monterey City Code	Chapter 31.5 - Storm Water Management	Ryan Ranch–Bishop Interconnection Improvements	***Section 31.5-12. Prohibitions of Illegal Discharges.*** No person or entity shall discharge or cause to be discharged into the municipal Storm Drain System or waters of the state, any materials, including but not limited to Pollutants or waters containing any Pollutants that cause or contribute to a violation of applicable water quality standards, other than storm water.	This section is intended to prevent discharges into the municipal Storm Drain System or waters of the state that could affect water quality.	Consistent: The project would conform to the State Construction General Permit and the Chapter 31.5 of the City Code, which require specific construction-related BMPs to prevent erosion and the release of contaminants to protect water quality.
City of Monterey (inland area)	Monterey City Code	Chapter 31.5 - Storm Water Management	Ryan Ranch–Bishop Interconnection Improvements	***Section 31.5-12. Requirement to Prevent, Control, and Reduce Storm Water Pollutants***. (c) Construction Sites. BMPs to reduce pollutants in any storm water runoff activities shall be incorporated in any land use entitlement and/or construction or building-related permit. The owner and developer shall comply with the terms, provisions, and conditions of such land use entitlements and/or building permits as required by the City and as required by the NPDES General Permit and as amended thereto.	This section is intended to prevent pollutants (including sediment) from entering stormwater runoff.	Consistent: The project would conform to the State Construction General Permit and the Chapter 31.5 of the City Code, which require specific construction-related BMPs to prevent erosion and the release of contaminants.
City of Monterey (inland areas)	Monterey City Code	Chapter 31.5 – Storm Water Management	Ryan Ranch-Bishop Interconnection Improvements	***Section 31.5-15 - Requirement to Prevent, Control, and Reduce Storm Water Pollutants. (b) New Development and Redevelopment.*** The City may require any owner or person developing real property to identify appropriate BMPs to control the volume, rate, and potential pollutant load of stormwater runoff from new development and redevelopment projects as may be appropriate to minimize the generation, transport and discharge of pollutants. The City shall incorporate such requirements in any land use entitlement and construction or building-related permit to be issued relative to such development or redevelopment. The owner and developer shall comply with the terms, provisions, and conditions of such land use entitlements and building permits as required in this Article and the City Stormwater Utility Ordinance, Chapter 31.5, Article 1. The requirements may also include a combination of structural and non-structural BMPs along with their long-term operation and maintenance.	This section is intended to protect stormwater quality from pollutants associated with new development.	Consistent: Within the city of Monterey, the project would conform to the State Construction General Permit and WDRs, which require BMPs and measures to prevent water pollution and control any pollutant discharge so as to protect water quality.
City of Monterey (inland areas)	Monterey City Code	Chapter 9 – Building Regulations	Ryan Ranch-Bishop Interconnection Improvements	***Section 9-70.1- Establishment of Development Permit.*** A Development Permit shall be obtained before construction or development begins within any area of special flood hazards established in Section 9-69. Application for a Development Permit shall be made on forms furnished by the Floodplain Administrator and may include, but not be limited to plans prepared by a registered civil engineer in duplicate drawn to scale showing the nature, location, dimensions, and elevation of the area in question; existing or proposed structures, fill, storage of materials, drainage facilities; along with their locations.	This section is intended to protect people and property from flood hazards.	Consistent: No new habitable development or redevelopment is proposed under the MPWSP within the city of Monterey.
City of Seaside (coastal zone and inland areas)	Seaside General Plan	Conservation/ Open Space	New Transmission Main, ASR Conveyance Pipeline, ASR Pump to Waste Pipeline, ASR Recirculation Pipeline, and Terminal Reservoir	***Policy COS.3-2:*** Work with all local, regional, State, and federal agencies to implement mandated water quality programs and regulations to improve surface water quality. *Implementation Plan COS-3.2.1: NPDES Requirements:* To reduce pollutants in urban runoff, require new development projects and substantial rehabilitation projects to incorporate Best Management Practices (BMPs) pursuant to the National Pollutant Discharge Elimination System (NPDES) permit to ensure that the City complies with applicable state and federal regulations.	This policy is intended to protect surface water quality from pollutants (including sediment) in urban runoff.	Consistent: The pipelines would be constructed below grade and would not increase the amount of impervious surfaces, or release pollutants. In addition, the project would conform to the State Construction General Permit and the Seaside Municipal Code, which require specific construction-related BMPs to prevent stormwater pollutants from leaving the construction sites. Once installed, the proposed pipelines would have no effect on stormwater quality or runoff. However, Terminal Reservoir would result in an increase in impervious surface area and would be subject to the MRSWMP, which requires stormwater control requirements under the MS4 permit and implementation of erosion and water quality control measures.

TABLE 4.3-7 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS, POLICIES, AND REGULATIONS PERTAINING TO SURFACE WATER HYDROLOGY AND WATER QUALITY

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 Seaside (coastal zone and inland areas)	Seaside General Plan	Conservation/ Open Space	New Transmission Main, ASR Conveyance Pipeline, ASR Pump to Waste Pipeline, ASR Recirculation Pipeline, and Terminal Reservoir	***Policy COS-4.2*:** Protect and enhance the creeks, lakes, and adjacent wetlands for their value in providing visual amenity, habitat for wildlife, and recreational opportunities.	This policy is intended to protect beneficial uses of creeks, lakes, and adjacent wetlands.	Consistent: The project would conform to State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-0001-DWQ),which require BMPs and measures to control and minimize any stormwater runoff and prevent water pollution so as to protect water quality. The project would conform with State WDRs under the NPDES Phase II Permit (Order No. 2013-0001-DWQ, NPDES No. CAS000004), which regulates stormwater discharge into storm sewer systems. For impacts related to wetlands, please refer to Section 4.6, Terrestrial Biological Resources. As discussed for wetlands in Section 4.6, Terrestrial Biological Resources, for wetlands, the project would have a less than a significant impact with mitigation.
City of Seaside (coastal zone and inland areas)	Seaside General Plan	Safety	New Transmission Main, ASR Conveyance Pipeline, ASR Pump to Waste Pipeline, ASR Recirculation Pipeline, and Terminal Reservoir	***Policy S-1.2*:** Protect the community from flooding hazards. *Implementation Plan S-1.2.1*: Project Flood Control. Require developers to provide flood control systems in new development areas that mitigate potential onsite flooding hazards and also avoid increasing flood hazards elsewhere.	This policy is intended to protect people and property from flood hazards.	Consistent: None of the MPWSP components proposed for Seaside would be located in a flood hazard area. With the exception of the Terminal Reservoir, all other MPWSP facilities in Seaside would be buried below ground surface and would not present a risk of flood hazard. The Terminal Reservoir site is not in a flood hazard area and would be subject to the State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-0001-DWQ) set forth in the local municipal stormwater permit, which includes requirements to control and minimize stormwater runoff so as to prevent flood hazards.
City of Seaside (coastal zone and inland areas)	Seaside General Plan	Land Use	New Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, ASR Pump-to-Waste Pipeline, and Terminal Reservoir	***Policy LU-8.2:*** Ensure that developers provide stormwater retention/detention facilities and institute Best Management Practices that regulate runoff and siltation that meets local, State, and federal standards.	This policy is intended to ensure that developers provide stormwater retention/detention facilities.	Consistent: None of the MPWSP components proposed for Seaside would be located in a flood hazard area. With the exception of the Terminal Reservoir, all other MPWSP facilities in Seaside would be buried below ground surface and would not present a risk of flood hazard. The Terminal Reservoir site is not in a flood hazard area and would be subject to the State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-0001-DWQ) set forth in the local municipal stormwater permit, which includes requirements to control and minimize stormwater runoff so as to prevent flood hazards.
City of Seaside (coastal zone and inland areas)	Seaside Municipal Code	Chapter 8.46 – Urban Storm Water Quality Manage Surface management and Discharge Control	New Transmission Main, ASR Conveyance Pipeline, ASR Pump to Waste Pipeline, ASR Recirculation Pipeline, and Terminal Reservoir	***Chapter 8.46 Urban Storm Water Quality Manage Surface Management and Discharge Control.*** Urban Stormwater Quality Management and Discharge Control would apply to all water entering the storm drain system generated on any developed and undeveloped lands lying within the city. The chapter lists requirements to prevent, control, and reduce stormwater pollutants, protection of water courses, and notification to emergency response officials in the event of a chemical release.	This guideline is intended to manage stormwater quality and control stormwater discharges.	Consistent: The proposed project would be constructed and operated in conformance with State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-0001-DWQ, NPDES No. CAS000004 and Order No. R3-2014-0013), which require implementation of BMPs and measures to control and minimize stormwater discharges into nearby water bodies. The State requirements are incorporated in the local municipal code and the municipal stormwater permit.
City of Seaside (coastal zone and inland areas)	Seaside Municipal Code	Chapter 8.46 - Health and Safety	New Transmission Main ASR Conveyance Pipeline, ASR Pump to Waste Pipeline, ASR Recirculation Pipeline, and Terminal Reservoir	***Section 8.46.130 Requirement to prevent, control, and reduce storm water pollutants (B) Responsibility to Implement Best Management Practices***. Notwithstanding the presence or absence of BMP requirements promulgated pursuant to subparagraphs A, B, C, and D of this section, each person engaged in activities or operations, or owning facilities or property which will or may result in pollutants entering storm water, the storm drain system, or waters of the U.S. shall implement best management practices to the extent they are	This section is intended to protect surface water quality from pollutants (including sediment) associated with development.	Consistent: The pipelines would be constructed below grade and would not increase the amount of impervious surfaces, or releasing pollutants. In addition, the proposed project would be subject to the State Construction General Permit, and the Seaside Municipal Code, which require the implementation of specific construction-related BMPs to prevent stormwater pollutants from leaving the construction sites. The Terminal Reservoir site would be subject to

TABLE 4.3-7 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS, POLICIES, AND REGULATIONS PERTAINING TO SURFACE WATER HYDROLOGY AND WATER QUALITY

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 Seaside (coastal zone and inland areas) (cont.)				technologically achievable to prevent and reduce such pollutants. The owner or operator of each commercial or industrial establishment shall provide reasonable protection from accidental discharge of prohibited materials or other wastes into the city storm drain system and/or watercourses. Facilities to prevent accidental discharge of prohibited materials or other wastes shall be provided and maintained at expense of the owner or operator.		the State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-0001-DWQ) set forth in the local municipal stormwater permit, which includes requirements to control and minimize stormwater runoff so as to protect water quality.
City of Seaside (coastal zone and inland areas)	Seaside Municipal Code	Chapter 8.46 - Health and Safety	New Transmission Main, ASR Conveyance Pipeline, ASR Pump to Waste Pipeline, ASR Recirculation Pipeline, and Terminal Reservoir	***Section 8.46.130 Requirement to prevent, control, and reduce storm water pollutants (C) Construction Sites***. The city's BMP Guidance Series includes appropriate best management practices to reduce pollutants in any storm water runoff from construction activities. The city shall incorporate such requirements in any land use entitlement and construction or building-related permit to be issued relative to such development or redevelopment. The owner and developer shall comply with the terms, provisions, and conditions of such land use entitlements and building permits as required in this chapter and the city storm water utility ordinance. Construction activities subject to BMP requirements shall continuously employ measures to control waste such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site that may cause adverse impacts on water quality, contamination, or unauthorized discharge of pollutants.	This section is intended to protect surface water quality from pollutants (including sediment) associated with development.	Consistent: The pipelines would be constructed below grade and would not increase the amount of impervious surfaces, or release pollutants. In addition, the proposed project would be subject to the State Construction General Permit and Seaside Municipal Code, which require the implementation of specific construction-related BMPs to prevent stormwater pollutants from leaving the construction sites. The Terminal Reservoir site would be subject to the State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-0001-DWQ) set forth in the local municipal stormwater permit, which includes requirements to control and minimize stormwater runoff so as to protect water quality.
County of Monterey (inland areas)	Carmel Valley Master Plan	Natural Resources	Carmel Valley Pump Station and Main System-Hidden Hills Interconnection Improvements	***Policy CV-1.20*** Design ("D") and site control ("S") overlay district designations shall be applied to the Carmel Valley area. Design review for all new development throughout the Valley, including proposals for existing lots of record, utilities, heavy commercial, and visitor accommodations, but excluding minor additions to existing development where those changes are not conspicuous from outside of the property, shall consider the following guidelines: f. Minimize erosion and/or modification of landforms.	This policy is intended to minimize erosion.	Consistent: The proposed project would be constructed and operated in conformance with State Construction General Permit, which requires implementation of BMPs and measures to control and minimize erosion.
County of Monterey (inland areas)	Carmel Valley Master Plan	Natural Resources	Carmel Valley Pump Station and Main System-Hidden Hills Interconnection Improvements	***Policy CV-4.1:*** In order to reduce potential erosion or rapid runoff: a. The amount of land cleared at any one time shall be limited to the area that can be developed during one construction season. b. Motorized vehicles shall be prohibited on the banks or in the bed of the Carmel River, except by permit from the Water Management District or Monterey County. c. Native vegetative cover must be maintained on areas that have the following combination of soils and slope: 1. Santa Lucia shaly clay loam, 30-50% slope (SfF) 2. Santa Lucia-Reliz Association, 30-75% slope (Sg) 3. Cieneba fine gravelly sandy loam, 30-70% slope (CcG) 4. San Andreas fine sandy loam, 30-75% slope (ScG) 5. Sheridan coarse sandy loam, 30-75% slope (SoG) 6. Junipero-Sur complex, 50-85% slope (Jc)	This policy is intended to reduce potential erosion or rapid runoff.	Consistent: The proposed project would be constructed and operated in conformance with State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-0001-DWQ), which require implementation of BMPs and measures to control and reduce erosion and stormwater runoff. The State requirements are incorporated in the municipal stormwater permit.

TABLE 4.3-7 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS, POLICIES, AND REGULATIONS PERTAINING TO SURFACE WATER HYDROLOGY AND WATER QUALITY

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
County of Monterey (coastal zone and inland areas)	Monterey County Code	Chapter 16.08 –Grading	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills Interconnection Improvements, and Ryan Ranch-Bishop Interconnection Improvements	***Chapter 16.08 -*** The Monterey County Grading Ordinance generally regulates grading activities that involve more than 100 cubic yards of excavation and fill. Minor fills and excavations ("cuts") of less than 100 cubic yards that are not intended to provide foundations for structures, or that are very shallow and nearly flat, are typically exempt from the ordinance, as are shallow footings for small structures. Submittal requirements for a County grading permit include site plans, existing contours and proposed contour changes, an estimate of the volume of earth to be moved, and geotechnical (soils) reports. Grading activities that involve over 5,000 cubic yards of soil must include detailed plans signed by a state-licensed civil engineer. Grading is not allowed to obstruct storm drainage or cause siltation of a waterway. All grading requires implementation of temporary and permanent erosion-control measures. Grading within 50 feet of a watercourse, or within 200 feet of a river, is regulated in the Monterey County Zoning Ordinance floodplain regulations. The Monterey County Grading Ordinance requires a soil engineering and engineering geology report (Section 16.08.110: Permit – Soil Engineering and Engineering Geology Reports [Ordinance 4029, 1999; Ordinance 2534, Section 110, 1979], unless waived by the Building Official because information of record is available showing such data is not needed. The soil engineering and engineering geology report must include the following: a. Data regarding the properties, distribution and strength of existing soils b. Recommendations for grading and corrective measures for project design, as appropriate c. An adequate description of the geology of the site and potential hazards. The recommendations from the soil engineering and engineering geology report must be incorporated in the grading plans and construction specifications.	This ordinance is intended to minimize soil erosion, and loss of topsoil, and associated environmental effects.	Consistent: As noted in Chapter 3, Description of the Project (Proposed Project), CalAm would be required to obtain a grading permit prior to project construction. As part of the grading permit review process, CalAm would have to demonstrate conformity with the requirements of the Monterey County Grading Ordinance, including specific provisions designed to minimize soil erosion, loss of topsoil, and associated environmental effects. In addition, the proposed project would be subject to the State Construction General Permit and the Monterey County Erosion Control Ordinance, which also require the implementation of specific construction-related BMPs to minimize erosion and soil loss, and prevent stormwater pollutants from leaving the construction sites.
County of Monterey (coastal zone and inland areas)	Monterey County Code	Chapter 16.12 -Erosion Control	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Chapter 16.12 - Erosion Control.*** Requires that specific design considerations be incorporated into projects to reduce the potential of erosion and that an erosion control plan be approved by the County prior to initiation of grading activities.	This ordinance is intended to minimize erosion and soil loss, and associated water quality impacts, among other environmental effects.	Consistent: As noted in Chapter 3, Description of the Project (Proposed Project), CalAm would be required to obtain a grading permit prior to project construction. As part of the grading permit review process, CalAm would have to demonstrate conformity with the requirements of the Monterey County Erosion Control Ordinance, including through preparation of an erosion control plan indicating proposed methods for the control of runoff, erosion, and sediment movement. In addition, the proposed project would be subject to the State Construction General Permit, which also requires the implementation of specific construction-related BMPs to minimize erosion and soil loss, and prevent stormwater pollutants from leaving the construction sites.
County of Monterey (coastal zone and inland areas)	Monterey County Code	Chapter 16.16 - Development of Floodplains	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Chapter 16.16 - Development of Floodplains.*** Establishes methods of reducing flood losses such as controlling the alteration of natural floodplains and requiring new construction in the floodplain to incorporate flood-proofing measures (Floodplain regulations in the county extend to areas within 200 feet of rivers or within 50 feet of watercourses).	This ordinance is intended to protect people, property, and the environment from the effects of development in flood hazard areas.	Consistent: The Carmel Valley Pump Station and Castroville Pipeline would be located in a floodplain. Once constructed, the Castroville Pipeline would be underground and would have no effect on flooding. The Carmel Valley Pump Station would be constructed in accordance with Chapter 16.16 of the Monterey County Code. None of the other proposed aboveground facilities would be constructed in a floodplain.

TABLE 4.3-7 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS, POLICIES, AND REGULATIONS PERTAINING TO SURFACE WATER HYDROLOGY AND WATER QUALITY

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
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Policy OS-3.3:*** Criteria for studies to evaluate and address, through appropriate designs and BMPs, geologic and hydrologic constraints and hazards conditions, such as slope and soil instability, moderate and high erosion hazards, and drainage, water quality, and stream stability problems created by increased stormwater runoff, shall be established for new development and changes in land use designations.	This policy is intended to protect people, property, and the environment from the effects of development in geologic and hydrologic hazard areas.	Consistent: The proposed project would be constructed and operated in conformance with State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-0001-DWQ and NPDES General Permit for Discharges with Low Threat to Water Quality and the General Waiver of WDRs for Specific Types of Discharges [Resolution R3-2014-0014]), which require implementation of BMPs and measures to control and reduce erosion and pollutant discharge, thus both stormwater runoff and quality. The State requirements are incorporated in the County's Municipal Code and the municipal stormwater permit.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Policy OS-4.2:*** Direct and indirect discharges of harmful substances into marine waters, rivers or streams shall not exceed state or federal standards.	This policy is intended to protect the quality of marine waters, rivers, and streams.	Inconsistent: The project would conform with State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-0001-DWQ and NPDES General Permit for Discharges with Low Threat to Water Quality and the General Waiver of WDRs for Specific Types of Discharges [Resolution R3-2014-0041], NPDES No. CAS000004 and Order No. R3-2014-0013, NPDES Permit No. CA0048551 for the Monterey Regional Water Pollution Control Agency Treatment Plant), which require BMPs and measures to control and reduce pollutants in the point and nonpoint discharges (e.g., stormwater runoff and brine discharge) from project facilities. The State requirements are incorporated in the County's Municipal Code and the municipal stormwater permit, and would be incorporated into any new permits obtained prior to project operation such as the amendment to the NPDES permit for discharging brine from the MPWSP Desalination Plant into Bay through the existing MRWPCA outfall. Operational discharges of the MPWSP under certain scenarios may exceed Ocean Plan water quality objective thresholds. This issue is discussed in Impact 4.3-5.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Policy OS-4.3:*** Estuaries, salt and fresh water marshes, tide pools, wetlands, sloughs, river and stream mouth areas, plus all waterways that drain and have impact on State Monterey County General Plan designated Areas of Special Biological Significance (ASBS) shall be protected, maintained, and preserved in accordance with state and federal water quality regulations.	This policy is intended to protect and maintain the quality of coastal waterways and designated ASBSs.	Inconsistent: The project would conform with State Construction General Permit and WDRs (NPDES Phase II Permit, Order No. 2013-0001-DWQ and NPDES General Permit for Discharges with Low Threat to Water Quality and the General Waiver of WDRs for Specific Types of Discharges [Resolution R3-2014-0041], NPDES No. CAS000004 and Order No. R3-2014-0013, NPDES Permit No. CA0048551 for the Monterey Regional Water Pollution Control Agency Treatment Plant), which require BMPs and measures to control and reduce pollutants in the discharges from project facilities, which eventually drain into the designated ASBSs. The State requirements are incorporated in the County's Municipal Code and the municipal stormwater permit, and would be incorporated into any new permits obtained prior to project operation such as the amendment to the NPDES permit for discharging brine from the MPWSP Desalination Plant into Bay through the existing MRWPCA outfall. Operational discharges of the MPWSP under certain scenarios may exceed Ocean Plan water quality objective thresholds. This issue is discussed in Impact 4.3-5.

TABLE 4.3-7 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS, POLICIES, AND REGULATIONS PERTAINING TO SURFACE WATER HYDROLOGY AND WATER QUALITY

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
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Policy S-2.3:*** All new development, including filling, grading, and construction, within designated 100-year floodplain areas shall conform to the guidelines of FEMA and the National Flood Insurance Program and ordinances established by the County Board of Supervisors. With the exception of the construction of structures, Routine and Ongoing Agricultural Activities shall be exempt from this policy.	This policy is intended to protect people and property from flood hazards.	Consistent: The Carmel Valley Pump Station and Castroville Pipeline would be located in a floodplain. Once constructed, the Castroville Pipeline would be underground and would have no effect on flooding. The Carmel Valley Pump Station would be constructed in accordance with Chapter 16.16 of the Monterey County Code and FEMA requirements for construction in the flood plain. None of the other proposed aboveground facilities would be constructed in a floodplain.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Policy S-2.6:*** Drainage and flood control improvements needed to mitigate flood hazard impacts associated with potential development in the 100-year floodplain shall be determined prior to approval of new development and shall be constructed concurrently with the development.	This policy is intended to protect people and property from flood hazards.	Consistent: The Carmel Valley Pump Station and Castroville Pipeline would be located in a floodplain. Once constructed, the Castroville Pipeline would be underground and would have no effect on flooding. The Carmel Valley Pump Station would be constructed in accordance with Chapter 16.16 of the Monterey County Code and FEMA requirements for construction in the flood plain. None of the other proposed aboveground facilities would be constructed in a floodplain.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Policy S-2.8:*** Alternative project designs and densities to minimize development in the floodplain shall be considered and evaluated.	This policy is intended to protect people and property from flood hazards.	Consistent: The Carmel Valley Pump Station and Castroville Pipeline would be located in a floodplain. Once constructed, the Castroville Pipeline would be underground and would have no effect on flooding. The Carmel Valley Pump Station would be constructed in accordance with Chapter 16.16 of the Monterey County Code and FEMA requirements for construction in the flood plain. None of the other proposed aboveground facilities would be constructed in a floodplain.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Policy S-3.1:*** Post-development, offsite peak flow drainage from the area being developed shall not be greater than pre-development peak flow drainage. Onsite improvements or other methods for storm water detention shall be required to maintain post-development, offsite, peak flows at no greater than predevelopment levels, where appropriate, as determined by the Monterey County Water Resources Agency.	This policy is intended avoid potential adverse effects of increased surface runoff from new development.	Consistent: Within the county of Monterey, the proposed project would be subject to State WDRs (NPDES Phase II Permit, Order No. 2013-0001-DWQ and NPDES General Permit for Discharges with Low Threat to Water Quality and the General Waiver of WDRs for Specific Types of Discharges [Resolution R3-2014-0041], NPDES No. CAS000004 and Order No. R3-2014-0013) which are set forth in the local municipal stormwater permit and which require implementation of site design and stormwater control measures such that post-project flow drainage from the site must match pre-project flows.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville 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 groundwater and surface water quality from pollutants associated with development.	Consistent: The proposed project would be constructed and operated in conformance with State Construction General Permit and WDRs, which require implementation of BMPs and measures to control and reduce pollutants in the discharges from project facilities that could affect water quality. The State requirements are incorporated in the County's Municipal Code and the municipal stormwater permit, and would be incorporated into any new permits obtained prior to project operation. The issue of groundwater quality is addressed further in Section 4.7, Hazards and Hazardous Materials. As discussed in Section 4.7, groundwater quality issues would be addressed through implementation of mitigation measures, thereby resolving potential conflicts with applicable groundwater quality protection policies.

TABLE 4.3-7 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS, POLICIES, AND REGULATIONS PERTAINING TO SURFACE WATER HYDROLOGY AND WATER QUALITY

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
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Policy S-3.3:*** Drainage facilities to mitigate the post-development peak flow impact of new development shall be installed concurrent with new development	This policy is intended avoid potential adverse effects of increased surface runoff from new development.	Consistent: Within the county of Monterey, the proposed project would be subject to State WDRs set forth in the local municipal stormwater permit, which require implementation of site design and stormwater control measures such that post-project flow drainage from the site must match pre-project flows.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Policy S-3.5:*** Runoff Performance Standards that result in an array of site planning and design techniques to reduce storm flows plus capture and recharge runoff shall be developed and implemented, where appropriate, as determined by the Monterey County Water Resources Agency.	This policy is intended to protect groundwater and surface water quality from pollutants associated with development.	Consistent: Within the county of Monterey, the proposed project would be subject to State WDRs set forth in the local municipal stormwater permit, which require implementation of site design and stormwater control measures such that post-project flow drainage from the site must match pre-project flows.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Policy S-3.9:*** In order to minimize urban runoff affecting water quality, the County shall require all future development within urban and suburban areas to implement Best Management Practices (BMPs) as approved in the Monterey Regional Storm Water Management Program which are designed to incorporate Low Impact Development techniques. BMPs may include, but are not limited to, grassy swales, rain gardens, bioretention cells, and tree box filters. BMPs should preserve as much native vegetation as feasible possible on the project site.	This policy is intended to protect surface water quality from pollutants that may be present in stormwater runoff.	Consistent: The proposed project would be subject to State WDRs set forth in the local municipal stormwater permit, which require implementation of site design and stormwater control and treatment measures (including LID measures where necessary) to control any pollutant discharges through the runoff and to minimize site runoff such that the post-project flow drainage from the site must match pre-project flows.
County of Monterey (coastal zone)	North County Land Use Plan	Land Use and Development	Source Water Pipeline and new Desalinated Water Pipeline	***Key Policy 4.3.4:*** All future development within the North County coastal segment must be clearly consistent with the protection of the area's significant human and cultural resources, agriculture, natural resources, and water quality.	This policy is intended to provide long-term management and protection of the County's coastal resources.	Consistent: The proposed project would be implemented in conformance of State Construction General Permit and WDRs set forth in the local municipal code and stormwater permit. The WDR requirements would be incorporated into any new permits obtained prior to project operation, such as minimizing erosion and sediment control and runoff. The project's implications for cultural, agricultural, and terrestrial biological resources are discussed in EIR Sections 4.15, Cultural Resources, 4.16, Agriculture and Forestry Resources, and 4.6, Terrestrial Biological Resources, respectively, which present additional discussion of the project's conformity with applicable North County Land Use Plan policies governing these resource areas, respectively.
County of Monterey (inland areas)	North County Area Plan	Seismic, Geologic, Flood, and Fire Hazards	Castroville Pipeline	***16.2.1.1 (NC):*** Site plans for new development shall indicate all perennial or intermittent streams, creeks, and other natural drainages. Development shall not be allowed within these drainage courses, nor shall development be allowed to disturb the natural banks and vegetation along these drainage courses, unless such disturbances are with approved flood or erosion control or water conservation measures.	This policy is intended to protect streams, creeks, and natural drainages from development disturbances.	Consistent: Within the county of Monterey, the proposed project would be subject to State WDRs set forth in the local municipal stormwater permit, which require implementation of site design and stormwater control measures such that post-project flow drainage from the site must match pre-project flows. The requirements are also aimed at minimizing soil erosion and protecting water quality.
County of Monterey (inland areas)	North County Area Plan	Seismic, Geologic, Flood, and Fire Hazards	Castroville Pipeline	***16.2.11 (NC):*** New development in North County shall be required to limit peak storm runoff to pre-project or pre-soil disturbance levels, unless otherwise dictated by the Monterey County Flood control and Water Conservation District (MCFCWCD). Runoff shall be limited by construction of detention ponds or other approved measures. In areas where the potential for erosion also exists, detention ponds shall be constructed for the dual process of storm water detention and sediment control.	This policy is intended to limit peak storm runoff to pre-project or pre-soil disturbance levels for new development.	Consistent: Within the county of Monterey, the proposed project would be subject to State WDRs set forth in the local municipal stormwater permit, which require implementation of site design and stormwater control measures such that post-project flow drainage from the site must match pre-project flows. The requirements are also aimed at minimizing soil erosion and protecting water quality.

TABLE 4.3-7 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS, POLICIES, AND REGULATIONS PERTAINING TO SURFACE WATER HYDROLOGY AND WATER QUALITY

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 (Seaside)	Fort Ord Reuse Plan	Conservation	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline, and 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 control runoff from new development.	Consistent: Within the county of Monterey, the proposed project would be subject to State WDRs set forth in the local municipal stormwater permit, which require implementation of site design and stormwater control measures such that post-project flow drainage from the site must match pre-project flows. The requirements are also aimed at minimizing soil erosion and protecting water quality.
Fort Ord Reuse Authority (Seaside)	Fort Ord Reuse Plan	Conservation	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline, and Terminal Reservoir	***Hydrology and Water Quality Policy C-2:*** At the project approval stage, the City shall require new development to demonstrate that all measures will be taken to ensure that onsite drainage systems are designed to capture and filter out urban pollution.	This policy is intended to control runoff from new development.	Consistent: Within the county of Monterey, the proposed project would be subject to State WDRs set forth in the local municipal stormwater permit, which require implementation of site design and stormwater control measures such that post-project flow drainage from the site must match pre-project flows. The requirements are also aimed at minimizing soil erosion and protecting water quality.
Fort Ord Reuse Authority (Monterey County)	Fort Ord Reuse Plan	Conservation	Ryan Ranch–Bishop Interconnection Improvements	***Hydrology and Water Quality Policy A-1:*** At the project approval stage, the County 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.	The intent of this policy is for new development to demonstrate implementation of measures to minimize and allow infiltration of the runoff.	Consistent: There would be no aboveground improvements that would constitute new development and increase in runoff. The proposed pipelines as part of the interconnections would be located underground and the surface along the pipeline alignments would be restored to pre-construction conditions.
Fort Ord Reuse Authority (County of Monterey)	Fort Ord Reuse Plan	Conservation	Ryan Ranch–Bishop Interconnection Improvements	***Hydrology and Water Quality Policy C-2*:** At the project approval stage, the County shall require new development to demonstrate that all measures will be taken to ensure that onsite drainage systems are designed to capture and filter out urban pollution.	The intent of this policy is for new development to demonstrate that onsite drainage systems are implemented such that they capture and filter out urban runoff.	Consistent: There would be no aboveground improvements that would constitute new development and increase in runoff. The proposed pipelines as part of the interconnections would be located underground and the surface along the pipeline alignments would be restored to pre-construction conditions.

SOURCE: City of Marina, 2000, 1982; City of Seaside, 2004b; FORA, 1997; Monterey County 1982, 1985, 1999, 2010a, 2010b 2013.

4.3.3 Evaluation Criteria

Implementation of the proposed project (MPWSP), which would include 10 slant wells at CEMEX, would have a significant impact related to surface water hydrology and water quality if it would:

- Violate any water quality standards or waste discharge requirements;
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river in a manner that would result in substantial erosion or siltation on- or offsite;
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increasing the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;
- Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;
- Otherwise substantially degrade water quality;
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other authoritative flood hazard delineation map;
- Place within a 100-year flood hazard area structures which would impede or redirect flood flows;
- Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam;
- Expose people or structures to a significant risk of loss, injury, or death involving inundation by seiche,[26] tsunami, or mudflow;
- Exceed the numeric water quality objectives established in the Ocean Plan, including those for salinity that require discharges not to exceed 2 ppt over ambient salinity levels at the edge of the regulatory Brine Mixing Zone (BMZ) associated with operation of new desalination facilities or cause dissolved oxygen concentration to be depressed more than 10 percent from that which occurs naturally as the result of the discharge of oxygen demanding waste materials; or,
- Expose people or structures to a significant risk of loss, injury, or death involving coastal flooding from sea level rise.

Based on the nature of the proposed project, there would be no impacts related to the following evaluation criteria for the reasons described below:

- ***Place Housing within a 100-Year Flood Hazard Zone.*** The proposed project would not involve construction of new housing or structures for human occupancy within a 100-year flood hazard zone. Therefore, the evaluation criterion related to the placement of housing within a 100-year flood hazard zone is not applicable to the proposed project and is not discussed further.

[26] A seiche is a rhythmic motion of water in a partially or completely landlocked water body caused by earthquakes, landslides, tsunamis, or local changes in atmospheric pressure.

- ***Expose People or Structures to Inundation by Seiche or Mudflow.*** The proposed project would have no effect on the frequency or probability of seiches (i.e., earthquake-induced oscillating waves in an enclosed water body such as the Del Monte Lake, Laguna del Rey, or El Estero Lake in the project area) because the proposed project would not create new enclosed water bodies or affect the frequency of earthquakes. Further, as the proposed project would not include construction of habitable structures, there would be no impacts related to property loss, injury, or death from a seiche. Due to the relatively flat topography of the project area, project implementation would not expose people or property to increased mudflow hazards. Therefore, no impact related to inundation by seiche or mudflow would result.

- ***Expose People or Structures to a Significant Risk of Loss, Injury, or Death Involving Flooding, Including Flooding as a Result of the Failure of a Levee or Dam.*** There are no dams or levees adjacent to the project area. Dams that are located in the region include Los Padres Dam on the Carmel River and Nacimiento and San Antonio Dams on the Salinas River. The Castroville Pipeline and Castroville Pipeline Optional Alignment 1 would be located within the dam inundation zone for Nacimiento and San Antonio Dams, but would be located below ground and, as such, are unlikely to become damaged during such an event and would not redirect flood flows in a manner that causes increased flood hazard offsite. None of the other proposed facilities would lie within a predicted dam inundation zone. Implementation of the proposed project would not affect reservoir operations. Therefore, the proposed project would not expose people or structures to flooding damages due to failure of a dam or levee. There would be no impact associated with potential flooding from levee or dam failure. Relevant flooding-related issues are addressed under Impacts 4.3-8 through 4.3-10 in Section 4.3.5.2, below.

- ***Violate any water quality standards or waste discharge requirements, or substantially degrade water quality, as a result of increased temperatures from operational discharges.*** Based on published literature on desalination plant discharges, temperature is a commonly studied parameter due to the commingling of the brine streams from desalination plants with power plant discharges of cooling water that have high temperatures (Roberts et al., 2010; Dawoud and Al Mulla, 2012). Such commingling of brine and power plant thermal discharges increase the temperature of operational discharges as a result of processes inherent to power plant cooling operations that involve high temperatures (Dawoud and Al Mulla, 2012). However, the proposed MPWSP Desalination Plant would not operate in combination with a power plant or other facility that uses ocean waters for cooling purposes. There would be no heating mechanism or any process that would increase the temperature of the source water as it passes through the treatment units. Therefore, the desalination process under the MPWSP would not substantially increase the temperature of the discharged effluent, and thermal impacts on receiving waters are not discussed further.

4.3.4 Approach to Analysis

This analysis evaluates the potential effects of the MPWSP (proposed project/10 slant wells at CEMEX) on surface water hydrology and water quality during project construction and operations. The reported ambient water quality parameters and constituent levels described in Section 4.3.1.3, above, are considered to be representative of baseline concentrations; these are used, in part, to assess the proposed project's impacts on water quality. Construction-related effects on surface water hydrology and water quality relate to direct and indirect impacts that

could occur during construction activities, including site preparation and clearing, excavation, dewatering, and demobilization and site restoration. Operational impacts involve long-term effects related to facility siting, operational discharges, and maintenance activities. The impact analysis is organized by construction impacts and operational impacts.

The discussion of construction impacts presented in Section 4.3.5.1, below, is based on conservative assumptions regarding project construction activities, existing site conditions, and the applicable water quality objectives established by the Construction General Permit and the local ordinances.

The discussion of operational impacts presented in Section 4.3.5.2 is based on conservative assumptions regarding operational discharges and any potential post-construction or long-term effects from building the new facilities (such as increases in storm runoff from addition of impervious surfaces). Additionally, the assessment of long-term operational discharges of desalination brine is based on analyzing adverse impacts on water quality and the environment, including consideration of the risk of hypoxia, or so-called "dead zones," occurring in the marine environment as a result of increased salinity and/or decreased dissolved oxygen. To assess these risks, model analyses were conducted to characterize projected salinity increases in the immediate vicinity of the discharge point (diffuser port upon discharge) or near-field, as well as farther away from the discharge at the regulatory compliance point represented by the edge of the BMZ, which is 100 meters (348 feet) from the discharge point (far-field). Modeling analyses were conducted for a number of likely discharge scenarios, including brine-only discharges and combined discharges where the brine effluent may be mingled with secondary treated wastewater with different seasonal characteristics during a typical operational year. Additionally, model analyses were conducted to determine whether discharges would be in compliance with numeric Ocean Plan water quality objectives. Specifically, the in-pipe concentration of a broad suite of water quality constituents was calculated. Following such calculation, a dilution model was applied to determine each water quality constituent's concentration at the regulatory point of compliance to determine Ocean Plan compliance and identify potential impacts related to water quality.

The impact analysis describes if, and to what degree, the MPWSP would change the existing hydrology, water quality, and flooding conditions described in Section 4.3.1 and how the MPWSP would comply with or exceed any regulatory requirements described in Section 4.3.2 (for certain regulations, compliance determinations are discussed in Section 4.3.2 only). The severity of an impact is determined using the evaluation criteria identified in Section 4.3.4. Impacts on water quality associated with the brine discharge are evaluated in the context of and against the requirements specified in the recently amended Ocean Plan water quality objectives (SWRCB, 2016). In response to public comments, specific analyses were conducted to address risks related to the occurrence of hypoxia, or so-called "dead zones," in the proximity of the discharge point.

4.3.5 Direct and Indirect Effects of the Proposed Project

Table 4.3-8 summarizes the significance determinations related to surface water hydrology and water quality impacts of the proposed project (10 slant wells at CEMEX).

TABLE 4.3-8
SUMMARY OF IMPACTS OF PROPOSED PROJECT – MPWSP, 10 SLANT WELLS AT CEMEX SURFACE WATER HYDROLOGY AND WATER QUALITY

Impacts	Significance Determinations
Impact 4.3-1: Degradation of water quality associated with increased soil erosion and inadvertent releases of hazardous chemicals during general construction activities.	LS
Impact 4.3-2: Degradation of water quality from construction-related discharges of dewatering effluent from open excavations and water produced during well drilling and development.	LSM
Impact 4.3-3: Degradation of water quality from discharges of treated water and disinfectant from existing and newly installed pipelines during construction.	LS
Impact 4.3-4: Violate water quality standards or waste discharge requirements or degrade water quality from increased salinity as a result of brine discharge from the operation of the MPWSP Desalination Plant.	LSM
Impact 4.3-5: Violate water quality standards or waste discharge requirements or degrade water quality as a result of brine discharge from the operation of the MPWSP Desalination Plant.	LSM
Impact 4.3-6: Degradation of water quality due to discharges associated with maintenance of the subsurface slant wells and the ASR-5 and ASR-6 Wells.	LS
Impact 4.3-7: Alteration of drainage patterns such that there is a resultant increase in erosion, siltation, or the rate or amount of surface runoff.	LS
Impact 4.3-8: Alteration of drainage patterns such that there is an increase in flooding on- or offsite or the capacity of the stormwater drainage system is exceeded.	LS
Impact 4.3-9: Impedance or redirection of flood flows following construction due to the siting of project facilities in a 100-year flood hazard area.	LS
Impact 4.3-10: Exposure of people or structures to a significant risk of loss, injury, or death from flooding due to a tsunami.	LS
Impact 4.3-11: Exposure of people or structures to a significant risk of loss, injury, or death from flooding due to sea level rise.	LS
Impact 4.3-C: Cumulative impacts related to surface water hydrology and water quality.	LSM

NOTES:
LS = Less than Significant impact, no mitigation proposed
LSM = Less than Significant impact with Mitigation

4.3.5.1 Construction Impacts

Impact 4.3-1: Degradation of water quality associated with increased soil erosion and inadvertent releases of hazardous chemicals during general construction activities. (*Less than Significant*)

General Construction Activities (Applies to All Project Components)

Project construction activities would involve site clearing and earthmoving activities, excavation and soil stockpiling, and temporary storage and use of chemicals such as fuel. Earthmoving activities associated with project construction would include vegetation removal, grading,

excavation, soil stockpiling, and backfilling. Prior to construction mobilization, the contractor(s) would prepare construction work areas and staging areas by removing vegetation and debris, and grading these areas to provide a relatively level surface for the movement of construction equipment.

Soil disturbing activities could result in soil erosion and the migration of soil and sediment in stormwater runoff to downgradient water bodies and storm drains. Sediment from project-related construction activities could degrade the water quality of receiving water bodies such as the Salinas River and Monterey Bay.

As part of project construction, workers would install approximately 21 miles of pipelines. Most pipeline segments would be installed using conventional open-trench construction methods. Open excavations would also be required for construction of buildings and aboveground structures, including the MPWSP Desalination Plant, ASR-5 and ASR-6 Wells, Carmel Valley Pump Station, and Terminal Reservoir. Grading and earthwork would be required for foundations, parking areas, and access road improvements. The combination of all project construction activities would generate an estimated 25,110 cubic yards of excess spoils and construction debris. If not properly managed, stockpiled spoils could migrate offsite during precipitation events and could result in increased sedimentation in downstream receiving waters bodies.

Construction activities could also result in the accidental release of hazardous construction chemicals such as adhesives, solvents, fuels, and petroleum lubricants that, if not managed appropriately, could adhere to soil particles, become mobilized by rain or runoff, and degrade water quality.

Project construction activities would disturb more than one acre of soil, and therefore would be subject to the NPDES Construction General Permit requirements. As required under the Construction General Permit, a SWPPP would be prepared by a Qualified SWPPP Developer and a Qualified SWPPP Practitioner would oversee its implementation. The SWPPP, which would include specific measures and conditions to reduce or eliminate stormwater flow carrying any pollutants or sediment from the drilling and related construction activities, would be implemented throughout the duration of construction activities. As discussed in Section 4.3.2, Regulatory Framework, above, the SWPPP is required to include specific elements such as erosion and stormwater control measures that would be implemented onsite. At a minimum, the SWPPP must include the following:

- A description of construction materials, practices, and equipment storage maintenance;
- A list of pollutants likely to contact stormwater and site specific erosion and sedimentation control practices;
- A list of provisions to eliminate or reduce discharge of materials to stormwater;
- BMPs for fuel and equipment storage;
- Non-stormwater management measures to manage pollutants generated by activities such as paving operations and vehicle and equipment washing and fueling;

- The requirement that the appropriate equipment, materials, and workers be available to respond rapidly to spills and/or emergencies. All corrective maintenance or BMPs must be performed as soon as possible, depending upon worker safety; and
- Onsite post-construction controls.

Examples of typical construction BMPs include scheduling or limiting certain activities to dry periods of the year, installing sediment barriers such as silt fencing and fiber rolls, maintaining equipment and vehicles used for construction, and tracking controls such as stabilization of construction access points. The development and implementation of BMPs such as overflow structures designed to capture and contain any materials that are inadvertently released from the storage containers on the construction site is also required. In accordance with the Construction General Permit, a Rain Event Action Plan would be required to ensure that active construction sites have adequate erosion and sediment controls in place prior to the onset of a storm event, even if construction is planned only during the dry season.

The construction contractor(s) would also be required to develop and implement a monitoring program as required under the NPDES Construction General Permit. The contractor would be required to conduct inspections of the construction site prior to anticipated storm events and after the actual storm events. During extended storm events, the inspections would be conducted after every 24-hour period. The inspections would be conducted to: identify areas contributing to stormwater discharge; evaluate whether measures to reduce pollutant loadings identified in the SWPPP are adequate, were properly installed, and are functioning in accordance with the Construction General Permit; and determine whether additional control practices or corrective measures are needed. Mandatory compliance with the NPDES Construction General Permit requirements would prevent significant construction-related impacts on water quality during general construction activities.

In addition to the NPDES Construction General Permit requirements, construction contractor(s) would be required to comply with the local City municipal codes and the County code, depending on the construction activities and the pertinent jurisdictions. For example, construction of the subsurface slant wells in the CEMEX active mining area and approximately 0.25 mile (1,320 feet) of the Source Water Pipeline would be subject to the City of Marina Municipal Code, which requires the installation of erosion control measures such as sediment fencing and adequate set back from the shoreline to withstand erosion to the extent that the reasonable economic life of the use would be guaranteed without need for shoreline protection structures. (Refer to Section 4.2, Geology, Soils, and Seismicity, for a discussion of effects associated with coastal erosion.) Mandatory compliance with the water quality protection requirements of the Construction General Permit and the accompanying regulatory process would ensure that the necessary controls to minimize soil erosion, manage runoff, and protect water quality are in place during general construction activities. Therefore, the water quality impact associated with general construction activities would be less than significant.

Impact Conclusion

For all project facilities, mandatory compliance with NPDES Construction General Permit requirements would involve implementation of erosion and stormwater control measures, which would prevent substantial adverse effects on water quality during construction. The impact on water quality associated with increased soil erosion and sedimentation, and inadvertent releases of hazardous chemicals during general construction activities, would be less than significant for all project components. No mitigation is necessary.

Mitigation Measures

None proposed.

Impact 4.3-2: Degradation of water quality from construction-related discharges of dewatering effluent from open excavations and water produced during well drilling and development. (*Less than Significant with Mitigation*)

Discharges of Water Produced during Well Drilling and Development (Subsurface Slant Wells and ASR-5 and ASR-6 Wells)

Construction activities associated with the subsurface slant wells and ASR-5 and ASR-6 Wells would involve: drilling the borehole (well drilling); constructing the well inside the borehole by installing the well casing and well screens and filling the annulus around the casing with a gravel (filter) pack and cement seal (well construction); and then surging water in and out of the well screen openings to clean the borehole and properly settle the gravel pack (well development).

Subsurface Slant Wells

Drilling of the subsurface slant wells would involve the use of water, bentonite mud, and/or the use of environmentally-inert biodegradable additives to push the drill rig through the uppermost layer of dry dune sands (the uppermost 100 feet so, when drilling at an angle). Once the drill bit reaches groundwater, the mud slurry from the upper 100 feet of drilling would be pumped out and put it in a storage container for offsite hauling and disposal. Beyond this point only the water already present in the sand and potable water would be used to circulate the drill cuttings. Once the borehole and the casing and gravel pack have been installed, potable water would be circulated through the well casing to develop the well. The effluent produced during well development, which may contain soil cuttings and formation water (water present at depth in geologic materials), would be pumped to baker tanks to allow sediment to settle out. The clarified effluent would then either be conveyed to the existing discharge pipeline for the test slant well and discharged to the ocean waters of MBNMS via the MRWPCA ocean pipeline and outfall in accordance with the MRWPCA's NPDES permit, or percolated into the ground at the CEMEX active mining area. The muds generated during drilling in the wet dune sands (beyond the first 100 feet) and development of the subsurface slant wells would fall under the category of "Water Supply Well Drilling Muds" in the General Waiver. The water produced during slant well drilling and development would be considered a "water supply discharge" under the General Waiver of

WDRs for Specific Types of Discharges (General Waiver) (RWQCB Resolution R3-2014-0041), discussed above in Section 4.3.2, Regulatory Framework. CalAm would not be required to submit a waste discharge report. However, the following conditions of the General Waiver would apply:

- The discharge shall be spread over an undisturbed, vegetated area capable of absorbing the top-hole water and filtering solids in the discharge, and spread in a manner that prevents a direct discharge to surface waters;
- The pH of the discharge shall be between 6.5 and 8.3;
- The discharge shall not contain oil or grease;
- The discharge area shall not be within 100 feet of a stream, water body, wetland, or streamside riparian corridor;
- The discharger shall implement appropriate management practices to dissipate energy and prevent erosion;
- The discharger shall implement appropriate management practices to preclude discharge to surface waters and surface water drainage courses; and
- The discharger shall immediately notify the Central Coast RWQCB staff of any discharge to surface waters or surface water drainages. The discharge shall not have chlorine or bromine concentrations that could impact groundwater quality.

Because the disposal of water produced during well drilling and development activities would comply with the conditions of the MRWPCA's NPDES permit and General Waiver, which are set to prevent impacts on water quality, there would be no injury to sanctuary resources, so the impact would be less than significant and no mitigation is proposed.

ASR Injection/Extraction Wells (ASR-5 and ASR-6 Wells)

As described in Section 3.5.7 of Chapter 3, Description of the Proposed Project, the ASR injection/extraction wells would be drilled without the use of drilling muds containing bentonite clays. However when necessary and depending on the formation material encountered, certain commercially available additives could 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 used to enhance the drilling performance 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. 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, biodegradable and do not contain chemicals that would contaminate the groundwater supply.

The muds and clay slurry generated during the drilling and development of the proposed ASR-5 and ASR-6 Wells in the Fitch Park military housing area would fall under the category of "Water Supply Well Drilling Muds" in the General Waiver. Water extracted during drilling and development of the ASR-5 and ASR-6 Wells would be placed in portable holding tanks to settle

out solids, conveyed to a 1.4-acre natural depression located east of the intersection between San Pablo Avenue and General Jim Moore Boulevard, and subsequently percolated into the ground. This depression was previously used to percolate water produced during the development of the existing ASR-3 and ASR-4 Wells (Phase II wells). Similar to the subsurface slant wells, it is anticipated that discharges of water produced during the drilling and development of the ASR-5 and ASR-6 Wells would be conducted in accordance with the General Waiver. Thus, the same conditions of the General Waiver described above for the slant wells would also apply to the ASR-5 and ASR-6 Wells.

Adherence to the conditions of the General Waiver would prevent significant adverse effects on water quality from discharges of water produced during drilling and development of the ASR-5 and ASR-6 Wells. The impact would be less than significant.

Dewatering Discharges (All Other Project Facilities)

Dewatering could be required during construction to create a dry work area if surface water or groundwater is encountered in excavations. Project construction activities, particularly open-cut trenching, jack-and-bore, and microtunneling for the installation of pipelines, could intercept shallow or perched groundwater and require temporary localized dewatering to facilitate construction.

Most of the dewatering effluent produced during construction and excavation is considered a low threat and could be discharged to land or the stormwater drainage system provided it complies with the *General WDRs for Discharges with a Low Threat to Water Quality* (Order No. R3-2011-0223, NPDES Permit No. CAG993001) (RWQCB, 2011a). The construction contractor(s) would be required to control, test, and treat the extracted water as needed to minimize or avoid water quality degradation, erosion, and sedimentation in the receiving waters. To receive coverage under the General WDRs, CalAm would submit a NOI along with the following materials to the Central Coast RWQCB (2011a):

- A list of all chemicals (including Material Safety Data Sheets) added to the water and the concentrations of such additives in the discharged effluent;
- Certified analytical results of the effluent for all priority toxic pollutants listed in Attachment D of the General WDRs. These analyses would fulfill the requirements set forth in the California Toxics Rule to evaluate the potential for water quality degradation and establish effluent limits, unless the discharge meets all requirements for a conditional exception;
- Certified analytical results of representative samples of the receiving surface water collected 50 feet upstream and 50 feet downstream from the point of discharge, respectively. Alternately, if access is limited, the samples can be collected at the first point upstream and downstream of the discharge, respectively, that is accessible for the following constituents: pH, temperature, color, turbidity, and dissolved oxygen;
- For low-threat discharges from proposed facilities, CalAm would provide analytical data for discharges from similar existing facilities, or information regarding the anticipated discharge characteristics of the proposed facility based on the specific facility design. As

part of facility startup, CalAm would submit all analytical results required in Section A of the General WDRs; and

- If the concentration of any constituent in the effluent sampled under the second bullet above exceeds the applicable criterion listed in Attachment D of the General WDRs, CalAm may submit a Reasonable Potential Analysis[27] consistent with Section 1.3 of the State Implementation Policy or Appendix VI of the Ocean Plan, as applicable.

As discussed in Section 4.3.2, Regulatory Framework, and in the bulleted list above, CalAm would be required to test the dewatering effluent for possible pollutants. The analytical constituents for such tests are generally based on the source of the water, the land use history of the construction site, and potential impacts on the quality of the receiving water. If the dewatering effluent meets the water quality requirements of the General WDRs, CalAm's construction contractor(s) would discharge the dewatering effluent to vegetated upland areas or the local storm drain system in accordance with the General WDRs. It is assumed most dewatering effluent would be disposed of in accordance with the General WDRs.

As described in detail under **Impact 4.7-2**, sites with known soil and/or groundwater contamination are located close to or extend into the proposed construction alignments for pipelines. The contaminants with the potential to be encountered during project construction activities include petroleum hydrocarbons, VOCs, PAHs, and metals from gasoline service stations, and dry cleaners. The dewatering of contaminated groundwater during construction excavation activities would be considered a significant impact if the contaminated groundwater (i.e., dewatering effluent) were not handled properly and released into the environment. The impact would be reduced to a less-than-significant level with implementation of **Mitigation Measure 4.7-2b (Soil and Groundwater Management Plan)**, which requires CalAm or its contractor to develop a groundwater dewatering control and disposal plan that identifies locations where groundwater dewatering is likely to be required, the method to analyze groundwater for hazardous materials, and appropriate treatment and/or disposal methods. If the dewatering effluent contains contaminants that exceed the requirements of the *General WDRs for Discharges with a Low Threat to Water Quality* (Order No. R3-2011-0223, NPDES Permit No. CAG993001), the construction contractor shall contain the dewatering effluent in a portable holding tank for appropriate offsite disposal or discharge.

Impact Conclusion

The water extracted during drilling and development of the subsurface slant wells and ASR-5 and ASR-6 Wells would be disposed of in accordance with the MRWPCA's NPDES permit (for discharges via the ocean outfall) and General Waiver (RWQCB Resolution R3-2014-0041) for clarified effluent that is percolated into the ground. All discharges of water produced during well drilling and development would occur in compliance with regulatory requirements that are protective of the receiving waters. Therefore, the impact associated with discharges of water produced during drilling and development of the subsurface slant wells and ASR-5 and ASR-6 Wells would be less than significant.

[27] A Reasonable Potential Analysis is the process for determining whether any of the constituents in a discharge causes, has reasonable potential to cause, or contributes to an exceedance of a water quality standard.

With respect to general construction dewatering, it is anticipated that most dewatering effluent would be disposed of in accordance with the General WDRs (Central Coast RWQCB Order R3-2011-0223). However, discharges of dewatering effluent exceeding the water quality limitations in the General WDRs would result in a significant impact. This impact would be reduced to a less-than-significant level with implementation of the **Mitigation Measure 4.7-2b**. Thus, for all project facilities except the subsurface slant wells and ASR-5 and ASR-6 Wells, the impact associated with discharges of dewatering effluent would be less than significant with implementation of mitigation.

Mitigation Measures

Mitigation Measure 4.7-2b applies to all project components except the subsurface slant wells and the ASR-5 and ASR-6 Wells.

> **Mitigation Measure 4.7-2b: Soil and Groundwater Management Plan.**
>
> (See Section 4.7, Hazards and Hazardous Materials, for the description.)

Impact 4.3-3: Degradation of water quality from discharges of treated water and disinfectant from existing and newly installed pipelines during construction. (*Less than Significant)*

Prior to constructing the connections between existing and new pipelines, segments of existing pipelines would need to be drained and disinfected before being returned to service. Newly installed pipelines (i.e., the Source Water Pipeline, new Desalinated Water Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Brine Discharge Pipeline, new Transmission Main, ASR pipelines [ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline], and the pipelines associated with the Ryan Ranch-Bishop Interconnection Improvements and Main System-Hidden Hills Interconnection Improvements) would also be disinfected before being put into service. It is anticipated that chlorine would be used for disinfection. The treated water generated from the draining of existing pipelines and the effluent generated from disinfection of newly installed pipelines would be discharged to the local storm drainage system. Without proper controls, these discharges could adversely affect water quality in downstream receiving water bodies by increasing turbidity (if discharged directly without appropriate treatment) or due to high chlorine (the primary disinfectant used for drinking water) concentrations. However, the discharges would be subject to the *General WDRs for Discharges with Low Threat to Water Quality* (Order No. R3-2011-0223, NPDES Permit No. CAG993001). The General WDRs require that CalAm neutralize the residual chlorine remaining in disinfection effluent such that detectable chlorine levels are less than 0.02 mg/L, and require that the total dissolved solids be within surface water and groundwater quality objectives (RWQCB, 2011a). Compliance with the General WDRs and the conditions therein would protect water quality in receiving water bodies. Therefore, the impact would be less than significant.

All Other Proposed Facilities

None of the other proposed facilities are anticipated to require flushing and generate disinfection effluent prior to being brought online. Thus, no impact would result.

Impact Conclusion

Adherence to the General WDRs (Order No. R3-2011-0223, NPDES Permit No. CAG993001) would ensure this impact is less than significant for the Source Water Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Brine Discharge Pipeline, new Desalinated Water Pipeline, new Transmission Main, ASR pipelines, Ryan Ranch-Bishop Interconnection Improvements, and Main System-Hidden Hills Interconnection Improvements. Construction of all other proposed project facilities would have no impact on water quality associated with discharges of treated water or disinfection effluent.

Mitigation Measures

None proposed.

4.3.5.2 Operational and Facility Siting Impacts

Impact 4.3-4: Violate water quality standards or waste discharge requirements for salinity, or degrade water quality from increased salinity as a result of brine discharge from the operation of the MPWSP Desalination Plant. (*Less than Significant with Mitigation*)

Operational discharges from the MPWSP would locally increase salinity levels and thus could violate water quality standards or waste discharge requirements or otherwise degrade the water quality of receiving waters in Monterey Bay, within MBNMS. As described in Section 4.3.2.2, the Ocean Plan establishes receiving water salinity limitations for brine discharges from desalination facilities to protect the quality of ocean waters for beneficial uses (such as aquatic habitat). This impact analysis uses the Ocean Plan's receiving water salinity limitations as significance thresholds, incorporates the Ocean Plan's requirements relating to water quality, and is consistent with the methods prescribed in the Ocean Plan for assessing increased salinity from the operation of desalination plants. In response to public comments, additional analysis is provided to address risks of increased salinity causing hypoxia, or so-called "dead zones" in the marine environment.

The Ocean Plan limits the increase of salinity of receiving water from desalination plant discharges to a daily maximum of 2 parts per thousand (ppt) above natural background salinity as measured no further than 100 meters (328 ft) horizontally from each discharge point (known as the brine mixing zone [BMZ]). For the MPWSP, the BMZ represents an area of approximately 27 acres based on the existing outfall diffuser structure (see Figure 4.3-7). While salinity increment limitations of 2 ppt must be met at the boundary of the BMZ, the Ocean Plan also requires that dischargers estimate salinity levels within the BMZ, where salinity may exceed

2.0 ppt above natural background salinity, to determine the potential frequency and intensity of impacts on marine biological resources and beneficial uses. As described in Section 4.3.3, a significant impact related to water quality, water quality standards or waste discharge requirements would occur if operational discharges from the MPWSP resulted in salinity greater than 2 ppt over ambient salinity levels at the edge of the BMZ. Consistent with Ocean Plan and MBNMS requirements, this impact analysis also evaluates the salinity and dilution dynamics of operational discharges within the BMZ by determining the Zone of Initial Dilution (ZID) for each discharge scenario and describes areas where salinity would exceed 2 ppt. The determination of the dilution dynamics, extent of the ZID, and determination of areas where salinity exceeds 2 ppt supports water quality analyses for other constituents (i.e., in addition to salinity) listed in the Ocean Plan (see Impact 4.3-5) and analysis of impacts on marine habitat and wildlife presented in Section 4.5, Marine Biological Resources. Additionally, the analysis addresses comments received during the public comment period for the April 2015 DEIR, on the fate and travel path of the discharge plume beyond the BMZ and the potential for hypoxia[28] to occur near the seabed. The Ocean Plan limits dissolved oxygen decreases as a result of operational discharges to no more than 10 percent from that which occurs naturally. Exceeding this standard for dissolved oxygen would result in a significant impact related to water quality, water quality standards or waste discharge requirements.

Introduction to the Impact Analysis

To comprehensively assess and describe the water quality effects associated with operational discharges and increased salinity of the proposed project (10 Slant Wells at CEMEX), Impact 4.3-4 is structured as follows:

- **Operational Discharge Scenarios**: The impact analysis first describes the range of operational discharges that could occur with implementation of the MPWSP to provide context for the modeling completed in support of the project analyses.
- **Approach to Analysis**: This subsection describes the various studies and model analyses related to plume dynamics, dilution, and salinity that were completed in support of the analysis of impacts related to the Project.
- **Dense Operational Discharges - Salinity Impact Analysis**: The analysis presents an assessment of effects on receiving water salinity levels for operational discharges that are denser than the ambient receiving sea water. Sinking plumes have substantially lower initial dilution from turbulent mixing than positively buoyant, or rising, plumes (i.e., discharges with densities less than the receiving seawater). As such, the evaluation of potential salinity impacts from MPWSP operational discharges focuses on negatively buoyant discharges.
- **Dense Operational Discharges - Areas Exceeding 2 ppt Salinity**: Consistent with Ocean Plan requirements, this analysis evaluates the plume dynamics of dense, negatively buoyant operational discharges to quantify areas where salinity would exceed 2 ppt above natural background salinity around the outfall diffuser. Areas determined to exceed 2 ppt above natural background salinity are considered further in Section 4.5, Marine Biological

[28] Hypoxia, or oxygen depletion, is an environmental phenomenon where the concentration of dissolved oxygen in the water column decreases to a level that can no longer support living aquatic organisms (so-called “dead zones”)

Resources, in the context of assessing and quantifying potential for mortality of aquatic wildlife and loss of habitat from operational discharges.

- **Dense Operational Discharges – Additional Considerations**: This subsection addresses concerns raised during the public comment period for the April 2015 DEIR. The comments received involved the brine discharge and its travel path beyond the BMZ, concerns relating to the propagation of a dense saline plume along the sea floor, and the potential for hypoxia to occur near the seabed as a result of extremely elevated salinity levels adjacent to the outfall diffuser.
- **Buoyant Operational Discharges – Analysis and Discussion**: The analysis evaluates positively buoyant operational discharges (i.e., that have densities less than the receiving seawater) using model analyses to determine salinity, dilutions, and plume behavior.
- **Impact Summary and Conclusion**: The above-described analyses are followed by a summary analysis that characterizes the entire range of results for the project. This section provides an impact statement and conclusion in the context of the relevant significance criteria.

Operational Discharge Scenarios

Described here is the range of operational discharge scenarios that could occur with implementation of the MPWSP to provide context for the modeling completed in support of the project impact analyses. The scenarios include brine-only discharges and combined discharges, which occur during certain times of the year when the brine would be blended with secondary treated wastewater (when available) from the MRWPCA Regional Wastewater Treatment Plant.

The Desalination Plant of the proposed project would treat the source water drawn from the slant wells at a 42 percent recovery rate, and approximately 14 mgd of brine would be generated, consisting of concentrates from the pretreatment and reverse osmosis (RO) processes as well as waste effluent produced during routine backwashing and operation and maintenance of the pretreatment filters (see Section 3.2.2 for details). The brine generated in the desalination process would be discharged into MBNMS through the MRWPCA's existing ocean outfall (see **Figure 3-2**). The MRWPCA outfall consists of a 2.1-mile-long pipeline that terminates at a 1,100-foot-long diffuser resting above the ocean floor at approximately 90 to 110 feet below sea level. The outfall pipe consists of a 60-inch internal diameter (ID) reinforced concrete pipe (RCP), and the diffuser consists of 480 feet of 60-inch RCP with a single taper to 840 feet of 48-inch ID. The diffuser has 172 2-inch diameter ports: 65 in the 60-inch section, 106 in the 48-inch section and an opening at the end of the diffuser pipe (Figure A-4, Appendix D; the "end gate"). The ports discharge horizontally, alternating on both sides of the diffuser, at a spacing of 16 ft on each side except for one port in the taper section that discharges vertically for air release. The 42 ports closest to shore are presently closed, so there are 129 open ports distributed over a length of approximately 1,024 ft (312 m). The 129 open ports are fitted with 4-inch Tideflex "duckbill" check valves (the "4-inch" refers to the flange size, not the valve opening). Because the valves open as the flow through them increases, the cross-sectional area is variable. The opening at the bottom of the end gate (from which flows exit the diffuser for flushing purposes) is about two inches high. **Appendix D1** discusses the effect of the valves on the flow distribution in

the diffuser as well as the procedure used for analyzing the internal hydraulics of the outfall and diffuser for the dilution modeling completed as part of the salinity impact assessment**.** The diffuser, representing the brine discharge point, would disperse the brine stream, thereby minimizing differences in salinity and other water quality parameters between the discharged brine and the surrounding seawater (see Section 3.2.2.5 for additional information).

During certain times of the year, the brine would blend with secondary treated wastewater (when available) from the MRWPCA Regional Wastewater Treatment Plant, forming a combined discharge (discussed in Section 3.2.2). **Table 4.3-9** shows the monthly projected brine flows from the MPWSP Desalination Plant and the average monthly wastewater flows from the MRWPCA.

TABLE 4.3-9
MONTHLY AVERAGE FLOWS OF SECONDARY-TREATED WASTEWATER FROM THE MRWPCA REGIONAL WASTEWATER TREATMENT PLANT (MGD) (1998–2012) AND OF THE ESTIMATED BRINE STREAM UNDER THE MPWSP

Months	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Brine (mgd)	13.98	13.98	13.98	13.98	13.98	13.98	13.98	13.98	13.98	13.98	13.98	13.98
Treated Wastewater from MRWPCA (mgd)	19.78	18.41	14.68	7.02	2.40	1.89	0.90	1.03	2.79	9.89	17.98	19.27
Combined Discharge (Brine+wastewater) (mgd)	33.76	32.39	28.66	21.00	16.38	15.87	14.88	15.01	16.77	23.87	31.96	33.25

SOURCES: MRWPCA, 2013.

As shown in **Table 4.3-9**, the treated wastewater flow varies throughout the year, with the highest flows observed during the non-irrigation season (November through March) and the lowest flows observed during the irrigation season (April through October), when the treated wastewater is processed through the SVRP for tertiary treatment and distributed to irrigators through the CSIP. Based on the monthly projected brine flows from the MPWSP Desalination Plant and the average monthly wastewater flows from the MRWPCA, the following discharge scenarios were assessed (summarized in **Table 4.3-10**):

- **Scenario 1:** Baseline condition – current operational discharges of secondary treated MRWPCA wastewater without desalination brine.
- **Scenario 2:** Desalination brine only – proposed discharge of project brine without wastewater into Monterey Bay/MBNMS through the outfall. This scenario would occur during the irrigation season as a result of the MRWPCA wastewater flows being provided to irrigators. To conservatively assess the potential impacts from operational discharges, it is assumed for this analysis that the discharge of brine occurs without dilution by wastewater during the entire irrigation season (April - October).
- **Scenarios 3 through 6**: Desalination brine with wastewater – proposed discharge of project brine with varying amounts of wastewater. These scenarios would occur during the non-irrigation season (November - March). For the combined discharge scenario, the analysis accounted for different wastewater flows (**Table 4.3-10**) ranging from 19.78 mgd

that result in a positively buoyant plume to a range of lower documented wastewater flow rates of 1, 2, and 9 mgd that result in a negatively buoyant plume (**Table 4.3-10**).

TABLE 4.3-10
PROPOSED PROJECT (MPWSP, 10 SLANT WELLS AT CEMEX) DISCHARGE SCENARIOS MODELED

No.	Scenario	Discharge flows (mgd)	
		Secondary Effluent	Brine
1	Baseline	19.78	0
2	Brine only	0	13.98
3	Brine and low SE[a]	1	13.98
4	Brine with low SE	2	13.98
5	Brine with moderate SE	9	13.98
6	Brine with high SE	19.78	13.98

NOTES:
[a] SE= Secondary Effluent (MRWPCA wastewater).

SOURCE: Roberts, 2016.

The combined discharge during the non-irrigation season would be consistent with the recommendations in the SWRCB's technical report on discharges of brine from desalination plants[29] and with the amendments to the Ocean Plan (SWRCB, 2015; 2016) by "co-discharging it with municipal wastewater" and discharging it "through a multiple-port diffuser system" (SWRCB, 2016). The proposed brine-only discharge during the irrigation season would adhere to the panel's recommendation for discharge through a multiple-port diffuser system.

Approach to Analysis

Described here are the various studies and model analyses related to plume dynamics, dilution, and salinity that were completed in support of the analysis of impacts related to the proposed project.

Based on the amended Ocean Plan (SWRCB, 2016) described in Section 4.3.2, Regulatory Framework, the MPWSP Desalination Plant would result in a significant water quality impact if operational discharges would exceed a daily maximum of 2 ppt above natural background salinity as measured at the BMZ (328 ft horizontally from the discharge point). Discharges that are denser than the receiving seawater would result in a sinking plume that impacts the sea floor at some distance from the diffuser nozzle (**Figure 4.3-5**). Because of its high exit velocity, the jet of effluent discharged from the diffuser port entrains seawater that mixes with and dilutes the effluent. Because sinking plumes have substantially lower initial dilutions than positively buoyant or rising plumes, the evaluation of potential salinity impacts from operational discharges focuses on sinking plumes (i.e., those plumes comprised mainly of brine). However, the analysis also addresses the dilution dynamics and salinity of rising plumes.

[29] The recommendations were made as part of the Southern California Coastal Water Research Project, discussed in Section 4.3.2, Regulatory Framework.

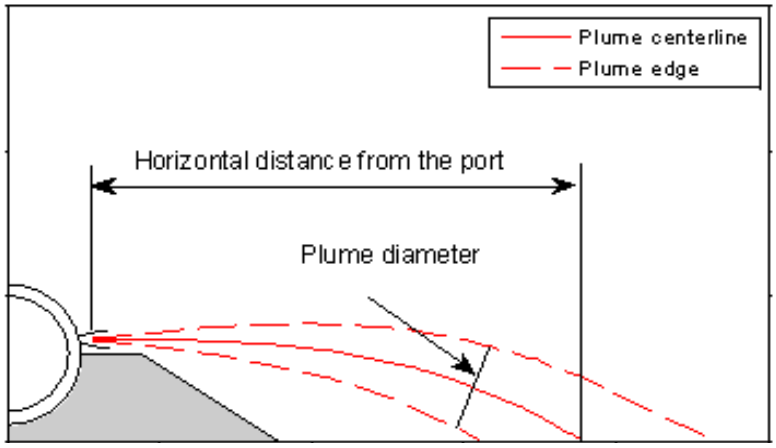


Figure 4.3-5
Illustrations of the Trajectory
of a Dense Brine Discharge Plume

Flow Science, Inc. (2014; see **Appendix D2**) conducted near-field (within the BMZ) modeling of the proposed MPWSP discharge through the existing MRWPCA outfall in Monterey Bay. Input to the model included temperature and salinity levels derived from within the ambient water column at Monterey Bay Aquarium Research Institute Monitoring Station C1 (see Figure 3 in **Appendix D2**) during the period from 2002 to 2012. This monitoring station is located approximately 5 miles northwest of the MRWPCA outfall at the head of the Monterey Submarine Canyon in an area considered representative of ambient conditions for the proposed discharge. The salinity and temperature of ocean water determine its density (discussed in detail in Section 4.3.1.3), which in turn affects the movement, dilution, and mixing of the brine plume upon discharge. Based on data (2010–2012) from Monterey Bay, a temperature, salinity, and density profile was developed for the upper 98 feet of the water column (the outfall diffuser is located at a depth of approximately 100 feet) for the three oceanic conditions (upwelling, oceanic, and Davidson, described in detail in Section 4.3.1.3, above). However, as described below, the temperature, salinity, density profile was subsequently updated to include more recent and site specific data from recent monitoring efforts. As discussed in Section 4.3.1, Setting / Affected Environment, salinity in Monterey Bay in the project vicinity, as monitored by the Monterey Bay Aquarium Research Institute, ranges between 33.1 and 34.2 ppt, with a natural variability of 3.3 percent or approximately 1.1 ppt and a temperature range from 47.5°F to 59.4°F. More recently, monthly measurements of salinity and temperature were collected between February 2014 and December 2015 by Applied Marine Sciences (Appendix D1) around the MRWPCA outfall at varying depths and locations. The purpose of this monitoring effort was to gather data over a two-year period that reflected ocean conditions in the immediate vicinity of the outfall structure and to support model analyses. Seasonal average temperatures ranged between 11.5 and 14.5 and seasonal salinity levels ranged from 33.3 to 33.9 at the depth of the diffuser.

An ocean current velocity of zero was used for the near-field modeling. This represents a worst-case (conservative) assessment scenario for dilution and mixing as it assumes no additional

mixing or dilution from wave or tidal currents occurs in addition to that resulting from the momentum of the discharged plume (Flow Science, Inc., 2014; SWRCB, 2012a). A wastewater-only discharge scenario (Scenario 1) was modeled for the Davidson oceanic condition to understand the dynamics of the baseline non-irrigation-season condition. The brine-only discharge scenario (Scenario 2) was modeled for all three oceanic climate conditions,[30] and combined discharge scenarios (Scenarios 3 through 6) with varying amounts of wastewater were modeled for the non-irrigation season. For the combined discharge scenarios, the analysis incorporated data on salinity, temperature, and total dissolved solids (representative of salinity) measured in the treated wastewater from the MRWPCA Regional Wastewater Treatment Plant.[31]

Consistent with the recommendations in the SWRCB's technical report on discharges from desalination plants (SWRCB, 2012a), the near-field modeling analysis (Flow Science, Inc., 2014) studied the plume behavior in terms of the density (a function of temperature and salinity) and flow rate of the discharge. The differences between the salinity levels in the discharge stream and in the ambient (or receiving) water were calculated by determining the size of the brine plume, its trajectory in the ocean and the dilution of the brine with the ambient seawater within the ZID (which occurs within the BMZ for all discharge scenarios assessed, as described below). As in Section 4.3.2, Regulatory Framework, under the Ocean Plan, the ZID (or the regulatory mixing zone) is defined as the zone adjacent to a discharge where momentum and buoyancy-driven mixing produces rapid dilution of the discharge (Flow Science, Inc., 2014). The size of the plume and the extent of dilution depends in part, on whether the plume is positively buoyant (rising) or negatively buoyant (dense or sinking) (**Figure 4.3-4**). In the near-field analysis for a sinking plume, the edge of the ZID would be located at the point where the plume contacts the sea floor. The edge of the ZID for a buoyant plume would be located at the point where the plume reaches the water surface or attains a depth level at which the density of the diluted effluent plume becomes the same as the density of ambient water (i.e., the "trap" level).

Flow Science, Inc. (2014) used two analytical methods — the Semi-Empirical Analysis (SEA) and the mathematical model UM3 in the US EPA model suite Visual Plumes (VP) — to characterize and understand the range of dilution that might be expected to occur for the operational discharges from the MRWPCA outfall diffuser; both methods are consistent with the regulatory approach recommended by the SWRCB for analyzing the brine discharge (Flow Science, Inc., 2014; SWRCB, 2012b). The model represents a constant discharge for each of the defined scenarios, and the discharge continues to move away from the port. The VP method is widely used in diffuser discharge analyses; however, data from the SEA method is presented to provide redundancy in the analysis and confirmation of the results (Flow Science, Inc., 2014; Roberts, 2016).

[30] The brine-only discharge during the non-irrigation season (January) is a less likely operating scenario because at least some wastewater would flow through the outfall, along with the brine, throughout the year. Nonetheless, this scenario was evaluated during the Davidson condition (January), as was the MRWPCA wastewater-only discharge, to understand how the brine would influence existing conditions.

[31] Wastewater monitoring data from the MRWPCA Regional Wastewater Treatment Plant for salinity and total dissolved solids (1998–2012) and for temperature (2006–2012).

In response to public comments and at the request of MBNMS, the modeling analysis completed by Flow Science, Inc. (2014; **Appendix D2**) was subsequently peer reviewed and updated by Roberts[32] (2016; **Appendix D1**), as described below (and discussed in detail in **Appendix D1**) to:

- Update the assessed operational discharge scenarios to ensure consistency with proposed operations (summarized in **Table 4.3-10**).
- Update in the model the number of open diffuser ports (129 versus 120) and the height of the ports off the ocean floor (4 feet versus 3.5 feet) to reflect current baseline conditions regarding the status of the outfall diffuser.
- Update data on density stratification at the MRWPCA diffuser to reflect more recently collected site-specific data (discussed in Section 4.3.1.3 and summarized in **Table 4.3-1**).
- Include detailed computations of the internal flow hydraulics of the diffuser to address the variation in flow along the diffuser outfall pipe and the subsequent effect on dilution.
- Update the Semi-Empirical Analysis (SEA) to use the Cederwall formula and provide validation of the applicability of Visual Plumes (VP) modeling methodologies for dense negatively buoyant discharge plumes (discussed in detail in Section 4 of **Appendix D1**).
- Update the analysis of plume dynamics and dilution for positively buoyant discharge plumes using two mathematical models within the US EPA model suite Visual Plumes: UM3 (described above) and NRFIELD. NRFIELD is specifically designed for conditions typical of very buoyant discharges of domestic effluent from multiport diffusers into stratified oceanic waters (discussed in detail in Section 5 of **Appendix D1**).
- Compute salinity within the BMZ (328 feet from point of discharge, as required by the Ocean Plan) and at its boundary for dense negatively buoyant discharges.
- Compute minimum dilution and plume behavior for positively buoyant discharges utilizing the site specific oceanic density stratification data.
- Estimate regions within the BMZ where salinity would exceed 2 ppt.

To revise the near-field brine discharge model analysis completed by Flow Science, Inc. (2014), Roberts (2016) combined the updated and site-specific environmental baseline conditions from **Table 4.3-1**, the updated discharge flows from the scenarios summarized in **Table 4.3-10**, and the effluent water quality characteristics of the brine and the MRWPCA wastewater (**Table 4.3-11**) to calculate flow, salinity, and density for all possible flow scenarios (**Table 4.3-12**, discussed in detail below). The values calculated for flow, salinity, and density for all possible discharge scenarios were then utilized for the near-field brine discharge model analysis to compute minimum dilution ratios (Dm) at the edge of the ZID, estimate the gradient of salinity between the diffuser ports and the edge of the ZID, and calculate the salinity beyond the ZID but within the regulatory mixing zone (BMZ). These results are presented below.

[32] Dr. Philip J. Roberts has extensive international experience in marine wastewater disposal including the design of ocean outfalls and numerical modeling. Dr. Roberts' mathematical models and methods have been adopted by the USEPA and are widely used around the world.

TABLE 4.3-11
EFFLUENT WATER QUALITY CHARACTERISTICS ASSUMED FOR ALL MODELED SCENARIOS

Season	Brine		Secondary Effluent	
	Salinity (PPT)	Temp (°C)	Salinity (PPT)	Temp (°C)
Upwelling (March-September)	58.23	9.9	0.8	24
Davidson (September-November)	57.40	11.6	0.8	20
Oceanic (November-March)	57.64	11.1	0.9	24

SOURCE: Roberts, 2016

Dense Operational Discharges - Salinity Impact Analysis

Presented here is an assessment of effects on receiving water salinity levels for operational discharges that are denser than the ambient receiving sea water. Sinking plumes have substantially lower initial dilution from turbulent mixing than positively buoyant, or rising, plumes (i.e., discharges with densities less than the receiving seawater). As such, the evaluation of potential salinity impacts from MPWSP operational discharges focuses in this section on negatively buoyant discharges.

As discussed in Section 4.3.4, Approach to Analysis, the potential water quality impact resulting from the brine-only and combined discharges was analyzed for the near field (the immediate vicinity of the diffuser port upon discharge) and beyond (the edge of the BMZ as the plume travels away from the diffuser port). The near-field analysis for salinity was based on modeling conducted within the mixing zone (i.e., the ZID). Of the assessed discharge scenarios (**Table 4.3-10**), discharges of brine only (Scenario 2) or low volumes of wastewater (Scenarios 3 through 5) were determined to be dense (i.e., with salinity levels in excess of ambient conditions and thus negatively buoyant). When the MPWSP brine is combined with high volumes of wastewater (Scenario 6), the plume is positively buoyant because the salinity of the effluent is substantially lower than that of ambient conditions (**Table 4.3-12**). Dilution values and plume dynamics for the positively buoyant plume under Scenario 6 (operational discharges during the non-irrigation months) are further discussed below under Buoyant Discharge Model Results and Discussion.

A typical jet trajectory output from Visual Plumes (for the pure brine case, Scenario 2, **Table 4.3-10**) is shown in **Figure 4.3-6**. In the case of Scenario 2, the centerline of the plume discharged from each of the 129 diffuser jets makes contact with the seabed approximately 10 ft from the nozzle (with a plume diameter of approximately 5 ft). Similar simulations were run for all discharge scenarios for which the operational discharge plume was dense and negatively buoyant. Additionally, simulations were run using the SEA method for redundancy and validation. The results of salinity predictions and minimum dilution values for each discharge scenario are summarized in **Table 4.3-13**. The distance from each diffuser port at which the dense discharge plume makes contact with the seabed (from the VP model) is also shown in **Table 4.3-13** for all dense discharge scenarios. The distance between the diffuser port and the point where the plume contacts the seabed can be interpreted as the ZID, with the point of contact with the seabed representing the edge of the ZID.

TABLE 4.3-12
OPERATIONAL DISCHARGE FLOW, SALINITY, AND DENSITY

Scenario	No	Season	Background			Brine			Secondary effluent			Combined discharge		
			Temp. (°C)	Salinity (ppt)[1]	Density (kg/m^3)	Flow (mgd)	Temp. (°C)	Salinity (ppt)	Flow (mgd)	Temp. (°C)	Salinity (ppt)	Flow (mgd)	Salinity (°C)	Density (kg/m^3)
Baseline	1	Baseline	-	-	-	-	-	-	19.78	20.0	0.8	19.78	0.80	998.8
Brine Only	2	Upwelling	11.48	33.89	1025.8	13.98	9.9	58.23	0	24.0	0.8	13.98	58.23	1045.2
Brine and Low (1 mgd) SE	3	Davidson	14.46	33.34	1024.8	13.98	11.6	57.40	1.00	20.0	0.8	14.98	53.62	1041.2
Brine and Low (2 mgd) SE	4	Davidson	14.46	33.34	1024.8	13.98	11.6	57.40	2.00	20.0	0.8	15.98	50.32	1038.5
Brine and Moderate SE	5	Davidson	14.46	33.34	1024.8	13.98	11.6	57.40	9.00	20.0	0.8	22.98	35.23	1026.4
Brine and High SE	6	Davidson	14.46	33.34	1024.8	13.98	11.6	57.40	19.78	20.0	0.8	33.76	24.24	1017.6

NOTES: SE = Secondary Effluent (MRWPCA wastewater)

[1] Unit used to measure salinity in terms of the concentration of dissolved salts in water. Equivalent to practical salinity units (PSU).

SOURCE: Roberts, 2016

TABLE 4.3-13
DILUTION MODEL RESULTS FOR DENSE DISCHARGE SCENARIOS

Scenario	No.	Background conditions		In-Pipe Effluent conditions		Model Results at Edge of ZID					Model Results at Edge of BMZ	
						SEA Results			VP Results			
							Salinity					
		Salinity (ppt)	Density (kg/m^3)	Salinity (ppt)	Density (kg/m^3)	Dilution (Dm)	At seabed contact (ppt)	Increment (ppt)	Dilution (Dm)	Contact distance (ft)	Dilution (Dm)	Salinity increment (ppt)
Baseline	1	-	-	0.80	998.8	-	-	-	-	-	-	-
Brine Only	2	33.89	1025.8	58.23	1045.2	15.6	35.45	1.56	16.3	10.3	18.7	1.30
Brine and Low (1 mgd) SE	3	33.34	1024.8	53.62	1041.2	16.2	34.60	1.25	16.9	10.7	19.4	1.04
Brine and Low (2 mgd) SE	4	33.34	1024.8	50.32	1038.5	17.0	34.34	1.00	17.8	11.8	20.5	0.83
Brine and Moderate SE	5	33.34	1024.8	35.23	1026.4	38.7	33.39	0.05	35.3	29.0	46.5	0.04
Brine and High SE	6	33.34	1024.8	24.24	1017.6	-	-	-	-	-	-	-

NOTES: SE = Secondary Effluent (MRWPCA wastewater)

SOURCE: Roberts, 2016

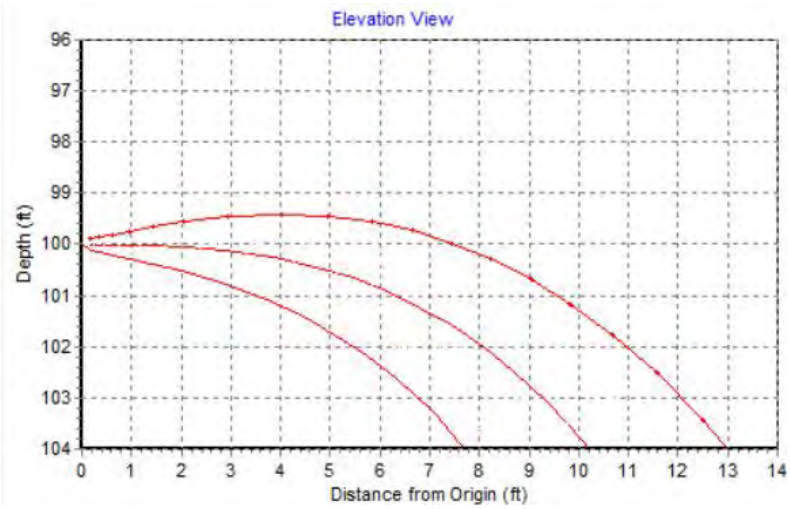
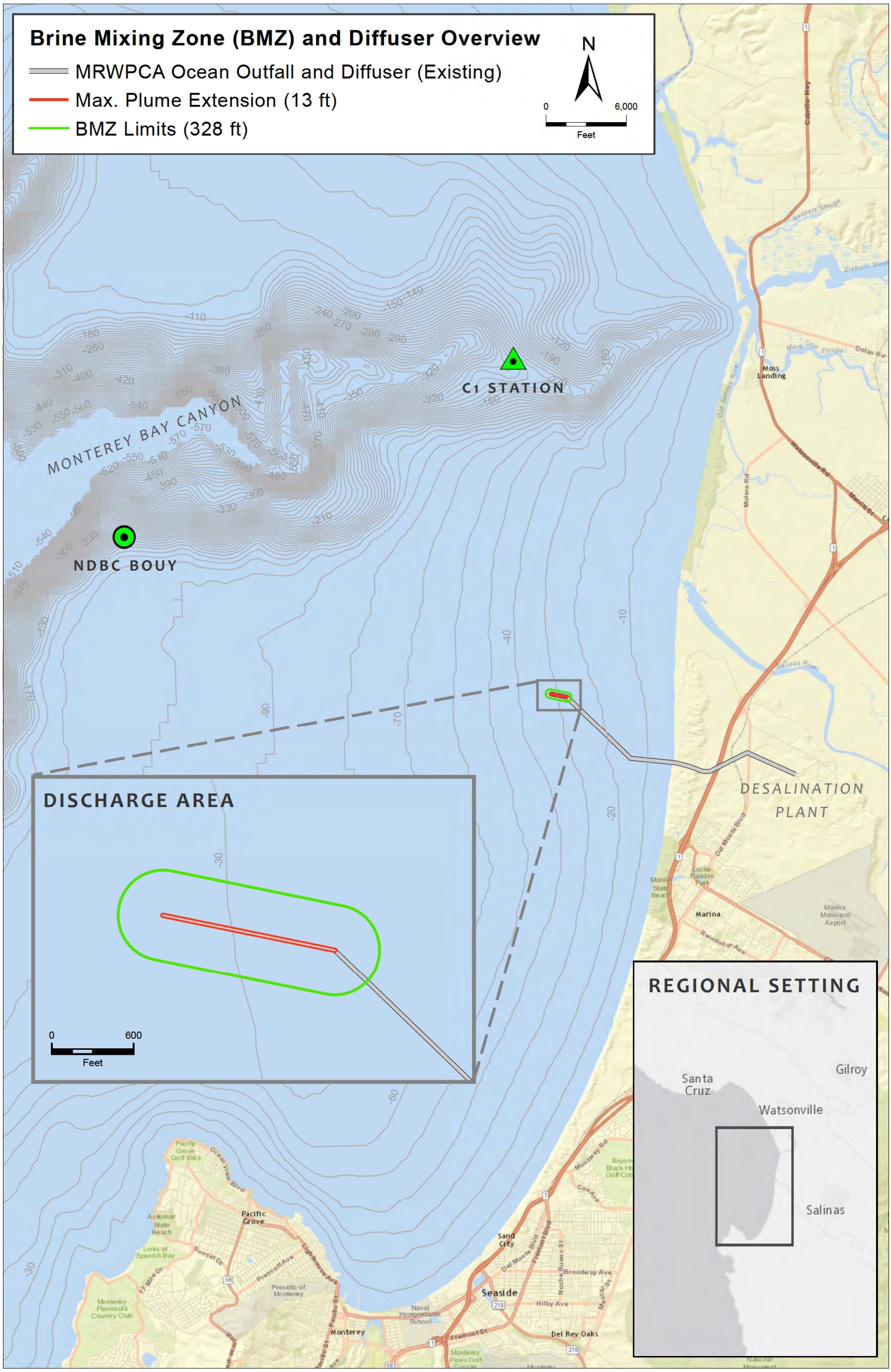


Figure 4.3-6
Typical Graphics Output of Jet Trajectory
from VP Method: Brine Only Discharge (Scenario 2)

The dilution predictions from the VP and SEA model analysis methods presented in **Table 4.3-13** are consistent, providing validation for the model results. The worst case, as expected, is the pure brine discharge scenario during the irrigation season (Scenario 2). For Scenario 2, the minimum dilution at the plume centerline is 1:15.6 (effluent : seawater) and the salinity increment above ambient at the edge of the ZID, located approximately 10 feet from the diffuser port, is 1.67 ppt. In all cases, the Ocean Plan salinity limit of 2 ppt is met at the edge of the ZID, the length of which ranges from approximately 10 to 29 feet for the dense discharge scenarios (**Figure 4.3-7**), well within the Ocean Plan receiving water limitation for salinity of 2 ppt at a distance of 328 feet from the diffuser (the BMZ). Therefore, for all discharge scenarios, the Ocean Plan water quality standard for salinity is met. Further, the standard is demonstrated to be met at a maximum distance from the diffuser (29 feet) much smaller than that allowed under the Ocean Plan (328 feet).

The subsequent increase in dilution from the edge of the ZID to the edge of the BMZ cannot be predicted using model analysis as no experimental data are available for these horizontal dense jet flows. Roberts (2016) conservatively calculates the increase in dilution of the dense discharges up to the edge of the BMZ using guidance obtained from experiments on buoyant jets and inclined dense jets which estimate dilution increases of between 60 percent and 22 percent, respectively, for non-merging and merging plumes. Because the diameters of individual discharge jets from the diffuser ports are generally much smaller than the port spacing of 16 ft, the plumes are not expected to merge before impacting the sea floor (**Figure 4.3-8**), thus allowing for maximum dilution at each diffuser port (Roberts, 2016; Geosyntec, 2015). As the dense discharge plumes from the diffuser jets contact the seabed, they would continue to dilute and ultimately merge beyond the edge of the ZID. For this analysis, it was conservatively assumed that the dense discharge plumes from the diffuser jets will merge within the BMZ and that the increase in dilution from the edge of the ZID to the BMZ would be 20 percent (see Appendix D1 for details). This increase was used to predict the BMZ dilutions and incremental salinity above baseline



Basemap Sources: ESRI, USGS

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Figure 4.3-7

Brine Mixing Zone (BMZ) and Diffuser Overview

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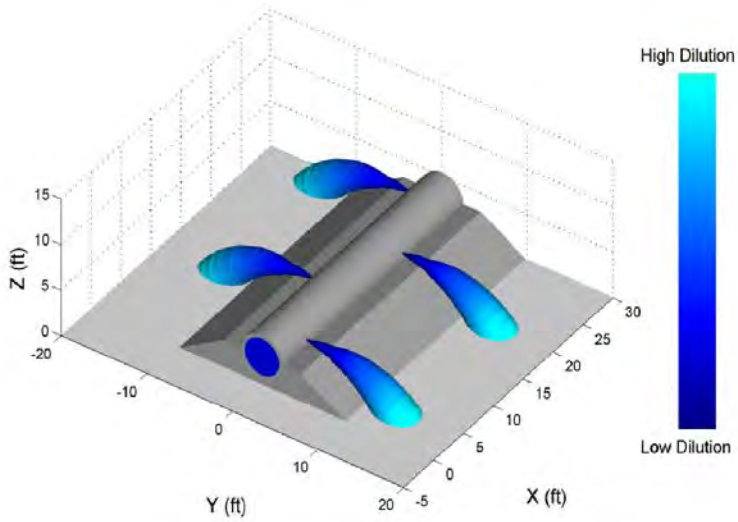
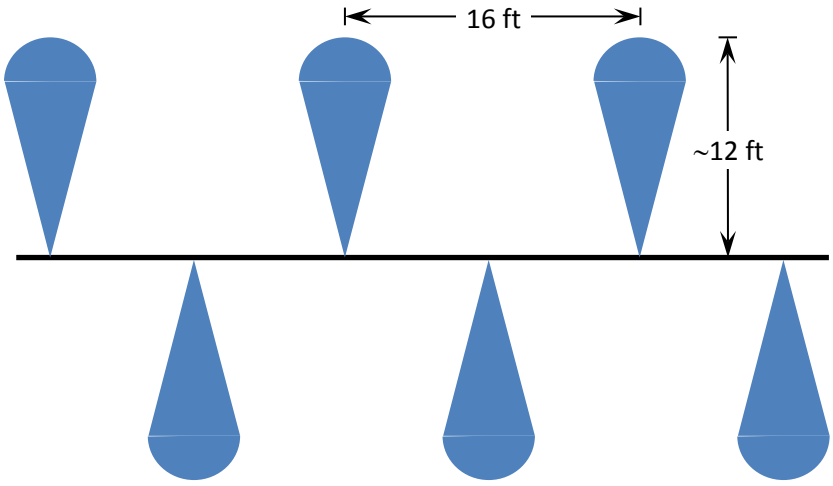


(a) Illustration of non-merging discharge plumes from VP (3D view, only 4 of the 129 open ports are shown).



(b) Illustration of non-merging discharge plumes (2D plan view)

Figure 4.3-8
Non-merging Dense Discharge Plumes from Diffuser Ports (near field)

conditions for each dense discharge scenario, as shown in **Table 4.3-13**. It is expected that dilution would actually be much greater than the assumed 20 percent (Roberts, 2016). As discussed above, the worst case is Scenario 2, the pure brine discharge scenario during irrigation months. For Scenario 2, the incremental increase in salinity above background conditions at the edge of the BMZ was conservatively calculated to be 1.30 ppt, which is below the Ocean Plan salinity limit of 2 ppt. Scenarios 3, 4, and 5 have incremental salinities at the edge of the BMZ of 1.04, 0.83, and 0.04 respectively, demonstrating incremental salinity reductions as increasing wastewater flows are combined with the brine. Therefore, operational discharges from the

MPWSP would not violate water quality standards or waste discharge requirements or otherwise substantially degrade the water quality of receiving waters in Monterey Bay by increasing salinity levels. Therefore, this impact would be less than significant.

The model results are conservative. The dilution calculations presented above assume that discharges are made from round nozzles whose area is the same as the effective opening of the check valves (described under Operational Discharge Scenarios Modeled and Assessed, above). No existing models predict the dilution from elliptically-shaped check valves, but experiments show that the centerline dilutions from elliptical nozzles are greater than from equivalent round nozzles due to the larger surface area available for entrainment (see **Appendix D1** for details). Furthermore, the computed salinities presented in **Table 4.3-13** occur only along the seabed. Salinities decrease with height in the water column and would be above ambient only near to the seabed. For most of the water column, incremental salinities would be much less than the conservative values shown in **Table 4.3-13**. Finally, the model conservatively assumed no additional mixing of the discharge would occur as a result of tidal or wave related currents.

Dense Operational Discharges - Areas Exceeding 2 ppt Salinity

Consistent with Ocean Plan requirements, the analysis presented in this section evaluates the plume dynamics of dense, negatively buoyant operational discharges to quantify areas where salinity would exceed 2 ppt above natural background salinity around the outfall diffuser. Areas determined to exceed 2 ppt above natural background salinity are considered further in Section 4.5, Marine Biological Resources, in the context of assessing and quantifying the potential for mortality of aquatic wildlife and loss of habitat from operational discharges as well as the potential for operational discharges to injure sanctuary resources. While no significance threshold or regulatory standard exists for the exceedance of 2 ppt salinity within the BMZ related to water quality, the following assessment is presented to further support the assessment of impacts on marine biological resources within the BMZ from operational discharges (see Section 4.5, Marine Biological Resources). Additionally, the assessment and disclosure of areas exceeding 2 ppt salinity is required by the Ocean Plan and MBNMS guidelines for desalination facilities (MBNMS, 2010). For dense discharges around the outfall diffuser, exceedances of the 2-ppt salinity threshold would be restricted to small areas adjacent to the diffuser ports. To estimate the area around the diffuser ports where salinities could exceed 2 ppt, Roberts (2016) presents three-dimensional, laser-induced fluorescence (3DLIF) images of a horizontal, negatively buoyant jet representative of those assessed in this impact analysis (**Figure 4.3-9**; see **Appendix D1** for additional details). The images were obtained by scanning a laser sheet horizontally through the dense discharge flow, to which a small amount of fluorescent dye was added. The fluoresced light was captured and converted to tracer concentrations and dilution and imaged by computer graphics techniques. The image in **Figure 4.3-9** shows the outer surface of a dense discharge plume as semi-transparent, with concentrations depicted in various colors through the jet centerline. High salinity concentrations (i.e., exceeding 2 ppt) would be confined to a relatively small area (by water volume) adjacent to the diffuser port and would attenuate rapidly with distance from the nozzle. Using **Figure 4.3-9** to represent a negatively buoyant plume similar to those assessed in this analysis and scaling up to be consistent with the proposed

project, the region of a salinity exceeding 2 ppt threshold would be represented by the area contained within the first three color contours (red, orange, and yellow contours). **Figure 4.3-10** presents a graphical output from Visual Plumes UM3 model (described above) for Scenario 2 (brine only discharge, the worst case scenario for salinity increases). Visual Plumes computes a constant salinity contour (blue line) representing a salinity increment of 2 ppt; within this contour, the salinity increment is greater than 2 ppt, and outside this line it is less than 2 ppt. The area where salinity exceeds the 2 ppt threshold under the worst case scenario (brine only) around each of the 129 outfall diffuser jets is a conical area with a volume on the order of 8.5 cubic feet (approximately 8 feet long by 2 feet in diameter), located approximately 2 feet above the sea floor (**Figure 4.3-10**). As discussed above, the brine plumes do not merge prior to contacting the sea floor, and so there would not be a contiguous area around the diffuser where salinity exceeds the 2 ppt salinity threshold. When the brine plume for Scenario 2 contacts the sea floor, the salinity would be 1.56 ppt above ambient (Table 4.3-13) and would pose no risk for the occurrence of hypoxia. For all discharge scenarios, the discharge plume contacts the sea floor and is less than 2 ppt above ambient at a distance ranging from 10 feet to 29 feet from the outfall diffuser, representing an area of the sea floor of 0.6 to 1.8 acres respectively (for context the total area within the BMZ represents a sea floor area of 27 acres). For additional discussion of the areas exceeding 2 ppt salinity levels in the context of potential impacts on marine organisms and sanctuary resources, see Section 4.5, Marine Biological Resources.

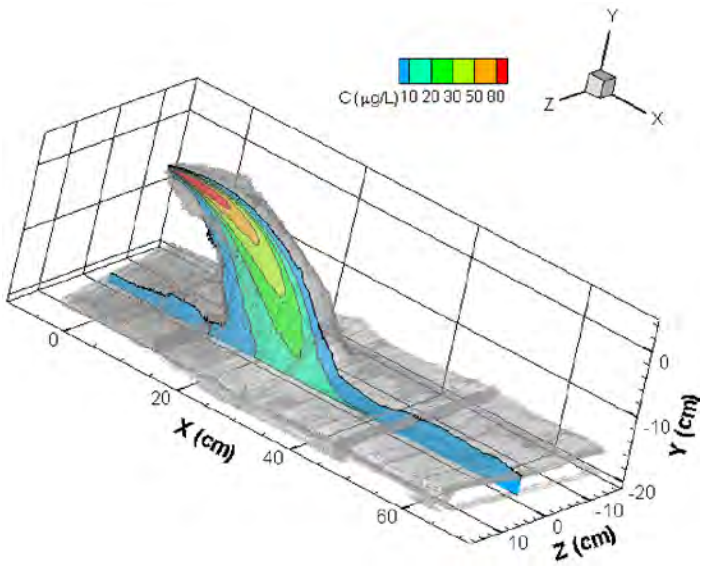
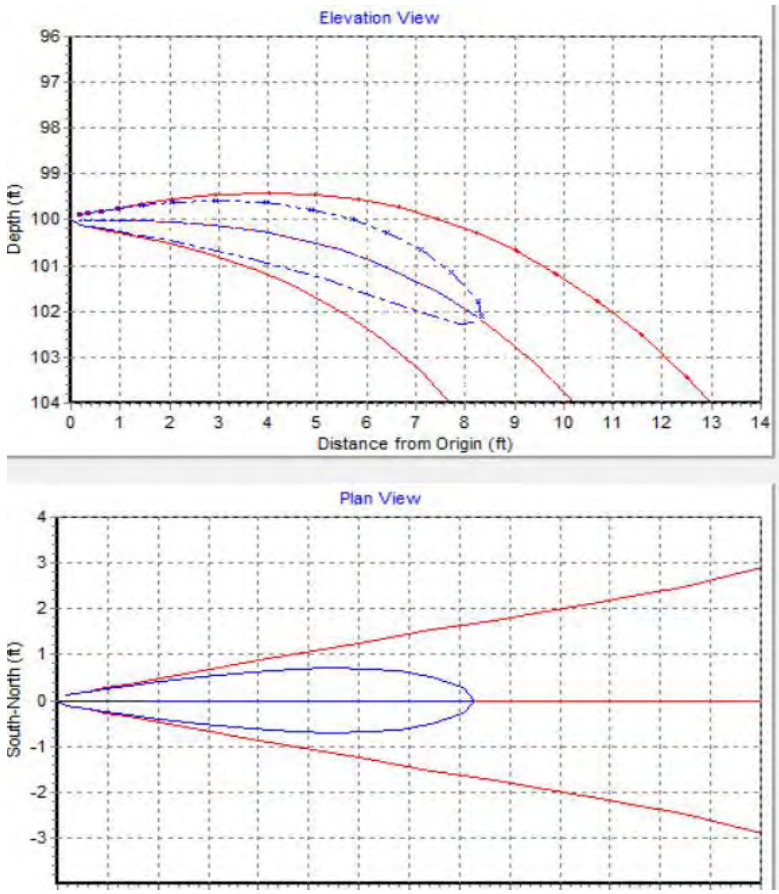


Figure 4.3-9
3DLIF Image of a Laboratory-generated Generic Horizontal Dense Jet



NOTES: Red line is the outer boundary of the jet. Blue line is contour of 2 ppt salinity increment.
SOURCE: Roberts, 2016

Figure 4.3-10
UM3 Graphical Output for Scenario 2
(pure brine at 13.98 mgd)

Dense Operational Discharges - Additional Considerations

This impact analysis addresses concerns raised during the public review of the April 2015 DEIR. The comments received involved the brine discharge and its travel path beyond the BMZ, concerns relating to the propagation of a dense saline plume along the sea floor, and the potential for hypoxia to occur near the seabed as a result of extremely elevated salinity levels adjacent to the outfall diffuser. Each of these concerns is addressed briefly below.

While there are no significance thresholds for salinity limitations beyond the BMZ boundary (328 ft), as discussed above, operational discharges would be less than 2 ppt above ambient salinity levels at the edge of the ZID, which ranges between 10 and 29 feet from the diffuser depending on discharge scenario. Further, the model analysis presented in **Appendix D1** demonstrates that, as the brine plume travels away from the point of discharge, salinity levels associated with the discharge would progressively decrease with time and distance from the point

of discharge, approaching background salinity levels beyond the BMZ through dispersion and dilution with the ocean currents.

Mixing and dilution of horizontal dense plumes from the diffuser jets could be affected by proximity to a local boundary, such as the sea floor (Roberts, 2016). As a fluid moves across a surface a certain amount of friction occurs between the fluid and the surface, which tends to slow the moving fluid. This resistance to the flow of the fluid pulls the fluid towards the surface. Thus, a fluid emerging from a nozzle (such as a dense plume from a diffuser) could potentially follow a nearby curved surface (such as the sea floor) if the curvature of the surface, or the angle the surface makes with the fluid stream, is not too sharp (i.e., acute). This effect (known as Coanda attachment), could result in substantially reduced dilution, or as public commenters suggested, result in creating a dense saline plume that forms a connection to and travels along the sea floor. In response to this concern, Roberts (2016) modeled the anticipated discharge to see if this effect was likely to occur. He determined that conditions of the discharge, namely, the expected negatively buoyant, density characteristics, were not likely to result in a Coanda effect of plume attachment to the sea floor (for details regarding methods and results see **Appendix D1**). Based on published research in the scientific literature on plume experiments relevant to desalination outfall facilities, a Coanda attachment to the sea floor will not occur for a negatively buoyant dense discharge when the parameter "z_o/dF" is greater than 0.12[33] (**Table 7** of **Appendix D**). The parameter "z_o/dF" represents a function of the internal hydraulics of the outfall and diffuser ports and was modeled as part of the dilution analyses described in **Appendix D**. Roberts (2016) concluded that, because "z_o/dF" is substantially greater than 0.12 for all discharge scenarios involving a dense negatively buoyant plume, a Coanda attachment would not occur, and that there would be no significant impairment to the dynamics or mixing of the discharges with receiving waters.

Comments received on the April 2015 DEIR expressed concerns over the potential for areas of hypoxia to form beneath dense discharges. Adequate DO is vital for aquatic life and higher concentrations are generally considered to be desirable. Dissolved oxygen content in water is, in part, a function of water temperature and salinity, which affect the point at which water becomes saturated with DO. As described in Section 4.3.1.3, the ability of oxygen to dissolve in water decreases as the temperature and salinity of water increases. As the temperature and/or salinity of water increases, water loses the ability to hold dissolved oxygen and the concentration goes down. Salinity also has properties that can facilitate the creation of hypoxic[34] zones. Because salt water is more dense than fresh water, under certain conditions, a less dense layer of fresh or low salinity water can form on top of a denser layer of high salinity water. Such a scenario can prevent adequate mixing of the water column and prevent oxygenated water to get to the lower depths resulting in the heavier, saltier layer at the bottom to become oxygen-depleted.

[33] Table 7 of Appendix D1 includes the model results for calculation of the internal hydraulics of the outfall and diffuser ports under "Port Conditions" used as part of the dilution analyses.

[34] Hypoxia occurs when the amount of dissolved oxygen in water becomes too low to support most aquatic life (typically below 2 mg/l).

However, DO varies per many other factors, including photosynthesis and biological and chemical oxygen demand associated with decomposition of organic material. Monterey Bay is a dynamic environment that includes variable concentrations of DO. Ambient DO levels in Monterey Bay at a depth of approximately 100 feet have ranged from 4.25 milligrams per liter (mg/L) to 8.00 mg/L (KLI, 1998; KLI, 1999); typically, DO in the range of 5 to 8 mg/L is considered protective of fish and marine biota depending on the species and life-stage. Under the Ocean Plan, a discharge may not increase DO more than 10 percent of ambient levels at the edge of the BMZ.

Comments specifically expressed concern that, due to sediment oxygen demand and potential limited mixing due to dense discharges forming Coanda attachments, limited dilution and mixing could restrict oxygen supply. As described above, Coanda attachments would not occur, and modeled salinity levels are less than 2 ppt above ambient salinity at the edge of the ZID. Further, to evaluate the potential for hypoxia, Geosyntec (2015) performed a mass-balance analysis (a mass-balance analysis accounts for a given material entering and leaving a system). The analysis applied a mass-balance approach to a conservative areal extent of a brine-only plume (i.e., the most dense of the proposed operational discharges) to derive estimates of oxygen demand in local sediments (70 to 180 kilograms/day) and estimates of oxygen supplied (less than 5,600 kilograms/day) by the operational discharges (including entrained seawater). Based on the results of the mass-balance analysis, the amount of oxygen supplied to the discharged plume by ambient seawater entrained during turbulent mixing and dilution is more than 30 times greater than that consumed by the sediments. As such the concentration of dissolved oxygen in receiving ocean waters would not become depressed by more than 10 percent from that which occurs naturally, hypoxia is unlikely to occur as a result of proposed operational discharges and impacts would be less than significant.

Buoyant Operational Discharges - Analysis and Discussion

The analysis presented in this section evaluates positively buoyant operational discharges (i.e., that have densities less than the receiving seawater) using model analyses to determine salinity, dilutions, and plume behavior.

Positively buoyant discharge plumes (i.e., those with densities less than the receiving water) require different analytical procedures than are used for negatively buoyant plumes. Only two discharge scenarios involve a positively buoyant discharge: Scenario 1, the baseline consisting only of MRWPCA wastewater and Scenario 6, MPWSP brine combined with high flows of wastewater during the non-irrigation season (**Table 4.3-10**). The plume dynamics for these scenarios were simulated with two models in Visual Plumes: UM3 and NRFIELD (**Appendix D1**). UM3 is an entrainment model that was previously described above. NRFIELD is based on experiments on multiport diffusers discharging from two sides (Roberts, 2016). NRFIELD is specifically designed for conditions typical of very buoyant discharges of domestic effluent from multiport diffusers into stratified oceanic waters, and as such, is considered applicable to this analysis. The primary outputs from NRFIELD are the minimum (centerline) dilution, the plume rise height, and thickness at the end of the near field.

The following procedure was used for the dilution simulations for Scenarios 1 and 6 (**Table 4.3-10**). The internal hydraulics of the outfall diffuser were computed for each of the scenarios (described in detail in **Appendix D1**). The average port diameter and flows were then obtained for the assessed scenarios. The UM3 and NRFIELD model suites in Visual Plumes were then run for the chosen flow and ambient combination scenarios summarized in **Table 4.3-12**: Scenario 1 with Upwelling, Davidson, and Oceanic conditions; and Scenario 6 with Davidson. The seasonal average density stratifications (**Table 4.3-1**) were used, and zero current speed was conservatively assumed.

The results are summarized in **Table 4.3-14**. For UM3, the average dilutions at the terminal rise height are given along with the centerline rise heights of the plume; for NRFIELD, the near field (minimum) dilution is given along with the height of the near field (centerline) dilution and the height to the top of the spreading plume. The average dilution predicted by UM3 is very close to the minimum (centerline) dilution predicted by NRFIELD. The reason for this is that the increase in mixing and dilution in the transition from vertical to horizontal flow and merging of the plumes from both sides, neither of which are incorporated into UM3, are accounted for in the ratio of average to the minimum dilutions (Roberts, 2016). Therefore, while the average dilution predicted by UM3 is presented as a model output, it is interpreted here as the minimum centerline dilution (see **Appendix D1** for details). The near field dilution is synonymous with the minimum initial dilution in the ZID, as defined in the California Ocean Plan.

The model output showed that the dilutions of project-related discharges would be high for all of the buoyant plume scenarios evaluated. The lowest is a minimum initial dilution of 154 for Scenario 6. The highest dilution was 351 for Scenario 1 (pure secondary effluent) during the Davidson season. As demonstrated by model analysis, when the MPWSP brine is combined with high volumes of wastewater (Scenario 6), the plume is positively buoyant because the salinity of the effluent is substantially lower than that of ambient conditions (**Table 4.3-12**). As such, for Scenario 6, operational discharges would not exceed the significance threshold of 2 ppt at the BMZ because the salinity of the discharge is already lower than that of the receiving waters, and impacts would be less than significant.

Impact Summary and Conclusion

The analysis of salinity levels indicates that for all scenarios, and assuming a continuous discharge stream, the MPWSP brine only discharges and discharges of brine combined with varying amounts of waste water will meet Ocean Plan salinity and dissolved oxygen standards and will not result in hypoxia on the ocean floor. Specifically, the discharges would result in salinity levels that would not exceed 2 ppt above ambient salinity at the edge of the ZID (the edge of which is 10 feet to 29 feet from the diffuser depending on discharge scenario), which means that salinity levels would not exceed 2 ppt above ambient salinity at the edge of the BMZ (328 ft from the diffuser) since the edge of the ZID is well within the BMZ under all scenarios. The proposed action would therefore not exceed or violate the Ocean Plan salinity standards or degrade water quality in terms of salinity.

TABLE 4.3-14
DILUTION RESULTS FOR BUOYANT DISCHARGE SCENARIOS

Scenario	No.	Flow rate (mgd)	Effluent density (kg/m^3)	Port diam. (in)	Ocean condition	UM3 simulations		NRFIELD simulations		
						Average dilution	Rise height (center-line) (ft)	Minimum dilution	Rise height (center line) (ft)	Rise height (top) (ft)
Baseline	1	19.78	998.8	2.00	Upwelling	191	58	186	59	42
Baseline	1	19.78	998.8	2.00	Davidson	327	100 (surface)	351	100	100
Baseline	1	19.78	998.8	2.00	Oceanic	240	82	239	50	72
Brine and High SE	6	33.76	1017.6	2.25	Davidson	154	86	163	86	89

NOTES:
SE = Secondary Effluent (MRWPCA wastewater)

SOURCE: Roberts, 2016

As the plumes discharged from each of the 129 outfall diffuser jets travel away from the ZID, they continue to dilute (further reducing salinity levels) and ultimately merge within the BMZ boundary. Salinity levels would exceed 2 ppt in a relatively small area, approximately 8.5 cubic feet, adjacent to each of the 129 diffuser ports in an area 2 feet above the sea floor, after which the discharge plumes would attenuate rapidly with distance from each port. The combined area of exceedances of 2 ppt is not likely to adversely impact the marine environment because it is a relatively small volume in the water column when considered in the context of the total volumes of Monterey Bay. Also, the salinity increases presented in the analysis represent conservative values and would occur only along the seabed. Modeling demonstrates that salinity plumes are not likely to travel, or become trapped, along the sea floor due to the Coanda effect. Hypoxia from salinity near the sea floor was determined to be unlikely based on a mass-balance analysis, which demonstrated that the amount of oxygen supplied to the discharged plume by ambient seawater entrained during turbulent mixing and dilution is more than 30 times greater than that consumed by the sediments. As such, the concentration of dissolved oxygen in receiving ocean waters would not become depressed by more than 10 percent from that which occurs naturally under baseline conditions. For the majority of the water column, incremental salinities would be much lower than the reported values. Additionally, the analysis assumed zero ocean current; however, under actual ocean conditions, waves, tidal forces, and seasonal currents would increase mixing and dilution, thus reducing these assessed salinity levels. Therefore, operational discharges from the MPWSP would not increase salinity levels or impact DO in a manner that violates water quality standards or waste discharge requirements or otherwise degrades the water quality of receiving waters in Monterey Bay and MBNMS. Environmental impacts and impacts on MBNMS resources would be less than significant.

The current NPDES permit (Order No. R3-2014-0013, NPDES Permit No. CA0048551), which regulates the wastewater discharge from the outfall, would be amended before the MPWSP Desalination Plant begins operation to incorporate the brine-only and combined discharges. Under the amended NPDES permit, the discharges would be subject to the Ocean Plan water quality objectives, which would be incorporated into the permit in the form of specific effluent limitations as water quality requirements. Further, the amended NPDES permit would require approval by MBNMS to ensure discharges would not impair or degrade the resources of the Sanctuary.

As described in Section 4.3.2.2, the Ocean Plan includes monitoring and reporting requirements for the operation of new desalination facilities (Section III.M.4, “Monitoring and Reporting Program”; SWRCB, 2016). The monitoring requirements for the operation of a new desalination facility are such that the owner or operator of a desalination facility must submit a Monitoring and Reporting Plan to the RWQCB for approval. The Monitoring and Reporting Plan must include provisions for monitoring of effluent and receiving water characteristics and impacts on all forms of marine life. The Monitoring and Reporting Plan must, at a minimum, include monitoring for benthic community health, aquatic life toxicity, hypoxia, and receiving water characteristics. Additionally, receiving water monitoring for salinity must be conducted at times when the monitoring locations detailed in the Monitoring and Reporting Plan are most likely affected by the discharge. Additionally, as described in Section 4.3.2.2, MBNMS has established

non-regulatory guidelines (MBNMS, 2010) for the construction and operation of desalination facilities to ensure that desalination plants in the sanctuary would be sited, designed, and operated in a manner that results in minimal impacts on the marine environment. The proposed project is substantially consistent with the guidelines relating to operational discharges regarding water quality and salinity. However, the guidelines also specify that a monitoring program should be developed to evaluate the extent of impacts from the plant's discharge operations on marine resources. The guidelines for developing a monitoring program are largely consistent with those described for the Ocean Plan with the addition that any proposed mitigation should be monitored for unavoidable impacts to ensure the mitigation is performing as intended.

A monitoring and reporting plan, consistent with the Ocean Plan requirements and MBNMS Guidelines for operation of a new desalination facility, has not been defined and proposed as part of the project. Several of the parties to the CPUC proceeding have agreed upon terms of the brine discharge that establishes, in part, a detailed monitoring and reporting program that includes the collection of relevant, long-term water quality data. The intent of the monitoring program is to determine compliance with defined water quality standards and to implement specific corrective actions when non-compliance is determined to occur. While the monitoring plan defined by the settling parties is consistent with portions of the Ocean Plan (SWRCB 2016) requirements and the MBNMS Desalination Guidelines (MBNMS 2010), it does not include biological monitoring to determine impacts on marine life. Further, while the Ocean Plan requires implementation of a monitoring plan for operation of a desalination facility, the requirement is new and, as such, is not well tested. Additionally, the monitoring requirements defined in the Ocean Plan are broadly described and do not include specific thresholds, performance standards, or corrective actions.

While impacts related to water quality from increased salinity have been determined to be less than significant based on model analyses, and although it is likely that monitoring would occur based on the Settlement Agreement and the Ocean Plan requirements, implementation of **Mitigation Measure 4.3-4 (Operational Discharge Monitoring, Analysis, Reporting, and Compliance)** would ensure compliance with the Ocean Plan monitoring requirements and consistency with MBNMS guidelines for operation of desalination facilities that are protective of the beneficial uses (including aquatic wildlife and habitat) of Monterey Bay. Further, Mitigation Measure 4.3-4 would ensure that monitoring data considers impacts on marine resources and that all collected data is assessed against defined performance standards and that corrective actions are implemented in the case that performance standards are not met. For these reasons, the following mitigation measure is proposed.

Mitigation Measure 4.3-4 requires CalAm to implement a comprehensive Monitoring and Reporting Plan (Plan), following review and approval by the RWQCB and MBNMS that is consistent with the requirements and monitoring guidelines of the Ocean Plan and the MBNMS Guidelines for desalination plants. The monitoring program set forth in the Plan would ensure that adequate water quality and marine resource data are gathered to determine baseline conditions and compliance with Ocean Plan water quality limitations related to salinity. The Plan shall include, at a minimum, the water quality performance standard that operational discharges must comply with the 2 ppt salinity limitation at the BMZ compliance point. The Plan shall also

include the performance standard that no statistically significant changes in benthic community composition occur within the maximum extent of the ZID, as compared to reference and baseline conditions that are directly and statistically associated with changes in salinity resulting from operational discharges (with consideration given to natural and seasonal variations and long-regional trends). The Plan shall also include corrective actions that would be required to be implemented if the acquired data indicated deleterious effects to receiving water quality or marine biological resources in the context of the performance standards resulting from operational discharges.

Mitigation Measures

Mitigation Measure 4.3-4 applies only to the operational discharges associated with the MPWSP Desalination Plant through the existing MRWPCA outfall.

Mitigation Measure 4.3-4: Operational Discharge Monitoring, Analysis, Reporting, and Compliance.

To ensure that the operational discharges from the MPWSP are in compliance with the 2 ppt receiving water salinity limitation at the BMZ compliance point required by the California Ocean Plan, the discharger(s) shall implement a Monitoring and Reporting Plan (Plan). The Plan shall, at a minimum, include protocols for monitoring of effluent and receiving water salinity characteristics as well as protocols for determining statistically significant changes in benthic community composition within the maximum extent of the ZID as compared to baseline conditions (established a minimum of one year prior to operations) that is directly associated with changes in salinity resulting from operational discharges (with consideration given to natural and seasonal variations and long-regional trends). Such protocols shall include, but not be limited to, monitoring for benthic community health, aquatic life toxicity, and hypoxia, within the ZID. The Plan shall be consistent with the standard monitoring procedures detailed in Appendix III of the Ocean Plan. Such monitoring protocols specify monitoring plan framework, scope, and methodological design for determining compliance with the Ocean Plan defined receiving water limitations relating to salinity. Prior to implementation, the Plan shall be approved by the RWQCB and MBNMS. Following implementation, the Plan shall be reviewed by the RWQCB, and revised if necessary, as part of the NPDES permit renewal process.

As part of the Plan, receiving water monitoring for salinity shall be conducted at times when the monitoring locations are most likely to be potentially adversely affected by the discharge. The Plan shall establish protocols to establish baseline biological conditions at the discharge location as well as at a reference location outside the influence of the discharge for at least one year prior to commencement of project construction. To determine impacts on marine biological resources against baseline biological conditions, the discharger(s) shall conduct biological surveys (e.g., Before-After Control-Impact studies), that evaluate and quantify the differences between biological communities at a reference site and at the discharge location before and after the discharge(s) commence. All monitoring data, results, and analyses shall be compiled and submitted to the RWQCB and MBNMS for review. Such monitoring shall continue until the RWQCB and MBNMS determines that a regional monitoring program is adequate to ensure compliance with the receiving water limitation.

Water Quality Monitoring. At a minimum, the Plan shall include the following water quality monitoring protocols and monitoring frequencies to assess baseline conditions and to track the compliance of the Project with the performance standard of ensuring operational discharges do not exceed ambient salinity by more than 2 ppt at the edge of the BMZ, as well as to assess the efficacy of any operational or design features implemented:

A. At least one year prior to implementing operational discharges, the discharger(s) shall install continuously recording automated water quality monitoring equipment, such as automatically recording water quality data sondes (water quality monitoring instrument), to monitor salinity and dissolved oxygen levels at one hour intervals in the receiving waters of Monterey Bay. The discharger(s) shall install water quality monitoring equipment at a minimum of four locations within 3 meters of the ocean floor as follows:

   a. 1 monitoring station at the edge of the Zone of Initial Dilution, but not more than 10 meters from the outfall diffuser.

   b. 1 monitoring station at the edge of the Brine Mixing Zone, representing the point of compliance with the Ocean Plan salinity standard (not more than 100 meters from the outfall diffuser).

   c. A representative reference location at least 1000 meters from the outfall diffuser, situated on the same elevation contour as that of the outfall diffuser, in an area outside the influence of operational discharges or other inputs to Monterey Bay, such as operational discharges from other facilities or fresh water inputs in the form of major surface water inputs.

B. Monitoring will be conducted for one year prior to the commencement of operational discharges to confirm baseline conditions.

C. Once operational discharges commence, the discharger(s) shall continue monitoring (for a minimum of five years, as described below) to confirm compliance of operational discharges with the Ocean Plan receiving water salinity limitation, which specifies discharges shall not exceed a daily maximum of 2 parts per thousand (ppt) above natural background salinity, as measured no further than 100 meters (328 ft) horizontally from the discharge point.

The discharger(s) shall retrieve all data from deployed water quality monitoring instrumentation at least four times a year at quarterly annual intervals during both the one year period of baseline monitoring and during the salinity standard compliance monitoring associated with operations. Following data collection, data shall be analyzed for compliance with the receiving water salinity standard defined in the Ocean Plan. Additionally, the salinity and dissolved oxygen data retrieved shall be used, in conjunction with biological survey data, to assess changes to benthic community composition within the ZID. The analyses and monitoring data shall be summarized and submitted to the RWQCB and MBNMS as annual reports as well as made publicly available via the project website. Reports shall include summary graphs of all quality assured/quality controlled data as well as statistical analyses of the data relative to historic baselines. Reports shall assess water quality data within the context of relevant water quality standards. The reports shall describe any measured adverse water quality related changes, such as high salinity or low dissolved oxygen levels that potentially impact marine habitat quality or benthic

communities. The reports shall include assessment of the extent to which any measured changes were attributable to controllable factors, such as the variation of combined flows as part of operational discharges.

The analysis and reporting conducted as part of the Plan shall determine the need for corrective actions to be implemented in the form of the design features and operational measures prescribed in **Mitigation Measure 4.3-5** to reduce identified impacts to less-than-significant levels. As part of such a determination for implementation of corrective actions, a schedule for implementation shall be provided, as well as rationale for how such design features and/or operational measures were selected and the expected results following implementation. All analysis and reporting, including determinations for the need for corrective actions to be implemented, the schedule for implementation, and the rationale for selected corrective actions shall be approved by the RWQCB and MBNMS. If at the end of five complete years of monitoring operational discharges, the 24-hour average salinity measured at the edge of the BMZ is less than 75% of the salinity performance standard for 45 days without interruption under all discharge scenarios representative of typical operations (i.e. irrigation season and non-irrigation season operations), and with approval by the RWQCB and MBNMS, the discharger(s) may terminate the monitoring and reporting specified as part of this mitigation measure (but not terminate monitoring and reporting required as part of compliance with NPDES permit conditions or Ocean Plan monitoring and reporting requirements for discharges into California ocean waters).

Impact 4.3-5: Violate water quality standards or waste discharge requirements, or degrade water quality as a result of brine discharge from the operation of the MPWSP Desalination Plant. (*Less than Significant with Mitigation*)

Operational discharges may contain a variety of water quality constituents that, in high enough concentrations, could degrade water quality and adversely affect the beneficial uses of the receiving waters in Monterey Bay and MBNMS resources. The concentrations of water quality constituents present in the operational discharges are determined and impacts on water quality are assessed based on compliance with the Ocean Plan water quality objectives. Depending upon the time of the year and the quantity of wastewater flows released, the operation of the MPWSP Desalination Plant would result in a brine-only discharge or a combined discharge (brine blended with varying flows of treated wastewater). Operational discharges from the MPWSP could violate water quality standards or waste discharge requirements or otherwise degrade the water quality of receiving waters in Monterey Bay.

Treated wastewater from the existing MRWPCA Regional Wastewater Treatment Plant is currently discharged through the MRWPCA outfall and is subject to the provisions and effluent limitations of an NPDES permit (Order No. R3-2014-0013, NPDES Permit No. CA0048551). Under the proposed MPWSP, the current NPDES permit would need to be amended to incorporate the brine-only and combined discharges before the MPWSP Desalination Plant commences operation. Under the amended NPDES permit, the discharges would be subject to the Ocean Plan water quality objectives, which would be incorporated into the permit as specific effluent limitations.

Compliance with water quality objectives other than salinity (see Impact 4.3-4 for assessment of salinity-related impacts) is assessed here. Noncompliance with the Ocean Plan water quality objectives could degrade water quality and adversely affect the beneficial uses of the receiving waters in Monterey Bay. When treated wastewater is discharged, it enters ocean waters into an area known as the zone of initial dilution (ZID). As prescribed in the Ocean Plan, the discharge must meet the water quality objectives at the outer boundary of the ZID, after the wastewater has undergone a period of initial dilution (i.e., mixing of the discharge with the receiving water). Discharge limitations for the NPDES permit (i.e., the permitted in-pipe concentration of water quality constituents) are obtained by quantifying the degree of dilution that occurs within the ZID, referred to as the minimum probable initial dilution (Dm). The water quality objectives established in the Ocean Plan are adjusted by the project-specific Dm to derive the NPDES permit limits on in-pipe constituent concentrations for a wastewater discharge prior to ocean dilution. Determination of a significant impact related to water quality, water quality standards, and waste discharge requirements is based on compliance with the Ocean Plan water quality objectives (see Section 4.3.3).

Introduction to the Impact Analysis

Impact 4.3-5 is structured as follows:

- **Operational Discharge Scenarios**: To provide context for the water quality analysis, this section describes the operational discharge scenarios that could occur as a result of implementing the MPWSP.
- **Approach to Analysis**: This section describes the methodologies used in the impact analysis to determine compliance with Ocean Plan water quality objectives.
- **Results and Impact Discussion:** In this section, concentrations of constituents regulated under the Ocean Plan are discussed for each evaluated discharge scenario. First, the concentrations at the edge of the ZID are presented in the context of the minimum dilution values assessed for each discharge scenario. The resulting concentrations are then compared to the Ocean Plan objectives to assess operational water quality impacts and regulatory compliance.
- **Consistency with Regulatory Requirements**: This section assesses the proposed project's consistency with applicable regulatory requirements adopted for the purpose of avoiding or mitigating environmental effects; these requirements are described above in Section 4.3.2, Regulatory Framework. Where the proposed project conflicts with applicable plans or policies, a significant impact would result.
- **Impact Summary and Conclusion**: This section summarizes the results of the comprehensive analysis of water quality impacts in the context of the evaluated operational discharge scenarios. An impact conclusion is provided that considers the results of the analysis in the context of proposed operations, the relevant described significance criteria, and applicable regulations.

Operational Discharge Scenarios

Table 4.3-10 summarizes the operational discharge scenarios evaluated for the MPWSP (described in detail under Impact 4.3-4). Predictive models were used to determine the potential water quality impacts under each discharge scenario.

Approach to Analysis

Potential water quality impacts were identified by determining whether operational discharges would exceed the water quality objectives established in the Ocean Plan. As discussed in detail in Section 4.3.2, Regulatory Framework, the Ocean Plan establishes objectives for a wide range of constituents and also forms the basis of NPDES permit effluent quality requirements for waste discharges to ocean waters. **Table 4.3-3** provides the suite of constituents and their Ocean Plan water quality objectives.

Initial Dilution of Discharges and the "Zone of Initial Dilution"

For typical wastewater discharges, when released from an outfall, the wastewater and ocean water undergo rapid mixing. The mixing of the discharge with receiving ocean waters is affected by the buoyancy and momentum of the discharge plume, a process referred to as initial dilution. Compliance with the Ocean Plan water quality objectives summarized in **Table 4.3-3** is required after the initial dilution of the discharge into the ocean is completed. The initial dilution occurs in an area known as the ZID. The ZID is defined as the zone where buoyancy- and momentum-driven mixing produces rapid dilution of the discharge. Compliance was determined by comparing water quality parameters measured at the edge of the ZID with Ocean Plan objectives, an approach to identifying impacts that is consistent with the requirements outlined in the Ocean Plan.

Data Sources

The impact analysis relies on a compilation of the most recent and best available water quality data from several sources. The MRWPCA wastewater constituent concentrations were determined using historical NPDES compliance data collected by the MRWPCA, results from water quality monitoring completed in support of the impact analysis for the proposed project, and water quality data collected by CCLEAN. The constituent concentrations in the brine were determined using available data from CalAm's temporary test subsurface slant well[35] on the CEMEX property in Marina, California, as well as consideration of the 42 percent efficacy of the treatment process at the MPWSP Desalination Plant. A summary of the estimated water quality for the MPWSP brine and the MRWPCA wastewater is presented in **Appendix D3** (Table 4).

Ocean Plan Discharge Compliance

Trussell Tech conducted the evaluation to determine compliance of the operational discharges with Ocean Plan objectives. This section provides a summary of the data sources and specific methodologies for each step of the model analysis (see **Appendix D3** for details). **Figure 4.3-11** illustrates the approach to analysis.

[35] Long-term pumping and water quality sampling from this well on the CEMEX property in Marina, California began in April 2015.

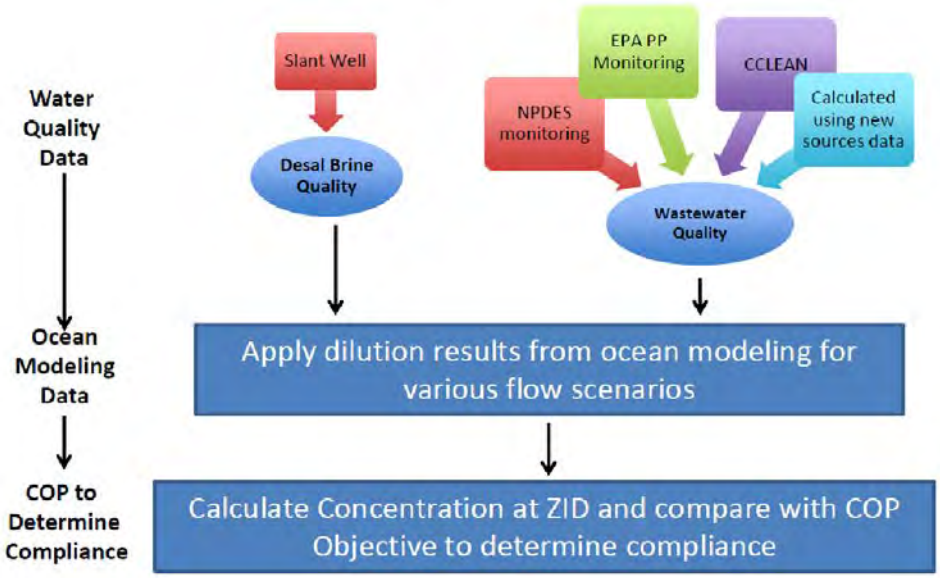


Figure 4.3-11
Summary of Approach to Analysis
for Determining Ocean Plan Compliance

After compiling water quality data for the desalination brine and MRWPCA wastewater (described above), Trussell Tech (2016; **Appendix D3**) combined the data for the evaluated discharge scenarios. Specifically, Trussell Tech calculated the combined in-pipe concentration of water quality constituents prior to discharge. This in-pipe concentration of constituents was calculated using a flow-weighted average of each discharge component for each of the flow scenarios described in **Table 4.3-10**.

The minimum dilution ratios (Dm) developed by Roberts (2016; **Appendix D1**) were then applied to the average flow-weighted in-pipe concentrations to determine the constituent concentrations at the edge of the ZID. The Dm value calculated for each discharge scenario was applied to the in-pipe concentration of the constituents to calculate each constituent's concentration at the edge of the ZID (described in detail in **Appendix D3**). This calculation also considered the existing background concentration of the constituents present in the ocean receiving water. This approach is consistent with the Implementation Provisions set forth in the Ocean Plan (SWRCB, 2016).

Finally, to determine Ocean Plan compliance, the calculated concentrations at the edge of the ZID were compared to the Ocean Plan water quality objective for that constituent (summarized in **Table 4.3-3**). **Appendix D3** documents the data sources and provides further detail on the methodology used to perform the ocean water quality modeling analysis.

Ocean Plan Water Quality Objectives

The Ocean Plan contains three categories of objectives: (1) Objectives for Protection of Marine Aquatic Life, (2) Objectives for Protection of Human Health – Non-Carcinogens, and (3) Objectives for Protection of Human Health – Carcinogens. There are three numeric thresholds

(water quality objectives) defined for each constituent in the first category: six-month median concentration, daily maximum concentration, and instantaneous maximum concentration. For the other two categories, there is one numeric threshold: 30-day average concentration. When a constituent had three numeric thresholds, the lowest—the six-month median—was used to estimate compliance. This approach was used to account for the fact that most of the operational discharge scenarios would be sustained on a seasonal basis for up to 6 months (i.e., during the irrigation and non-irrigation seasons), and therefore the 6-month median objective would need to be met. However, the scenarios in which brine is discharged with low flows of wastewater (see Scenarios 3 and 4 in **Table 4.3-10**) are unlikely to be implemented in a sustained manner seasonally, but rather represent the time periods when seasonal operations change and wastewater flows are ramped up or down depending on inputs of wastewater to the Salinas Valley Reclamation Project (SVRP) via the Castroville Seawater Intrusion Project (CSIP). Therefore, these transitional scenarios provide a conservative, worst-case assessment of potential water quality impacts.

Basis for Impact Conclusion: The Zone of Initial Dilution

A conservative threshold of 80 percent or greater (≥80%) of the Ocean Plan objective was established for determining potential impacts for constituent concentrations at the edge of the ZID. For each discharge scenario, if the concentration of a constituent at the edge of the ZID was below the 80 percent Ocean Plan water quality objective threshold, then it was assumed that the discharge would comply with the Ocean Plan. However, if the concentration of a constituent at the edge of the ZID exceeded the Ocean Plan objective, then it was concluded that the discharge scenario could violate the Ocean Plan objective and result in a significant impact. If the concentration of a constituent at the edge of the ZID exceeded the conservative threshold of 80 percent or greater of the Ocean Plan objective, it was concluded that the discharge scenario could result in a significant impact unless additional analysis could provide context, such as data outliers or water quality data not representative of proposed operations, to conclude otherwise. Note that this approach could not be applied for some water quality objectives defined in the Ocean Plan, such as acute toxicity, chronic toxicity, and radioactivity.[36] Also, reliable water quality data were not available for several Ocean Plan constituents, in which case a concentration at the edge of the ZID could not be calculated, and no compliance determination was made. This lack of information regarding certain constituents is conservatively addressed in the analysis and impact conclusion presented below.

4.3.5.3 Results and Impact Discussion

The first step in the Ocean Plan compliance analysis was to estimate the worst-case concentrations of water quality constituents present in the source water for the desalination brine and in the MRWPCA secondary effluent wastewater. The estimated water quality constituent concentrations for each discharge component are presented in **Appendix D3** (Table 4). The flow-weighted in-pipe concentration for each constituent was calculated for each modeled discharge scenario using the water quality results presented in **Appendix D3** (Table 4) and the discharge

[36] Calculating flow-weighted averages for toxicity (acute and chronic) and radioactivity (gross beta and gross alpha) is not appropriate based on the nature of the constituents (see Appendix D3 for details).

flows presented in **Table 4.3-10**. The in-pipe concentration was then used to calculate the concentration at the edge of the ZID using the Dm values presented in **Table 4.3-13** (for negatively buoyant discharge plumes) and **Table 4.3-14** (for positively buoyant discharge plumes) for each discharge scenario. The estimated concentrations for the full suite of Ocean Plan constituents are presented as concentrations at the edge of the ZID and as a percentage of the Ocean Plan numeric water quality objective in **Table 4.3-15** and **4.3-16** (see also **Appendix D3**, Tables A1 and A2, p. 29) for the discharge scenarios assessed for the MPWSP.

TABLE 4.3-15
MPWSP OPERATIONAL DISCHARGE SCENARIOS: ESTIMATED CONCENTRATIONS AT THE EDGE OF THE ZID FOR OCEAN PLAN CONSTITUENTS

Constituent	Units	Ocean Plan Objective	Estimated Concentration at Edge of ZID by Scenario				
			MPWSP				
			2	3	4	5	6
Objectives for protection of marine aquatic life - 6-month median limit							
Arsenic	µg/L	8	3.9	4.0	4.1	3.7	3.2
Cadmium	µg/L	1	0.3	0.3	0.3	0.1	0.02
Chromium (Hexavalent)	µg/L	2	0.1	0.1	0.1	0.04	0.01
Copper	µg/L	3	1.9	2.0	2.0	2.1	2.0
Lead	µg/L	2	0.03	0.03	0.03	0.01	0.003
Mercury	µg/L	0.04	0.03	0.02	0.02	0.01	0.002
Nickel	µg/L	5	0.7	0.7	0.6	0.2	0.05
Selenium	µg/L	15	0.04	0.05	0.05	0.04	0.01
Silver	µg/L	0.7	0.2	<0.2	<0.2	<0.2	<0.2
Zinc	µg/L	20	8.1	8.1	8.2	8.2	8.0
Cyanide	µg/L	1	0.6	0.5	0.5	0.2	0.1
Total Chlorine Residual	µg/L	2	–	–	–	–	–
Ammonia (as N) - 6-mo median	µg/L	600	25.7	*172.1*	287	409.0	139.2
Ammonia (as N) - Daily Max	µg/L	2,400	31.4	228.8	384	549.8	187.2
Acute Toxicity[a]	TUa	0.3					
Chronic Toxicity[a]	TUc	1					
Phenolic Compounds (non-chlorinated)	µg/L	30	5.5	5.2	4.9	2.2	0.5
Chlorinated Phenolics[b]	µg/L	1	<2.20	<2.06	<1.92	<0.82	<0.17
Endosulfan	µg/L	0.009	7.05E-06	6.77E-05	1.15E-04	1.68E-04	5.72E-05
Endrin	µg/L	0.002	1.35E-07	4.45E-07	6.86E-07	9.09E-07	3.05E-07
HCH (Hexachlorocyclohexane)	µg/L	0.004	1.82E-05	1.56E-04	2.63E-04	3.81E-04	1.30E-04
Radioactivity (Gross Beta)[a]	pCi/L	0.0					
Radioactivity (Gross Alpha)[a]	pCi/L	0.0					
Objectives for protection of human health – non carcinogens – 30-day average limit							
Acrolein	µg/L	220	<0.2	<0.2	<0.2	<0.1	<0.03
Antimony	µg/L	1200	0.01	0.01	0.01	0.01	0.003
Bis (2-chloroethoxy) methane	µg/L	4.4	<1.1	<1.0	<0.9	<0.3	<0.05
Bis (2-chloroisopropyl) ether	µg/L	1200	<1.1	<1.0	<0.9	<0.3	<0.05

TABLE 4.3-15 (Continued)
MPWSP OPERATIONAL DISCHARGE SCENARIOS: ESTIMATED CONCENTRATIONS AT THE EDGE OF THE ZID FOR OCEAN PLAN CONSTITUENTS

Constituent	Units	Ocean Plan Objective	Estimated Concentration at Edge of ZID by Scenario				
			MPWSP				
			2	3	4	5	6
Objectives for protection of human health – non carcinogens – 30-day average limit (cont.)							
Chlorobenzene	µg/L	570	<0.1	<0.1	<0.05	<0.02	<0.004
Chromium (III)	µg/L	190,000	1.1	1.0	0.9	0.3	0.1
Di-n-butyl phthalate	µg/L	3,500	<1.1	<1.0	<0.9	<0.3	<0.1
Dichlorobenzenes	µg/L	5,100	<0.1	0.1	0.1	0.03	0.01
Diethyl phthalate	µg/L	33,000	<0.1	<0.1	<0.1	<0.1	<0.02
Dimethyl phthalate	µg/L	820,000	<0.1	<0.1	<0.1	<0.04	<0.01
4,6-dinitro-2-methylphenol	µg/L	220	<5.4	<4.8	<4.3	<1.5	<0.2
2,4-Dinitrophenol[b]	µg/L	4.0	<5.5	<4.9	<4.4	<1.5	<0.2
Ethylbenzene	µg/L	4,100	<0.1	<0.1	<0.05	<0.02	<0.004
Fluoranthene	µg/L	15	<0.01	0.01	0.01	0.003	0.0005
Hexachlorocyclopentadiene	µg/L	58	<0.01	<0.01	<0.01	<0.01	<0.002
Nitrobenzene	µg/L	4.9	<2.6	<2.4	<2.1	<0.7	<0.1
Thallium	µg/L	2	<0.01	<0.01	<0.01	<0.01	<0.002
Toluene	µg/L	85,000	<0.06	<0.05	<0.05	<0.02	<0.004
Tributyltin[b]	µg/L	0.0014	<0.01	<0.005	<0.005	<0.002	<0.0004
1,1,1-Trichloroethane	µg/L	540,000	<0.1	<0.1	<0.05	<0.02	<0.004
Objectives for protection of human health – carcinogens – 30-day average limit							
Acrylonitrile[c,d]	µg/L	0.10	--	--	--	--	--
Aldrin[b]	µg/L	0.000022	<6.51E-06	<2.63E-05	<4.18E-05	<5.70E-05	<1.92E-05
Benzene	µg/L	5.9	<0.1	<0.1	<0.05	<0.02	<0.004
Benzidine[b]	µg/L	0.000069	<5.5	<4.9	<4.4	<1.5	<0.2
Beryllium[d]	µg/L	0.033	2.38E-6	2.14E-6	1.91E-6	6.41E-7	1.00E-7
Bis(2-chloroethyl)ether[b]	µg/L	0.045	<2.6	<2.4	<2.1	<0.7	<0.1
Bis(2-ethyl-hexyl)phthalate	µg/L	3.5	0.1	0.4	0.7	0.9	0.3
Carbon tetrachloride	µg/L	0.90	<0.1	<0.1	<0.05	<0.02	<0.004
Chlordane	µg/L	0.000023	1.23E-6	3.91E-6	6.00E-6	7.89E-6	2.65E-6
Chlorodibromomethane	µg/L	8.6	<0.1	<0.1	<0.05	<0.02	<0.004
Chloroform	µg/L	130	0.1	0.1	0.1	0.04	0.01
DDT	µg/L	0.00017	1.53E-7	5.28E-7	8.21E-7	1.09E-6	3.68E-7
1,4-Dichlorobenzene	µg/L	18	0.1	0.1	0.1	0.03	0.01
3,3-Dichlorobenzidine[b]	µg/L	0.0081	<5.5	<4.9	<4.4	<1.5	<0.2
1,2-Dichloroethane	µg/L	28	<0.1	<0.1	<0.05	<0.02	<0.004
1,1-Dichloroethylene	µg/L	0.9	0.1	0.1	0.05	0.02	0.004
Dichlorobromomethane	µg/L	6.2	<0.1	<0.1	<0.05	<0.02	<0.004
Dichloromethane	µg/L	450	<0.1	0.1	0.05	0.02	0.004
1,3-dichloropropene	µg/L	8.9	<0.1	<0.1	<0.05	<0.02	<0.004
Dieldrin	µg/L	0.00004	3.01E-6	3.15E-6	3.21E-6	2.01E-6	5.37E-7
2,4-Dinitrotoluene	µg/L	2.6	<0.01	<0.02	<0.02	<0.03	<0.01

TABLE 4.3-15 (Continued)
MPWSP OPERATIONAL DISCHARGE SCENARIOS: ESTIMATED CONCENTRATIONS AT THE EDGE OF THE ZID FOR OCEAN PLAN CONSTITUENTS

Constituent	Units	Ocean Plan Objective	Estimated Concentration at Edge of ZID by Scenario				
			MPWSP				
			2	3	4	5	6
Objectives for protection of human health – carcinogens – 30-day average limit (cont.)							
1,2-Diphenylhydrazine[b]	µg/L	0.16	<1.1	<1.0	<0.9	<0.3	<0.05
Halomethanes	µg/L	130	0.1	0.1	0.05	0.02	0.004
Heptachlor[b]	µg/L	0.00005	<4.60E-06	<4.51E-05	<7.69E-05	<1.12E-04	<3.81E-05
Heptachlor Epoxide	µg/L	0.00002	1.35E-07	4.45E-07	6.86E-07	9.09E-07	3.05E-07
Hexachlorobenzene	µg/L	0.00021	4.18E-06	4.08E-06	3.93E-06	1.99E-06	4.72E-07
Hexachlorobutadiene	µg/L	14	2.60E-08	6.03E-08	8.68E-08	1.06E-07	3.52E-08
Hexachloroethane	µg/L	2.5	<1.1	<1.0	<0.9	<0.3	<0.05
Isophorone	µg/L	730	<0.1	<0.1	<0.05	<0.02	<0.004
N-Nitrosodimethylamine	µg/L	7.3	0.0002	0.0003	0.0003	0.0002	0.0001
N-Nitrosodi-N-Propylamine	µg/L	0.38	0.0003	0.001	0.001	0.001	0.0003
N-Nitrosodiphenylamine	µg/L	2.5	<1.1	<1.0	<0.9	<0.3	<0.05
PAHs	µg/L	0.0088	1.51E-04	2.48E-04	3.23E-04	3.45E-04	1.11E-04
PCBs	µg/L	0.000019	8.76E-06	1.07E-05	1.20E-05	9.86E-06	2.94E-06
TCDD Equivalents[d]	µg/L	3.9E-09	6.23E-11	6.17E-10	1.05E-09	1.53E-09	5.22E-10
1,1,2,2-Tetrachloroethane	µg/L	2.3	<0.1	<0.1	<0.05	<0.02	<0.004
Tetrachloroethylene	µg/L	2.0	<0.1	<0.1	<0.05	<0.02	<0.004
Toxaphene[e]	µg/L	2.1E-04	5.75E-06	3.42E-05	5.65E-05	7.99E-05	2.71E-05
Trichloroethylene	µg/L	27	<0.1	<0.1	<0.05	<0.02	<0.004
1,1,2-Trichloroethane	µg/L	9.4	<0.1	<0.1	<0.05	<0.02	<0.004
2,4,6-Trichlorophenol[b]	µg/L	0.29	<1.1	<1.0	<0.9	<0.3	<0.05
Vinyl chloride	µg/L	36	<0.03	<0.03	<0.03	<0.01	<0.003

NOTES:

[a] Calculating flow-weighted averages for toxicity (acute and chronic) and radioactivity (gross beta and gross alpha) is not appropriate based the nature of the constituent.

[b] All observed values from some data sources were below the MRL, and the flow-weighted average of the MRLs is higher than the Ocean Plan objective. No compliance conclusions can be drawn for these constituents.

[c] Acrylonitrile was only detected in one potential source water for the Variant Project. It was not detected in any potential source waters for the MPWSP Project; therefore, a compliance determination cannot be made for the MPWSP Project.

[d] Acrylonitrile, beryllium and TCDD equivalents represent a special case; they were detected in some source waters, but were also not detected above the MRL in others, and the MRL values are above the Ocean Plan objectives. For these constituents, a value of 0 was assumed when it was not detected in a source water and the MRL was above the Ocean Plan objective. This assumption was made to show there is potential for the constituent to exceed the Ocean Plan objective in some flow scenarios, but there is not enough information to provide a complete compliance determination at this time. When only the detected values were considered, acrylonitrile and beryllium did not exceed the Ocean Plan objective by 80% or more.

[e] Toxaphene was only detected using the low-detection techniques of the CCLEAN program. It was detected once (09/2011) out of 12 samples collected from the secondary effluent from 2010 through 2015, and during the 7-day composite sample from the test slant well.

SOURCE: Appendix D3.

TABLE 4.3-16
MPWSP OPERATIONAL DISCHARGE SCENARIOS: ESTIMATED CONCENTRATIONS AT THE EDGE OF THE ZID EXPRESSED AS PERCENTAGE OF OCEAN PLAN OBJECTIVE FOR OCEAN PLAN CONSTITUENTS

Constituent	Units	Ocean Plan Objective	Percentage of Ocean Plan Objective at Edge of ZID by Scenario[a]				
			MPWSP				
			2	3	4	5	6
Objectives for protection of marine aquatic life - 6-month median limit							
Arsenic	µg/L	8	49%	50%	51%	46%	40%
Cadmium	µg/L	1	32%	29%	26%	10%	2%
Chromium (Hexavalent)	µg/L	2	3%	3%	3%	2%	1%
Copper	µg/L	3	64%	65%	67%	69%	68%
Lead	µg/L	2	2%	2%	2%	1%	0.2%
Mercury	µg/L	0.04	67%	61%	54%	20%	4%
Nickel	µg/L	5	14%	13%	12%	5%	1%
Selenium	µg/L	15	0.3%	0.3%	0.4%	0.3%	0.1%
Silver	µg/L	0.7	26%	<26%	<25%	<24%	<23%
Zinc	µg/L	20	40%	41%	41%	41%	40%
Cyanide	µg/L	1	57%	54%	51%	23%	5%
Total Chlorine Residual	µg/L	2	–	–	–	–	–
Ammonia (as N) - 6-mo median	µg/L	600	4%	29%	48%	68%	23%
Ammonia (as N) - Daily Max	µg/L	2,400	1%	10%	16%	23%	8%
Acute Toxicity[b]	TUa	0.3					
Chronic Toxicity[b]	TUc	1					
Phenolic Compounds (non-chlorinated)	µg/L	30	18%	17%	16%	7%	2%
Chlorinated Phenolics[c]	µg/L	1	--	--	--	--	--
Endosulfan	µg/L	0.009	0.1%	1%	1%	2%	1%
Endrin	µg/L	0.002	0.01%	0.02%	0.03%	0.05%	0.02%
HCH (Hexachlorocyclohexane)	µg/L	0.004	0.5%	4%	7%	10%	3%
Radioactivity (Gross Beta)[b]	pci/L	0.0					
Radioactivity (Gross Alpha)[b]	pci/L	0.0					
Objectives for protection of human health – non carcinogens – 30-day average limit							
Acrolein	µg/L	220	<0.1%	<0.1%	<0.1%	<0.1%	<0.01%
Antimony	µg/L	1,200	0.0010%	0.0011%	0.0012%	0.0009%	0.0002%
Bis (2-chloroethoxy) methane	µg/L	4.4	<24%	<22%	<20%	<7%	<1%
Bis (2-chloroisopropyl) ether	µg/L	1200	<0.09%	<0.08%	<0.07%	<0.02%	<0.01%
Chlorobenzene	µg/L	570	<0.01%	<0.01%	<0.01%	<0.01%	<0.01%
Chromium (III)	µg/L	190,000	0.0006%	0.0005%	0.0005%	0.0002%	0.00003%
Di-n-butyl phthalate	µg/L	3,500	<0.03%	<0.03%	<0.03%	<0.01%	<0.01%
Dichlorobenzenes	µg/L	5,100	0.001%	0.001%	0.001%	0.001%	0.0002%
Diethyl phthalate	µg/L	33,000	<0.01%	<0.01%	<0.01%	<0.01%	<0.01%
Dimethyl phthalate	µg/L	820,000	<0.01%	<0.01%	<0.01%	<0.01%	<0.01%
4,6-dinitro-2-methylphenol	µg/L	220	<2%	<2%	<2%	<1%	<0.1%
2,4-Dinitrophenol[c]	µg/L	4.0	--	--	--	--	--
Ethylbenzene	µg/L	4,100	<0.01%	<0.01%	<0.01%	<0.01%	<0.01%

TABLE 4.3-16 (Continued)
MPWSP OPERATIONAL DISCHARGE SCENARIOS: ESTIMATED CONCENTRATIONS AT THE EDGE OF THE ZID EXPRESSED AS PERCENTAGE OF OCEAN PLAN OBJECTIVE FOR OCEAN PLAN CONSTITUENTS

Constituent	Units	Ocean Plan Objective	Percentage of Ocean Plan Objective at Edge of ZID by Scenario[a]				
			MPWSP				
			2	3	4	5	6
Objectives for protection of human health – non carcinogens – 30-day average limit (cont.)							
Fluoranthene	µg/L	15	0.1%	0.1%	0.1%	0.02%	0.003%
Hexachlorocyclopentadiene	µg/L	58	<0.01%	<0.01%	<0.01%	<0.01%	<0.01%
Nitrobenzene	µg/L	4.9	<54%	<48%	<43%	<15%	<2%
Thallium	µg/L	2	<0.3%	<0.4%	<0.4%	<0.4%	<0.1%
Toluene	µg/L	85,000	<0.01%	<0.01%	<0.01%	<0.01%	<0.01%
Tributyltin[c]	µg/L	0.0014	--	--	--	--	--
1,1,1-Trichloroethane	µg/L	540,000	<0.01%	<0.01%	<0.01%	<0.01%	<0.01%
Objectives for protection of human health – carcinogens – 30-day average limit							
Acrylonitrile[d,e]	µg/L	0.10	--	--	--	--	--
Aldrin[c]	µg/L	0.000022	--	--	--	--	--
Benzene	µg/L	5.9	<1%	<1%	<1%	<0.3%	<0.1%
Benzidine[c]	µg/L	0.000069	--	--	--	--	--
Beryllium[e]	µg/L	0.033	0%	0%	0%	0%	0%
Bis(2-chloroethyl)ether[c]	µg/L	0.045	--	--	--	--	--
Bis(2-ethyl-hexyl)phthalate	µg/L	3.5	3%	12%	19%	25%	9%
Carbon tetrachloride	µg/L	0.90	<6%	<6%	<5%	<2%	<0.5%
Chlordane	µg/L	0.000023	5%	17%	26%	34%	12%
Chlorodibromomethane	µg/L	8.6	<1%	<1%	<1%	<0.2%	<0.05%
Chloroform	µg/L	130	0.04%	0.04%	0.05%	0.03%	0.01%
DDT	µg/L	0.00017	0.09%	0.31%	0.48%	0.64%	0.22%
1,4-Dichlorobenzene	µg/L	18	0.3%	0.3%	0.3%	0.2%	0.05%
3,3-Dichlorobenzidine[c]	µg/L	0.0081	--	--	--	--	--
1,2-Dichloroethane	µg/L	28	<0.2%	<0.2%	<0.2%	<0.1%	<0.02%
1,1-Dichloroethylene	µg/L	0.9	6%	6%	5%	2%	0.5%
Dichlorobromomethane	µg/L	6.2	<1%	<1%	<1%	<0.3%	<0.1%
Dichloromethane	µg/L	450	0.01%	0.01%	0.01%	0.005%	0.001%
1,3-dichloropropene	µg/L	8.9	<1%	<1%	<1%	<0.2%	<0.05%
Dieldrin	µg/L	0.00004	8%	8%	8%	5%	1%
2,4-Dinitrotoluene	µg/L	2.6	<0.5%	<1%	<1%	<1%	<0.3%
1,2-Diphenylhydrazine[c]	µg/L	0.16	--	--	--	--	--
Halomethanes	µg/L	130	0.04%	0.04%	0.04%	0.02%	0.003%
Heptachlor[c]	µg/L	0.00005	--	--	--	--	--
Heptachlor Epoxide	µg/L	0.00002	1%	2%	3%	5%	2%
Hexachlorobenzene	µg/L	0.00021	2%	2%	2%	1%	0.2%
Hexachlorobutadiene	µg/L	14	1.86E-7%	4.30E-7%	6.20E-7%	7.60E-7%	2.52E-7%
Hexachloroethane	µg/L	2.5	<43%	<38%	<35%	<12%	<2%
Isophorone	µg/L	730	<0.008%	<0.007%	<0.007%	<0.003%	<0.001%
N-Nitrosodimethylamine	µg/L	7.3	0.003%	0.004%	0.004%	0.003%	0.001%

TABLE 4.3-16 (Continued)
MPWSP OPERATIONAL DISCHARGE SCENARIOS: ESTIMATED CONCENTRATIONS AT THE EDGE OF THE ZID EXPRESSED AS PERCENTAGE OF OCEAN PLAN OBJECTIVE FOR OCEAN PLAN CONSTITUENTS

Constituent	Units	Ocean Plan Objective	Percentage of Ocean Plan Objective at Edge of ZID by Scenario[a]				
			MPWSP				
			2	3	4	5	6
Objectives for protection of human health – carcinogens – 30-day average limit (cont.)							
N-Nitrosodi-N-Propylamine	µg/L	0.38	0.1%	0.1%	0.2%	0.2%	0.1%
N-Nitrosodiphenylamine	µg/L	2.5	<43%	<38%	<34%	<12%	<2%
PAHs	µg/L	0.0088	2%	3%	4%	4%	1%
PCBs	µg/L	0.000019	46%	56%	63%	52%	15%
TCDD Equivalents[e]	µg/L	3.9E-09	2%	16%	27%	38%	13%
1,1,2,2-Tetrachloroethane	µg/L	2.3	<2%	<2%	<2%	<1%	<0.2%
Tetrachloroethylene	µg/L	2.0	<3%	<3%	<2%	<1%	<0.2%
Toxaphene[e]	µg/L	2.1E-04	3%	16%	27%	38%	13%
Trichloroethylene	µg/L	27	<0.2%	<0.2%	<0.2%	<0.1%	<0.02%
1,1,2-Trichloroethane	µg/L	9.4	<1%	<1%	<1%	<0.2%	<0.04%
2,4,6-Trichlorophenol[c]	µg/L	0.29	--	--	--	--	--
Vinyl chloride	µg/L	36	<0.1%	<0.1%	<0.1%	<0.04%	<0.01%

NOTE: footnotes provided under Table 4.3-15

SOURCE: Appendix D3.

The model analysis determined that MPWSP operational discharges would not exceed Ocean Plan water quality objectives for the constituents listed in **Table 4.3-3** for which a compliance determination could be made. However, 10 of the constituents[37] were not detected above the analytical laboratory Method Reporting Limit[38] (MRL) in any of the source waters, but the MRLs were higher than the Ocean Plan objective.[39] For this reason, no compliance conclusion can be drawn for these 10 constituents. This is a typical occurrence for ocean discharges because the MRL can be higher than the Ocean Plan objective for certain constituents. Three additional constituents—acrylonitrile, beryllium, and TCDD equivalents—were initially identified as having the potential to exceed water quality objectives because they were detected in either the desalination brine or wastewater, but not in both. However, there is not enough information to assess the concentrations for these three constituents in the combined discharge of wastewater and brine due to differences in MRLs applied in the brine source waters as compared to the

37 Chlorinated phenolics, 2,4-dinitrophenol, tributyltin, aldrin, benzidine, bis(2-chloroethyl)ether, 3,3-dichlorobenzidine, 1,2-diphenylhydrazine, heptachlor, 2,4,6-trichlorophenol.

38 The lowest amount of an analyte in a sample that can be quantitatively determined with acceptable precision and accuracy under stated analytical conditions (i.e., the lower limit of quantitation).

39 The exceptions to this statement are:2,4-dinitrophenol was not detected in the MPWSP secondary effluent, and this MRL is lower than the Ocean Plan objective (i.e., MRL = 0.5 µg/L versus 4 µg/L = objective); heptachlor was not detected above the MRL in the slant well, and this MRL is lower than the Ocean Plan objective (i.e., MRL = 0.00000069 µg/L versus 0.00005 µg/L).

MRWPCA wastewater. As such, a complete compliance determination could not be conclusively made for these three constituents.

Based on the 80 percent threshold, described above, implementation of the MPWSP would not cause exceedances of Ocean Plan water quality objectives for the measureable constituents (see **Tables 4.3-15** and **4.3-16**). As shown in the tables, concentrations would not become elevated for the assessed discharge scenarios to levels greater than 80 percent of the Ocean Plan objectives. However, gaps in the available water quality data mean that a compliance determination could not be made for numerous constituents listed in **Table 4.3-3**. Additionally, only a partial determination could be made for three constituents (acrylonitrile, beryllium, and TCDD equivalents). As such, it is possible that Ocean Plan water quality objectives would be exceeded as a result of operational discharges. Only future water quality testing and analysis, such as that required under the NPDES permit process, would determine whether operational discharges under the MPWSP would fully comply with Ocean Plan water quality objectives. Therefore, it must be conservatively concluded that the MPWSP could result in a significant, yet mitigable, impact.

Consistency with Regulatory Requirements

In addition to the impacts described above, operational discharges of the MPWSP could conflict with other applicable regulatory requirements and guidelines, as noted in Section 4.3.2, Regulatory Framework. Operational discharges resulting from implementation of the proposed MPWSP may be potentially inconsistent with provisions of the National Marine Sanctuaries Act, the California Ocean Plan, MBNMS Guidelines for operation of desalination facilities, and the City of Marina LCP (Section 30231: Biological Productivity; Water Quality). Specifically, operational discharges could conflict with requirements and guidelines which were established to avoid or mitigate impacts on water quality, aquatic wildlife, and other beneficial uses of marine waters. **Mitigation Measure 4.3-5 (Implement Protocols to Avoid Exceeding Water Quality Objectives)** would require CalAm to perform an extensive water quality assessment prior to implementation of the MPWSP; in addition, operational discharges that cannot be demonstrated to conform to the prescribed performance standards may only be released following implementation of additional design features, engineering solutions, and/or operational measures. With implementation of the proposed mitigation, the proposed project would be consistent with regulatory requirements and MBNMS guidelines.

Impact Summary and Conclusion – Ocean Plan Water Quality Constituents

The model-based analyses concluded constituent concentrations would not become elevated for the assessed discharge scenarios to levels greater than 80% of the Ocean Plan objective. However, a compliance determination could not be made for numerous constituents due to insufficient available data. Water quality testing and analysis required under the NPDES permit process, would determine whether operational discharges under the MPWSP would fully comply with Ocean Plan water quality objectives. Therefore, in the absence of such data, it was conservatively concluded that the MPWSP could result in exceedances of Ocean Plan objectives, resulting in a significant impact related to water quality standards, waste discharge requirements and water quality of receiving waters in Monterey Bay. Significant impacts would be reduced to a

less-than-significant level by implementing **Mitigation Measure 4.3-5 (Implement Protocols to Avoid Exceeding Water Quality Objectives)**.

Mitigation Measure 4.3-5 (Implement Protocols to Avoid Exceeding Water Quality Objectives) (presented below) requires that, prior to implementing operational discharges via the existing outfall, CalAm must perform an extensive water quality assessment as part of a waste disposal study to demonstrate compliance with Ocean Plan water quality objectives and minimum initial dilution requirements. Specifically, CalAm (and other dischargers, if applicable) would be required to analyze MPWSP operational discharges for the full range of regulated water quality constituents specified in the Ocean Plan and NPDES water quality requirements, in accordance with protocols approved by the RWQCB. Discharges would not be allowed if they do not conform to the Ocean Plan objectives for water quality. If the water quality assessment shows that releases via the existing outfall would exceed Ocean Plan objectives, then additional design features, engineering solutions, and/or operational measures must be implemented to reduce the concentration of water quality constituents in the operational discharges such that they conform with these objectives.

Mitigation Measure 4.3-4 (Operational Discharge Monitoring, Analysis, Reporting, and Compliance), described under Impact 4.3-4, above, would further reduce and minimize potential impacts by requiring CalAm to implement a comprehensive Monitoring and Mitigation Plan (Plan), following approval by the RWQCB and MBNMS, to obtain field monitoring and marine resource data in the area affected by a project. The Plan would set forth appropriate response thresholds and corrective actions that would be required if the acquired data indicated deleterious effects on receiving water quality or marine biological resources from MPWSP operational discharges.

Additionally, as stated above, it is required by law that operational discharges from the MPWSP be incorporated into an amended NPDES Permit. Under the amended NPDES permit, MPWSP operational discharges would be subject to the permit requirements prescribed by the RWQCB as part of the permit amendment process. Such requirements would be designed to ensure that operation of the MPWSP Desalination Plant would not violate waste discharge requirements defined in the amended NPDES permit, which incorporate the Ocean Plan objectives, upon discharge of the brine.

Mitigation Measures

Mitigation Measure 4.3-5 applies only to the operational discharges associated with the MPWSP Desalination Plant through the existing MRWPCA outfall.

> **Mitigation Measure 4.3-5: Implement Protocols to Avoid Exceeding Water Quality Objectives.**
>
> ***Compliance with Water Quality Objectives.*** Prior to MPWSP operations, and as part of the MRWPCA NPDES Permit amendment process (Order No. R3-2014-0013, NPDES Permit No. CA0048551), the permitee shall complete a water quality assessment. As part of the water quality assessment, the permitee shall:

- Quantify the projected final design discharge volume(s) by month based on project design and historic and projected monthly wastewater discharge volumes.
- Collect samples of the source waters and operational discharges and analyze them in a certified laboratory for the constituents listed in Table 1 of the California Ocean Plan (Ocean Plan Water Quality Objectives). Sampling must be completed in accordance with protocols approved by the US EPA and RWQCB.
- Demonstrate compliance for the full range of regulated water quality constituents specified in the Ocean Plan and NPDES water quality requirements in the context of minimum initial dilution values at the edge of the Zone of Initial Dilution (ZID) for the point of discharge.

If the results of the water quality assessment and waste disposal study find that operational discharges will not meet the NPDES water quality requirements, including the Ocean Plan receiving water limitation for salinity, at the edge of the zone of initial dilution (ZID) and the Brine Mixing Zone (BMZ), respectively (incorporated here as performance standards), then the MPWSP operational discharges shall not be released as proposed. Such operational discharges shall be subject to additional design features, engineering solutions, and/or operational measures to reduce the concentration of water quality constituents to be in conformance with the Ocean Plan water quality objectives and amended NPDES permit requirements at the edge of the ZID or BMZ, as applicable. Such necessary design features and operational measures shall either be implemented individually or in combination to achieve compliance (unless the RWQCB determines that different but equally effective measures be employed).

Such possible additional design features and operational measures include:

(1) *Additional pre-treatment of source water to the Desalination Plant:* Feasible methods to remove polychlorinated biphenyls (PCBs) and other organic compounds from the source water include additional filtration or use of granular activated carbon (GAC) - a U.S. Environmental Protection Agency-approved method.

(2) *Treatment of discharge:* The dischargers must consider one or more of the alternative feasible methods that remove residual compounds from the discharge to meet water quality objectives at the edge of the ZID. These methods include the following:

    (a) Use of GAC (similar to that under the additional pre-treatment of source water described above, but here such treatment would be applied to the effluent following processing at the desalination facility instead of to the source water from the slant wells);

    (b) Advanced oxidation with ultraviolet light with concurrent addition of hydrogen peroxide; or

    (c) Biologically active filtration downstream of ozone treatment to reduce the concentration of ammonia and residual organic matter present in the ozone effluent and to reduce the solids loading on the membrane filtration process. The filtration system would consist of gravity-fed filter basins with granular media and ancillary systems such as an alkalinity addition system for pH

control, backwash water basin (also used for membrane filtration backwash), and backwash water basin and pumps.

(3) *Retrofitting the existing outfall to increase dilution:* If this operational measure is implemented, the dischargers shall retrofit the outfall diffuser to include inclined diffuser jets positioned at the optimum angle to achieve maximum dilution.

(4) *Flow Augmentation:* If this operational measure is implemented, the dischargers shall decrease the density difference of the discharge and the receiving water through the addition of up to 5 mgd of flows with densities close to freshwater to increase the minimum dilution of dense discharges.

Determination of Efficacy of Mitigation Measures

The design features, engineering solutions, and/or operational measures required to be implemented, as necessary, either individually or as a combination, through Mitigation Measure 4.3-5 and/or Mitigation Measure 4.3-4, include additional pre-treatment of source water, post processing treatment of discharge flows, retrofit of the outfall diffuser, and/or flow augmentation. Information is provided below regarding the feasibility for these measures to reduce constituent concentrations and/or increase minimum dilution at the edge of the ZID from operational discharges in a manner that would ensure compliance with Ocean Plan objectives:

- Use of granular activated carbon (GAC) - a U.S. Environmental Protection Agency approved method – as part of pretreatment of source water of post processing treatment of effluent. GAC acts as a very strong sorbent and can effectively remove PCBs and other organic compounds from the source water (Luthy, 2015).
- Advanced oxidation with ultraviolet light with concurrent addition of hydrogen peroxide. This method is successfully used for the destruction of a variety of environmental contaminants such as synthetic organic compounds, volatile organic compounds, pesticides, pharmaceuticals and personal care products, and disinfection byproducts. This process is energy intensive, but oxidizes compounds that are difficult to adsorb with activated carbon, and requires a relatively small footprint.
- Biologically active filtration downstream of ozone treatment to reduce the concentration of ammonia and residual organic matter present in the ozone effluent and to reduce the solids loading on the membrane filtration process.
- Retrofitting the existing outfall to increase dilution. Diffusers for discharging dense effluents typically consist of nozzles that are inclined upwards to increase dilution and mixing. Such methods for dilution have been extensively studied (Roberts, 2016). These studies have demonstrated that retrofitting the existing outfall to include inclined diffuser jets (jets are currently oriented horizontally) increases dilution substantially. The optimum angle to the horizontal for the discharge of dense plumes for increasing initial dilution is 60° as this maximizes the path length and dilution of the dense discharge at the point of contact on the seafloor. For example, modeled dilution increases from 16:1 to 46:1 for the proposed MPWSP brine only discharge scenario when all diffuser ports are assumed to be inclined jets angled at 60° to the horizontal in model analyses (**Appendix D1**). Inclined jets can be achieved by retrofitting the existing check valves with upwardly inclined nozzles. From model analysis, all diffuser ports would require retrofit to achieve substantially increased dilution (i.e., not a subset).

- Flow Augmentation to increase dilution: The minimum dilution of dense discharges may be increased through the addition of flows with densities close to freshwater (such as the MRWPCA waste water), when available. The addition of such flows would decrease the density difference of the operational discharge and the receiving water. As modeled by Roberts (2016; Appendix D1), it was demonstrated that when flows with densities similar to that of freshwater were added to the dense brine discharges, the resulting discharge plumes exiting the diffuser ports had a flatter and longer trajectory due to smaller density differences of the discharge as compared to the receiving waters. The decrease in density differences resulted in increased dilution. For low added volumes (e.g. 1 mgd), the effect on dilution was determined to be minor. As the added flows are increased to where the density of the combined effluent approaches that of the background, i.e., the flow becomes neutrally buoyant, the dilution increases exponentially. Roberts (2016) demonstrated that adding 2.3 to 4.8 mgd of freshwater flows, depending on the discharge scenario, can substantially increase minimum dilution at the edge of the ZID to a degree similar to that achieved by retrofitting the diffuser ports with nozzles that are inclined upwards 60° (described above).

4.3.5.4 Secondary Impacts of Mitigation Measure 4.3-5

Potential secondary impacts associated with implementation of **Mitigation Measure 4.3-5 (Implement Protocols to Avoid Exceeding Water Quality Objectives)** are discussed below. Secondary impacts would be associated with the treatment methods and any components that may be installed as part of **Mitigation Measure 4.3-5**.

GAC Facility to Treat the Source Water and/or Brine:

- The GAC facility would consist of GAC adsorption equipment likely consisting of a series of pressure vessels, a building and a backwash system similar to the proposed pressure filtration pretreatment system. Based on the preliminary MPWSP Desalination Plant design, the GAC units could be accommodated within the currently proposed building footprint. The installation of the GAC facility would be a part of the construction activities associated with the MPWSP Desalination Plant site within the existing footprint and would not create new or additional impacts beyond those discussed for the construction at the site in this EIR/EIS. The impact would be less than significant.

- Treatment of the source water (as opposed to the brine) could potentially be provided by GAC filter-adsorbers that would be similar to the proposed pressure filtration pretreatment system. If GAC adsorption of the source water were to replace or supplement the proposed conventional filtration process, water quality of the drinking water delivered to the distribution system would likely improve as measured by lower concentrations of organic compounds, total organic carbon, disinfection byproducts; fewer tastes and odors; and more stable chlorine residuals. Other benefits might include reduced fouling potential at the RO membranes.

  Operation of the GAC adsorption process would generate spent GAC, which would be considered hazardous waste. Handling and disposal of the waste generated would be subject to federal and state hazardous waste regulations (discussed in Section 4.7, Hazards and Hazardous Materials**)**. For example, the federal Toxic Substances Control Act of 1976 and the Resource Conservation and Recovery Act of 1976 authorized the USEPA to regulate the generation, transportation, treatment, storage, and disposal of hazardous waste.

The Resource Conservation and Recovery Act was amended in 1984 by the Hazardous and Solid Waste Act, which affirmed and extended the "cradle to grave" system of regulating hazardous wastes. Further, the California Occupational Safety and Health Act (OSHA) of 1973 would apply to handling of spent GAC material onsite. The California OSHA addresses California employee working conditions, enables the enforcement of workplace standards, and provides for advancements in the field of occupational health and safety. Thus, handling, transportation, and disposal of the spent GAC material generated at the MPWSP Desalination Plant site would be subject to, and would adhere to, the regulations intended to protect environmental and public health and ensure safety. Therefore, the impact would be less than significant.

- Operating the GAC adsorption system would result in an increase in energy use, in particular if there is additional pumping necessary. The system could operate using the pressure of the brine stream, or it may require an intermediate pumping station. It is anticipated that operation of the GAC adsorption system would thus increase the energy use at the proposed MPWSP Desalination Plant. The impacts resulting from energy use from the proposed project are discussed in Section 4.11, Greenhouse Gas Emissions and Section 4.18, Energy Conservation, and the secondary impacts from the operation of the GAC adsorption system are discussed below.

  – Section 4.11, Greenhouse Gas Emissions, identifies the increase in greenhouse gas emissions due to increased energy use from the proposed project as a significant and unavoidable impact. Any increase in the energy usage resulting from operating the GAC adsorption system would increase the severity of the significant impact. Therefore, in this case, operating the GAC adsorption system would contribute to a significant and unavoidable impact.

  – CalAm's operational electrical power demand for water production under the proposed project (including water produced from the MPWSP Desalination Plant, Seaside Groundwater Basin production wells, ASR system, and the Carmel River) and the net increase in annual electrical power demand for water production is described in Section 4.18, Energy Conservation. The analysis in Section 4.18 determined that the proposed project would not consume energy wastefully or inefficiently. The GAC adsorption system for removing organic compounds from the source water and/or the brine would be employed to ensure that the brine discharged to the bay would comply with the water quality standards or regulatory requirements, which are protective of the beneficial uses of the bay. Therefore, electricity consumed as a result of project operations, including that from operating the GAC system, would not be wasteful or inefficient. The increase in the energy use for any GAC adsorption system would be less than significant.

    As discussed in Section 4.18, Energy Conservation, Pacific Gas and Electric (PG&E), the power provider in the project area, would have adequate capacity and infrastructure to support the proposed project. Electric power for implementation of the proposed project could be accommodated by the existing local and regional energy supplies and the impact would be less than significant. An incremental increase in the energy use from the operation of the GAC adsorption system would be accommodated within the existing capacity. Therefore, the secondary impact would be less than significant.

- Maintenance of the GAC system would involve removing and replacing the GAC, which would be accommodated within the proposed operations and maintenance of the MPWSP Desalination Plant; therefore, no environmental impact would result from maintenance.

Advanced Oxidation System and Facility to Treat the Brine:

- The advanced oxidation system would likely include a building with a liquid hydrogen peroxide chemical storage and feed system. The building would be installed as part of the construction activities associated with the MPWSP Desalination Plant site and would not create new or additional impacts beyond those discussed for the construction at the site.
- The advanced oxidation process would generate minimal byproducts and no residuals compounds or liquid or solid waste. The quality of the brine discharged to Monterey Bay would improve as a result of the removing organic compounds. The impact related to solid or liquid waste and disposal would therefore be less than significant.
- Implementing the advanced oxidation system would result in an increase in energy use. It is anticipated that operation of the advanced oxidation system would thus increase the energy use at the proposed Desalination Plant. The impacts resulting from energy use from the proposed project are discussed in Section 4.11, Greenhouse Gas Emissions, and Section 4.18, Energy Conservation, and the secondary impacts from the operation of the advanced oxidation are discussed below:
  - Section 4.11, Greenhouse Gas Emissions, identifies the increase in greenhouse gas emissions due to increased energy use from the proposed project as a significant and unavoidable impact. Any additional increase in energy use resulting from operating the advanced oxidation system would increase the severity of the significant impact. Therefore, in this issue area, operating the advanced oxidation system would contribute to a significant and unavoidable impact.
  - CalAm's operational electrical power demand for water production under the proposed project (including water produced from the MPWSP Desalination Plant, Seaside Groundwater Basin production wells, ASR system, and the Carmel River) is estimated in Section 4.18, Energy Conservation. The analysis in Section 4.18 determined that the proposed project would not consume energy wastefully or inefficiently. The advanced oxidation system for removing organic compounds from the source water and/or the brine would be employed to ensure that the brine discharged to the bay would comply with the water quality standards or regulatory requirements, which are protective of the beneficial uses of the bay. Therefore, electricity consumed as a result of project operations, including that from operating of the advanced oxidation system, would not be wasteful or inefficient. The increase in the energy use for any advanced oxidation system would be less than significant.

    Further, PG&E, the power provider in the project area, would have adequate capacity and infrastructure to support the proposed project. Electric power for implementation of the proposed project could be accommodated by the existing local and regional energy supplies and the impact would be less than significant. An incremental increase in energy use from the operation of the advanced oxidation system would be accommodated within the existing capacity of PG&E. Within the MPWSP Desalination Plant site, this could require increasing the capacity of the power distribution system to accommodate the additional electrical load; however this

would not entail additional construction or installation activities. The secondary impact is considered less than significant.

- The advanced oxidation system would require a liquid hydrogen peroxide chemical storage and feed system onsite. Under the proposed project, the MPWSP Desalination Plant operations would involve the use and storage of chemicals to remove performance-reducing deposits from the pretreatment filtration system and RO membranes, as well as chemicals to adjust product water quality. The impact from routine transport, use, or disposal of hazardous materials during project operations is discussed under Impact 4.7-6 in Section 4.7, Hazards and Hazardous Materials. As discussed in the section, CalAm, as required by law, would submit a Hazardous Materials Business Plan (HMBP) for the project facilities to the Monterey County Environmental Health Division prior to the start of project operations. The HMBP is required to include information on hazardous material handling and storage, including containment, site layout, and emergency response and notification procedures in the event of a spill or release. In addition, the plan requires annual employee health and safety training. The plan must be approved by the County prior to commencement of project construction and the project facilities would be subject to post-construction compliance inspections. The HMBP would also provide the local agencies with the information they need to plan appropriately for a chemical release, fire, or other incident, which would reduce the potential for an accidental release to cause harmful health effects to workers or the public or substantial degradation to soil or water quality. Compliance with these various regulations would ensure this impact is less than significant. The hydrogen peroxide storage and feed system for the advanced oxidation system would be included as part of the HBMP and be subject to the regulatory requirements described for other chemicals proposed to be stored, used, and handled onsite and would not result in a new or significant impact. The secondary impact therefore would be less than significant.

Biologically Active Filtration System to Treat the Brine

The biologically active filtration system would consist of gravity-fed filter basins with approximately 12 feet of granular media, and a media support system. Ancillary systems would include an alkalinity addition system for pH control, backwash waste water basin (also used for membrane filtration backwash wastewater), backwash pumps, an air compressor and supply system for air scour, an air compressor and supply system for process air, and a wash water basin to facilitate filter backwashing (the wash water basin may be combined with the membrane filtration flow equalization basin at the plant).

The biologically active filtration system would be installed within the existing footprint of the Regional Wastewater Treatment Plant. Construction and operation of the system would not result in additional or more severe secondary impacts on the environment beyond those discussed in this EIR. The secondary impact from the biologically active filtration system would be less than significant.

Retrofitting the Existing Outfall to Increase Dilution

Retrofitting the existing MRWPCA outfall diffuser would be achieved by installing inclined nozzles on the existing diffuser check valves. The impacts associated with the physical construction of such a retrofit would likely be minor and temporary, consisting primarily of minor

construction-related sea-bed disturbance and water quality degradation in the form of increased turbidity and disturbance of benthic organisms on and adjacent to the outfall diffuser. Such temporary disturbances to the sea-bed and increases in turbidity would be minor, primarily occurring through the process of divers staging and installing equipment to complete the retrofit of the diffuser. Water quality would rapidly return to ambient conditions following completion of the retrofit as sediments re-settle on the seabed. Similarly, any disturbance to benthic communities would consist of a minor disturbance over a small area, consisting of the outfall diffuser and seabed immediately surrounding the diffuser. Prior to implementation of the retrofit, MBNMS would review and approve design specifications and construction plans to ensure that disturbances to benthic communities are minimized or avoided. The disturbance would be short in duration and of low intensity and benthic communities would likely recover to baseline conditions. The secondary impact from retrofitting the existing outfall to increase dilution would be less than significant.

Flow Augmentation

Flow augmentation would be achieved by the addition of flows to operational discharges with densities close to freshwater (such as the MRWPCA waste water), when available. The impacts associated with such flow augmentation would be minor, consisting of negligible increased velocities of the operational discharges. Extreme discharge velocities have the capacity to entrain aquatic wildlife, such as larval stage or planktonic stage organisms, and subject such organisms to shear stress, resulting in increased rates of mortality. As demonstrated by Roberts (2016), because the existing diffuser ports are equipped with Tideflex duckbill diffuser nozzles, the diffuser ports increase in opening diameter as flow increases. Therefore, velocity increases as a result of flow augmentation would be negligible due to the increased port opening diameter offsetting the increased jet velocity as compared to increased velocities that would occur for a fixed orifice port. Impacts relating to entrainment and shear stress are discussed in detail in Section 4.5, Marine Biological Resources. The secondary impact from flow augmentation to increase dilution would be less than significant.

Impact 4.3-6: Degradation of water quality due to discharges associated with maintenance of the subsurface intake wells and ASR-5 and ASR-6 Wells. *(Less than Significant)*

This impact focuses on discharges of effluent generated during maintenance of the subsurface intake wells and ASR-5 and ASR-6 Wells. This impact does not apply to any of the other proposed facilities.

Subsurface Slant Wells

As described in Section 3.6.1 of Chapter 3, Description of the Proposed Project, the subsurface slant wells would require periodic maintenance every 5 years. Slant well maintenance activities would disturb roughly 6 acres at the CEMEX active mining area for 9 to 18 weeks during well

cleaning operations. Beach sand disturbed during maintenance activities would be susceptible to erosion and could migrate outside of the work area. However, because sand migration is a natural ongoing process along the shoreline, the migration of sand within and to areas adjacent to the CEMEX active mining area would not adversely affect water quality. However, toxic chemicals used to maintain heavy maintenance equipment, such as fuels and petroleum lubricants, if not managed appropriately, could be accidentally released to sensitive beach areas and adversely affect shallow groundwater and/or water quality in Monterey Bay.

As described in Chapter 3, Description of the Proposed Project, mechanical brushes would be lowered into the slant wells to mechanically clean the well screens. If chemical cleaning products are needed for maintenance, only environmentally inert products would be used. However, the effluent produced during slant well cleaning could carry sediment or other contaminants that, if discharged directly to the beach area, could adversely affect water quality in Monterey Bay.

Slant well maintenance activities would be considered a "land disturbance activity" and would be subject to the water quality control requirements of the *General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (Order No. 2009-0009, NPDES No. CAS000002)* (Construction General Permit) (SWRCB, 2009). Similar to slant well construction activities, the contractor conducting the maintenance would be required to prepare a SWPPP that includes specific measures to manage pollutants generated during maintenance activities. These measures would address the potential adverse effects to water quality associated with equipment fueling and storage, inadvertent releases of toxic chemicals, and discharges of cleaning effluent. The cleaning effluent would be conveyed to portable holding tanks to allow chemical residuals and sediment to settle out, and the decanted water would be subsequently percolated into the ground in the CEMEX active mining area. (See Section 4.3.2.2 and Impact 4.3-1, above, for additional information regarding the Construction General Permit requirements.) Adherence to these requirements would prevent significant water quality impacts during slant well maintenance activities. The impact would be less than significant. No mitigation is necessary.

ASR-5 and ASR-6 Wells

As part of routine maintenance of the ASR-5 and ASR-6 Wells, CalAm facility operators would regularly backflush accumulated sediment and turbid water from the two wells. The duration of the backflushing would range from a few minutes to 2 hours. Water produced during routine backflushing would be conveyed via the new ASR Pump-to-Waste Pipeline to the existing Phase I ASR Pump-to-Waste System located at the intersection of General Jim Moore Boulevard and Coe Avenue. These discharges would be considered "water supply discharges" and would be conducted under the *General Waiver of WDRs for Specific Types of Discharges* (Resolution R3-2014-0041) (General Waiver) (RWQCB, 2014). As such, discharges of backflush effluent would be subject to the conditions of the General Waiver, including the requirements that all discharges occur at distances greater than 100 feet from streams, wetlands, and other water bodies, and that appropriate management practices be implemented to preclude discharging to surface waters and surface water drainage courses. In addition, backflush effluent discharges would be subject to the condition that it would not have chlorine or bromine concentrations that could impact

groundwater quality. Compliance with the conditions of the General Waiver would prevent the degradation of water quality during routine maintenance of the ASR-5 and ASR-6 Wells. The impact would be less than significant, and no mitigation is necessary.

Impact Conclusion

Discharges related to periodic maintenance of the subsurface slant wells and routine maintenance of the ASR-5 and ASR-6 Wells would be conducted in accordance with regulatory requirements designed to protect water quality. As a result, the impact would be less than significant for both facility components.

Mitigation Measures

None proposed.

Impact 4.3-7: Alteration of drainage patterns such that there is a resultant increase in erosion, siltation, or the rate or amount of surface runoff. (*Less than Significant*)

During construction of the various proposed MPWSP components, soil disturbance associated with grading and earthmoving operations could expose soils to stormwater runoff, which could result in onsite erosion and sediments being transported in stormwater runoff, subsequently resulting in downstream siltation. Following construction (operation phase), stormwater runoff volumes and rates generated from undeveloped, unpaved areas can increase considerably when drainage patterns are substantially altered, a site is paved, the impervious surface area is increased, and the ability of surface water to infiltrate the ground surface is reduced or eliminated. The addition of impervious surfaces or the alteration of drainage patterns (such as through grading) can increase peak stormwater flows, causing erosion or siltation onsite or downstream. The majority of the proposed facilities would be constructed below ground and would not increase impervious surfaces or alter long-term drainage patterns during operations in a manner that increases onsite or offsite erosion or siltation. As discussed in detail above (Impact 4.3-1), construction of the proposed project would be subject to the Construction General Permit requirements, which include preparation of a SWPPP as well as additional local requirements governing management of construction stormwater and the use of established BMPs for the management of erosion during construction activities. As described in Impact 4.3-1, preparation and approval of the SWPPP associated with the Construction General Permit would include site-specific erosion and sedimentation control practices. Incorporation of these permit requirements would ensure the implementation of BMPs and specific measures for the protection of water quality effective in minimizing the potential for erosion or siltation as a result of altered drainage patterns. The SWPPP also includes descriptions of the BMPs required to reduce pollutants, including sediment, in stormwater discharges after all construction phases have been completed at the site (post-construction BMPs). Since the proposed project would create new impervious surfaces at the aboveground facilities located throughout the project area, impacts related to altered drainage patterns, erosion, and siltation are assessed in detail for specific project components below.

Subsurface Slant Wells

The subsurface slant wells would be constructed in a previously disturbed portion of the CEMEX active mining area in the city of Marina. The 10 slant wells would be located at six sites along the back of the dunes: four sites (the test slant well site and three new sites) would each have one slant well and two sites would have three slant wells at each (see **Figure 3-3**). Sites 1 through 6 would include the following aboveground facilities: one wellhead vault per slant well, mechanical piping (meters, valves, gauges), electrical control cabinet, and a pump-to-waste vault. The new permanent slant wells and associated aboveground infrastructure at Sites 2 through 6 would be constructed on a 5,250- to 6,025-square-foot concrete pad located above the maximum high tide elevation (no concrete pad would be constructed at Site 1).

Implementation of the subsurface slant wells at the CEMEX active mining area would result in a total increase in impervious surface area of approximately 27,800 square feet. As indicated in **Table 4.3-6**, above, the subsurface slant wells would qualify as a Tier 4 project and CalAm would be required to ensure flows for the 2-year through 10-year storm events match pre-project flows. With mandatory compliance with the post-construction stormwater requirements, alterations in drainage patterns at the CEMEX active mining area would not result in substantial increases in erosion, siltation, or the rate or amount of surface runoff. The impact would be less than significant.

MPWSP Desalination Plant

The proposed MPWSP Desalination Plant site would disturb approximately 25 acres of a 46-acre undeveloped parcel located on Charles Benson Road, northwest of the MRWPCA Regional Wastewater Treatment Plant. The proposed improvements at the MPWSP Desalination Plant site would include laboratory and administration buildings, various treatment and storage facilities, as well as paved parking, driveways, and maintenance areas. The site would add approximately 15 acres of impervious surfaces, which would reduce stormwater infiltration onsite and could increase stormwater runoff from the site. If not managed, an increase in stormwater runoff could increase erosion and/or siltation downstream.

CalAm would be required to comply with the most recent post-construction stormwater control requirements (Central Coast RWQCB Resolution No. R3-2013-0032), which are enforced by the local jurisdictions in accordance with the MRSWMP and the NPDES Municipal Stormwater Permit for MS4s (described in Section 4.3.2, Regulatory Framework, above). As indicated in **Table 4.3-6**, above, the MPWSP Desalination Plant would qualify as a Tier 4 project and CalAm would be required to: incorporate LID measures into site design, treat stormwater runoff, retain a portion of stormwater runoff from the site, and manage flows for the 2- through 10-year storm events such that they match pre-project flows. Post construction stormwater BMPs could include, but would not be limited to, the use of pervious concrete or pavement, bioswales, vegetated swales, buffer strips, and vegetated retention ponds. CalAm would be required to prepare and implement a post-construction SWMP that details the maintenance schedule for post-construction BMPs. With mandatory compliance with the post-construction stormwater requirements, alterations in drainage patterns at the MPWSP Desalination Plant site would not result in substantial increases in erosion, siltation, or the rate or amount of surface runoff. The impact would be less than significant.

All Pipelines

Once constructed, all of the proposed pipelines would be located entirely underground and the surface along the pipeline alignments would be restored to pre-construction conditions. No substantial long-term changes in drainage patterns would result from implementation of the proposed pipelines. Therefore, no impact would result.

ASR-5 and ASR-6 Wells

The proposed ASR-5 and ASR-6 Wells at the Fitch Park military housing area would add a total or approximately 2,000 to 2,500 square feet of impervious surface due to the addition of the concrete pump houses, electrical transformer, and access driveway for maintenance vehicles. It is assumed that the ASR-5 and ASR-6 Wells would qualify as a Tier 1 project under the post-construction stormwater management requirements (see **Table 4.3-6**, above) and CalAm would be required to implement LID elements into the site design. With adherence to the post-construction stormwater management requirements, this negligible increase in impervious surfaces would not significantly impede infiltration, alter drainage patterns, or increase erosion and siltation. Therefore, the impact would be less than significant.

Terminal Reservoir – Aboveground Tanks Option

The two 33-foot-high and 130-foot-diameter Terminal Reservoir tanks would be located on a 0.75-acre concrete pad in Seaside. The Terminal Reservoir site is currently undeveloped, and the 0.75-acre increase in impervious surface would impede infiltration at the site, increase runoff, and increase erosion and siltation. Terminal Reservoir would qualify as a Tier 4 project under the post-construction stormwater management requirements. As a result, CalAm would be required to incorporate LID measures into site design, treat stormwater runoff from the site, retain a portion of stormwater runoff from the site, and manage peak flows for the 2- through 10-year storm events such that they match pre-project flows. With mandatory compliance with the post-construction stormwater requirements, alteration in drainage patterns at the Terminal Reservoir site resulting from an increase in impervious surfaces would not result in substantial increases in erosion, siltation, or the rate or amount of surface runoff. The impact would be less than significant.

Terminal Reservoir – Buried Tanks Option

The buried tanks option for Terminal Reservoir would not include a concrete pad and would not increase impervious surfaces at the site. However, substantial grading and excavation would be associated with implementation of the buried tank option. Such activities could increase stormwater runoff volumes and rates as a result of altered drainage patterns. As discussed above, the Construction General Permit would include site-specific erosion and sedimentation control practices during construction. The SWPPP required as part of coverage under the Construction General Permit also includes BMPs required to reduce pollutants, including sediment, in stormwater discharges after all construction phases have been completed (post-construction BMPs). Further, adherence to grading and excavation requirements contained in local ordinances, described in Section 4.3.2.3, would apply to the buried tank option. Monterey County Code 16.08

and 16.12, relating to grading, excavation, and erosion control, require implementation of temporary and permanent erosion-control measures, avoidance of storm drainage obstruction or siltation of waterways, and that specific design considerations be incorporated into projects to reduce the potential of erosion, such as from alteration of drainage patterns, and that an erosion control plan be approved by the County prior to initiation of grading activities. With mandatory compliance with the construction and post-construction stormwater requirements, alteration in drainage patterns at the Terminal Reservoir site would not result in substantial increases in erosion, siltation, or the rate or amount of surface runoff. The impact would be less than significant.

Carmel Valley Pump Station

The Carmel Valley Pump Station would be enclosed in a 500-square-foot single-story building along with a 100-square-foot electrical control building outside of the pump station building. These structures would add approximately 600 feet of impervious surfaces. These negligible increases in impervious surfaces would not result in a substantial change in drainage patterns, erosion, or siltation. Therefore, the impact would be less than significant.

Impact Conclusion

The subsurface slant wells, MPWSP Desalination Plant, ASR-5 and ASR-6 Wells, and Terminal Reservoir would be subject to the post-construction stormwater management requirements of the municipal stormwater permit and CalAm would be required to implement post-construction stormwater BMPs into the final site designs. With adherence to the post-construction requirements, the existence and operation of these facilities would result in a less than significant impact related to changes in drainage patterns, increased soil erosion, and siltation. Implementation of the Carmel Valley Pump Station and Monterey Pump Station would result in a less than significant impact. No impact would result from implementation of the proposed pipelines.

Mitigation Measures

None proposed.

Impact 4.3-8: Alteration of drainage patterns such that there is an increase in flooding on- or offsite or the capacity of the stormwater drainage system is exceeded. (*Less than Significant*)

During construction of the various components of the proposed project, grading and earthmoving operations could alter local drainage patterns and redirect or concentrate stormflows, which could result in increased risks related to onsite and/or downstream (offsite) flooding, especially if stormwater conveyance capacity is exceeded in existing or planned stormwater systems. Following construction (operation phase) stormwater runoff volumes and rates can increase significantly when drainage patterns are substantially altered or when the impervious surface area is increased.

As discussed in detail under Impact 4.3-7, implementation of the proposed facilities would not result in substantially altered drainage patterns or increased stormwater runoff as a result of increased impervious surfaces. The subsurface slant wells, MPWSP Desalination Plant, and Terminal Reservoir (above ground option) would qualify as a Tier 4 project and CalAm would be required to ensure flows for the 2-year through 10-year storm events match pre-project flows (**Table 4.3-6**). Other project components (ASR-5 and ASR-6 Wells) would qualify as a Tier 1 project and CalAm would be required to implement LID elements into the final site design (**Table 4.3-6**), ensuring stormwater runoff is not increased such that flood risks on- or offsite are increased or stormwater conveyance structure capacity is exceeded. Further, the existing ASR settling basin at the intersection of General Jim Moore Boulevard and Coe Avenue would be used for settling of backflush effluent from the wells and would not result in flooding or affect the capacity of the stormwater drainage system. Pipelines would be located entirely underground and the surface along the pipeline alignments would be restored to pre-construction conditions. No changes in drainage patterns would result from implementation of the proposed pipelines. Changes in drainage patterns associated with the Terminal Reservoir (buried tank option) would be localized, subject to grading, excavation, and erosion ordinances detailed in the Monterey County Code and would not result in increased runoff, and would not increase flooding on- or offsite. Implementation of the Carmel Valley Pump Station would add approximately 600 square feet of impervious surfaces and land uses in the vicinity of the pump station site include low density residential development and open space. This negligible increase in impervious surfaces would not result in substantial impacts related to changes in drainage patterns, flooding, or flows in excess of the stormwater drainage system.

With mandatory compliance with the post-construction stormwater management requirements, alterations in drainage patterns resulting from implementation of the proposed facilities would not result in substantial alterations in drainage patterns such that flooding on or offsite were increased, nor the capacity of stormwater drainage systems exceeded. The impact would be less than significant.

Mitigation Measures

None proposed.

Impact 4.3-9: Impedance or redirection of flood flows due to the siting of project facilities within a 100-year flood hazard area. (*Less than Significant*)

The subsurface slant wells and portions of the Source Water Pipeline, Castroville Pipeline, and new Transmission Main would be constructed in a 100-year flood hazard area.

Subsurface Slant Wells

As shown in **Figure 4.3-2**, the subsurface slant wells would be located within the 100-year coastal flood hazard area. The subsurface slant wells would be constructed at the western terminus of the

CEMEX access road and just south of the CEMEX settling ponds. Electrical control cabinet at each well site would be a single-story structure 16 feet long by 7 feet wide. Any flood flows diverted by the electrical control cabinet would be diverted to the sandy areas immediately surrounding the cabinet, still within the CEMEX active mining area, and would not affect other properties or structures. The wellheads and supporting structures would extend at a maximum height of 2 feet above the ground surface and would not impede or redirect flood flows in the area. Therefore, the impact would be less than significant.

Source Water Pipeline, Castroville Pipeline, and New Transmission Main

Portions of the Source Water Pipeline and new Transmission Main in Marina, and the Castroville Pipeline in unincorporated Monterey County would be located within 100-year coastal flood hazard areas (see **Figure 4.3-3**). However, once constructed, these pipelines would be located underground and would not impede or redirect surface flood flows in the area. The impact would be less than significant.

All Other Project Components

None of the other project components are located within a 100-year flood hazard area. Therefore, no impact related to the impedance or redirection of flood flows in a 100-year flood hazard area would result.

Impact Conclusion

Portions of the Source Water Pipeline, new Transmission Main, and Castroville Pipeline would be constructed in a 100-year flood hazard area. However, these facilities would be placed underground would not impede or redirect flood flows. The impact would be less than significant for the subsurface slant wells, and Source Water Pipeline. No impact would result from implementation of all other proposed facilities because none of the other project components are located within a 100-year flood hazard area.

Mitigation Measures

None proposed.

Impact 4.3-10: Exposure of people or structures to a significant risk of loss, injury, or death from flooding due to a tsunami. (*Less than Significant*)

Tsunami damage is typically confined to low-lying coastal areas. As shown in **Figure 4.3-2**, the near-shore margins of Monterey County, including coastal portions of Marina, Seaside, and Monterey, are subject to flooding in the event of a tsunami. The subsurface slant wells in Marina, and the Castroville Pipeline in unincorporated Monterey County would be located in areas subject to flooding from a tsunami.

Subsurface Slant Wells

All facilities in the CEMEX active mining area would be designed to withstand inundation. As a result, the slant wells would not be subject to a significant risk of damage from flooding in the event of a tsunami. The slant wells would be operated remotely using a SCADA system, with routine site visits by facility operators to monitor operations. Because the presence of onsite personnel would be minimal, operation of the subsurface slant wells would not expose facility operators to significant tsunami hazards. The impact would be less than significant for the subsurface slant wells.

Castroville Pipeline

Because the Castroville Pipeline would be located underground and designed to withstand inundation, the pipeline would not be subject to a significant risk of damage from flooding in the event of a tsunami.

Site visits from facility operators associated with pipeline operations and maintenance would be limited to annual inspections of the cathodic protection system, testing and servicing of valves, vegetation maintenance, and repairs of minor leaks in buried pipeline joints or segments. Pipeline operations and maintenance would not expose personnel or structures to significant risks from flooding in the event of a tsunami. The impact would be less than significant.

All Other Project Components

None of the other project components are located within a tsunami inundation zone. Therefore, no impact would result.

Impact Conclusion

The MPWSP would not expose people or structures to a significant risk of loss, injury, or death from flooding due to a tsunami. The impact would be less than significant for the subsurface slant wells, and Castroville Pipeline. For all other facilities, no impact would result.

Mitigation Measures

None proposed.

Impact 4.3-11: Exposure of people or structures to a significant risk of loss, injury, or death from flooding due to sea level rise. (*Less than Significant*)

Coastal flooding impacts would be short-term (from storm tides) and long-term (from sea level rise). Short-term impacts from coastal flooding could occur during 100-year storm events and include coastal erosion, which is discussed under Impact 4.2-10 in Section 4.3, Geology, Seismicity, and Soils, and impedance or redirection of flood flows, which is discussed under Impact 4.3-9, above. This impact focuses only on the long-term impacts related to exposure of people or structures to a significant risk of loss, injury, or death from flooding due to sea level rise.

The proposed project could expose project facilities to long-term flooding from sea level rise. The subsurface slant wells, the northernmost portion of the MPWSP Desalination Plant site, and portions of the Source Water Pipeline would be located in areas that could be subject to sea level rise. However, because the subsurface slant wells and the two pipelines would be constructed underground and designed to withstand inundation, these facilities would not be subject to a significant risk of damage from flooding due to sea level rise. The proposed aboveground facilities at the 40-acre MPWSP Desalination Plant site would be constructed on the upper terrace of the site and at elevations higher than the predicted 2100 sea level elevation. The desalination facilities would be designed so as to minimize the risk from flooding due to sea level rise. The impact would be less than significant.

Subsurface Slant Wells

The subsurface slant wells in Marina would be located in the CEMEX active mining area. This area is subject to sea level rise as shown in **Figure 4.3-3**. All facilities in the CEMEX active mining area would be designed to withstand inundation. Therefore, the slant wells would not be subject to a significant risk of damage from flooding due to sea level rise. The impact would be less than significant.

MPWSP Desalination Plant

According to reports related to climate change and sea level rise (see the discussion of Coastal Flooding and Sea Level Rise under Section 4.3.1.4, above, for further details), during the lifetime of the desalination facilities (approximately 50 years), the sea level in the project vicinity is projected to rise by a total of 27.5 inches (2.3 feet). Further, the mean sea level rise trend in Monterey Bay is estimated to be increasing by 0.053 inches per year (NOAA, 2013b).

The MPWSP Desalination Plant site is located in close vicinity of the areas subject to flooding from sea level rise (see **Figure 4.3-3**). The MPWSP Desalination Plant would be located at elevations between 85 and 110 feet above msl, which is greater than the sea level rise of approximately 2.3 feet estimated to occur during the lifetime of the proposed project (the next 50 years). Thus, the MPWSP Desalination Plant site facilities would not be subject to flooding and would not expose people or structures to risk from flooding due to sea level rise during the lifetime of the proposed project. Therefore, the impact on proposed project action facilities would be less than significant.

Source Water Pipeline and Castroville Pipeline

Portions of the proposed Source Water Pipeline in Marina and the Castroville Pipeline in unincorporated Monterey County (see **Figure 4.3-3**) would be located in areas that would be subject to flooding from sea level rise. However, once constructed, the pipelines would be located underground and would not impede or redirect flood flows, nor be subject to a significant risk of flood damage from sea level rise. The impact would be less than significant.

All Other Proposed Facilities

None of the other proposed facilities would be located in areas that would be subject to flooding from sea level rise. No impact would result.

Impact Conclusion

The MPWSP would not expose people or structures to a significant risk of loss, injury, or death from flooding due to sea level rise. The impact would be less than significant for the subsurface slant wells, MPWSP Desalination Plant, and Source Water Pipeline, and Castroville Pipeline. All other proposed facilities would have no impact.

Mitigation Measures

None proposed.

4.3.6 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 4.3-C: Cumulative impacts related to surface water hydrology and water quality (*Less than Significant with Mitigation)*

The geographic scope for potential cumulative surface hydrology and water quality impacts consists of the project area and surrounding Salinas River and Carmel River watershed lands as well as marine waters in Monterey Bay. The analysis of potential cumulative impacts on hydrology and water quality considers those cumulative projects listed in **Table 4.1-2** and shown in **Figure 4-1**. The analysis focuses on cumulative adverse effects on water quality associated with construction and operations. The timeframe during which the MPWSP could contribute to cumulative surface water hydrology and water quality effects includes the 24-month construction period, as well as the estimated 40-year operations phase.

Impacts on Surface Hydrology and Surface Water Quality during Construction

Construction activities associated with the MPWSP could result in the degradation of water quality from increased soil erosion and associated sedimentation of water bodies due to stormwater runoff, as well as accidental releases of hazardous materials (see Impact 4.3-1). In addition, discharges of dewatering effluent from excavated areas and treated water and disinfectant from pipelines could adversely affect water quality (see Impacts 4.3-2 and 4.3-3).

Nearly all the cumulative projects identified in **Table 4.1-2** involve excavation and use of heavy equipment during construction. Therefore, the cumulative projects in **Table 4.1-2** have the potential to degrade surface water quality as a result of construction-related soil erosion or accidental discharges of hazardous construction chemicals. A number of the cumulative projects

could also require construction dewatering. Cumulative projects that include the installation of new pipelines, such as the Salinas Valley Water Project Phase II, Granite Ridge Water Supply Project, DeepWater Desal, RUWAP, Pacific Grove Local Water Project, Pacific Grove Recycled Water project, Monterey-Pacific Grove ASBS Stormwater Management Project, and Peoples' Moss Landing Desal Project (Nos. 1, 33, 34, 31, 22, 23, 45, and 57), would likely involve discharges of treated water produced during pipeline draining and disinfection. The relevant cumulative projects would have control measures (described below) such that there would be no combined cumulative impact related to the degradation of water quality.

As described in Impact 4.3-1, projects that would disturb more than one acre of soil (including nearly every project in **Table 4.1-2**) would be subject to the National Pollutant Discharge Elimination System (NPDES) Construction General Permit requirements. The NPDES Construction General Permit requirements are themselves measures based, in part, on the consideration of cumulative effects on receiving waters. Such requirements include the preparation and implementation of project-specific Stormwater Pollution Prevention Plans (SWPPPs). The SWPPPs would include specific erosion and stormwater control measures to prevent substantial adverse effects on water quality during construction and would be implemented throughout the duration of construction activities. Nearly every project in the cumulative scenario would be required to implement a SWPPP. As a result, the effects of the MPWSP would not be expected to combine with those of cumulative projects to cause a cumulatively significant water quality impact from increased soil erosion and sedimentation, or inadvertent releases of toxic chemicals during general construction activities. Therefore, no overall cumulatively significant effect would occur; thus the project would not have a cumulatively considerable contribution to a significant cumulative effect (*less than significant*).

As with the MPWSP, the cumulative projects in **Table 4.1-2** could also require dewatering during construction to create a dry work area if groundwater is encountered in open excavations. In addition, for cumulative water supply projects, segments of existing pipelines would need to be drained and disinfected prior to being returned to service and newly installed pipelines would need to be disinfected before being put into service. The dewatering effluent from open excavations, treated water from the draining of existing pipelines, and the effluent generated from disinfection of pipelines could be discharged to the storm drainage system or to vegetated upland areas. As discussed in Impacts 4.3-2 and 4.3-3, these discharges would be regulated by the Regional Water Quality Control Board (RWQCB) and would be subject to *General Waste Discharge Requirements for Discharges with a Low Threat to Water Quality* (General WDRs). The General WDRs include measures to bring such effluent into conformance with State standards prior to discharge (e.g., neutralizing residual chlorine and reducing total dissolved solids). For the discharges of treated water and disinfection effluent, compliance with the General WDRs and the conditions therein would protect water quality in receiving water bodies. Since all other water supply projects that involve pipelines would also need to comply with the General WDRs, the effects of MPWSP treated water and disinfection effluent discharges when combined with those of cumulative projects would not cause a cumulatively significant effect on water quality. Thus, the proposed project would not result in a cumulatively considerable contribution to a significant cumulative impact (*less than significant*).

However, if the MPWSP's dewatering effluent from open excavations were to contain materials from previous spills or leaks, discharges of contaminated dewatering effluent to vegetated upland areas or the local storm drain system would result in a significant impact, which also could result in a cumulatively considerable contribution to a significant cumulative surface water quality impact. To reduce the potential for residual contaminants in the MPWSP dewatering effluent to adversely affect water quality, Impact 4.3-2 calls for implementation of **Mitigation Measure 4.7-2b (Soil and Groundwater Management Plan)**, which would require construction contractors to comply with all relevant environmental regulations and plan for the safe and lawful disposal of contaminated groundwater, when encountered. With implementation of **Mitigation Measure 4.7-2b**, the residual effects of MPWSP discharges of dewatering effluent would not be expected to combine with that of projects in the cumulative scenario to cause a significant cumulative impact. Therefore, with implementation of mitigation, the proposed project's contribution to any cumulative impact would not be cumulatively considerable (*less than significant with mitigation*).

The water extracted during drilling and development of the subsurface slant wells and ASR-5 and ASR-6 Wells would be disposed in accordance with the RWQCB's *General Waiver of WDRs for Specific Types of Discharges* (General Waiver). The General Waiver would allow the extracted water to be discharged to upland areas after allowing suspended solids to settle out (e.g., routing to temporary holding tank). The conditions of the General Waiver would minimize the potential for water quality degradation by regulating the types and concentrations of pollutants in the discharges, and restricting the location and method of disposal. However, dewatering of contaminated groundwater could result in a significant impact if released into the environment, which also could result in a cumulatively considerable contribution to a significant cumulative surface water quality impact. With implementation of **Mitigation Measure 4.7-2b (Soil and Groundwater Management Plan)** and mandatory compliance with the NPDES Construction General Permit, General Waiver, and General WDRs, residual effects of MPWSP discharges of water extracted during well drilling and development would not be expected to combine with those of projects in the cumulative scenario to cause a significant cumulative impact. Therefore, with implementation of mitigation, the proposed project's contribution to any cumulative impact would not be cumulatively considerable (*less than significant with mitigation*).

Impacts on Surface Hydrology and Surface Water Quality during Operation and Maintenance

Operation and maintenance of MPWSP facilities could degrade surface and marine water quality during the anticipated approximately 40-year operations phase as a result of altered drainage patterns, operational discharges, flooding and flood hazards.

Discharge from the Operation of the MPWSP Desalination Plant

The geographic area associated with the assessment of cumulative water quality impacts from operation of the MPWSP is Monterey Bay. For water quality impacts related to the discharge of brine from the operation of the MPWSP Desalination Plant, the cumulative projects whose water quality impacts could overlap with those of the MPWSP include the Sand City Coastal Desalination Plant (No. 6), RUWAP Desalination Element (No. 31), RUWAP Recycled Water

Project (No. 35), Monterey Bay Regional Water (DeepWater Desal) Project (No. 34), and The People's Moss Landing Water Desal Project (People's Project; No. 48). The Sand City Coastal Desalination Plant was completed in 2010. As such, the Sand City Coastal Desalination Plant represents a "past/present" project for purposes of cumulative analysis and water quality impacts relating to MPWSP operations associated with the Sand City Coastal Desalination Plant are reflected in the baseline used for the project-level and the cumulative analysis. As proposed by their respective applicants, both the DeepWater Desal Project and the People's Project would develop supplemental water supplies to serve the same customers in the Monterey Peninsula (in CalAm's Monterey District service area). The People's Project is proposed as an alternative to the MPWSP such that both the People's Project and the proposed project would not both be implemented since their purposes and customers would be largely the same. Therefore, this EIR/EIS assumes that the People's Project is not a reasonably foreseeable project in the cumulative scenario relevant to the proposed project. Further, for purposes of the analysis presented here, consideration of the DeepWater Desal project represents the more conservative worst-case cumulative scenario since this project is larger than the People's Project. However, in the case of DeepWater Desal, water could be provided to other off-takers in Santa Cruz County or the City of Salinas, and the project could be approved in addition to the proposed project. Therefore, the cumulative impacts of the DeepWater Desal Project are considered as they relate to the provision of water to Santa Cruz County and the City of Salinas. The significance thresholds identified for the analysis of cumulative water quality impacts from the brine discharge are listed below. A cumulative impact would occur if the combined impact from the cumulative projects considered here would result in an exceedance of the following significance standards:

- Exceed the receiving water limitation for salinity of 2 ppt at the edge of the Brine Mixing Zone (BMZ) established in the Ocean Plan.
- Exceed water quality objectives established in the Ocean Plan at the edge of the zone of initial dilution (ZID).

Implementation of the MPWSP would require the MRWPCA NPDES permit to be amended to incorporate the brine discharge from the MPWSP Desalination Plant, where the brine and its combination with the wastewater would be subject to the water quality requirements in the amended NPDES Permit, which would incorporate the Ocean Plan water quality objectives and the receiving water limitation for salinity from operation of a new desalination plant. Further, operation of the MPWSP would be required to adhere to all monitoring and reporting requirements prescribed in the Ocean Plan relating to operational discharges and receiving water characteristics as well as assessments relating to impacts on all forms of marine life.

As discussed under Impact 4.3-4, modeling of the MPWSP brine discharge from the MRWPCA outfall indicates that the brine effluent would be below the 2 ppt salinity significance threshold under the worst case scenario. Additional modeling (ESA, 2015) further indicates that the brine plume would generally reach ambient salinity levels at a distance of approximately 0.26 miles from the outfall diffuser under worst case conditions. All existing and proposed outfalls associated with the cumulative projects (listed above) are greater than 0.26 mile from the MRWPCA outfall. Therefore, the likelihood of discharge plumes from different outfalls or their

ZIDs intersecting or merging and resulting in exceedances of Ocean Plan defined water quality objectives or receiving water salinity limitations and adversely affecting beneficial uses of receiving waters (Monterey Bay) is very low.

At the project level, it is conservatively determined that under the assessed discharge scenarios, operational discharges from implementation of the MPWSP could exceed Ocean Plan water quality objectives for certain constituents. This would result in a significant impact, and because the Ocean Plan water quality objectives are based on the effects of cumulative impacts on ocean water quality, an exceedance of water quality objectives also would represent a cumulatively considerable contribution to a potential significant cumulative impact. The proposed project's contribution would be minimized to a less-than-significant level by implementation of **Mitigation Measure 4.3-4 (Operational Discharge Monitoring, Analysis, Reporting, and Compliance)** and **Mitigation Measure 4.3-5 (Implement Protocols to Avoid Exceeding Water Quality Objectives)**.

As discussed under Impact 4.3-5, future water quality testing and analysis, required as part of the NPDES permit process, would determine whether operational discharges under the MPWSP Project comply with Ocean Plan water quality objectives. The water quality testing and analysis would be conducted as per protocol approved by the RWQCB. **Mitigation Measure 4.3-4 (Operational Discharge Monitoring, Analysis, Reporting, and Compliance)** requires CalAm to implement a comprehensive Monitoring and Mitigation Plan consistent with the requirements of the Ocean Plan (described in detail in Section 4.3.2.2) that would set forth appropriate response thresholds and corrective actions that would be required if the acquired data indicated deleterious effects to receiving water quality or marine biological resources from the proposed MPWSP operational discharges. **Mitigation Measure 4.3-5 (Implement Protocols to Avoid Exceeding Water Quality Objectives)** would require data gathering to determine baseline conditions and compliance with Ocean Plan water quality objectives and would involve employing design features and/or operational measures to achieve the required minimum dilution of the discharge at the edge of the ZID to ensure compliance with Ocean Plan water quality objectives. With implementation of **Mitigation Measure 4.3-4** and **Mitigation Measure 4.3-5**, the MPWSP would comply with NPDES permit requirements as well as all water quality objectives detailed in the Ocean Plan. The requirements of NPDES permits, which incorporate the Ocean Plan water quality objectives in the case of operational discharges from the MRWPCA outfall, are designed and intended to protect beneficial uses of receiving waters (i.e., Monterey Bay) from the effects of numerous potential sources of pollution, and are therefore protective against significant adverse cumulative impacts.

The brine discharge from the operation of the proposed MPWSP Desalination Plant would be subject to water quality requirements in the amended NPDES Permit for the discharge through the MRWPCA outfall. Any new or modified waste discharges to the bay, such as those proposed as part of the DeepWater Desal Project, are subject to the water quality requirements of the NPDES permit system, administered by the Central Coast RWQCB. Thus, operation of the cumulative projects that would result in waste discharge (listed above), including and similar to the proposed project would be subject to, and would be required to comply with, the regulatory

requirements for the protection of the beneficial uses of Monterey Bay. The SWRCB establishes the regulatory limitations and guidance on compliance and continues to develop and administer regulations through the RWQCBs (the Central Coast RWQCB in the project area) to regulate the water quality of the waters of the U.S. The most recent amendment to the Ocean Plan (SWRCB, 2016) reflects the SWRCB's process of adapting to the need to regulate discharges from desalination projects. As also discussed above, the Ocean Plan objectives are incorporated into the NPDES permits issued to the dischargers by RWQCBs in the form of specific water quality requirements.

With mandatory compliance with the regulatory requirements and the NPDES effluent limitations, and implementation of mitigation measures, the cumulative impact from the discharges resulting from MPWSP and the projects in **Table 4.1-2** is therefore considered less than significant. Additionally, with implementation of mitigation measures, the proposed project's contribution to any cumulative water quality impact in Monterey Bay would be reduced to a level that is not cumulatively considerable (*less than significant with mitigation*).

Discharges Related to Maintenance of Subsurface Intake Wells and ASR Wells

As discussed in Impact 4.3-6, the proposed project would require site disturbance for the slant well maintenance and routine cleaning of the ASR wells, which could result in discharges that would affect water quality. Site disturbance as part of the proposed project would occur once in five years and would be subject to the water quality control requirements of the Construction General Permit. Nearly all the cumulative projects identified in **Table 4.1-2** would involve site disturbance activities as part of construction and, as discussed above, would be subject to the Construction General Permit requirements, including implementation of a SWPPP to prevent substantial adverse effects on water quality during construction. As a result, the effects of the MPWSP would not be expected to combine with those of cumulative projects to cause a significant cumulative water quality impact from increased soil erosion and sedimentation, or inadvertent releases of toxic chemicals during general construction activities as part of the slant well maintenance. The proposed project would not result in a cumulatively considerable contribution to a significant cumulative impact (*less than significant*).

As discussed in Impact 4.3-6, as part of the ASR well maintenance, the proposed project would require backflushing of the accumulated sediment and turbid water in the two ASR wells. The duration of backflushing would range from a few minutes to 2 hours. The discharge of the backflushed effluent would be subject to specific requirements under the General Waiver of WDRs for Specific Types of Discharges (Resolution R3-2014-0041) to protect surface water quality. The projects in **Table 4.1-2** that would include maintenance-related discharges from water supply wells would be subject to and be required to comply with the water quality control requirements under the General Waiver. As a result, the effects of the proposed project would not be expected to combine with those of cumulative projects to cause a significant cumulative water quality impact from ASR well maintenance-related discharges. The proposed project would not result in a cumulatively considerable contribution to a significant cumulative impact (*less than significant*).

Alteration of Drainage Patterns and Non-point Source (Stormwater) Pollution

As discussed in Impacts 4.3-7 and 4.3-8, the MPWSP would require site disturbance in a manner that could alter drainage patterns and a net increase in impervious surface area at several project sites. Most of the projects identified in **Table 4.1-2** would also involve new impervious surfaces, which may alter site drainage. Alterations to site drainage could cause increased peak flows in creeks, exacerbate erosion and sedimentation, and result in greater non-point source pollution in downstream water bodies. Increased areas of impervious surfaces could also increase flooding of downstream waterways and cause runoff volumes to exceed stormwater conveyance system capacities.

However, operation of the proposed project would not represent a substantial land use change within the geographic scope when combined with the projects identified in **Table 4.1-2** as compared to current conditions at the site and in the surrounding area. The majority of the projects identified in **Table 4.1-2** are located within the urbanized portion of the Salinas River and Carmel River watershed lands (the geographic scope), and along the margin of Monterey Bay. The urbanized portions of these watershed lands no longer reflect natural historic conditions in terms of stormwater quality, volume, and drainage. The majority of the surfaces associated with the identified projects in the cumulative scenario, including most locations affected by the project, are covered with impervious surfaces and as a result stormwater runoff is generally rapid and surface infiltration rates are very low. Stormwater flows in the lower portions of the affected watershed lands adjacent to the proposed project are generated as runoff from paved surfaces and drain down gradient into stormwater conveyance systems and can contain pollutants typical of urbanized watersheds. While the proposed project and many of the projects identified in **Table 4.1-2** would result in some increase in impervious area, storm runoff volumes and rates as well as water quality generated during the operations phase would be similar to the existing runoff typical of urbanized watersheds.

Additionally, as discussed in Impacts 4.3-7 and 4.3-8, such developments would be required to comply with the Central Coast RWQCB Resolution No. R3-2013-0032, as implemented through the Monterey Regional Stormwater Management Program and NPDES Municipal Stormwater Permit. Adherence to these requirements would ensure potential effects of the MPWSP on site drainage would be less than significant. Projects constructed after March 6, 2014 that create or replace 2,500 square feet of impervious surface area are also subject to these requirements.

As the previously noted stormwater requirements are part of a regional program designed to address the potential cumulative effects of past, present, and foreseeable projects within the region, adherence to these requirements would ensure hydrology and water quality effects related to the alteration of drainage patterns would not cause a significant cumulative impact. The proposed project therefore would not result in a cumulatively considerable contribution to any cumulative impact (*less than significant*).

Risk of Loss, Injury, or Death due to Flooding

As discussed in Impacts 4.3-9, 4.3-10, and 4.3-11, the MPWSP would involve the siting of facilities in locations within or near areas subject to inundation due to 100-year flood, tsunami,

and sea level rise. Specifically, the subsurface slant wells, and portions of the new Transmission Main, Castroville Pipeline, and Source Water Pipeline would be located in areas subject to inundation from 100-year flood and sea level rise. The subsurface slant wells would also be subject to inundation from tsunami. However, these facilities would be operated remotely and would not be regularly manned. Further, they would be designed to withstand periods of inundation. The MPWSP Desalination Plant would be constructed at elevations between 85 and 110 feet above mean sea level, well above areas of anticipated inundation due to flood, tsunami, and sea level rise. Some of the cumulative projects identified in **Table 4.1-2** and shown on **Figure 4-1** could have significant adverse effects related to flooding, tsunami, and sea level rise inundation. However, because the MPWSP components within such areas would be below grade, and with construction areas returned to their approximate pre-construction topography, they would not have a cumulatively considerable contribution to any significant cumulative impacts associated with flooding, tsunami, and sea level rise (*less than significant*).

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4.4 Groundwater Resources

Sections

4.4.1	Setting/Affected Environment	4.4.4	Approach to Analysis
4.4.2	Regulatory Framework	4.4.5	Direct and Indirect Effects of the Proposed Project
4.4.3	Evaluation Criteria	4.4.6	Cumulative Effects of the Proposed Project

Figures

4.4-1	Groundwater Basins and Areas in the Western Salinas Valley Groundwater Basin
4.4-2	Conceptual Model of Coastal Aquifers
4.4-3	Project Area Hydrogeologic Cross Section
4.4-4	Thickness of Salina Valley Aquitard
4.4-5	Salinas Valley Groundwater Basin – Groundwater Elevations in 180 Foot-Aquifer
4.4-6	Salinas Valley Groundwater Basin –Groundwater Elevations in 400 Foot-Aquifer
4.4-7	Groundwater Flow – Seaside Basin Shallow Zone, July/August 2015
4.4-8	Groundwater Flow – Seaside Basin Deep Zone, July/August 2015
4.4-9	Slant Well and Monitoring Well Locations
4.4-10	Historic Seawater Intrusion in the Salinas Valley Groundwater Basin – 180-Foot Aquifer
4.4-11	Historic Seawater Intrusion in the Salinas Valley Groundwater Basin – 400-Foot Aquifer
4.4-12	Groundwater Model Boundaries
4.4-13	Proposed Action: Response of 180-Foot Aquifer after 63 Years 0% Return Water
4.4-14	Proposed Action: 1-Foot Response in Dune Sand Aquifer
4.4-15	Proposed Action: 1-Foot Response in 180-Foot Aquifer
4.4-16	Proposed Action: 1-Foot Response in 400-Foot Aquifer
4.4-17	Proposed Project Impact on Location of Freshwater/Seawater Interface

Tables

4.4-1	Summarized Characteristics of Water Bearing Geologic Units
4.4-2	Summary of ASR Injection Volumes
4.4-3	Groundwater Extraction Summary for the Salinas Valley and Seaside Groundwater Basins
4.4-4	Groundwater Quality of Test Slant Well
4.4-5	Water Chemistry Results of Mixing Study
4.4-6	Groundwater Quality Objectives
4.4-7	Applicable Regional and Local Plans and Policies Relevant to Groundwater Resources
4.4-8	Correlation of Geologic Units, Aquifers, and Model Layers
4.4-9	Summary of Impacts – Groundwater Resources
4.4-10	Known Active Supply Wells within Vicinity of the Proposed MPWSP Slant Wells
4.4-11	Water Chemistry of Treated Carmel River Water and Sand City Desalinated Water

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**).

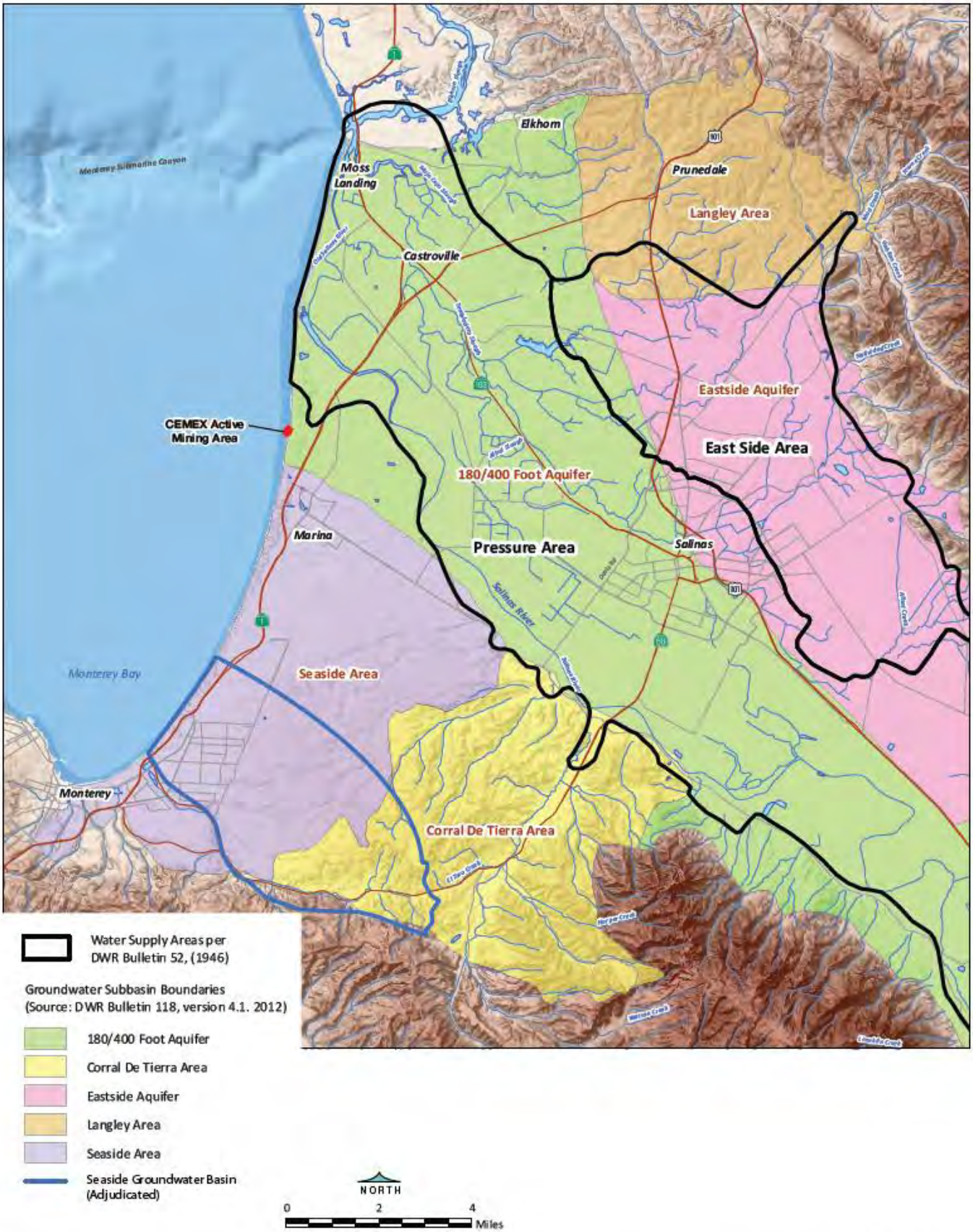
4.4.1.1 Terminology and Concepts

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

205335.01 Monterey Peninsula Water Supply Project

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

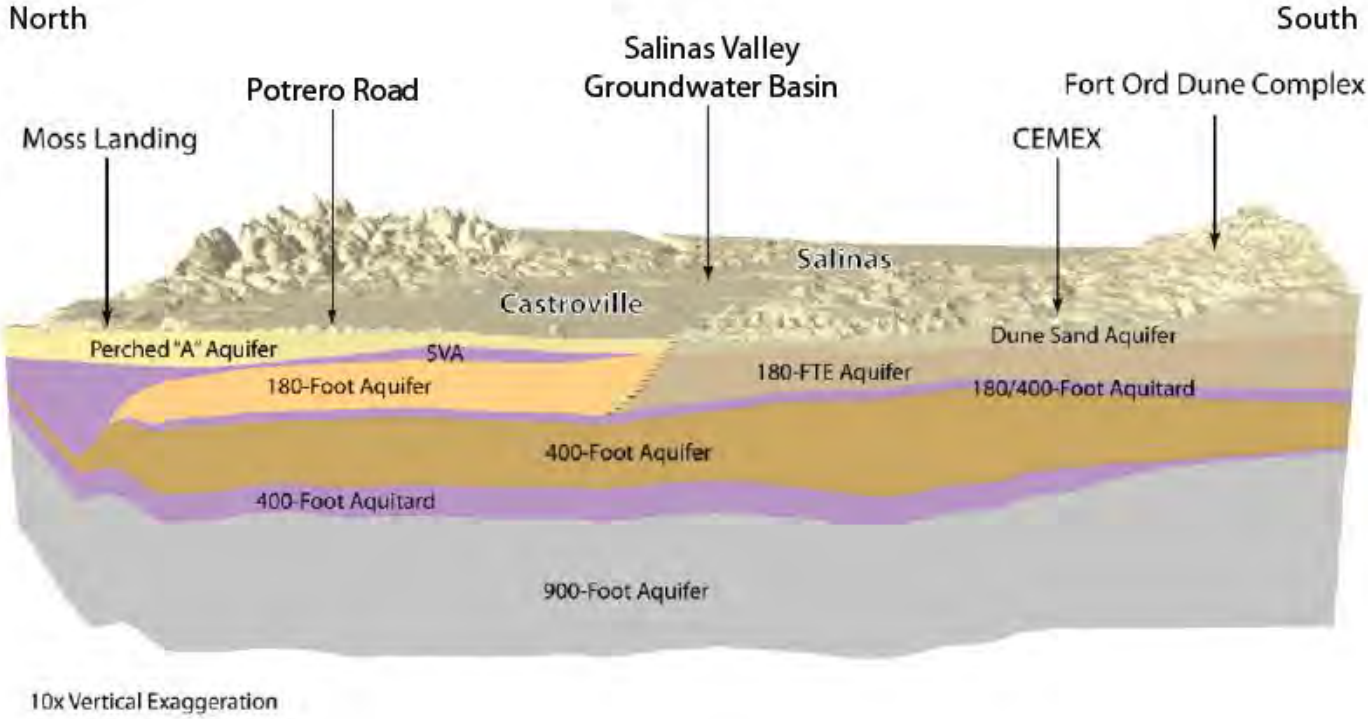
Geologic Unit (Listed youngest to oldest)	Geologic and Groundwater Storage Characteristics
Quaternary Alluvium	The Younger and Older Dune Sands. Younger, sparsely vegetated, active dunes are present along the coastline. Older dune deposits with more established vegetation are present inland. Shallow 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

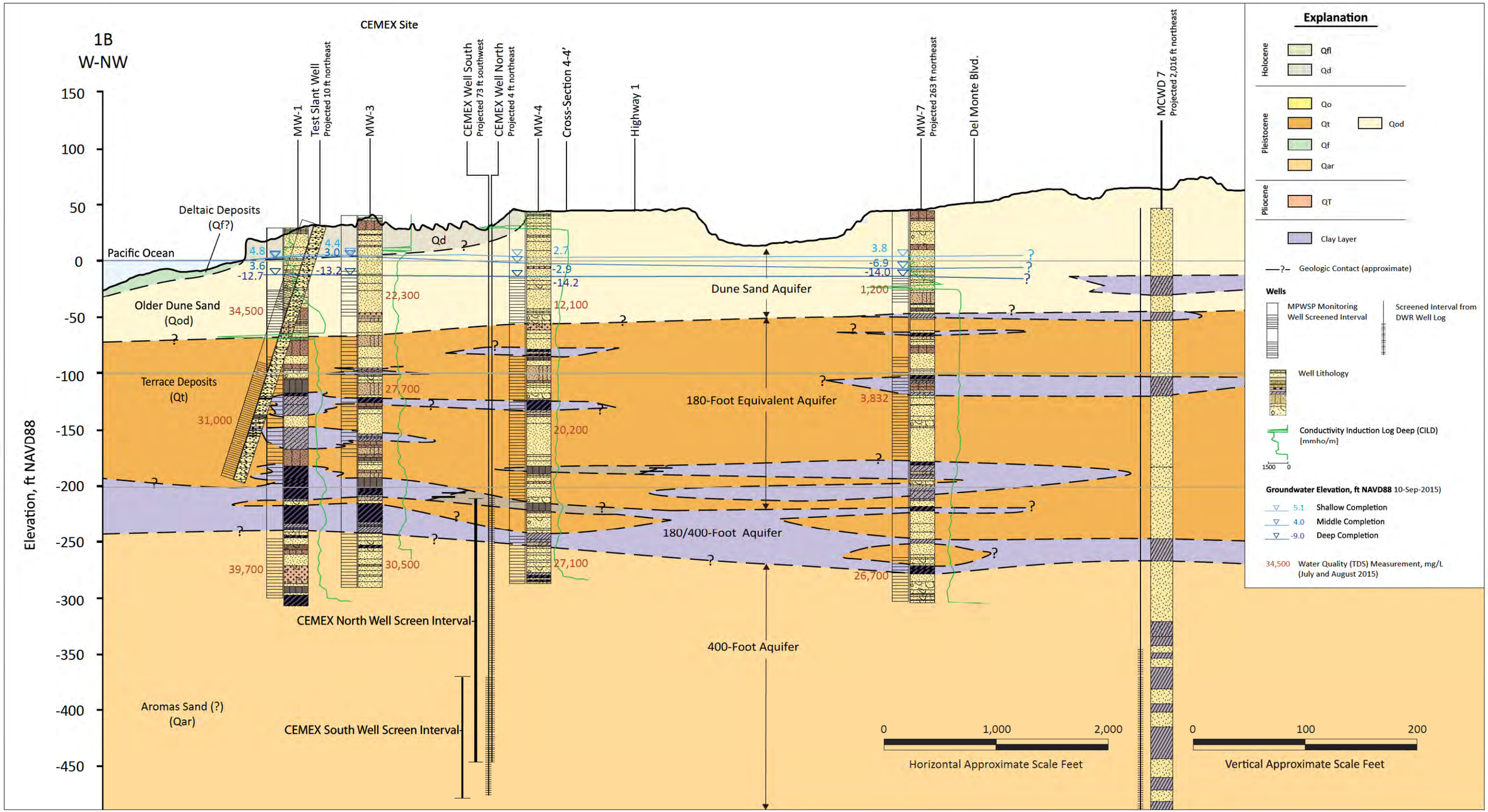
The Salinas Valley Aquitard is a blue or yellow sandy clay formation up to 100 to 150 feet thick that lies mostly north of and generally parallel to the northwest-flowing Salinas River (MCWRA, 2006; Kennedy/Jenks, 2004; Durbin et al., 1978; Geoscience, 2013a). **Figure 4.4-4** shows the extent and thickness 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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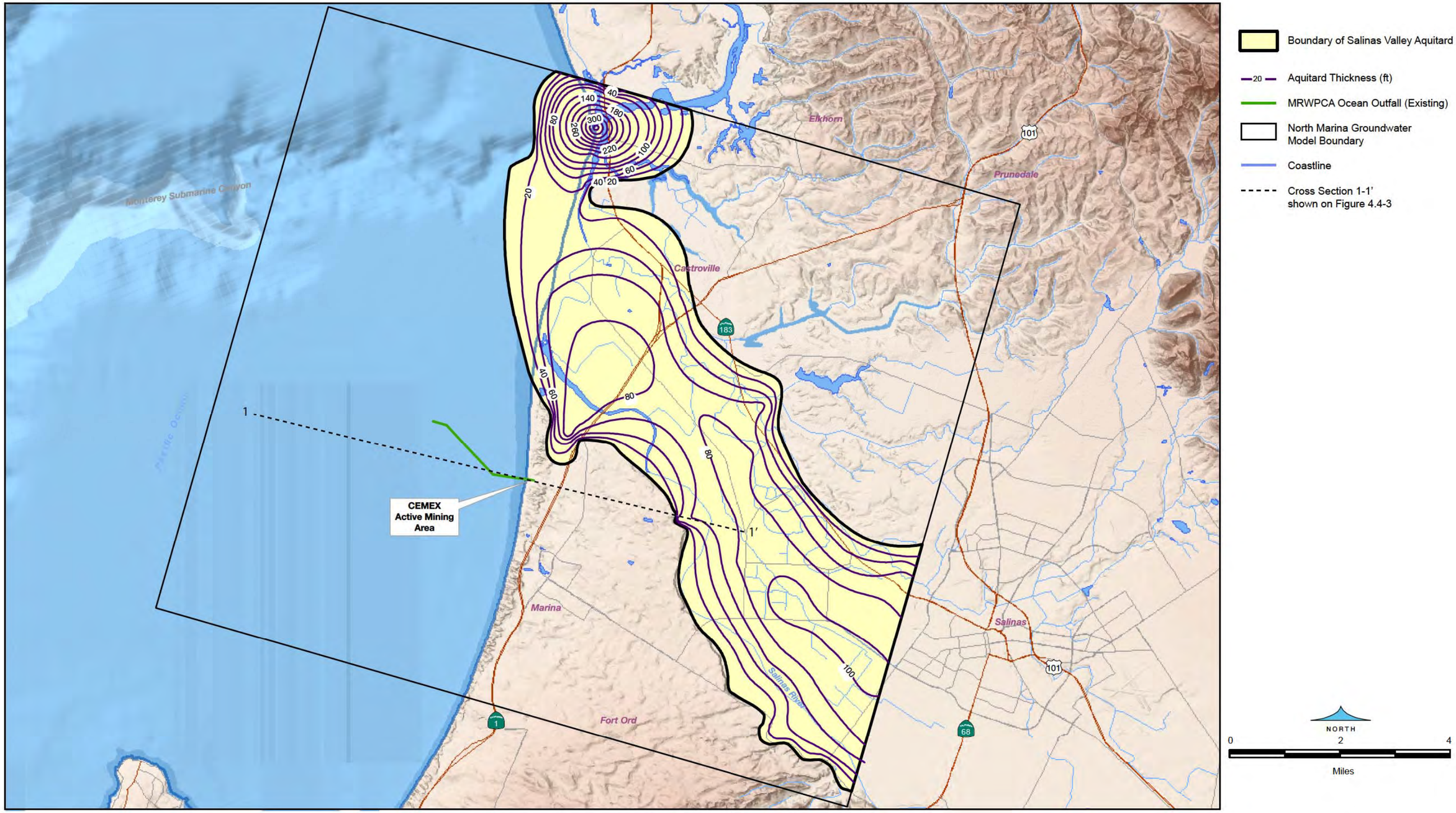
Figure 4.4-3

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.

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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).

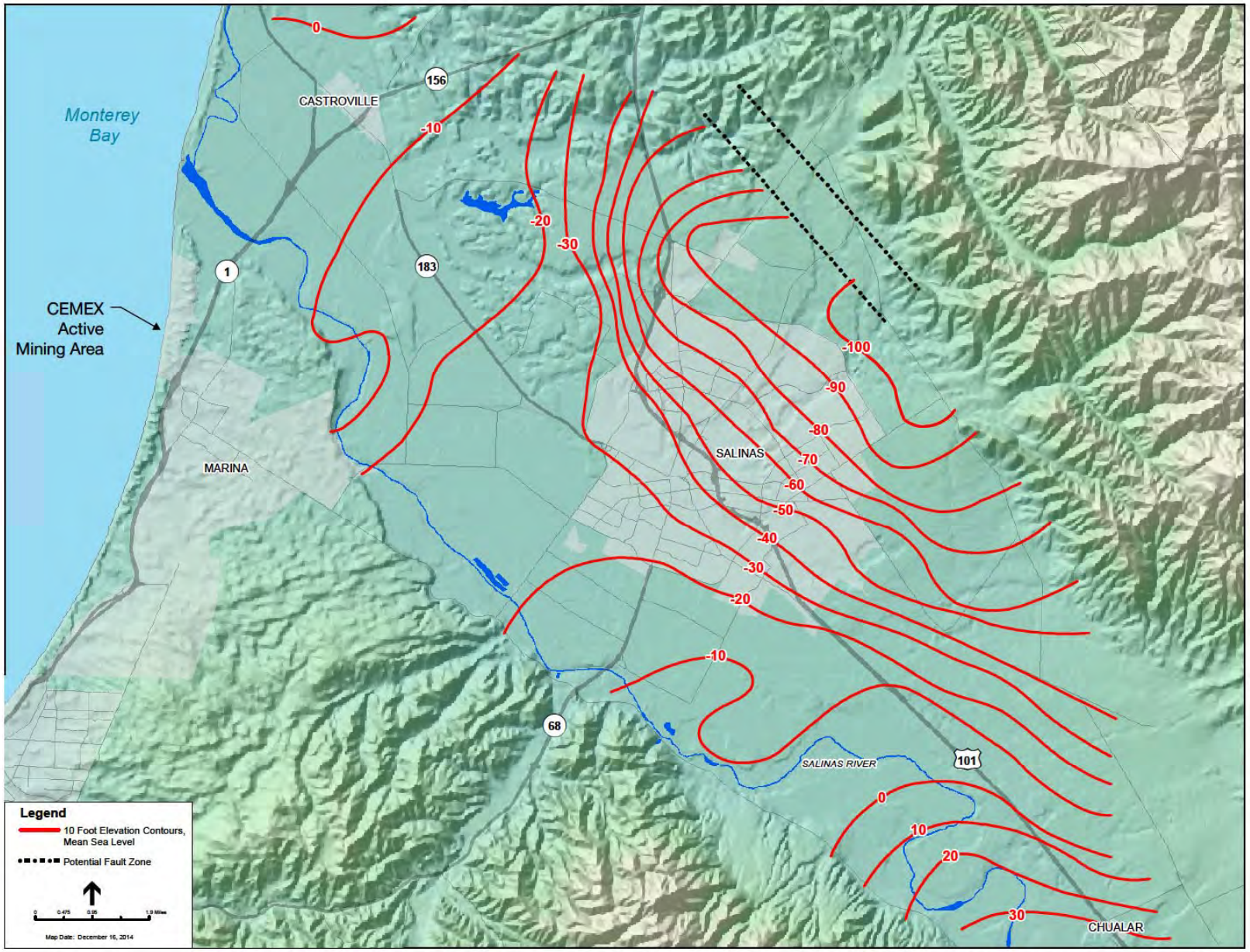
Basin Groundwater Balance

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

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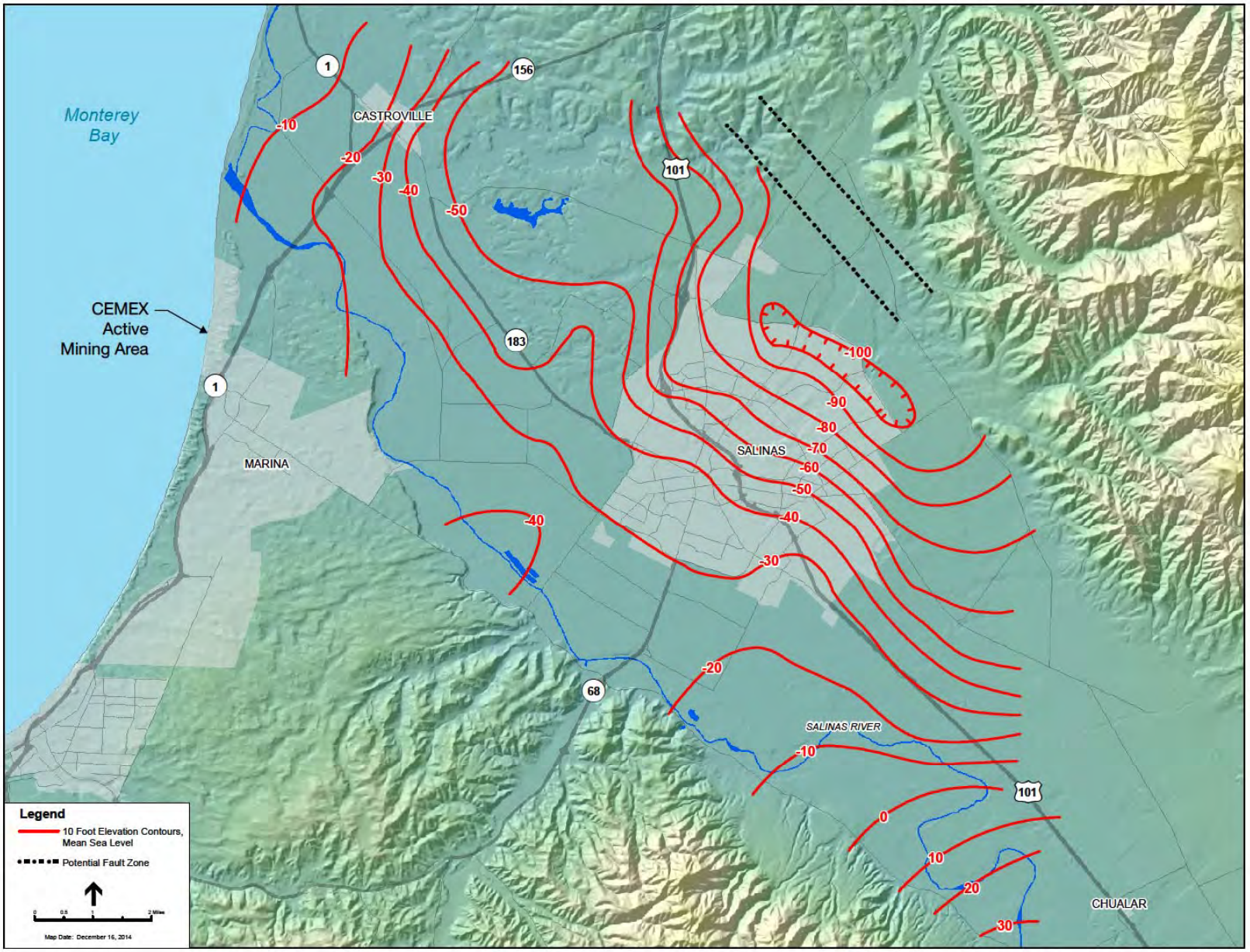
Figure 4.4-5

Salinas Valley Groundwater Basin - Groundwater Elevations in 180-Foot-Aquifer



SOURCE: MCRWA, 2014a

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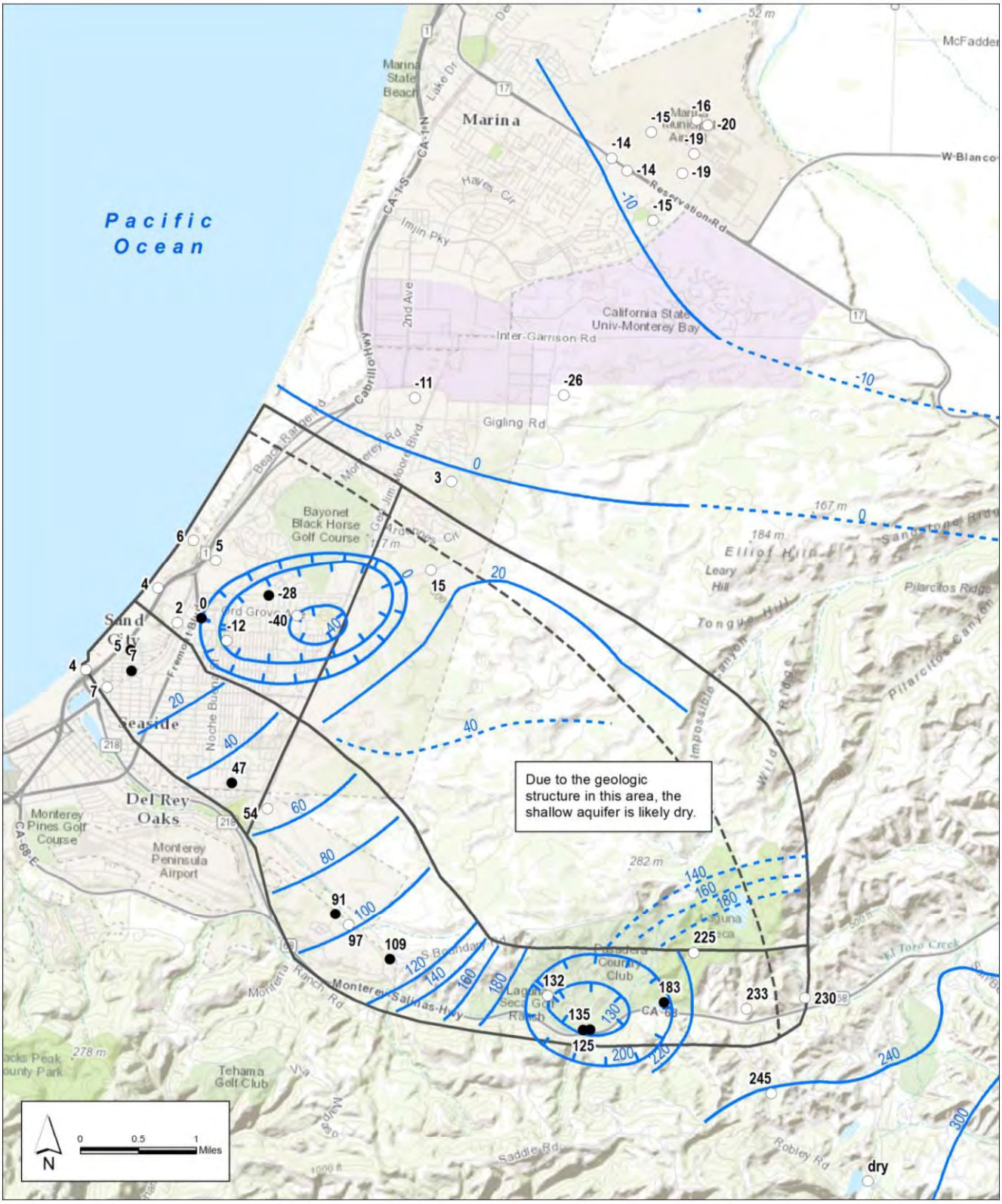
Figure 4.4-6

Salinas Valley Groundwater Basin - Groundwater Elevations in 400-Foot-Aquifer



SOURCE: HydroMetrics, 2015

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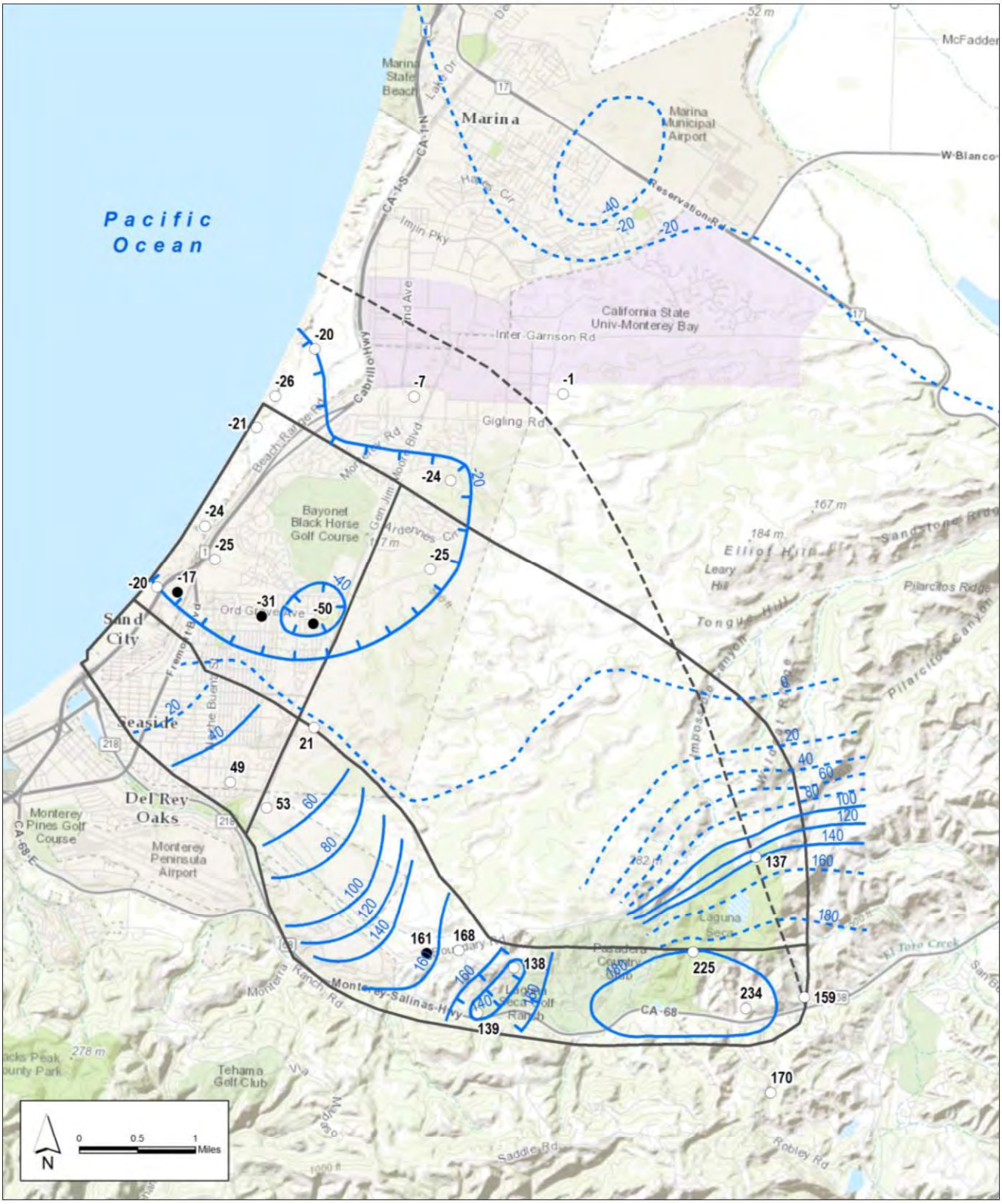
Figure 4.4-7

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.

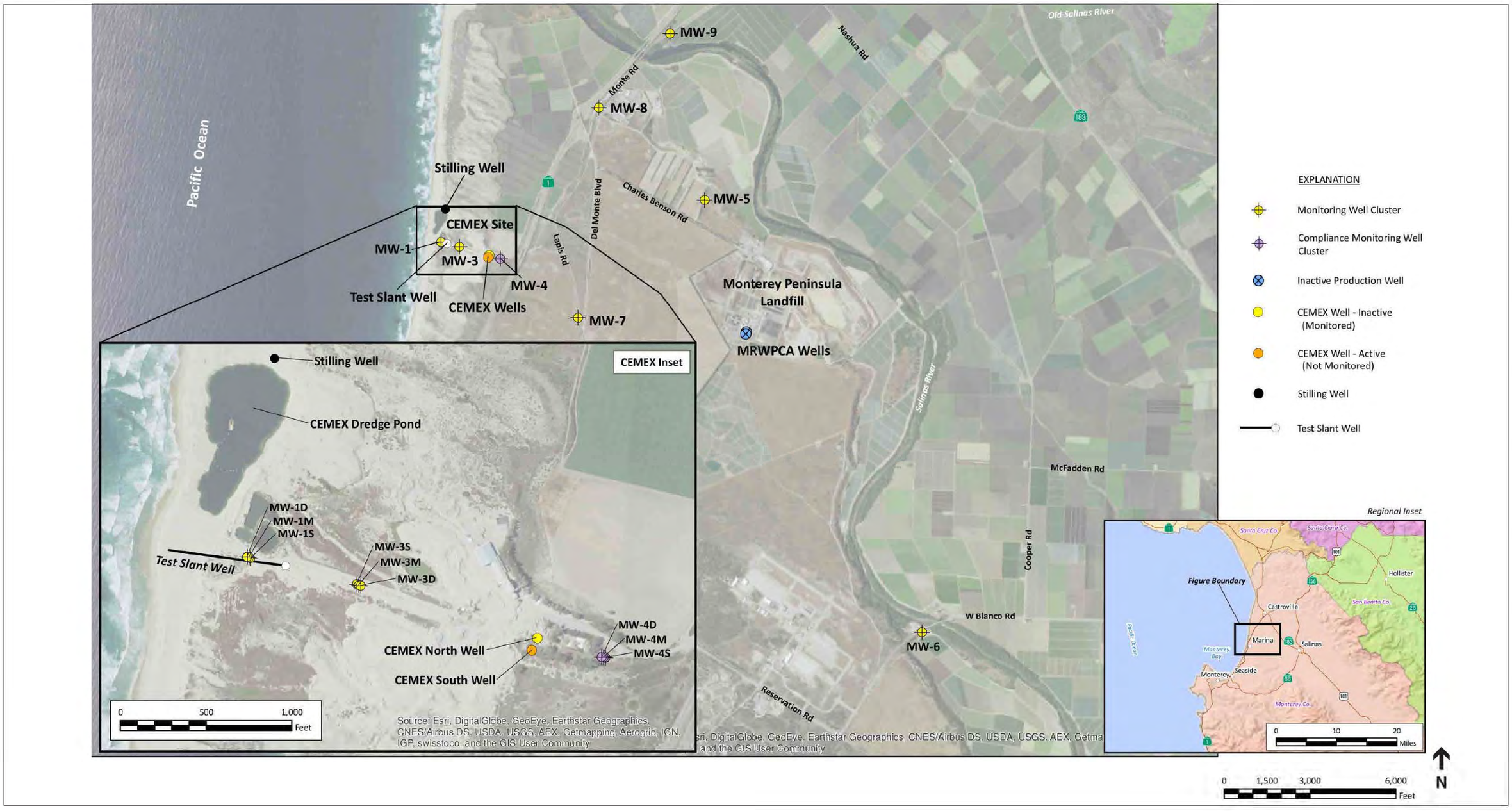
The proposed slant wells would draw water from the Dune Sand Aquifer and the 180-FTE Aquifer from about 30 feet below msl to 200 feet below mean sea level (Geosciences, 2016b). As discussed above in Section 4.2, the Dune Sand Aquifer overlies the 180-FTE Aquifer with no aquitard /between the units. The 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

Monterey Peninsula Water Supply Project . 205335.01

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.

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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).

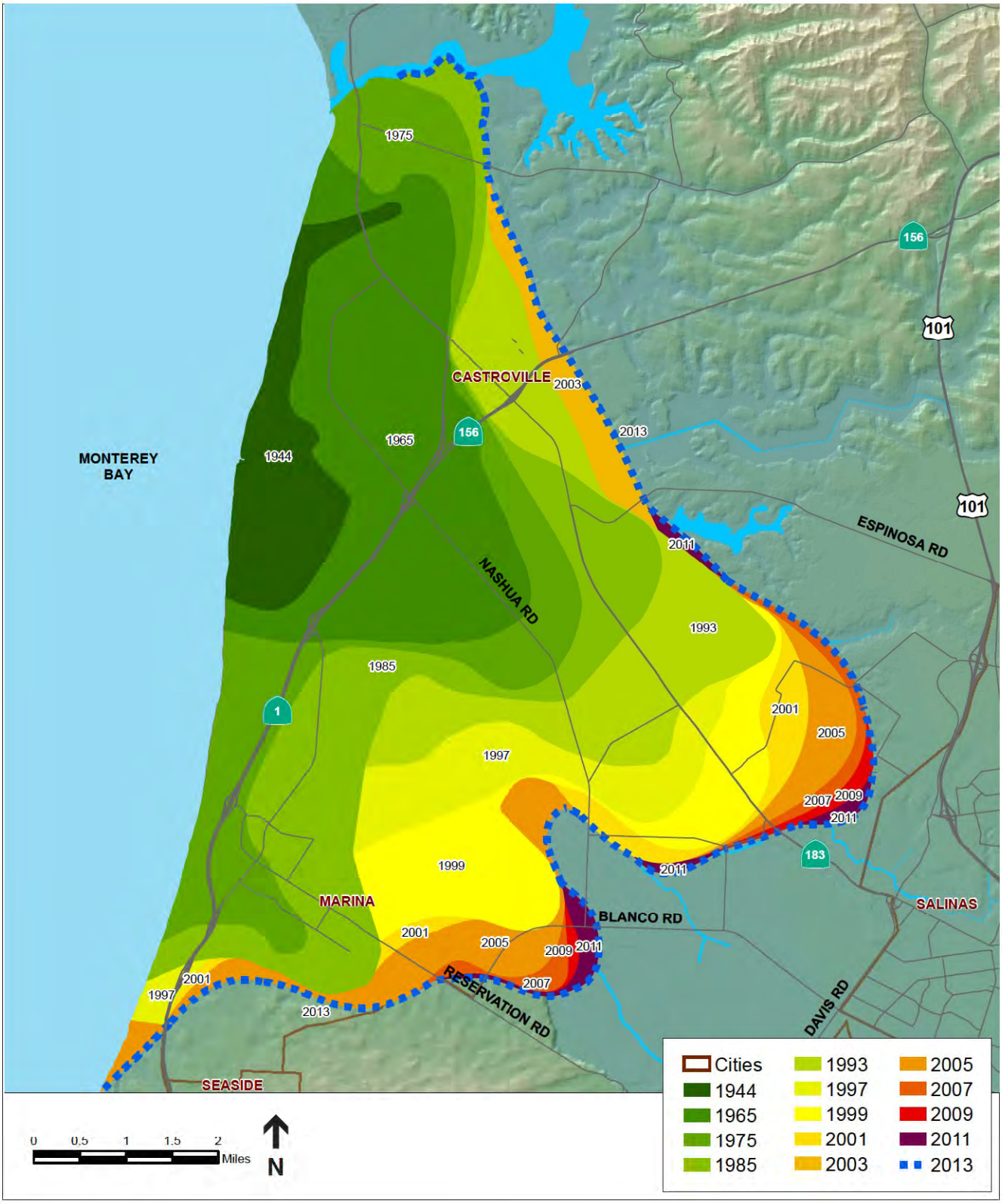
Seawater Intrusion

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.

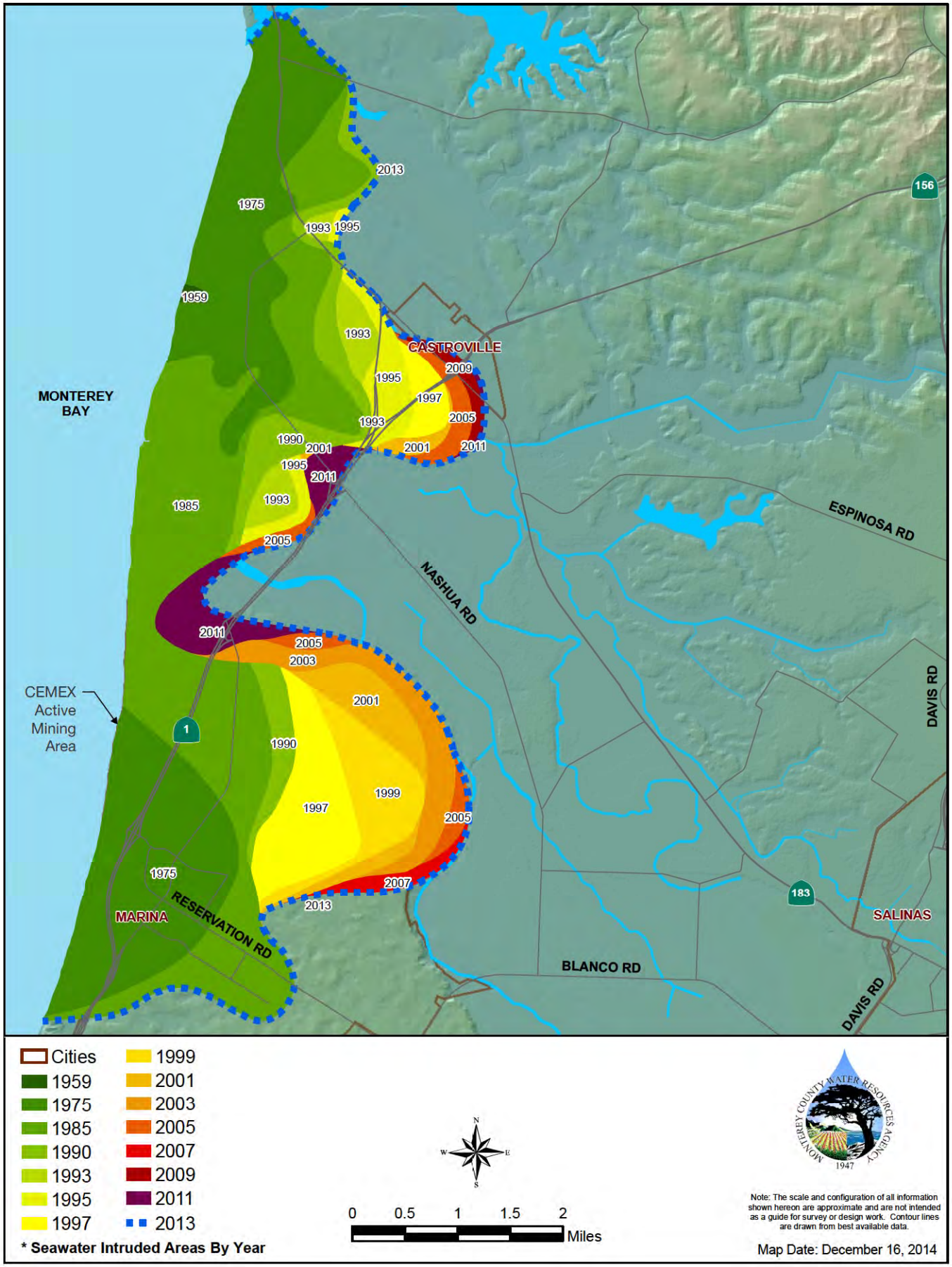


SOURCE: MCWRA, 2015b

Monterey Peninsula Water Supply Project . 205335.01

Figure 4.4-10

Historic Seawater Intrusion in the Salinas Valley Groundwater Basin - 180-Foot Aquifer



SOURCE: MCWRA, 2014b

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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/c1f1l.

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

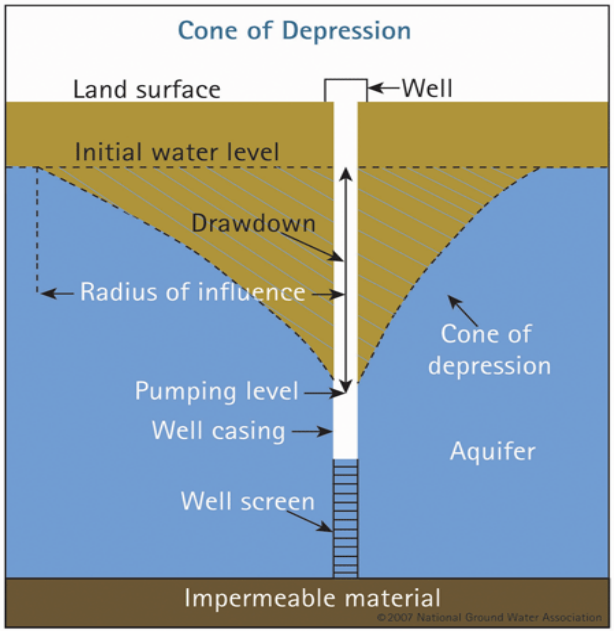
Groundwater models simulate aquifer conditions based on a specific set of data that describes parameters such the subsurface characteristics, groundwater flow, and land use. The more robust the data set, the more capable the model will be to accurately simulate subsurface conditions. Most groundwater 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.



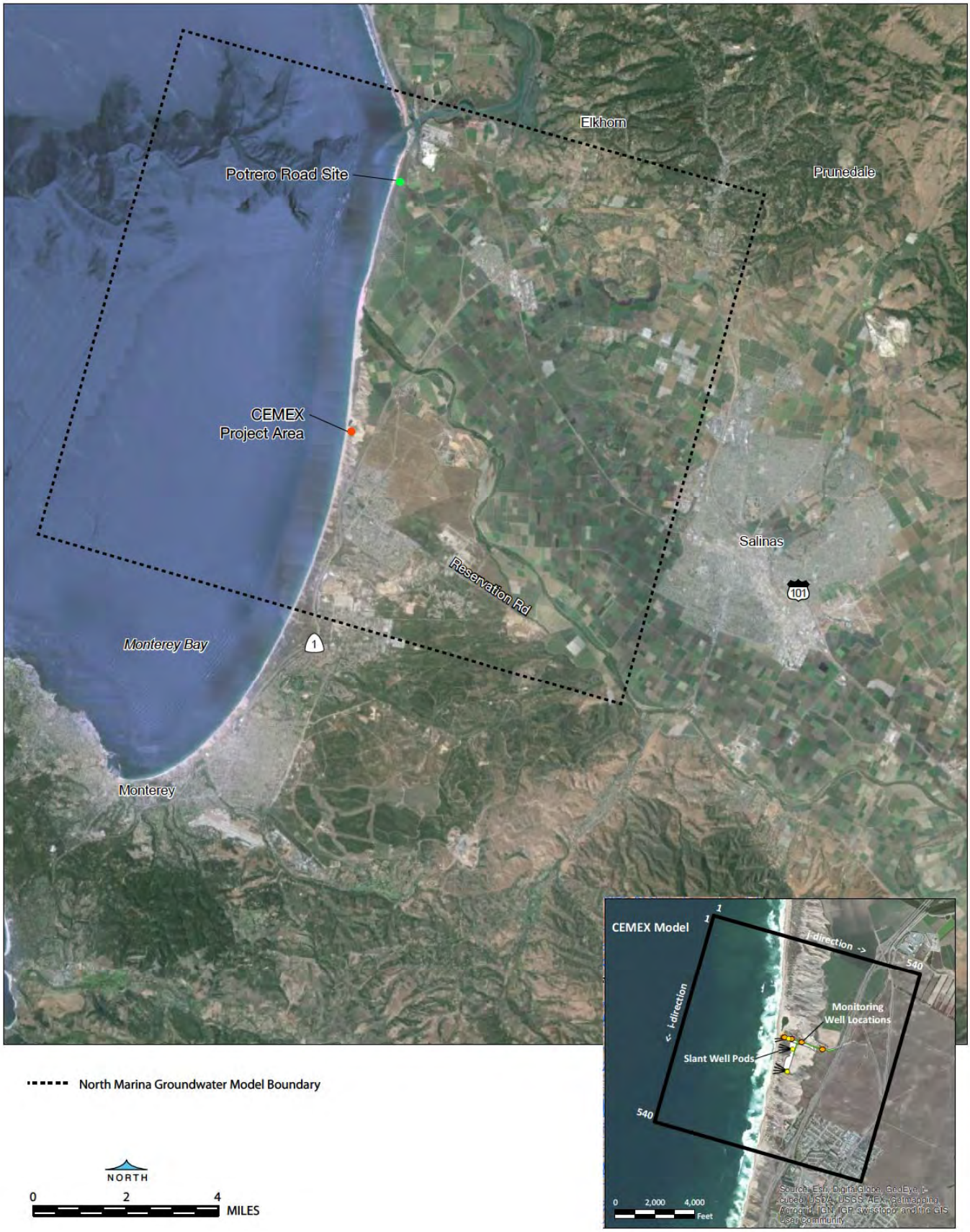
SOURCE: http://www.ngwa.org/Fundamentals/use/PublishingImages/cone_of_depression.gif

- **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.

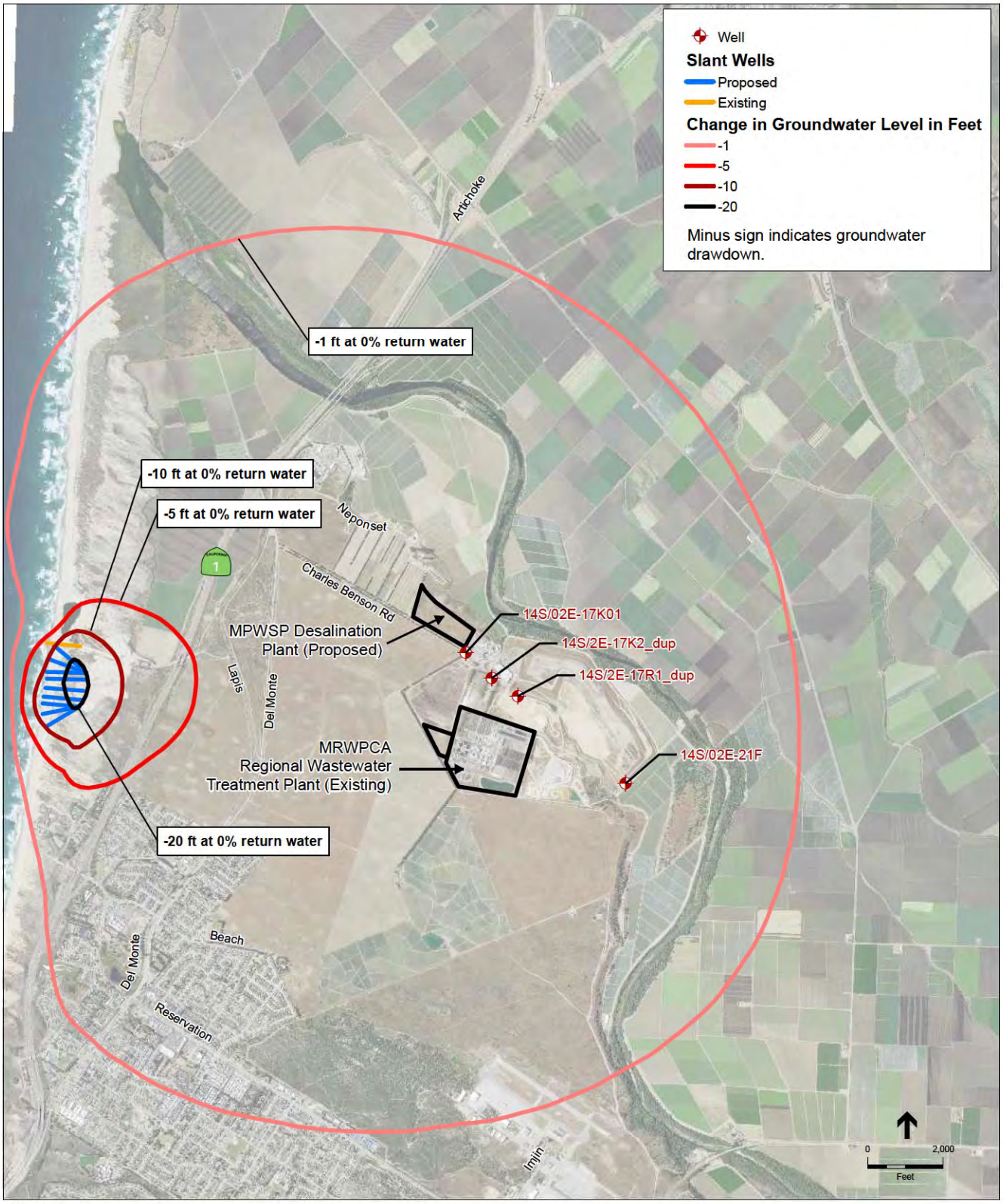
Impact on Groundwater Supply in the SVGB

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

205335.01 Monterey Peninsula Water Supply Project

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

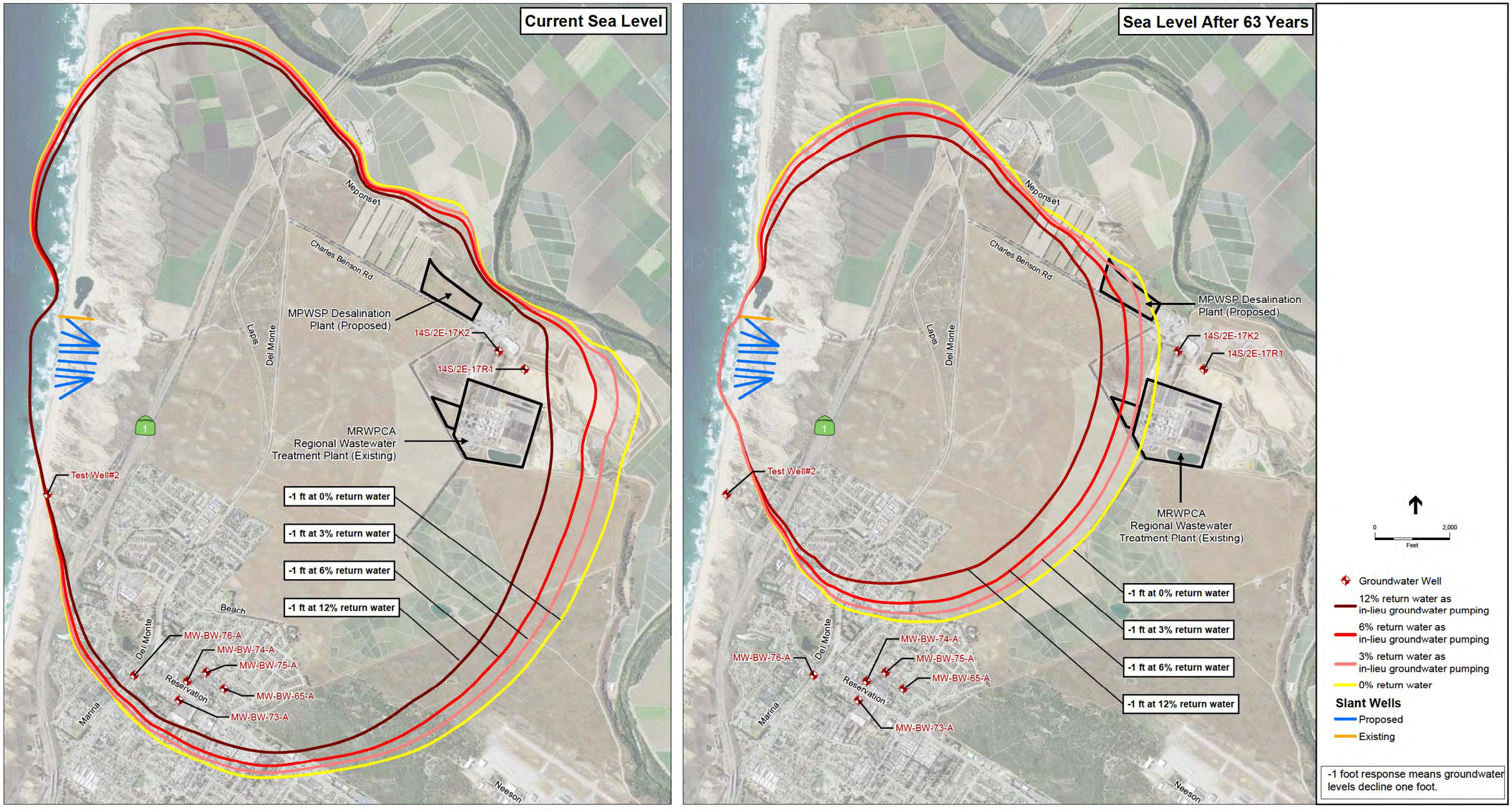
The proposed project would not deplete groundwater supplies; it would extract primarily seawater and a smaller volume of brackish inland groundwater from a localized area with only minor localized groundwater drawdown. The area influenced by the MPWSP groundwater pumping is within a zone that is degraded 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.

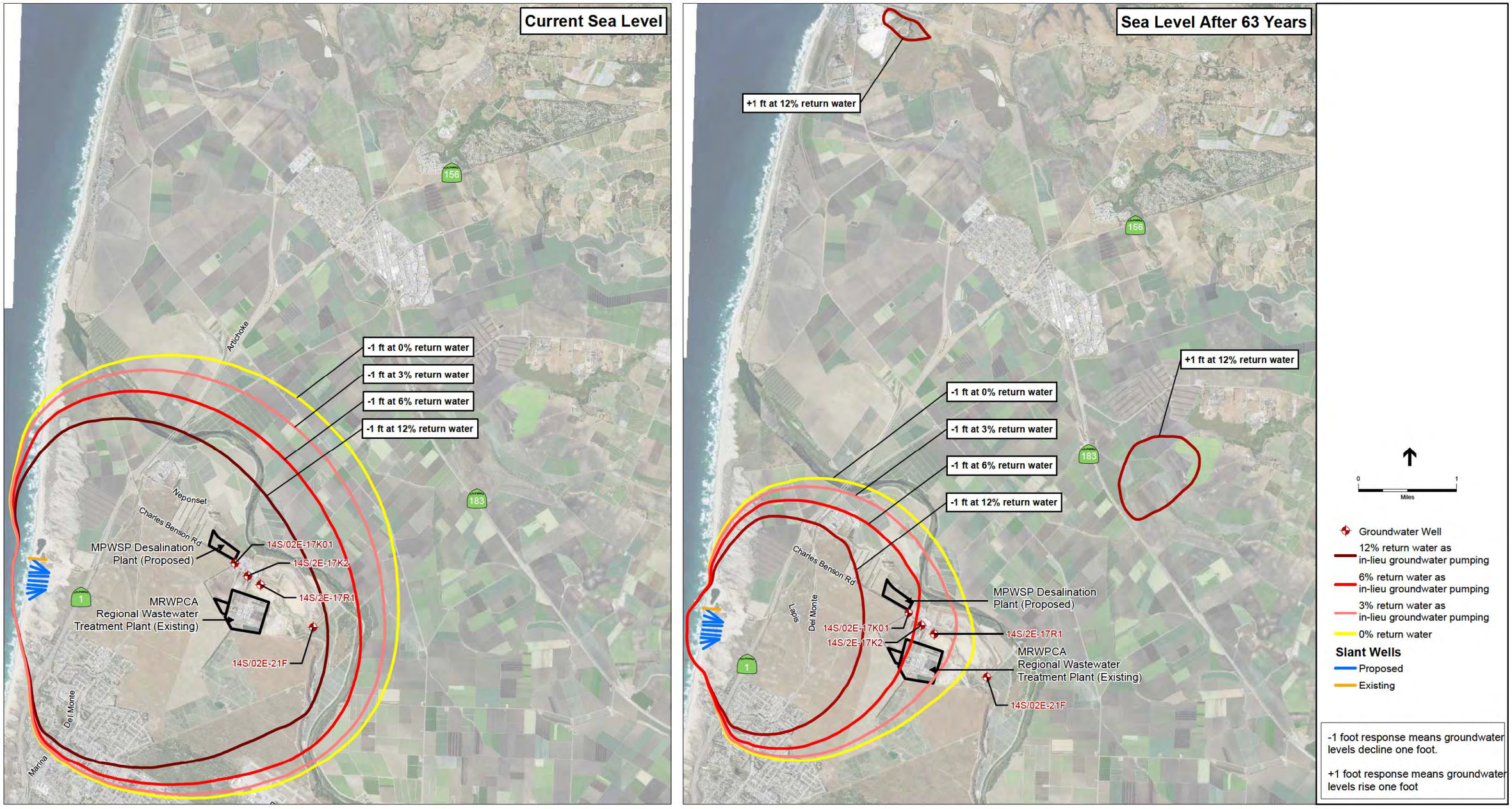


SOURCE:HydroFocus, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.4-14

Proposed Action: 1-Foot Response in Dune Sand Aquifer

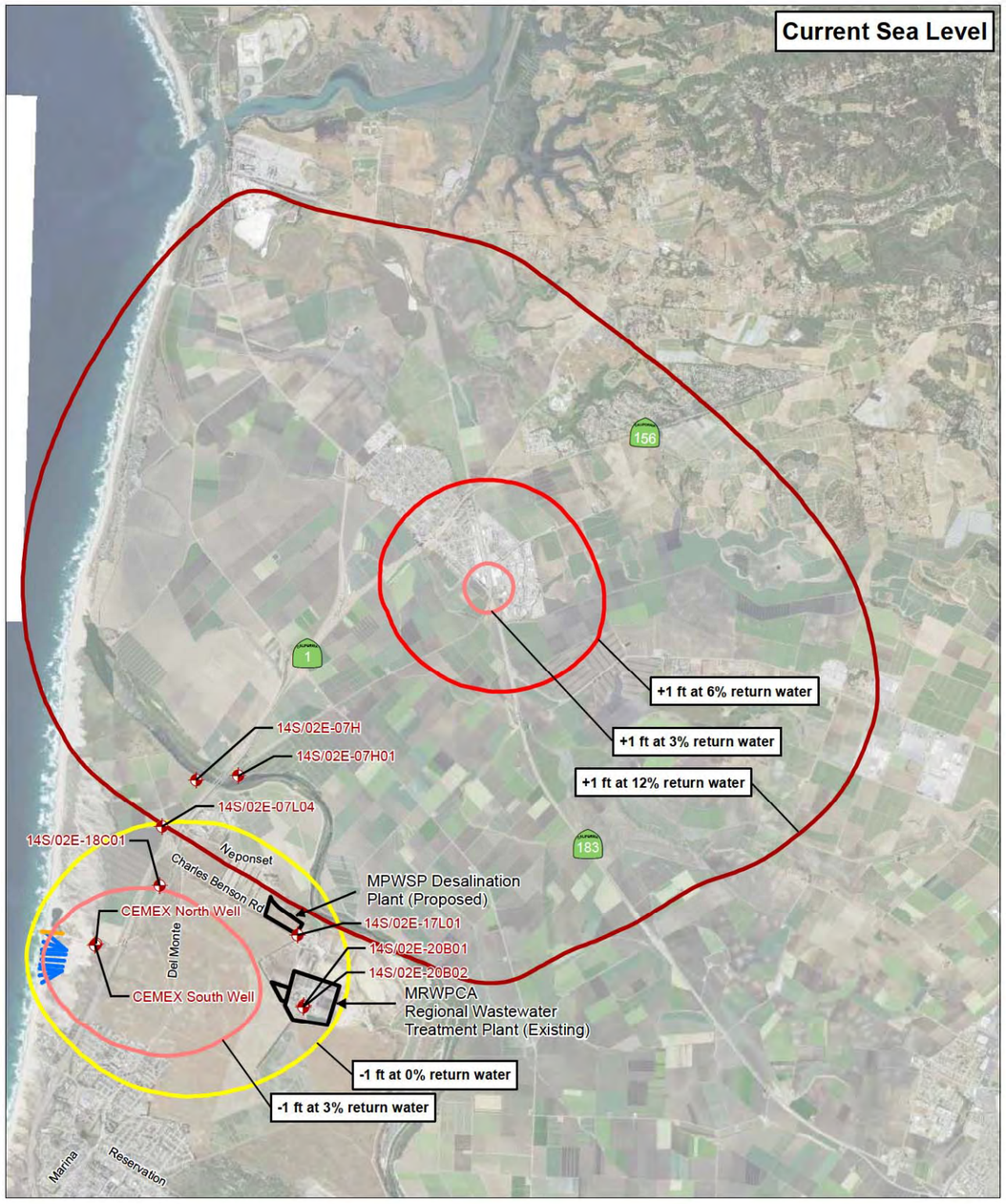


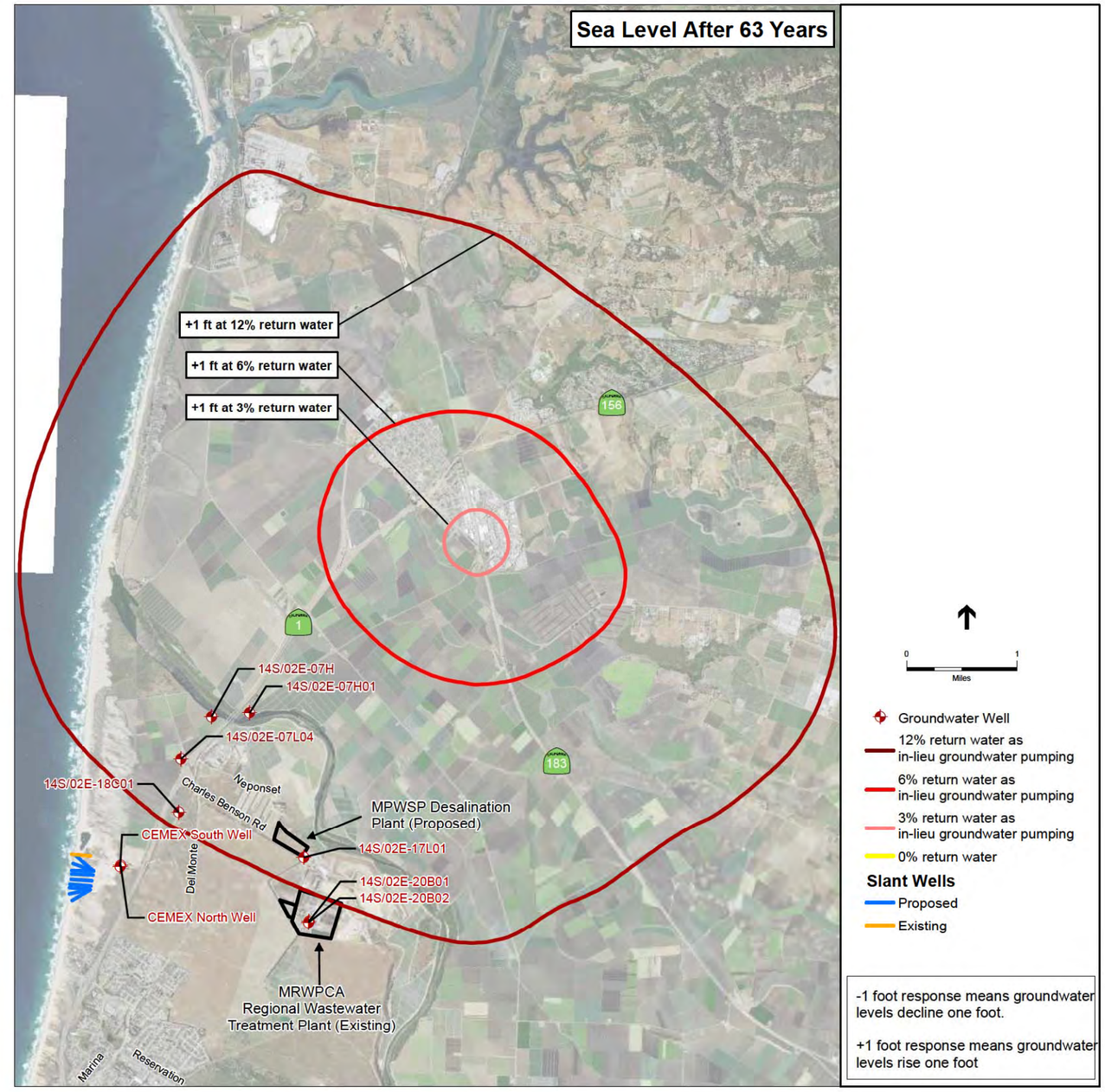
SOURCE:HydroFocus, 2016

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,

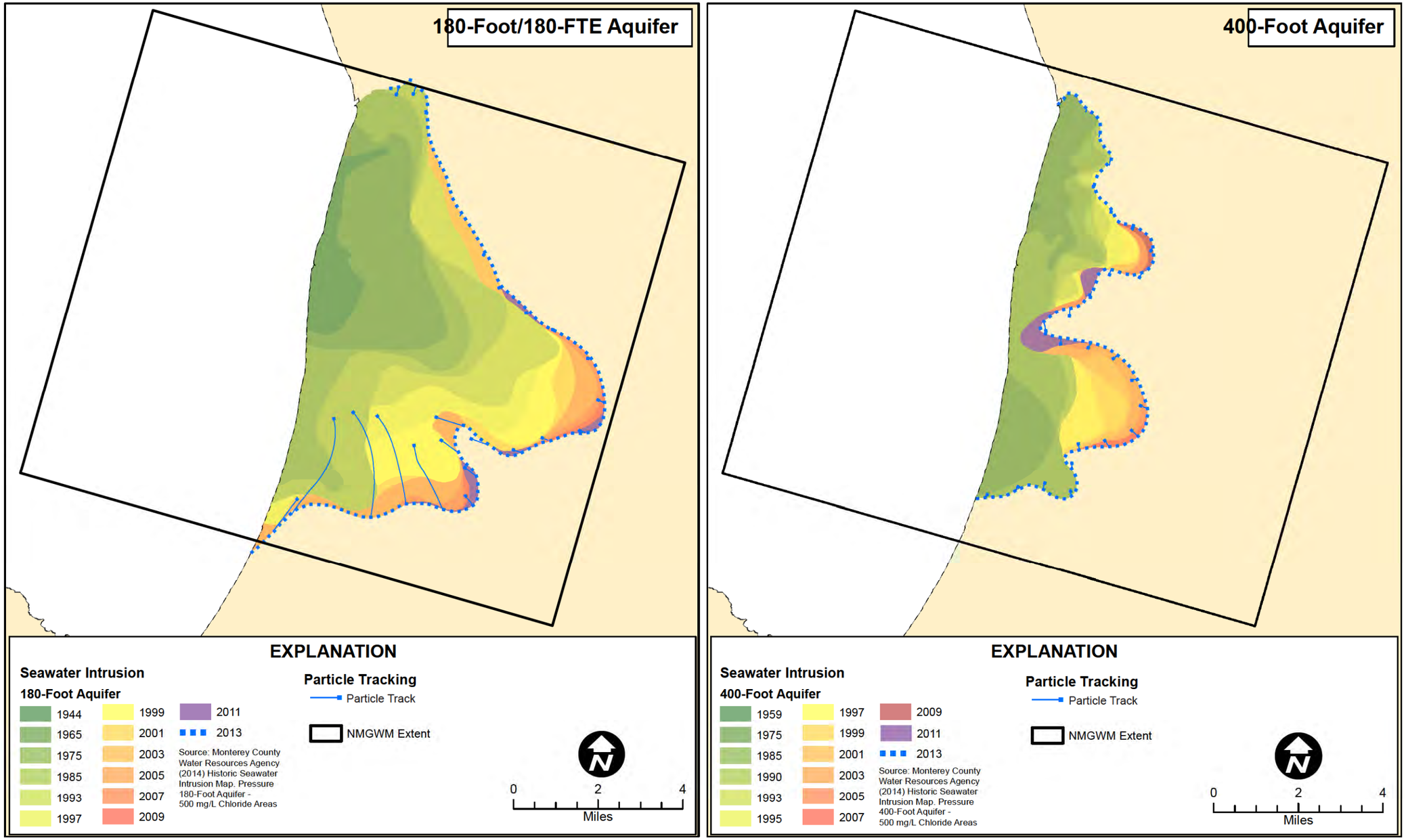
the cones of depression interfere with each other and can cause the groundwater contamination to spread into previously uncontaminated or previously remediated areas.

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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4.5 Marine Biological Resources

Sections		Figures	
4.5.1	Setting / Affected Environment	4.5-1	Identified Seafloor Habitats in Study Area
4.5.2	Regulatory Framework	4.5-2	Hard Substrate Subtidal Habitat in Monterey Bay
4.5.3	Evaluation Criteria	4.5-3	Rockfish Conservation Areas Designated in MBNMS under Federal Regulations
4.5.4.	Approach to Analysis	4.5-4	Essential Fish Habitat Designated in MBNMS under Federal Regulations
4.5.5	Direct and Indirect Effects of the Proposed Project	4.5-5	Sanctuary Ecologically Significant Areas Designated in MBNMS
4.5.6	Cumulative Effects of the Proposed Project	4.5-6	Marine Protected Areas along the California Coast

Tables			
4.5-1	Zooplankton Collected Near the MRWPCA Outfall in May 2016	4.5-7	Summary of NOAA Established Permanent Threshold Shift (PTS) and Temporary Threshold Shift (TTS) Sound Levels from Underwater Noise Levels for Marine Mammals
4.5-2	Special-Status Marine Species and Their Potential to Occur within the Study Area	4.5-8	Swimming Speeds of Plankton, Invertebrates, and Larval Fish
4.5-3	Fish Species Present in Monterey Bay Managed under Magnuson-Stevens Act	4.5-9	Results from Studies on the Effects of Elevated Salinity on Marine Organisms
4.5-4	Species Managed under the Magnuson-Stevens Fisheries Management Plan and California Nearshore Fisheries Management Plan and their Potential to Occur within the Study Area	4.5-10	Toxicity Test Results and Mean Effective Concentrations of Salinity Toxicity
4.5-5	Summary of Impacts – Marine Biological Resources	4.5-11	Summary of International Brine Limits
4.5-6	Potential Effects of Varying Underwater Noise Levels on Fish and Marine Mammals	4.5-12	Dilution Model Results for Dense Discharge Scenarios

This section analyzes the potential for the Monterey Peninsula Water Supply Project (MPWSP or proposed project), which includes 10 slant wells at CEMEX, to adversely affect marine habitats and associated marine biological resources. The marine biological resources study area encompasses the nearshore waters (within 5 miles from shore) of Monterey Bay and extends from the Salinas River southward to the northern limits of Sand City. This area encompasses the ocean waters adjacent to the proposed subsurface slant wells site at the CEMEX sand mining facility and surrounding the Monterey Regional Water Pollution Control Agency's (MRWPCA) existing ocean outfall, which CalAm proposes to use to discharge the brine produced during the desalination process (see **Figure 4.5-1**). This area also includes the waters of Monterey Bay National Marine Sanctuary, and impacts associated with the federal proposed action, which includes the permitting and authorization of those project components that may affect sanctuary resources, including the brine discharge. This analysis considers construction and operational impacts associated with the subsurface slant wells and operational impacts associated with brine discharge because they are the only proposed actions that affect marine biological resources. The analysis of brine discharge impacts on marine biological resources relies on water quality information and analysis presented in Section 4.3, Surface Water Hydrology and Water Quality. Section 4.3 also discusses the indirect impacts on Marine Biological Resources resulting from the implementation of water quality mitigation. Marine birds, anadromous fish, and inland fish are addressed in Section 4.6, Terrestrial Biological Resources.

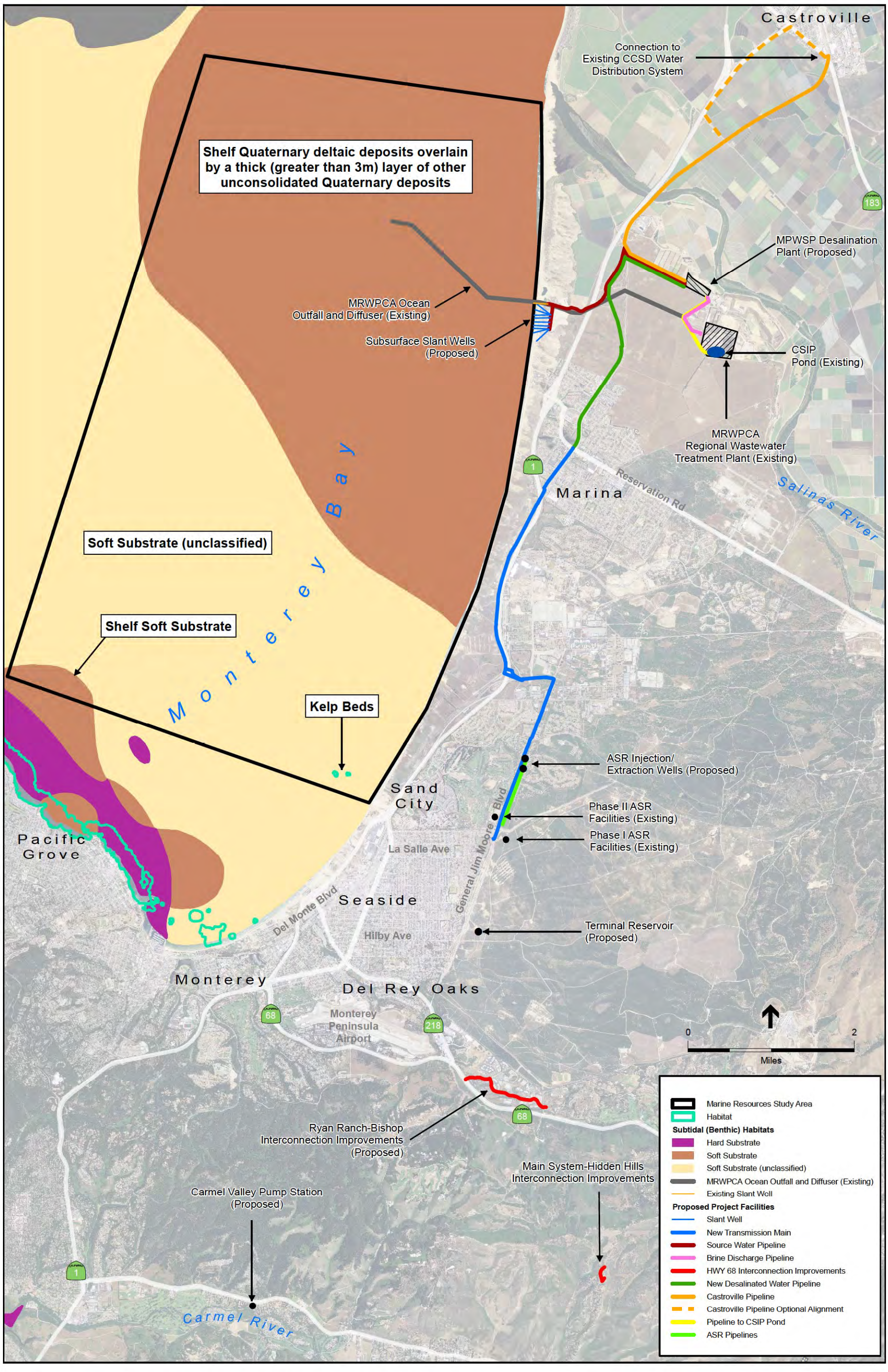
The CPUC received several comments pertaining to marine biological resources during the public review period for the April 2015 Draft EIR. Comments requested revision of the description of National Marine Sanctuary Program Regulations; and expansion of the discussion of state regulations to provide a more complete description of the Marine Life Protection Act and the Marine Life Management Act, as well as management plans for nearshore fishes and market squid. These comments have been addressed in Section 4.5.2, Regulatory Framework. Other comments include suggested revisions to the analysis approach and significance thresholds for analysis brine discharge impacts. Accordingly, the approach and significance thresholds have been revised and are presented in Sections 4.5.4 and 4.5.5. Comments received on the April 2015 Draft EIR expressed concerns over the potential for hypoxia[1] *to occur near the seabed as a result of proposed MPWSP operational discharges. Specifically, there was concern that high salinity discharges from the MRWPCA outfall would restrict oxygen supply near the seabed and result in stress or mortality to benthic organisms and other marine biological resources. These issues are addressed in detail in Chapter 4.3, Water Quality, specifically Section 4.3.5.2 under Impact 4.3-4 and Impact 4.3-5, and a summary of this analysis is repeated in 4.5. Some commenters requested more quantitative analysis of shear stress effects on plankton associated with brine discharges and consideration of brine discharge impacts on squid. These issues are addressed under Impacts 4.5-4, 4.5-5, and 4.5-6. Finally, a concern was expressed regarding the presence of cold water offshore seeps. Although cold water seeps are one of the more unique and sensitive benthic habitats that occurs within Monterey Bay, they are located at depths greater than 3,000 feet (1,000 meters). There are no known cold water seeps within the study area and this topic is not further discussed.*

4.5.1 Setting/Affected Environment

This setting section describes the regional oceanographic conditions and marine biological resources of Monterey Bay within Monterey Bay National Marine Sanctuary (MBNMS), and provides more specific information on habitats and resources in the study area. The impact analysis presented in Section 4.5.5, below, focuses on those resources located within the marine biological resources study area (**Figure 4.5-1**). The information on marine communities, plant and animal species, and sensitive biological resources used in the preparation of this section was obtained from regional databases including information available from MBNMS (MBNMS, 2013; 2015a, b; 2016a, b, c, d, e) environmental impact assessments prepared for other regional projects (MCRMA, 2014, SWCA/MBNMS, 2014), and scientific publication articles relevant to the proposed project, and reconnaissance-level surveys of the project area. A survey of marine plankton was performed on May 5, 2016 (AMS, 2016).

The study area is located in the nearshore coastal area of MBNMS, which was designated as a federally protected area in 1992. MBNMS is managed by the National Oceanographic and Atmospheric Administration (NOAA), Office of National Marine Sanctuaries (ONMS) and includes coastal waters from Marin to Cambria. MBNMS includes 276 statute miles of shoreline,

[1] Hypoxia, or oxygen depletion, is an environmental phenomenon where the concentration of dissolved oxygen in the water column decreases to a level that can no longer support living aquatic organisms. The impacts of hypoxia are often described as creating a so-called “dead zone” in the marine environment.



SOURCE: CSUM; NOAA

205335.01 Monterey Peninsula Water Supply Project

Figure 4.5-1

Identified Seafloor Habitats in Study Area

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extends an average distance of 30 miles from shore (MHWL) and encompasses 4,601 square nautical miles of ocean (MBNMS, 2015a). It was established for the purposes of research and monitoring, education and outreach, public use and resource protection, and includes a variety of habitats that support highly productive biological communities.

MBNMS resources include a variety of habitats that support extensive marine life, including 34 species of marine mammals, over 180 species of seabirds and shorebirds, at least 525 fish species, four sea turtle species, 31 different invertebrate phyla, and over 450 species of marine algae. Its natural resources include central California's largest contiguous kelp forest, one of North America's largest underwater canyons, and the closest-to-shore deep ocean environment off the continental United States. Its productive biological communities host one of the highest levels of marine biodiversity in the world, including 27 federally listed threatened and endangered species.

4.5.1.1 Existing Oceanographic Conditions

Monterey Bay has three ocean climate seasons: upwelling, oceanic, and Davidson current (Pennington and Chavez, 2000). The upwelling period, typically occurs mid-February through November, and is characterized by higher nutrient concentrations at the surface, where sunlight and stratification of the water column often lead to high primary production and chlorophyll values (see the discussion of pelagic habitat, below, for more details). MBNMS represents one of four major coastal upwelling regions worldwide. The seasonal upwelling makes Monterey Bay extremely productive in terms of being able to support a variety of species, including some whales and small schooling fish (e.g., sardine, herring).

During the oceanic period, which usually begins in mid-August and continues through mid-October, phytoplankton blooms are intermittent and primarily composed of small phytoplankton. Phytoplankton productivity is lowest in winter months and during the Davidson current period. Section 4.3, Surface Water Hydrology and Water Quality, provides more detail about the hydrology and water quality of Monterey Bay.

4.5.1.2 Existing Marine Habitats and Communities

The study area includes a variety of habitats that can be broadly divided into nearshore, pelagic (open water), and benthic (sea floor) habitats, as described in the following subsections.

Intertidal & Nearshore Habitats

The intertidal zone is located between the highest and lowest tide elevations. Intertidal zones along the central California coast include rocky shores, sandy beaches, coastal marshes, and tidal flats located within estuaries and lagoons. The intertidal zone adjacent to the project area is characterized by sandy beaches.

Sand and gravel beach communities are structured in part by grain size, slope of the beach, and wave energy. Intertidal beach communities are also subject to daily tidal changes that result in highly fluctuating physical regimes in temperature, salinity, and moisture content of the sand.

Various invertebrate animals live in the sand and in wracks of decaying seaweed and other detritus. These include crustaceans, cirolanid isopods, and mole crabs (Oakden and Nybakken, 1977). Polychaete worms, bivalves (i.e. clams, mussels, and scallops) are also regularly present, though typically in low abundances. In addition, there are numerous species of shorebirds that use the sandy beaches in the project area to feed at the water's edge, such as sanderling, marbled godwit, and willet. Western snowy plover is a protected species that nest on these same beaches. Marine mammals, including California sea lions, harbor seals, and elephant seals, haul out on isolated beaches and sands spits. Southern sea otters (*Enhydra lutris nereis*) forage for crustaceans and bivalves in the surf zone during high tide. Sand dollars, worms, clams, crabs, and a variety of fish, including multiple species of surfperch, flatfish, rays, and sharks, inhabit or utilize the surf zone.

Pelagic (Open Water) Habitat

The pelagic habitat supports planktonic organisms that float or swim in the water, as well as fish, marine birds, and marine mammals. Monterey Bay has a high level of phytoplankton primary production[2] due to annual seasonal upwelling. Phytoplankton, the primary producers in the marine pelagic food web, are consumed by many species of zooplankton. In turn, the zooplankton supports a variety of species, such as small schooling fish (e.g., sardine, herring) and baleen whales (*Mysticeti*).

Seasonal blooms of phytoplankton regularly occur in Monterey Bay (Pennington and Chavez, 2000) when optimal conditions for each species (e.g. temperature, nutrient concentrations, salinity) develop. Some phytoplankton species, such as the dinoflagellate (*Cochlodinium*), produce toxins and can cause harmful algal blooms when they reproduce to very high densities (Kudela et al., 2008; Shahraki et al, 2013). A diatom (*Pseudo-nitzschia*) produces domoic acid, a neurotoxin that can bioaccumulate in the food chain and result in mortality in marine mammals, birds, and humans. This diatom is regularly associated with harmful algal blooms in Monterey Bay (Armstrong-Howard et al, 2007; Kudela et al, 2005).

Common zooplankton in Monterey Bay include small shrimp-like invertebrates (crustaceans) of the order Euphausiacea commonly known as krill. Large aggregations of euphausiids often precede the arrival of blue whales that come to feed on crustaceans at the edge of the Monterey Bay Submarine Canyon. Euphausiids feed on phytoplankton that grow after nutrient rich water has upwelled to the surface. Euphausiid species typically present in these groups are *Euphausia pacifica, Thyanoessa spinifera,* and *Nyctiphanes simplex* (Croll et al., 2005).

Small zooplankton was sampled near the MRWPCA outfall in the spring of 2016, to characterize the assemblages that could be affected by the proposed discharge of desalination brine (AMS, 2016). Three oblique tows (at the diffuser, 0.3 mile [0.5 kilometer] north of the diffuser, and 0.3 mile [0.5 kilometer] south of the diffuser) were made perpendicular to shore to bracket the water depth of the diffuser using a net with a 1-meter opening and net mesh of 202 µm. Calanoid copepods and euphausiid crustaceans were the most abundant organisms observed in sorted subsamples (see **Table 4.5-1**). Various crustacean, polychaete, and molluscan larvae and other

[2] Phytoplankton primary production refers to the growth rate of the phytoplankton community.

small zooplankton were also observed. When total counts were normalized to volume, abundances ranged from 77 to 176 individuals per cubic foot (or 2,702 to 6,202 individuals per cubic meter), with an overall average of 123 individuals per cubic foot (4,357 individuals per cubic meter).

TABLE 4.5-1
ZOOPLANKTON COLLECTED NEAR THE MRWPCA OUTFALL IN MAY 2016

Station	CALAM-1 North of Diffuser	CALAM-2 Over the Diffuser	CALAM-3 South of Diffuser	Overall
Date	**14 May 2016**	**14 May 2016**	**14 May 2016**	
Time	**10:05**	**10:59**	**11:39**	
Wire out (m)	**99**	**100**	**62**	
Taxonomic Group (#/m^3)				**Mean #/m^3**
Copepod_unid	88.47	0.00	12.72	33.73
Calanoid	3,025.59	1,918.70	4,213.87	3,052.72
Oithona_sp	253.61	207.32	648.61	369.85
Corycaeus_sp	5.90	81.05	105.98	64.31
Copepod_nauplii	76.67	3.77	152.61	77.69
Euphausiid_nauplii	23.59	5.65	12.72	13.99
Euphausiid_Calyptopis	837.49	275.18	729.16	613.94
Euphausiid_furcilia	117.96	65.97	55.11	79.68
Cirripedia_nauplii	11.80	16.96	12.72	13.83
Cladocera_podon	0.00	0.00	8.48	2.83
Salp	159.24	45.23	33.91	79.46
Appendicularia_unid	41.28	5.65	127.18	58.04
Oikopleura_unid	23.59	9.42	8.48	13.83
Chaetognath_unid	23.59	35.81	29.68	29.69
Polychaete_unid	0.00	5.65	8.48	1.97
Polychaete_trocophore	0.00	3.77	4.24	4.71
Gastropod_larvae	0.00	5.65	4.24	2.67
Bivalve_veliger	0.00	3.77	8.48	4.40
Siphonophore	0.00	0.00	21.20	3.30
Hydromedusa	0.00	0.00	4.24	4.08
Sum	4,706.47	2,702.76	6,202.10	4,357.11

SOURCE: AMS, 2016

The nearshore phytoplankton and zooplankton communities of Monterey Bay support a diverse group (over 80 species) of fish, sharks, and rays. These include flatfish such as halibut, sand dabs, flounder, turbot, and sole that are closely associated with sandy habitats, as well as surfperch, rockfish, gobies, and sculpins, which are normally associated with rocky habitats. Pelagic schooling fish include northern anchovy (*Engraulis mordax*), Pacific herring (*Clupea pallasi*), smelt (*Osmeridae)*, Pacific sardine (*Sardinops sagax*), and silversides (*Atherinidae*). The close proximity of the Monterey Bay Submarine Canyon to the shoreline means that certain fish, sharks, and marine mammals that would normally exist predominantly in deeper offshore waters can also be frequent inhabitants of the nearshore pelagic environment.

Market squid *(Doryteuthis (Loligo) opalescens*) inhabits the pelagic habitat in Monterey Bay and supports a major commercial fishery in the area, as well as providing a key food source for marine mammals, birds, fish, and sharks. Between 2009 and 2014, commercial landings of market squid in Monterey Bay ranged between 2.3 million and 90.4 million pounds annually with an average annual landing of 43.1 million pounds (CDFW, 2016a).

Market squid adults typically inhabit deeper offshore waters but return to shallower nearshore areas to spawn on sand and mud sea floor habitats. Peak spawning in Monterey Bay occurs in April. Squid larvae and juveniles inhabit the nearshore coastal waters of the study area (Porzio and Brady, 2006).

Monterey Bay has one of the most diverse and abundant marine mammal assemblages in the world with up to six species of seals and sea lions, 20 species of whales, dolphins, and porpoises, and one species of sea otter potentially occurring within the study area (MBNMS, 2016a). The most common seals and sea lions observed in the study area include the Pacific harbor seal (*Phoca vitulina*), California sea lion (*Zalophus californianus*), and the northern elephant seal (*Mirounga angustirostris*). Although any of these species can haul out on the sandy beaches or rocky intertidal breakwalls at Moss Landing Harbor, there are no known haul out areas for these species within the study area (MBNMS, 2016a).

The most commonly observed cetaceans (whales) within the study area include the humpback whale (*Megaptera novaengliae*), California gray whale (*Eschrichtius robustus*), the blue whale (*Balaenoptera musculus*), and occasionally the Minke whale (*Balaenoptera acutorostrata*). Other whale species that occur within Monterey Bay but are rarely or infrequently observed in the nearshore waters of the study area include the fin, sperm, North Pacific right, Sei, killer, and Baird's beaked whales. The most commonly observed dolphins and porpoises in the study area of Monterey Bay include the common dolphin (*Delphinus spp*.), bottlenose dolphin (*Tursiops truncates*), Pacific white-sided dolphin (*Lagenorhynchus obliguidens*), and Risso's dolphin (*Grampus griseus*). Additionally, while harbor porpoises (*Phocena phocena*) are frequently observed in the nearshore waters adjacent to Sunset Beach to the north of the study area, they are infrequently observed in the study area. Other dolphin and porpoise species present in the study area do not utilize nearshore waters or occur very infrequently; these include Dall's porpoise, Northern right whale dolphin, and striped dolphin. Southern sea otter (*Enhydra lutris nereis*) inhabits the nearshore waters of Monterey Bay and the study area using Elkhorn Slough in Elkhorn Slough National Estuarine Research Reserve as a pupping area (MBNMS, 2016a).

Benthic (Sea Floor) Habitats

Two sea floor or benthic habitat types occur in the study area (see **Figure 4.5-1**): soft substrate and hard substrate, which comprise the benthic habitat or submerged lands of MBNMS.

Soft Substrate (Mud & Sand) Habitat

The soft substrate habitat in the study area consists primarily of deltaic deposits from the Salinas River and other unclassified soft substrate. Physical processes, such as waves and currents, sort

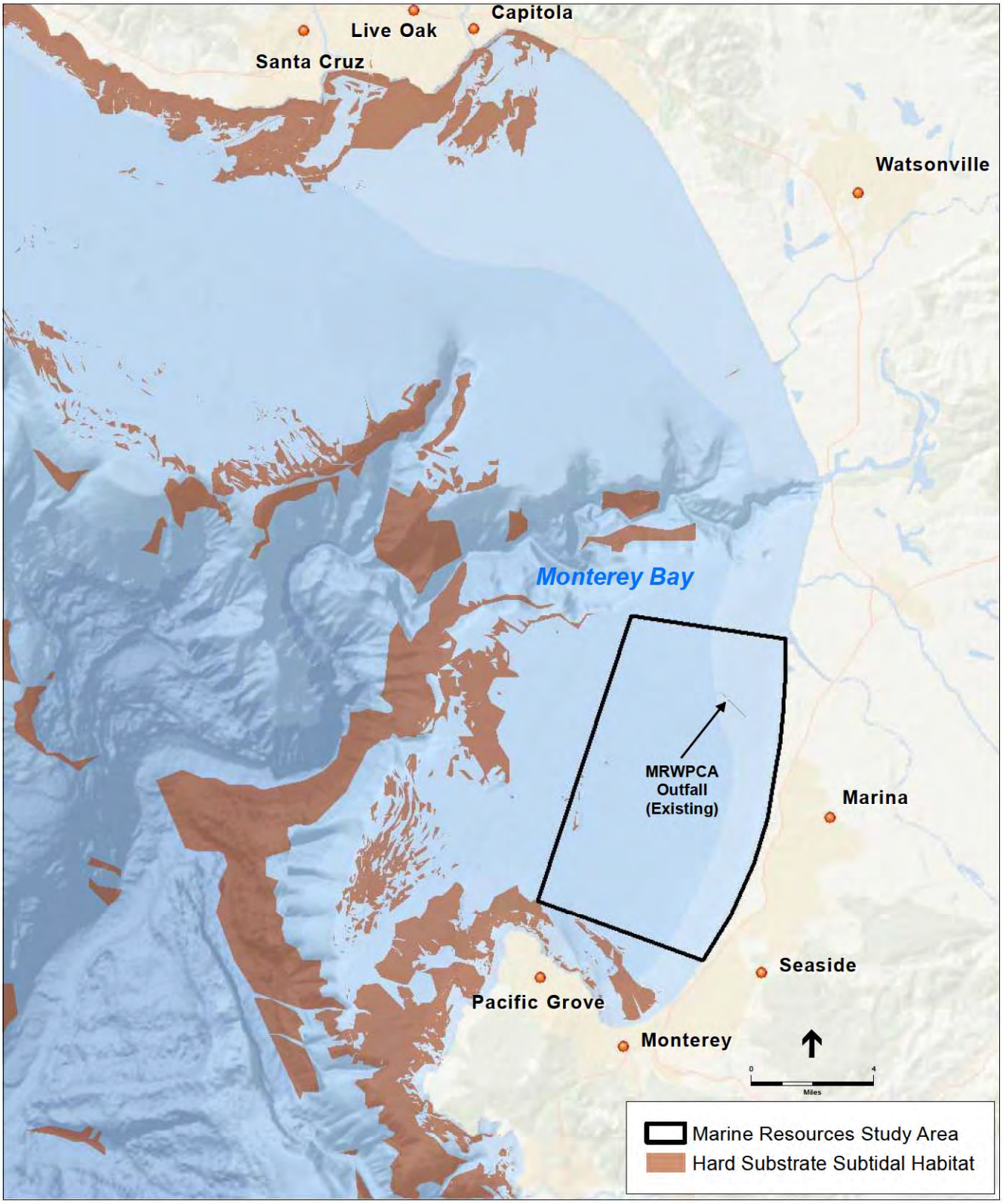
the sediment particles roughly by grain size so that there are onshore-offshore gradients in the fineness of sediments. The sea floor habitat located within the high-energy surf zone is characterized by coarse, mobile sands and contains a limited range and abundance of species commonly including flatfish, rays, shrimp, crabs, sand dollars, amphipods, clams, and large polychaete worms. Offshore, the sea floor sediment gradually changes to a finer mud composition with increasing percentages of silts and clays, as a result of decreasing wind-driven wave energy. As a result of the increased organic and silt/clay composition of the sea floor sediments, and decreased energy, the associated invertebrate and fish communities commonly inhabiting these areas increase substantially over the nearshore surf zone. The infaunal marine community typically consists of multiple species of polychaete and oligochaete worms, amphipods, cumaceans, isopods, ostracods, mollusks, decapods, gastropods, and ophiuroides. Common megabenthic epifauna include anemones, crabs, shrimp, gastropod snails, echinoderm sea stars, and sea pens. Many different fish species spend all or part of their life cycle in association with the sea floor. These species include flatfish, gobies, poachers, eelpouts, and sculpins, which all live in close association with the benthos during their subadult and adult life. Others, such as salmon, steelhead, smelt, sturgeon and other fish species, use the benthos for foraging.

This habitat area typically extends throughout most of the Monterey Bay with associated species composition and abundance changing gradually with depth. This habitat is not as physically dynamic as the nearshore sandy habitat and is normally not subject to large fluctuations in water quality parameters like salinity and temperature. However, this region is still subject to wave and current action, which sorts bottom sediments and removes organic material.

Hard Substrate Habitat

Rocky areas along the central California coast provide habitat for a diverse group of organisms. More than 660 marine algae and kelp species are present in the rocky habitats of central California (Abbott and Hollenberg, 1976). Kelp forests occur in rocky subtidal areas and provide abundant microhabitats by virtue of their vertical structure. Kelp forests are capable of providing sufficient primary productivity (rate of formation of energy-rich organic compounds) to sustain the entire ecosystem. The growth requirements for kelp include light, relatively cool water, and high nutrients (primarily nitrates, phosphates, and some metals). In addition to macrophytes like giant kelp (*Macrocystis pyrifera*) and bull kelp (*Nereocystis* spp.) that anchor on hard substrate, highly diverse invertebrate and fish assemblages also inhabit rocky areas. These include multiple species of bryozoans, anemones, shrimp, ectoprocts, solitary and branching corals, hydrocorals, sponges, scallops, crabs, tubeworms, tunicates, and fish, including rockfish (*Sebastes*), sculpins, lingcod, and greenlings.

NOAA, as part of their coastal marine resource mapping efforts (NOAA, 2014a), indicates on one of their sensitivity index maps the potential presence of a small area of rocky subtidal habitat supporting kelp at the very southern end of the study area (see **Figure 4.5-1**). Additionally, MBNMS' Sanctuary Ecologically Significant Areas (SESAs) Map identifies rocky habitat that coincides with the ballast rock that is used to secure the MRWPCA outfall on the seabed (see **Figure 4.5-2**) (MBNMS, 2016d). As described above, the majority of the study area is soft bottom substrate and there are no SESAs in the study area. Video obtained during a recent inspection of the



SOURCE: NOAA, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.5-2

Hard Substrate Subtidal Habitat in Monterey Bay

MRWPCA outfall revealed a rich hard-substrate assemblage on the ballast rock. Numerous species of rockfishes, sea cucumbers, anemones, solitary cup corals, and sponges were observed (Ballard Marine Construction, LLC, 2014).

Submarine Canyons

A major feature of Monterey Bay is the system of submarine canyons that incise the coastal shelf. Monterey Canyon, whose head is close to shore near Moss Landing, is similar in size to the Grand Canyon (MBNMS, 2016f) with a maximum rim to floor relief greater than 5,500 feet. Soquel Canyon, much smaller than Monterey Canyon, begins offshore of Soquel and intersects with the northern rim of Monterey Canyon. The canyon walls are a mixture of soft substrate and rocky outcrops and support a very diverse biota of benthic organisms, such as corals, sea pens, tunicates, sponges, and crinoids, and fishes. Krill, a major prey item for many cetaceans, also exist in high concentrations along canyon walls and near canyon heads. None of the canyons in Monterey Bay are located within the study area.

4.5.1.3 Special-Status Marine Species

The high phytoplankton productivity of Monterey Bay and Elkhorn Slough supports numerous special-status mammals, birds, turtles, and fish. Special-status species include those species that are listed as federal or state endangered, threatened, proposed, and candidate species; and state or local species of concern. For the purposes of this analysis, special-status marine species include:

- Marine species that are listed or proposed or are candidate species for listing as Threatened or Endangered by the USFWS pursuant to the Federal Endangered Species Act (FESA);
- Marine species listed as Rare, Threatened, or Endangered by CDFW pursuant to the California Endangered Species Act (CESA);
- Marine species managed and regulated under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act or MSA);
- Marine species protected under the Marine Mammals Protection Act (MMPA);
- Marine species managed and regulated by CDFW under the Nearshore Fisheries Management Plan and the Market Squid Fisheries Management Plan;
- Marine species designated by CDFW as California Species of Concern; and
- Marine species not currently protected by statute or regulation but considered rare, threatened, or endangered under CEQA (Guidelines Section 15380).

Table 4.5-2 presents the FESA, CESA, and MMPA marine species in Monterey Bay and their potential to occur within the study area. The special-status marine species that have the highest risk of being adversely affected by project construction and operational activities because of their presence within the study area are discussed below. **Table 4.5-3** presents marine fish and invertebrate species that are managed and regulated under the MSA and **Table 4.5-4** presents marine fish and invertebrates that are managed under the California Nearshore Fisheries Management Plan (NFMP) and the California Market Squid Fisheries Management Plan (MSFMP), that occur within the study area.

TABLE 4.5-2
SPECIAL-STATUS MARINE SPECIES AND THEIR POTENTIAL TO OCCUR WITHIN THE STUDY AREA

Common Name	Scientific Name	Listing Status[a]	Habitat	Regional Occurrence	Potential to Occur in Study Area[b]
Marine Mammals					
Southern Sea Otter	*Enhydra lutris nereis*	FT, P	A top carnivore in its coastal range and a keystone species of the nearshore coastal zone. Frequent inhabitor in kelp forests.	Year-round-Common	**High.** Otters are commonly found in Monterey Bay and the nearshore waters within the study area.
California Sea Lion	*Zalophus californianus*	P	Coastal waters of Monterey Bay are used for foraging with haul-out sites near Fishermen's Wharf; most abundant pinniped in MBNMS.	Seasonal-Common	**Moderate.** Main haul-out sites are located south of the study area; however, foraging can be expected to occur over the entire continental shelf.1
Steller Sea Lion	*Eumetopias jubatus*	FT, P	Occasional visitor in fall and winter utilizing the coastal waters of Monterey Bay for foraging, usually found among the California sea lions on the Coast Guard jetty in Monterey harbor.	Seasonal-Occasional	**Not Expected.** A small population breeds on Año Nuevo Island, just north of Monterey Bay and occasional individuals transit through MBNMS waters but no sightings within the study area have been reported.[1]
Harbor Seal	*Phoca vitulina richardii*	P	Most commonly observed pinniped along MBNMS coastline. Use the offshore waters of Monterey Bay for foraging and beaches for resting. Occur on offshore rocks, on sand and mudflats in estuaries and bays, and on some isolated beaches.[1]	Year-round-Common	**High.** Residents of MBNMS throughout the year, occurring mainly close to shore.
Northern Fur Seal	*Callorhinus ursinus*	FD	Usually come ashore in California only when debilitated, however, few individuals observed on Ano Nuevo Island. Occur off of central California during winter following migration from northern breeding grounds.	Seasonal-Very Rare	**Not Expected.** Usually 18-28 km from shore in California, however, they have been observed within 5 km of Point Pinos to the south of the study area.[1]
Northern Elephant Seal	*Mirounga angustirostris*	P	Usually observed offshore swimming and foraging and only come ashore in Monterey Bay when debilitated or at one of the established rookeries. Three rookeries are on mainland beaches in MBNMS at Pt. Piedras Blancas, Cape San Martin/Gorda, and Año Nuevo State Park.	Year-round, Common	**Low.** Northern elephant seals are widely distributed in MBNMS but have a low probability of occurring in the study area. They are sighted regularly over shelf, shelf-break, and slope habitats and they are also present in deep ocean habitats seaward of the 2000 m isobaths. Rookeries are located to the north and south of the study area.
Guadalupe Fur Seal	*Arctocephalus townsendi*	CT, FT, FD	Breed along the eastern coast of Guadalupe Island, approximately 200 Kilometers west of Baja California. In addition, individuals have been sighted in the southern California Channel Islands, including two males who established territories on San Nicolas Island. Guadalupe fur seals have been reported on other southern California islands, and the Farallon Islands off northern California with increasing regularity since the 1980s and only occasional observed foraging and swimming in the waters of Monterey bay.	Seasonal-Very Rare	**Not Expected to Low.** This species is not known to regularly haul out or breed in the study area, but occasionally individuals have been sighted in MBNMS waters or have stranded on beaches located within the study area.[1]

TABLE 4.5-2 (Continued)
SPECIAL-STATUS MARINE SPECIES AND THEIR POTENTIAL TO OCCUR WITHIN THE STUDY AREA

Common Name	Scientific Name	Listing Status[a]	Habitat	Regional Occurrence	Potential to Occur in Study Area[b]
Marine Mammals (cont.)					
Harbor Porpoise	*Phocoena phocoena*	P	Observed in shallow sandy bottom areas of the Monterey Bay Shelf where they forage.	Year-round-Common	**Low.** Although the main population is located offshore Sunset Beach State Park to the north of the study area, individuals have been reported in the nearshore waters adjacent to the former Fort Ord military base.[2]
Risso's Dolphin	*Grampus griseus*	P	Generally found in waters greater than 1,000m in depth and seaward of the continental shelf and slopes.	Year-round-Very Rare	**Not Expected.** An increase in the number of Risso's dolphins in MBNMS has occurred since 1973; however, they generally occur in deeper waters offshore of the study area.[3]
Common Dolphin – Long-beaked	*Delphinus capensis*	P	Found relatively close to shore swimming and foraging.	Year-round-Common	**High.** The common dolphin is the most abundant cetacean found in the coastal waters of California, and the abundance within MBNMS has increased in recent years.[3]
Common Dolphin – Short-beaked	*Delphinus delphis*	P	A more pelagic species than the long-beaked common dolphin, they utilize Monterey Bay for foraging.[3]	Year-round-Rare	**Not Expected.** Generally found offshore of the study area.
Dall's Porpoise	*Phocoenoides dalli*	P	The most pelagic of the porpoises in MBNMS, they utilize Monterey bay for foraging.	Year-round-Rare	**Not Expected.** Most frequently seen off of Point Pinos and over the Monterey Canyon, both of which are outside of the study area.[3]
Bottlenose Dolphin	*Tursiops truncatus*	FD	Includes coastal and offshore populations. Both species use the waters of Monterey Bay for foraging.	Year-round-Common	**Moderate.** More than 45 individuals have been sighted during one recent survey. This species is now considered a resident of Monterey Bay, and is confined to occur within one km of shore.[3]
Pacific White-sided Dolphin	*Lagenorhynchus obliquidens*	P	Commonly seen near the shelf break in the offshore waters of Monterey Bay.	Year-round Common	**Not-Expected - Low.** This had been the most frequently seen dolphin in Monterey Bay but has recently been replaced by the common dolphin. Occurs primarily within 15km west of Carmel Bay to the south of the study area and within 25km southwest of Santa Cruz to the north of the study area.[3]
Northern Right Whale Dolphin	*Lissodelphis borealis*	P	Deep, cold temperate waters over the continental shelf and slope in offshore Monterey Bay.	Year-round-Rare	**Low.** Most frequently seen south of MBNMS. Abundance of this species appears to have increased since 1973.[3]
Minke Whale	*Balaenoptera acutorostrata*	P	Can be in coastal/inshore and oceanic/offshore areas of Monterey bay.	Year-round-	**Low-Moderate**. Numerous sightings in the nearshore waters of Monterey Bay. Sightings are usually of single individuals.[3]

TABLE 4.5-2 (Continued)
SPECIAL-STATUS MARINE SPECIES AND THEIR POTENTIAL TO OCCUR WITHIN THE STUDY AREA

Common Name	Scientific Name	Listing Status[a]	Habitat	Regional Occurrence	Potential to Occur in Study Area[b]
Marine Mammals (cont.)					
Blue Whale	*Balaenoptera musculus*	FE, FD	In Monterey Bay, blue whales often occur near the edges of the submarine canyon where krill tends to concentrate. Blue whales feed only on krill and are in Monterey Bay between June and October, during times of high krill abundance. Blue whales begin to migrate south during November.	Seasonal-Common	**Low.** Regularly observed in Monterey Bay but mostly in deeper waters.
Humpback Whale	*Megaptera novaeangeliae*	FE, FD	Central California population of humpback whales migrates from their winter calving and mating areas off Mexico to their summer and fall feeding areas off coastal California. Humpback whales occur in Monterey Bay from late April to early December.	Seasonal-Common	**Moderate.** Observed throughout Monterey Bay.
Fin Whale	*Balaenoptera physalus*	FE, FD	More common farther from shore; occasionally encountered during the summer and fall in Monterey Bay.	Seasonal-Common	**Not Expected.** Due to their occurrence mainly farther offshore in deeper waters, it is not likely they would be seen in the study area.
Sperm Whale	*Physeter macrocephalus*	FE, FD	Occur in many open oceans; live at the surface of the ocean but dive deeply to catch giant squid.	Seasonal-Rare	**Not Expected.** Offshore but mostly in deeper waters.
Gray Whale	*Eschrichtus robustus*	FDL, P	Predominantly occur within the nearshore coastal waters of Monterey Bay. This species has been delisted under FESA but remains protected under MMPA.	Seasonal-Common	**High.** Occurring in coastal waters during late fall-winter southward migration and again late winter to early summer during their northward migration.
Killer Whale	*Orcinus orca*	P	Transient species observed throughout coastal California waters. Presence and occurrence can be common but unpredictable.	Seasonal-Common	**Low.** Most common during April, May, and June as they feed on northbound migrating gray whales. Generally observed in the deeper waters offshore of the study area.
North Pacific Right Whale	*Eubalaena glacialis*	FE, FD	Seasonally migratory; inhabit colder waters for feeding, and then migrate to warmer waters for breeding and calving. Although they may move far out to sea during their feeding seasons, right whales give birth in coastal areas.	Seasonal-Very Rare	**Not Expected.** Sightings in MBNMS are very rare.[4]
Sei Whale	*Balaenoptera borealis*	FE, FD	Sighted in offshore waters throughout the latitudinal range of MBNMS, though usually occur seaward of the sanctuary's western boundary. Observed generally in deep water habitats including along the edge of the continental shelf, over the continental slope, and in the open ocean.	Seasonal-Very Rare	**Not Expected.** Sightings have become rare in MBNMS since the 1980s.[5]
Short-finned Pilot Whale	*Globicephala macrorhynchus*	P	Found primarily in deep waters in warmer tropical and temperate waters. Forage in areas with high densities of squid.	Year-round-Very Rare	**Not Expected.** Generally found in deeper water than that in the study area.
Baird's Beaked Whale	*Berardius bairdii*	FD	Inhabit deep offshore waters in the North Pacific.	Seasonal-Very Rare	**Not Expected.** Sightings in the fall in Monterey Bay and in deeper waters than the study area.

TABLE 4.5-2 (Continued)
SPECIAL-STATUS MARINE SPECIES AND THEIR POTENTIAL TO OCCUR WITHIN THE STUDY AREA

Common Name	Scientific Name	Listing Status[a]	Habitat	Regional Occurrence	Potential to Occur in Study Area[b]
Marine Mammals (cont.)					
Cuvier's Beaked Whale	*Ziphius cavirostris*	P	Deep pelagic waters (usually greater than 1,000m deep) of the continental shelf and slope. Seasonality and migration patterns are unknown.[6]	Seasonality unknown-Very Rare	**Not Expected.** Generally occur in the deeper waters west of the study area. Infrequent strandings in Monterey Bay.
Marine Turtles					
Leatherback Sea Turtle	*Dermochelys coriacea*	FE	Offshore pelagic environment.	Seasonal-Occasional	**Low.** Leatherback sea turtles are most commonly seen between July and October, when the surface water temperature warms to 15-16° C and large jellyfish, the primary prey of the turtles, are seasonally abundant offshore.
Green Sea Turtle	*Chelonia mydas*	FE	Primarily use three types of habitat: oceanic beaches (for nesting), convergence zones in the open ocean, and benthic feeding grounds in coastal areas.	Seasonal-Rare	**Low.** In the eastern Pacific, green turtles have been sighted from Baja California to southern Alaska but most commonly occur from San Diego south.
Olive Ridley Sea Turtle	*Lepidochelys olivacea*	FT	Mainly a "pelagic" sea turtle, but has been known to inhabit coastal areas, including bays and estuaries.	Seasonal-Very Rare	**Not Expected.** In the eastern Pacific, the range of the Olive Ridley turtle extends from southern California to northern Chile.
Loggerhead Sea Turtle	*Caretta caretta*	FT	Occupy three different ecosystems during their lives: the terrestrial zone, the oceanic zone (> 100 fathoms water depth), and the neritic one (< 100 fathoms water depth).	Seasonal-Very Rare	**Low.** In the U.S., most recorded sightings are of juveniles off the coast of California but occasional sightings are reported along the coasts of Washington and Oregon.
Fish					
Chinook Salmon (winter-run)	*Oncorhynchus tshawytscha*	CE, FE	Anadromous and semelparous. This means that as adults, they migrate from a marine environment into the fresh water streams and rivers of their birth (anadromous) where they spawn and die (semelparous).	Seasonal	**Moderate.** Chinook salmon are normally entering the Sacramento River from November to June and spawning from late-April to mid-August, with a peak from May to June. They inhabit nearshore coastal waters of Central California throughout the year, but especially during migration time.
Chinook Salmon (Central California Evolutionary Significant Unit)	*Oncorhynchus tshawytscha*	FT, CSC	Juveniles may spend from 3 months to 2 years in freshwater before migrating to estuarine areas as smolts and then into the ocean to feed and mature. They prefer streams that are deeper and larger than those used by other Pacific salmon species.	Seasonal	**Low.** Historically, the range extended from Oregon to the Ventura River in California, but presently does not appear to extend very far south of San Francisco Bay but into Monterey Bay. Chinook salmon in this ESU exhibit an ocean-type life history and use Monterey Bay waters for foraging.

TABLE 4.5-2 (Continued)
SPECIAL-STATUS MARINE SPECIES AND THEIR POTENTIAL TO OCCUR WITHIN THE STUDY AREA

Common Name	Scientific Name	Listing Status[a]	Habitat	Regional Occurrence	Potential to Occur in Study Area[b]
Fish (cont.)					
Coho Salmon (Central California Evolutionary Significant Unit)	*Oncorhynchus kisutch*	CT, FT	Spend approximately the first half of their life cycle rearing and feeding in streams and small freshwater tributaries. Spawning habitat is small streams with stable gravel substrates. The remainder of the life cycle is spent foraging in estuarine and marine waters of the Pacific Ocean.	Seasonal	**Low to Moderate.** Historically, there was a run in the Pajaro and Salinas Rivers but not since the 1990s. Current runs exist in Waddell Creek, Scott Creek, San Lorenzo River, Soquel Creek, and Aptos Creek. In Monterey County, the only runs are two small runs in the Carmel and Big Sur Rivers.
Steelhead Trout (South Central Coast Evolutionary Significant Unit)	*Onchorhynchus mykiss irideus*	FT, CSC	Trout can be anadromous or freshwater resident (and under some circumstances, apparently yield offspring of the opposite form). Resident forms are usually called rainbow, or redband, trout. Those that are anadromous can spend up to 7 years in fresh water prior to smoltification, and then spend up to 3 years in salt water prior to first spawning.	Seasonal	**Low to Moderate.** This ESU occupies rivers from the Pajaro River in Santa Cruz County to (but not including) the Santa Maria River in Santa Barbara County.
Tidewater Goby	*Eucycloglobius newberryi*	FE	Despite the common name, this goby inhabits lagoons formed by streams running into the sea. The lagoons are blocked from the Pacific Ocean by sandbars, admitting salt water only during particular seasons, and so their water is brackish and cool. The tidewater goby prefers salinities of less than 10 parts per thousand (ppt) (less than a third of the salinity found in the ocean) and is thus more often found in the upper parts of the lagoons, near their inflow.	Seasonal	**Low.** Seasonally present in Elkhorn Slough, Bennet Slough, and Salinas River, all of which are outside of the study area.
Western River Lamprey	*Lampetra ayresi*	CSC	Rivers for spawning and rearing; nearshore marine and estuarine habitat as adults. Adult river lampreys enter the ocean in late spring, spending 3-4 months in salt water where they exhibit rapid growth.[8,9]	Seasonal-Very Rare	**Not Expected to Low.** Uncommon in California and potentially in decline.
North American green sturgeon, Southern Distinct Population Segment (DPS)	*Acipenser medirostris*	FT	Within the marine environment, the Southern DPS occupies coastal bays and estuaries from Monterey Bay to Puget Sound in Washington. Individuals occasionally enter coastal estuaries to forage. All of Monterey Bay is designated Critical Habitat for green sturgeon.	Seasonal	**Low.** There are very few data on green sturgeon presence in coastal waters. This species may forage in or near the project area but its distribution in ocean waters is essentially unknown. Spawning occurs in the upper Sacramento River for the southern DPS and fish are known to frequent coastal waters < 110 meters.[16] In 2006, an individual was entrained at the Moss Landing Power Plant intake. No other sightings or reported presence in other entrainment and fish studies have indicated a more than occasional presence.

TABLE 4.5-2 (Continued)
SPECIAL-STATUS MARINE SPECIES AND THEIR POTENTIAL TO OCCUR WITHIN THE STUDY AREA

Common Name	Scientific Name	Listing Status[a]	Habitat	Regional Occurrence	Potential to Occur in Study Area[b]
Fish (cont.)					
White sharks	*Carcharodon carcharias*	CSC	In California, important white shark habitat occurs around Monterey Bay and Greater Farallones, national marine sanctuaries. White shark populations are impacted by purposeful and incidental capture by fisheries, marine pollution, and coastal habitat degradation	Year-round	**Moderate to High.** Present in coastal waters throughout the State and juveniles and adults are known to frequent the nearshore coastal waters along Monterey Bay coastline.
Eulachon	*Thaleichthys pacificus*	FT	Spawning and rearing in estuarine river habitat; migrate to saltwater where they spend three years and then return to river spawning locations.	Seasonal-Very Rare	**Low.** Monterey Bay is at the southernmost limit of this species distribution, and the population is in decline.[10]
White Sturgeon	*Acipenser transmontanus*	CSC	Live in estuaries of large rivers, but migrate to spawn in freshwater and often travel long distances between river systems.	Seasonal-Very Rare	**Low.** Exist in salt water from the Gulf of Alaska south to Ensenada, Mexico, but spawning only occurs in a few large rivers from the Sacramento-San Joaquin system northward. Self-sustaining spawning populations are currently only known in the Fraser (British Columbia), Columbia (Washington), and Sacramento (California) rivers.[11]
Longfin Smelt	*Spirinchus thaleichthys*	CT	Spend the majority of their life cycle in brackish to marine waters and migrates upstream to freshwater to spawn. A pelagic species.	Seasonal-Very Rare	**Not Expected.** A single longfin smelt collected from the Monterey Bay area was reported by Eschmeyer et al. (1983) but the San Francisco Bay-Delta population is considered to be the southernmost population for the species (Moyle 2002).[12]
Cowcod	*Sebastes levis*	CSC	Juveniles recruit to fine sediment habitat in Monterey Bay in late summer. They have been observed at depths between 40 and 100m. Young cowcod move to deeper habitat within their first year.[13,14]	Seasonal-Common	**Moderate.** Juveniles documented on soft-bottom habitat in study area.
Basking Shark	*Cetorhinus maximus*	CSC	This species movements and migrations are poorly understood. Usually sighted from British Columbia to Baja California in the winter and spring months; where they go once they leave coastal areas is unknown.	Seasonal-Very Rare	**Low.** Basking shark populations were severely depleted by commercial fisheries of the 1950s, and they have never fully recovered due to slow growth and low fecundity.[15]

TABLE 4.5-2 (Continued)
SPECIAL-STATUS MARINE SPECIES AND THEIR POTENTIAL TO OCCUR WITHIN THE STUDY AREA

Common Name	Scientific Name	Listing Status[a]	Habitat	Regional Occurrence	Potential to Occur in Study Area[b]
Marine Invertebrates					
Black Abalone	*Haliotis cracherodii*	FE	Coastal and offshore island intertidal habitats on exposed rocky shores where bedrock provides deep, protective crevices for shelter.	Year-round-Very Rare	**Not Expected.** Study area is not designated as critical habitat due to the lack of preferred habitat (rocky intertidal vs. fine- to medium-grained sand beaches of Monterey Bay).[7] Could be present on hard substrate areas to the north and south of the study area.

NOTES:

FESA = Federal Endangered Species Act
MMPA = Marine Mammal Protection Act
CESA = California Endangered Species Act

Potential for Species Occurrence Rankings:
Not Expected - Suitable foraging or spawning habitat is not known to be present and the species has not been documented to occur
Low - Suitable foraging or spawning habitat is present, but the species has either not been documented to be present or if present, the presence is infrequent
Moderate - Suitable foraging or spawning habitat is present and the species has been documented to be present for part of the year
High - Suitable foraging or spawning habitat is present and the species has been documented to be present throughout the year and/or in substantial numbers

STATUS CODES:

Federal: National Oceanographic and Atmospheric Administration (NOAA); MMPA
FD = Depleted Population
P = Federally Protected

Federal: U.S. Fish and Wildlife Service (USFWS), NOAA National Marine Fisheries Service (NMFS); FESA
FDL = Delisted
FE = Listed as "endangered" (in danger of extinction) under FESA
FT = Listed as "threatened" (likely to become Endangered within the foreseeable future) under FESA
FC = Candidate to become a proposed species
FSC = Former "federal species of concern". The USFWS no longer lists Species of Concern but recommends that species considered to be at potential risk by a number of organizations and agencies be addressed during project environmental review. *NMFS still lists "Species of Concern".

State: California Department of Fish and Game (CDFG); CESA
CE = Listed as "endangered" under the CESA
CT = Listed as "threatened" under the CESA
CSC = CDFW designated "species of special concern"

SOURCES: KLI, 2005; CDFG, 2001; MBNMS, 2015a; NOAA, 2014a; CSUMB, 2014. [1]Monterey Bay National Marine Sanctuary (MBNMS), 2016a; [2]Sanctuary Integrated Monitoring Network (SIMoN), 2016a; [3]MBNMS, 2016b; [4]SIMoN, 2016b; [5]SIMoN, 2016c; [6]National Oceanic and Atmospheric Administration (NOAA), 2016a; [7]NOAA, 2011b; [8]California Department of Fish & Wildlife (CDFW), 2015a; [9]Burton & Lea, 2013; [10]Gustafson, RG, 2016; [11]CDFW, 2015b; [12]The Bay Institute (TBI) et al., 2007; [13]Love & Yoklavich 2008; [14]Johnson et al., 2001; [15]PSRF, 2016.

TABLE 4.5-3
FISH SPECIES PRESENT IN MONTEREY BAY MANAGED UNDER MAGNUSON-STEVENS ACT

Fisheries Management Plan	Common Name	Scientific Name	Life Stages Present	Potential to Occur in Study Area
Coastal Pelagic	Northern anchovy	*Engraulis mordax*	L, J, A[1]	High
	Pacific sardine	*Sardinops sagax*	L, J, A[1]	Moderate-High
	Jack mackerel	*Trachurus symmetricus*	J, A[1]	Moderate-High
	Pacific mackerel	*Scomber japonicus*	L, J, A[1]	Moderate-High
	Pacific herring	*Clupea pallasi*	L, J, A	Moderate-High
	Market squid	*Doryteuthis (Loligo) opalescens*	L, J, A[1]	Moderate-High, when in season
Pacific Groundfish	English sole	*Parophrys vetulus*	L, J, A[2]	High
	Sand sole	*Psettichthys melanostictus*	L, J, A[1]	Moderate-High
	Rock sole	*Pleruonectes bilineatus*	J, A	Moderate-High
	Butter sole	*Pleuronectes isolepsis*	J, A	Moderate-High
	Pacific sanddab	*Citharichthys sordidus*	L, J, A[1]	Moderate-High
	Starry flounder	*Platichthys stellatus*	L, J, A[3]	Low-Moderate
	Diamond turbot	*Hypsopsetta guttulata*	A	Moderate-High
	Ratfish	*Hydrolagus colliei*	J, A	Moderate-High
	Lingcod	*Ophiodon elongatus*	L, J, A[4]	Low-Moderate
	Brown rockfish	*Sebastes auriculatus*	L, J, A[5]	Low-Moderate
	Kelp rockfish	*Sebastes atrovirens*	L, J, A	Low-Moderate
	Aurora rockfish	*Sebastes aurora*	L	Moderate-High
	Gopher rockfish	*Sebastes carnatus*	L, J, A	Low-Moderate
	Splitnose rockfish	*Sebastes diploproa*	L, J[6]	Low-Moderate
	Yellowtail rockfish	*Sebastes flavidus*	A	Moderate-High
	Shortbelly rockfish	*Sebastes jordani*	L, J[7]	Low-Moderate
	Black rockfish	*Sebastes melanops*	L, J, A[8]	Low-Moderate
	Black and yellow rockfish	*Sebastes chrysomelas*	L, J, A[9]	Very Low
	Blue rockfish	*Sebastes mystinus*	L, J, A[10]	Low
	Boccacio	*Sebastes paucispinis*	L, J, A	Low
	Grass rockfish	*Sebastes rastrelliger*	L, J, A[11]	Low
	Stripetail rockfish	*Sebastes saxicola*	L, J	Low-Moderate
	Juvenile & larval rockfish	*Sebastes spp.*	J, L	Low-Moderate
	Leopard shark	*Triakis semifasciata*	J, A[1]	Low-Moderate, when in season
	Spiny dogfish	*Squalus acanthias*	A, J,	Moderate-High
	Soupfin shark	*Galeorhinus zyopterus*	J, A	Low-Moderate
	Big skate	*Raja binoculata*	J, A	Low-Moderate
	California skate	*Raja inornata*	J, A	Low-Moderate
	Longnose skate	*Raja rhina*	J, A	Low-Moderate[12]
	Cabezon	*Scorpaenichthys marmoratus*	L, J, A	Moderate-High
Pacific Coast Salmon	Chinook salmon	*Oncorhynchus tshawytscha*	J, A	Moderate-High, when in season
	Coho salmon	*Oncorhynchus kisutch*	J, A	Moderate-High, when in season
Highly Migratory Species	Common thresher shark	*Alopias vulpinus*	J, A	Low-Moderate
	Shortfin mako shark	*Isurus oxyrinchus*	J, A	Rare, Present in waters deeper than 600 feet
	Albacore tuna	*Thunnus alalunga*	J, A	Moderate-High
	Northern bluefin tuna	*Thunnus orientalis*	J	Rare, Present in waters deeper than 600 feet

NOTES:
Life Stages- A = Adult, J = Juvenile, L = Larvae

SOURCES: [1]Tenera, 2014; [2]Boehlert & Mundy, 1987; [3]PFMC, 2005; [4]Allen, 2014; [5]NOAA, 2014b; [6]NOAA, 2016b; [7]Lenarz, 1980; [8]Miller & Shanks, 2004; [9]SIMoN, 2016d; [10]CDFG, 2001; [11]ODFW, 2016; [12]Driscoll, 2014.

TABLE 4.5-4
SPECIES MANAGED UNDER THE MAGNUSON-STEVENS FISHERIES MANAGEMENT PLAN AND CALIFORNIA NEARSHORE FISHERIES MANAGEMENT PLAN AND THEIR POTENTIAL TO OCCUR WITHIN THE STUDY AREA

Common Name	Scientific Name	Habitat	Regional Occurrence	Potential to Occur in Study Area
Market Squid	*Doryteuthis opalescens*	Pelagic. Adults migrate inshore to spawn over sand habitats and larvae generally occur inshore.	Year-round-Common	**Moderate.** The range of market squid is from the southern tip of Baja California, Mexico to southeastern Alaska. In central California spawning activity starts around April and ends in October. Adults occur in the upper 100m of the water column at night.[1]
Black Rockfish	*Sebastes melanops*	Occur in loose schools 10-20 ft above shallow, rocky reefs, but individuals may also be found resting on rocky bottoms or schooling in mid-water over deeper reefs. Larvae are pelagic, Young-of-year (YOY)[3] settle nearshore in shallower portions of kelp beds, and adults inhabit mid-water and pelagic areas over high relief rocky reefs.	Year-round-Rare	**Low.** Not common south of Santa Cruz.[2]
Black-and-Yellow Rockfish	*Sebastes chrysomelas*	Bottom-dwelling, generally in water less than 60 ft. Inhabit kelp beds and rocky reefs. Larvae and young juveniles are pelagic, but juveniles eventually settle on nearshore rocky areas or in kelp forests.	Year-round-Common	**Moderate.** Distributed from Eureka, California to Isla San Natividad, Baja California, but they are less common south of San Diego.[2]
Blue Rockfish	*Sebastes mystinus*	Larvae are pelagic. In spring, YOY appear in the kelp canopy, shallow rocky areas, and nearshore sand-rock interfaces. Adults inhabit the mid-water and pelagic areas around high-relief rocky reefs, the kelp canopy, and artificial reefs.	Year-round-Common	**High.** Distributed from the Bering Sea to Punta Banda, Baja California, from surface waters to a maximum depth of 1,800 ft. Most abundant rockfish in central California kelp beds.[2]
Brown Rockfish	*Sebastes auriculatus*	YOY migrate into bays and estuaries, which they use as nursery habitat (primarily in waters less than 175 ft deep). They may remain in higher salinity areas of bays for 1 to 2 years before returning to the open coast. Typically associated with sand-rock interfaces, rocky bottoms of artificial or natural reefs, and in eelgrass beds. In shallow areas they are associated with rocky areas and kelp beds, while in deeper water they stay near the rocky bottom.	Year-round-Common	**Moderate.** Distributed from southeast Alaska to Hipolito Bay, central Baja California. San Francisco Bay appears to be an important habitat.[2]
Cabezon	*Scorpaenichthys marmoratus*	Typically occur nearshore from the intertidal to 335 ft. As they get older and larger they tend to move to deeper water. Found in subtidal habitats in or around rocky reefs, under kelp beds, and in shallow tide pools.	Year-round-Common	**Moderate.** Distributed from Point Abreojos, Baja California to Sitka, Alaska.[2]

3 YOY – Young of Year. i.e., newly hatched juveniles.

TABLE 4.5-4 (Continued)
SPECIES MANAGED UNDER THE MAGNUSON-STEVENS FISHERIES MANAGEMENT PLAN AND CALIFORNIA NEARSHORE FISHERIES MANAGEMENT PLAN AND THEIR POTENTIAL TO OCCUR WITHIN THE STUDY AREA

Common Name	Scientific Name	Habitat	Regional Occurrence	Potential to Occur in Study Area
Calico Rockfish	*Sebastes dallii*	Found in areas of soft sand-silt sediment and on artificial reefs, from 60 to 840 ft deep. Adults inhabit rocky shelf areas where there is a mud-rock or sand-mud interface with fine sediments. Associated with areas of high and low relief.	Year-round-Common	**Moderate.** Distributed from Sebastian Viscaino Bay, Baja California to San Francisco.[2]
China Rockfish	*Sebastes nebulosus*	Larvae and early juveniles are pelagic, but larger juveniles and adults settle on rocky reefs or cobble substrate, generally at depths between 30 and 300 ft.	Year-round-Rare	**Low.** Distributed from Kachemak Bay, northern Gulf of Alaska to Redondo Beach and San Miguel Island in southern California, but are most abundant from southeastern Alaska to Sonoma County, California.[2]
Copper Rockfish	*Sebastes caurinus*	Found in the shallow subtidal to 600 ft. New recruits associate with surface-forming kelp. Juveniles settle to the bottom on rocky reefs and well as sandy areas. Adults are commonly found in kelp bed areas but also occur on deeper rocky reefs.	Year-round-Common	**Moderate.** Distributed from the northern Gulf of Alaska to central Baja California.[2]
Gopher Rockfish	*Sebastes carnatus*	Larvae and juveniles are pelagic, but as juveniles mature they settle on rocky reefs or into the kelp canopy. Adults are residential and bottom-dwelling, associated with kelp beds, rocky reefs, or sandy areas near reefs, from the intertidal to about 260 ft.	Year-round-Common	**Moderate.** Distributed from Eureka, California to San Roque, central Baja California, but are most common from Mendocino County, California to Santa Monica Bay.[2]
Grass Rockfish	*Sebastes restrelliger*	Shallow-water species, commonly found from the intertidal to 20 ft. Juveniles are pelagic, but adults are associated with kelp beds and reefs. Usually only juveniles are found in tide pools.	Year-round-Common	**Moderate.** Distributed from Yaquina Bay, Oregon to Bahia Playa Maria, central Baja California, although they are most commonly found from northern California south.[2]
Kelp Greenling	*Hexagrammos decagrammus*	Found in the intertidal to 500 ft, but are most common at depths of 150 ft or less. Found in subtidal habitats in or around rocky reef areas and under kelp beds. Juveniles and adults are common on any rocky bottom area with dense algal growth.	Year-round-Common	**Moderate.** Distributed from La Jolla, California to the Aleutian Islands in Alaska.[2]
Rock Greenling	*Hexagrammos lagocephalus*	Juveniles and adults are found in subtidal habitats in or around rocky reef areas and in kelp beds.	Year-round-Common	**Low.** Distributed from the Bering Sea to Point Conception. In California, this species is infrequently observed south of San Francisco.[2]
Kelp Rockfish	*Sebastes atrovirens*	Occur in rocky reef and artificial reef areas, but most commonly found in kelp beds, drifting within the kelp blades. Occur at depths up to 150 ft, but most often found at depths between 15 and 50 ft.	Year-round-Common	**High.** Distributed from Timber Cove, northern California to Punta San Pablo, central Baja California. Most abundant between northern Baja and central California.
Monkeyface Prickleback	*Cebidichthys violaceus*	Rocky areas with crevices, including high and low intertidal tide pools, jetties and breakwaters, and relatively shallow subtidal areas, particularly kelp beds. Juveniles are well adapted for high-intertidal areas. Occur from the intertidal to 80 ft in depth.	Year-round-Common	**Moderate.** Distributed from San Quintin Bay, Baja California to southern Oregon.[2]

TABLE 4.5-4 (Continued)
SPECIES MANAGED UNDER THE MAGNUSON-STEVENS FISHERIES MANAGEMENT PLAN AND CALIFORNIA NEARSHORE FISHERIES MANAGEMENT PLAN AND THEIR POTENTIAL TO OCCUR WITHIN THE STUDY AREA

Common Name	Scientific Name	Habitat	Regional Occurrence	Potential to Occur in Study Area
Olive Rockfish	*Sebastes serranoides*	Larvae and planktonic. YOY settle out of the plankton onto kelp beds, oil platforms, surfgrass. Occur from surface waters to about 396 ft.	Year-round-Common	**Moderate.** Distributed from southern Oregon to Islas San Benitos, central Baja California. Common from Cape Mendocino to Santa Barbara.[2]
Quillback Rockfish	*Sebastes maliger*	Larvae are planktonic. YOY settle out of the plankton onto shallow, low-relief rocky substrate and shallow, vegetated habitats such as kelp and eelgrass beds. Juveniles also inhabit the very nearshore sea floor and are found over both low- and high-relief rocky substrate. Adults are found in deeper water in close association with the bottom, perched on rocks or taking shelter in crevices.	Year-round-Rare	**Low.** Distributed from the Gulf of Alaska to San Miguel Island in southern California. Common between southeast Alaska and northern California.[2]
California Scorpionfish	*Scorpaena guttata*	Live in tide pools and to depths of about 600 ft. Very young scorpionfish live in shallow water in habitats with dense algae and bottom-encrusting organisms. Juveniles and adults are common on hard bottom such as rocky and artificial reefs.	Year-round-Rare	**Low.** Distributed from Santa Cruz, California south along the coast of Baja California and into the Gulf of California. Common as far north as Santa Barbara.[2]
California Sheephead	*Semicossyphus pulcher*	Inhabit nearshore rocky reefs, kelp beds, and surfgrass beds. Appear to prefer areas of high and low relief but have also been observed foraging over sandy bottom habitat. Use rock crevices and holes to sleep.	Year-round-Rare	**Low.** Distributed form Monterey Bay, California south into the Gulf of California. Not common north of Point Conception.[2]
Treefish	*Sebastes serriceps*	Found drifting in mats of kelp in areas of high rocky relief and on artificial reefs. Adult treefish are found on rock reefs, often in caves and crevices. Occur in shallow habitats to 150 ft in depth.	Year-round-Common	**Moderate.** Distributed from Cedros Island, Baja California to San Francisco.[2]

NOTES
[a] STATUS:
FE=Federally Endangered, SE= State Endangered, FT=Federally Threatened, ST=State Threatened, SSC= Species of Special Concern, FDL=Federally Delisted
[b] POTENTIAL TO OCCUR:
Not Expected = Not expected to occur. No suitable habitat within marine biological resources study area; study area outside currently known distribution or elevation range; no nearby documented occurrences or nearby documented occurrences are historical only.
Low = Low potential to occur: Potentially suitable habitat highly limited and/or of marginal quality; potentially suitable habitat present but species not documented nearby.
Moderate = Moderate potential to occur: Low to moderate quality habitat present; species documented in the study area.
High = High potential to occur: High quality suitable habitat present within study area; species documented in the project vicinity.

SOURCES: [1]CDFG. 2005, [2]CDFG. 2002.

FESA, CESA, and MMPA Species

Mammals

The special-status marine mammals that are most likely to be present within the resource study area, within MBNMS, identified in **Table 4.5-2**, include the southern sea otter, humpback whale, California gray whale, common long-beak dolphin, bottlenose dolphin, California sea lion, and Pacific harbor seal. Southern sea otter predominantly inhabits nearshore environments, where it dives to the sea floor to forage on predominantly marine invertebrates such as sea urchins, mollusks, crustaceans, and fish. Humpback and blue whales are found throughout Monterey Bay and tend to concentrate in areas with abundant krill or anchovies where they can be observed feeding. Bottlenose and the common long-beak dolphin are the two most frequently observed marine mammals in the shallower coastal waters of the study area. They are year-round inhabitants often observed in moderate-sized groups. Harbor porpoise are shy and harder to observe, yet they also have resident populations in the area. Harbor seals and California sea lions are also routinely observed within the study area, although usually as single individuals. No haul outs for either species are known to occur within the study area, although individuals can and do haul out temporarily on the beaches within the study area. The California gray whale, although no longer a federal and State-listed species, is one of the most commonly observed whales in Monterey Bay. Similarly, the federally endangered humpback whale has become a common sight within Monterey Bay between April and December when migrating through the region.

Additional species of marine mammals are known to be present in Monterey Bay either year-round or seasonally, but are not likely to occur or rarely occur in the study area.

Birds

One special-status marine bird occurs in the study area. The California western snowy plover (*Charadrius alexandrinus nivosus*) and other marine and terrestrial birds potentially inhabiting the study area are discussed in Section 4.6, Terrestrial Biological Resources.

Turtles

Special-status marine turtles that have a very low probability of occurring seasonally in the study area include the leatherback sea turtle (*Dermochelys coriacea*), Green sea turtle (*Chelonia myda*), Olive Ridley sea turtle (*Lepidochelys olivacea*), and loggerhead sea turtle (*Caretta caretta*). Leatherback sea turtles are federally endangered and most commonly seen in Monterey Bay from July to October. Green sea turtles, Olive Ridley sea turtles, and loggerhead sea turtles are federally threatened species rarely seen in Monterey Bay. NOAA has designated all of Monterey Bay as leatherback sea turtle critical habitat (NOAA, 2016c). The leatherback, green and loggerhead turtles have a low potential to occur within the study area; and the Olive Ridley turtle is not expected to occur within the study area.

Fish

The special-status fish with the highest probability of occurring in the study area are Chinook salmon (*Oncorhynchus tshawytscha*), Coho salmon (*Onchorhynchus kisutch*), Steelhead trout

(*Onchorhynchus mykiss irideus*), Cowcod (*Sebastes levis)*, green sturgeon (*Acipenser medirostris*), and white shark (*Carcharodon carcharias*). Chinook salmon, depending on the run, is State endangered or threatened, federally endangered or threatened and has a moderate to high potential to occur in the study area. Coho salmon is a State and federally threatened species that has a low to moderate potential to occur in the study area. Steelhead trout is a federally threatened species and a State species of special concern that has a low to moderate potential to occur in the study area. Green sturgeon is a federal threatened species and State species of concern that has a low potential to occur in the study area.

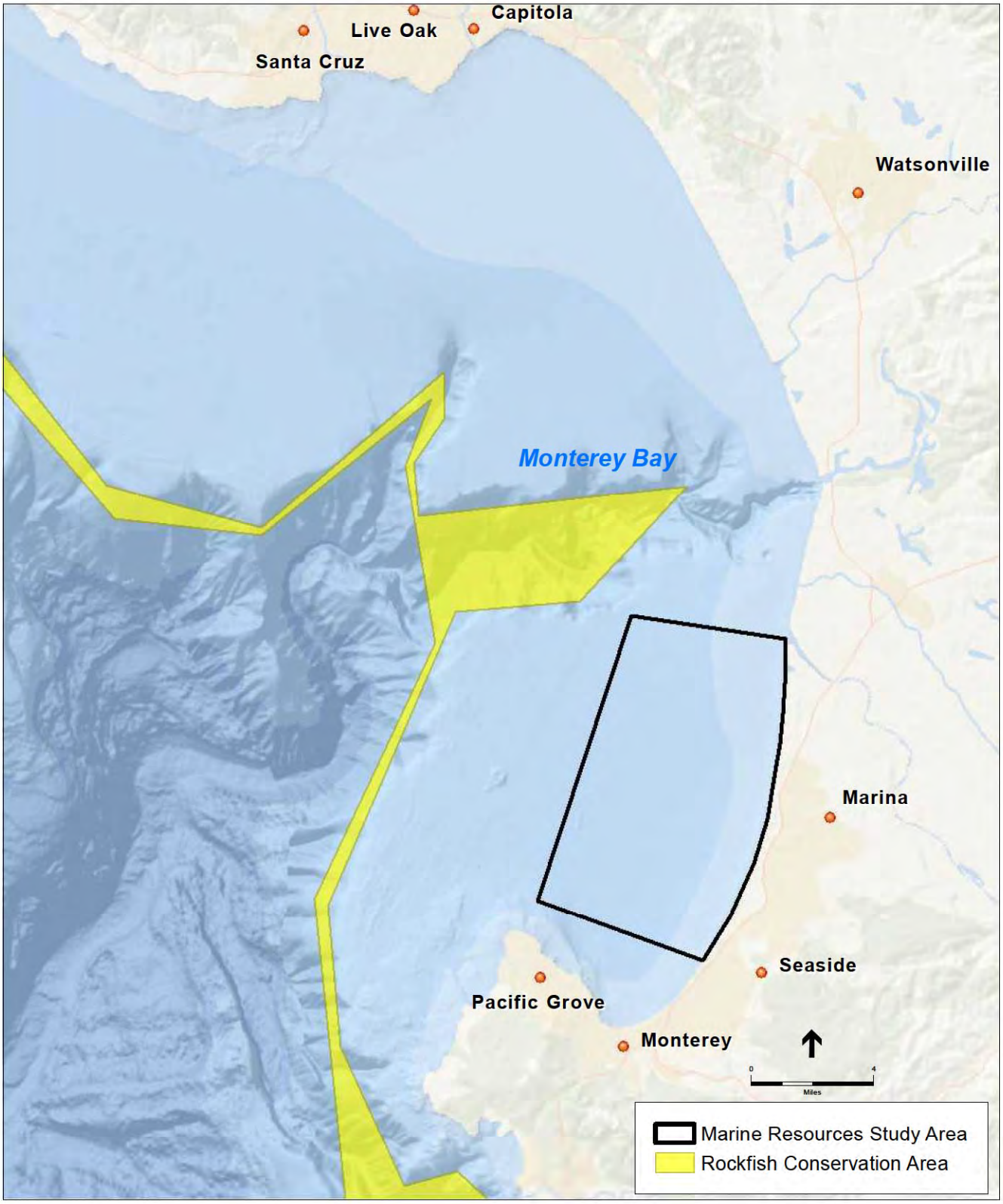
The tidewater goby is federally endangered and occurs seasonally in Elkhorn Slough and can be flushed out into the ocean during tidal events. Historically, due to pressures of fisheries mortality, loss of prey due to overharvesting, disease, predation, and habitat degradation linked to contaminants, white shark numbers had declined in the Northern Pacific. In 2013, NMFS[4] determined that recent information is consistent with a stable or increasing white shark population. CDFW identifies the white shark as a species of special concern while continuing to study its population. Similarly, juvenile cowcod rockfish, a California species of special concern, are known to inhabit the shallower waters of the study area.

Managed Fish Species

Under the Magnuson-Stevens Conservation and Management Act (discussed in Section 4.5.2, Regulatory Framework, below), NMFS, the Fishery Management Councils, and all federal agencies are required to cooperatively protect "essential fish habitat" for commercially important fish species such as Pacific coast groundfish, three species of salmon, and five species of coastal pelagic fish and squid. Essential Fish Habitat includes waters and substrates that support fish spawning, breeding, feeding, and maturation. Fish species found in the coastal waters of Monterey Bay and in Elkhorn Slough are protected by Federal Fishery Management Plans prepared by regional Fishery Management Councils under the Magnuson-Stevens Act are listed in **Table 4.5-3**. All of the coastal waters of Central California and Monterey Bay are identified as Essential Fish Habitat for fish identified in the Pacific coast groundfish, salmon and coastal pelagic fisheries management plans under MSA. **Figures 4.5-3** and **4.5-4** illustrate areas designated by NOAA as essential fish habitat for rockfish and MSA managed groundfish, respectively.

Commercial landings in the Monterey Bay ports (Monterey, Moss Landing, and Santa Cruz) indicate that in 2012 the major fish and invertebrates commercially harvested in Monterey Bay include northern anchovy, grenadier, California halibut, Pacific mackerel, assorted rockfish including blackgill, splitnose, and chillipepper, sablefish, Chinook salmon, white seabass, Pacific sardine, staghorn sculpin, sanddab, longnose skate, Dover sole, petrale sole, longspine thornyhead, shortspine thornyhead, albacore tuna, Dungeness crab, spot prawn, and squid (CDFW, 2013).

4 NMFS, 2013

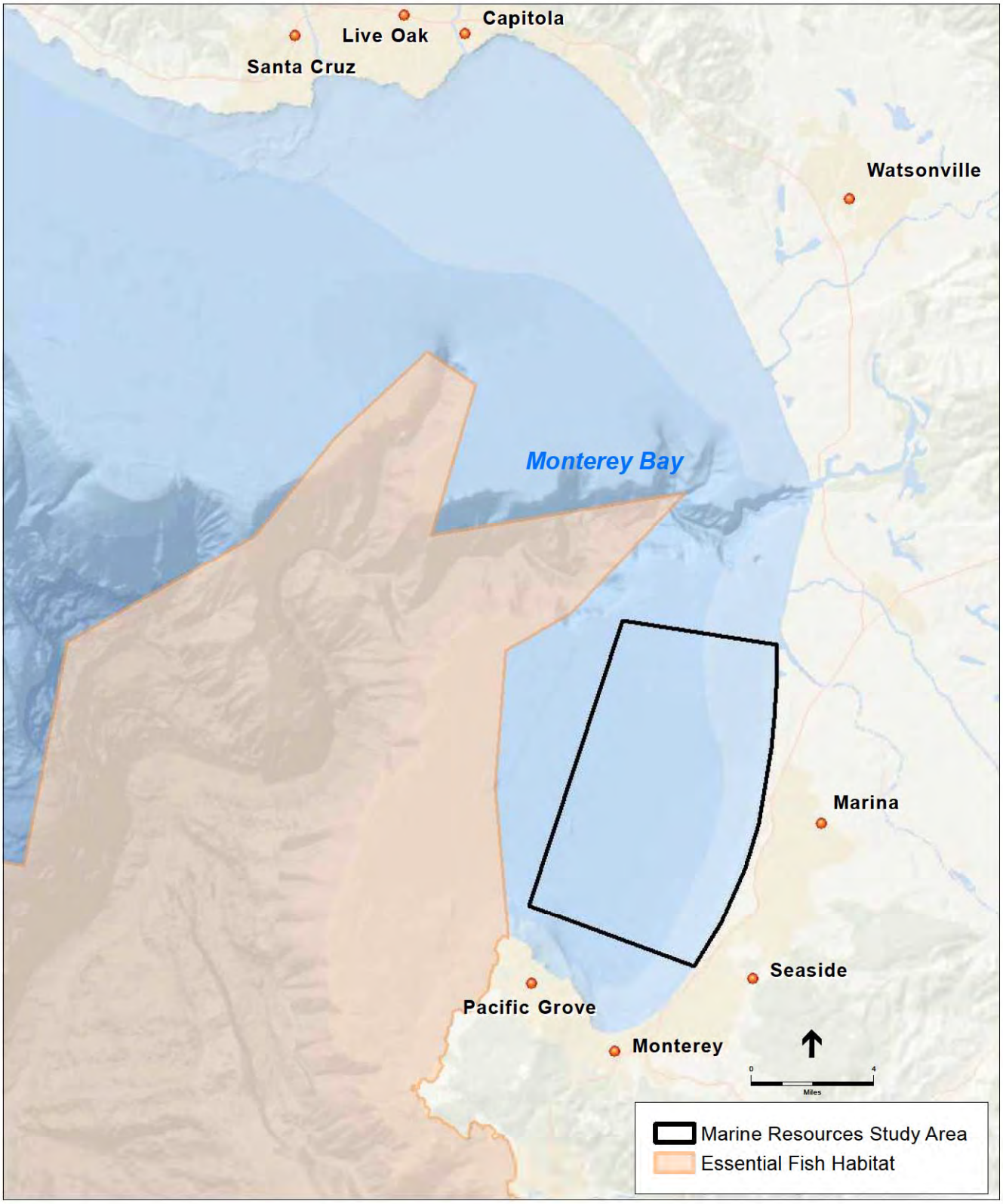


SOURCE: NOAA, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.5-3

Rockfish Conservation Areas Designated in MBNMS under Federal Regulations



SOURCE: NOAA, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.5-4

Essential Fish Habitat Designated in MBNMS under Federal Regulations

The most commonly landed recreational sport fishes in 2013 in central California and Monterey Bay were barred surfperch, assorted rockfish, including brown, black, copper, kelp, gopher, vermillion, yellowtail, and blue, calico surfperch, California lizardfish, Chinook salmon, Pacific mackerel, jacksmelt, northern anchovy, Pacific sanddab, silver surfperch, striped seaperch, walleye surfperch, sharks, and Dungeness crab (RECFIN, 2014).

4.5.1.4 Existing Marine Environment at the Proposed Intake and Outfall Locations

Many marine organisms inhabit either the surface (i.e., epifaunal) or reside within (i.e., infaunal) sea floor sediments. In particular, two communities are organized along a gradient of wave-induced substrate motion that is observed from San Diego to Washington:

- **Crustacean zone:** this shallower zone, characterized by strong water motion and sandy sediments, is occupied by small, mobile, deposit-feeding crustaceans, including sand-burrowing amphipods and surface-active cumaceans and ostracods. All can burrow into the loosely consolidated superficial sediments and flourish in wave-disturbed sand bottoms.
- **Polychaete zone:** characterized by more stable, fine sand with a significant amount of mud, this deeper zone is dominated by polychaete worms living in relatively permanent tubes and burrows. Many other relatively sessile[5] and suspension-feeding groups are also common here.[6]

The width and depth limits of these two zones vary, depending on the strength of wave activity. Benthic fishes are less abundant in the crustacean zone than the polychaete zone. Fish diversity on the sandy sea floor is relatively low compared to adjacent hard substrate areas.

The subsurface slant wells would terminate within the crustacean zone. The MRWPCA's existing ocean outfall and diffuser are in the polychaete zone. The marine communities inhabiting these zones are discussed in more detail below.

Proposed Subsurface Slant Wells

The subsurface slant wells would be drilled from roughly 900 feet inland of the shore and would extend beneath the coastal dunes and sandy beach, terminating 161 to 356 feet seaward of the MHW line, within the submerged lands of MBNMS, (except #8, which would not extend past the MHW line) in the nearshore zone at an estimated depth of 200 to 220 feet below MHW (190 to 210 feet beneath the sea floor).

Coastal dune habitat is described in detail in Section 4.6, Terrestrial Biological Resources. The intertidal beach area adjacent to the slant well locations is inhabited by crustaceans, cirolanid isopods, and mole crabs (Oakden and Nybakken, 1977). Polychaete worms, and bivalves (i.e. clams, mussels, and scallops) are also regularly present, though typically in low abundances. In addition, there are numerous species of shorebirds that use these beaches such as sanderling,

5 Sessile = of an organism, e.g., a barnacle, fixed in one place; immobile.
6 Zone descriptions from MBNMS, 2016g.

marbled godwit, and willet that feed at the water's edge, and western snowy plover, a protected species that nest on these same beaches.

The high-energy surf zone is predominantly populated by sand dollars, polychaete worms, shrimp and other arthropods, clams, crabs, and a variety of fish, including multiple species of surfperch, flatfish, rays, and sharks. Marine mammals that may utilize the waters of the surf zone include California sea lions and Pacific harbor seals. Southern sea otters also forage for crustaceans and bivalves in the surf zone during high tide.

Existing MRWPCA Ocean Outfall for Brine Discharges

The habitat surrounding the existing MRWPCA ocean outfall and diffuser is a high-energy sand and mud soft-substrate, as illustrated in Figure 4.5-1. The existing 2.1-mile-long MRWPCA outfall ends approximately 1.5 miles offshore with a 1,100-foot-long underwater diffuser that sits on ballast rock at approximately 90 to 110 feet below sea level, within the waters of MBNMS. The outfall and diffuser are located approximately 3.5 miles southwest of the mouth of the Salinas River, within the area affected by the sediment plume from the river. A long-term monitoring study of the ocean outfall (ABA Consultants, 1999) reported no effects from the outfall discharge on benthic communities, or biological accumulation of contaminants in tissue. No effects were observed on the physical and chemical properties of the sediments and water column except adjacent to the outfall. The increased sediment stability provided by the physical structure of outfall pipe and accompanying ballast rock has allowed a community of tubiculous polychaetes (*Diopatra ornata*) to become established in a distinct band within 6–7 feet of the south side of the outfall. This occurrence increased the diversity and abundance of organisms near the outfall. The monitoring program also reported that the benthic community structure in the vicinity of the outfall shifted over time with a general increase in mobile epifauna and opportunistic species and a decrease in sessile species and their predators, which was consistent with patterns seen in other parts of Monterey Bay and not linked to the outfall (ABA Consultants, 1999). Video of the MRWPCA outfall taken during routine maintenance (Ballard Marine Construction, LLC 2014) revealed a rich assemblage of hard-substrate organisms inhabiting the ballast rock covering the outfall.

4.5.1.5 Non-native Invasive Aquatic Species

The introduction of non-native invasive aquatic species is one of the greatest threats to MBNMS subtidal and intertidal habitats. The introduction of non-native species into coastal Monterey Bay or estuarine ecosystems (Elkhorn Slough) can result in large-scale changes to aquatic communities. California's estuaries, in particular, have become home to many non-native or introduced species that have dominated local intertidal and subtidal marine communities. Elkhorn Slough has been reported to contain approximately 40 non-native, invasive species and a smaller number has been reported for the coastal waters of MBNMS (MBNMS 2016c).

Although the effects of introduced aquatic species on habitats they colonize is often unknown, some clearly have had serious negative influences. Impacts include decreasing abundance and even local extinction of native species, alteration of habitat structure, and extensive economic costs due to heavy organism and algal growths on vessel bottoms and navigation, scientific, and

weather buoys. Historically, the principal mechanism of introduction to California coastal waters and estuaries has been fouling, boring, and release of ballast-dwelling organisms. Introduced species include snails, shrimp, plankton, crabs, and algae (MBNMS 2016c).

There are no known or reported occurrences of non-native aquatic species in the study area or more specifically the areas that will be affected by the proposed project.

The two documented non-native species occurring within coastal waters of MBNMS are the seaweed *Undaria pinnatifida* and the European green crab *Carcinus Maenas*. Both species are normally associated with hard substrate habitat (SIMoN, 2016e).

4.5.2 Regulatory Framework

This section summarizes federal and state environmental laws, policies, plans, regulations, and/or guidelines (hereafter referred to generally as "regulatory requirements") pertaining to marine biological resources and indicates the project's consistency with those regulatory requirements. There are no such local requirements related to marine biological resources that would apply to the MPWSP. The consistency findings are based on the project, as proposed, without mitigation. Where the proposed project would be consistent with the applicable regulatory requirement, no further discussion of project consistency with that regulatory requirement is provided. Where the proposed project 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 Project, below, where the potential inconsistency is addressed in more detail. Where applicable, the discussion in Section 4.5.5 includes identification of feasible mitigation that would resolve or minimize the potential inconsistency.

4.5.2.1 Federal Regulations

Federal Endangered Species Act

Under the Federal Endangered Species Act (FESA), the Secretary of the Interior and the Secretary of Commerce jointly have the authority to list a species as threatened or endangered (16 United States Code [USC] 1533(c)). Multiple species of fish and marine mammals are listed by the USFWS under FESA, as discussed in Section 4.5.1.3. The statute also prohibits the "take" of a federally listed species. "Take" is defined by the FESA as an action that harasses, harms, pursues, hunts, shoots, wounds, kills, traps, captures, or collects, or to attempt to engage in any such conduct." MBNMS will be consulting with NMFS and FWS pursuant to section 7 of the FESA to assess the level of potential effects from the project and minimize and mitigate those effects, wherever appropriate, to ensure consistency with the statute. Additional discussion of MPWSP effects related to FESA and the terrestrial environment is provided in Section 4.6, Terrestrial Biological Resources.

Federal Regulation of Wetlands and Other Waters

The United States Army Corps of Engineers (USACE) and the United States Environmental Protection Agency (USEPA) regulate the discharge of dredged or fill material into waters of the

United States, including wetlands, under Sections 404 and 401 of the Federal Clean Water Act. Projects that would result in the placement of dredged or fill material into waters of the United States require a Section 404 permit from the USACE. Section 401 of the Federal Clean Water Act requires every applicant for a federal permit or license for any activity that may result in a discharge to a water body to obtain State Water Quality Certification (Certification) that the proposed activity will comply with state water quality standards. Some classes of fill activities may be authorized under General or Nationwide Permits if specific conditions are met. Nationwide permits do not authorize activities that are likely to jeopardize the existence of a threatened or endangered species listed or proposed for listing under the Federal Endangered Species Act. In addition to conditions outlined under each Nationwide Permit, project-specific conditions can be required by the USACE as part of the Section 404 permitting process. When a project's activities do not meet the conditions for a Nationwide Permit, an Individual Permit may be issued.

The federal government also supports a policy of minimizing "the destruction, loss, or degradation of wetlands." Executive Order 11990 (May 24, 1977) requires that each federal agency take action to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands.

The MPWSP components proposed for the marine environment would be consistent with Sections 404 of the Federal Clean Water Act, and Executive Order 11990 because their construction would not include dredging or drilling in the territorial or federal waters; slant well drilling would begin approximately 900 feet inland of the shoreline and drill into and under the submerged lands of the Pacific Ocean, in State waters. Additional discussion of MPWSP effects related to wetlands and other waters of the terrestrial environment is provided in Section 4.6, Terrestrial Biological Resources.

Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act or MSA) (16 U.S.C. Sections 1801−1884) of 1976, as amended in 1996 and reauthorized in 2007, is intended to protect fisheries resources and fishing activities within 200 miles of shore. Conservation and management of U.S. fisheries, development of domestic fisheries, and phasing out of foreign fishing activities are the main objectives of the MSA. The MSA provided NOAA Fisheries with legislative authority to regulate U.S. fisheries in the area between 3 miles and 200 miles offshore and established eight regional fishery management councils that manage the harvest of the fish and shellfish resources in these waters.

The MSA defines "essential fish habitat" as those waters and substrate that support fish spawning, breeding, feeding, or maturation. The MSA requires that NOAA Fisheries, the regional fishery management councils, and federal agencies that take an action that may have an effect on managed fish species under MSA, identify essential fish habitat and protect important marine and anadromous fish habitat. The regional fishery management councils, with assistance from NOAA Fisheries, are required to develop and implement Fishery Management Plans. Fishery Management Plans delineate essential fish habitat and management goals for all managed fish species, including some fish species that are not protected under the MSA. Federal agency actions that fund, permit, or

carry out activities that may adversely affect essential fish habitat are required under Section 305(b) of the MSA, in conjunction with required Section 7 consultation under FESA, to consult with NOAA Fisheries regarding potential adverse effects of their actions on essential fish habitat and to respond in writing to NOAA Fisheries' recommendations.

Monterey Bay is designated as essential fish habitat under four Fishery Management Plans (see **Figure 4.5-4**). These plans provide protection for Pacific groundfish, coastal pelagic species, highly migratory species, and Pacific coast salmon (i.e. Chinook salmon and Coho salmon). A total of 37 commercially important fish and shark species are managed through these four Fishery Management Plans. Within the study area, coastal pelagic species, some groundfish species, thresher sharks, and occasionally salmon are known to be present (**Table 4.5-2**). The MPWSP would be consistent with the MSA because the construction and operational impacts of the proposed project are not expected to result in any degradation of essential fish habitat within Monterey Bay.

Rivers and Harbors Appropriations Act of 1899

Section 10 of the Federal Rivers and Harbors Appropriations Act of 1899 (30 Stat. 1151, codified at 33 U.S.C. §§401, 403) prohibits the unauthorized obstruction or alteration of any navigable water (33 U.S.C. §§403). Navigable waters under the Rivers and Harbors Appropriations Act are tidally influenced waters that are presently used, have been used in the past, or could be used in the future to transport interstate or foreign commerce (33 C.F.R. 3294). Activities that commonly require Section 10 permits include construction of piers, wharves, bulkheads, marinas, ramps, floats, intake structures, cable and pipeline crossings, and dredging and excavation.

The MPWSP components proposed for the marine environment would be consistent with Section 10 of the Rivers and Harbors Appropriations Act of 1899, because their construction would occur onshore and would not obstruct or alter navigable waters. Additional discussion of MPWSP effects related to navigable waters of the terrestrial environment is provided in Section 4.6, Terrestrial Biological Resources.

Marine Mammal Protection Act

The Marine Mammal Protection Act of 1972 (MMPA), as amended in 1981, 1982, 1984, and 1995, establishes a federal responsibility for the protection and conservation of marine mammal species by prohibiting the "take" of any marine mammal. The MMPA defines "take" as the act of hunting, killing, capture, and/or harassment of any marine mammal, or the attempt at such. The Act also imposes a moratorium on the import, export, or sale of any marine mammals, parts, or products within the U.S. These prohibitions apply to any person in U.S. waters and to any U.S. citizen in international waters.

The primary authority for implementing the act belongs to the USFWS and NMFS. The USFWS is responsible for the protection of sea otters, and NMFS is responsible for protecting pinnipeds (seals and sea lions) and cetaceans (whales and dolphins).

The MMPA, as amended, provides that a citizen may request an authorization for taking of small numbers of marine mammals incidental to a specified activity (e.g. dredging, marine construction, marine transport) within a specified region. Authorizations may only be allowed if the activity would have a negligible impact on marine mammal species, or stock (a regional population under the MMPA), and would not have an unmitigable adverse impact on subsistence uses.

The MPWSP would be consistent with the MMPA because incidental take is not likely to occur from the construction and operation of the proposed project, and project activities are not expected to result in take or harassment of any marine mammals as discussed further in Section 4.5.5

Coastal Zone Management Act

The Coastal Zone Management Act (CZMA), enacted by Congress in 1972, is administered by NOAA's Office for Coastal Management. The CZMA provides for management of the nation's coastal resources, including the Great Lakes, and balances economic development with environmental conservation. The CZMA outlines two national programs: the National Coastal Zone Management Program and the National Estuarine Research Reserve System. Thirty-four states have approved coastal management programs. The 34 coastal programs aim to balance competing land and water issues in the coastal zone, while estuarine reserves serve as field laboratories to provide a greater understanding of estuaries and how humans impact them. The overall program objectives of CZMA remain balanced to "preserve, protect, develop, and where possible, to restore or enhance the resources of the nation's coastal zone." The MPWSP would be located in a unique area that encompasses both a national marine sanctuary (MBNMS) and a national estuary (Elkhorn Slough National Estuarine Research Reserve).

Under Section 307 of the CZMA (16 USC 1456), activities that may affect coastal uses or resources that are undertaken by federal agencies, require a federal license or permit, or receive federal funding must be consistent with a State's federally approved coastal management program. The primary authorities of California's federally approved coastal management program are the California Coastal Act, the McAteer-Petris Act, and the Suisun Marsh Protection Act. The California Coastal Commission (CCC) implements the California Coastal Act and the federal consistency provisions of the CZMA for activities affecting California coastal uses and resources outside of San Francisco Bay.

The MPWSP components proposed for marine environments would be fully consistent with the enforceable policies of CCC's coastal management program. See additional discussion of consistency with CCC's coastal management program under Section 4.5.2.2., State Regulations, below. Additional discussion of MPWSP consistency with the enforceable policies of CCC's coastal management program concerning terrestrial biological resources of the coastal zone is provided in Section 4.6, Terrestrial Biological Resources.

Clean Water Act

The Clean Water Act is described in Section 4.3, Surface Water Hydrology and Water Quality. Under the Clean Water Act, the USEPA seeks to restore and maintain the chemical, physical, and

biological integrity of the nation's waters by implementing water quality regulations. Section 4.3, Surface Water Hydrology and Water Quality, summarizes Sections 303(d) and 402(p) of the Clean Water Act. Section 303(d) requires states to identify impaired water bodies (i.e., 303(d) List of Impaired Water Bodies). In the study area, impaired water bodies that eventually drain into Monterey Bay include Elkhorn Slough, Moro Cojo Slough, Salinas Reclamation Canal, Tembladero Slough, Old Salinas River estuary, Salinas River, and Moss Landing Harbor. In addition, the nearshore waters of northern Monterey Bay are on the 303(d) list. Section 402(p) requires National Pollutant Discharge Elimination System (NPDES) permits to control discharges of waste into waters of the United States and prevent the impairment of the receiving water for beneficial uses, which includes harm to marine biota. The USEPA has delegated authority of issuing NPDES permits in California to the SWRCB, which has nine regional boards. The Central Coast Regional Water Quality Control Board (RWQCB) regulates water quality in the project area. Discussion of the NPDES program and relevant permits is provided in Section 4.3, Surface Water Hydrology and Water Quality, Subsection 4.3.2.2. Determinations of consistency of the proposed MPWSP with specific applicable SWRCB regulations, plans and policies are also provided in Section 4.3.2.2.

National Marine Sanctuaries Act, MBNMS Regulations and Desalination Guidelines

Pursuant to the National Marine Sanctuaries Act (NMSA), originally referred to as the Marine Protection, Research, and Sanctuaries Act of 1972, the primary purpose of the NMSA is to identify, designate and manage areas of the marine environment of special national significance due to their conservation, recreational, ecological, historical, research, educational, or aesthetic qualities. Under the NMSA, it is unlawful for any person to destroy, cause the loss of, or injure any sanctuary resource managed under law or regulations for that sanctuary. NMSA general regulations define sanctuary resource as any living or non-living resource that contributes to the conservation, recreational, ecological, historical, research, educational or aesthetic value of the sanctuary, including any algae and other marine plants, marine invertebrates, brine-seep biota, phytoplankton, zooplankton, fish, seabirds, sea turtles, and marine mammals.

MBNMS was designated in 1992 in recognition that the area provides a highly productive ecosystem and a wide variety of marine habitat, including outstanding concentrations of pinnipeds, whales, otters, and seabirds, abundant fish stocks, a variety of crustaceans, and other invertebrates.

MBNMS regulations that are relevant to the construction and operation of desalination plants include restrictions on discharging material or other matter into the sanctuary and restrictions on activities that alter the submerged lands (aka seabed) as a result of the installation of desalination facility structures on or beneath the ocean floor (e.g. an intake or outfall pipeline). Each of these activities first requires MBNMS approval. In particular, MPWSP activities that would be subject to MBNMS approval include disturbance of the submerged lands due to installation of the seawater intake below the ocean floor, and the discharge of brine into sanctuary waters from an existing ocean outfall, approximately 2 miles off shore and 90-110 feet below sea level. Any actions that have the potential to alter the seabed would require an MBNMS Authorization of a

Coastal Development permit issued by the CCC. Operational discharges into sanctuary waters would require MBNMS authorization of an NPDES permit issued by the RWQCB (see Section 1.3.2 for additional information). NOAA may also issue Special Use Permits to establish conditions of access to, and use of, any sanctuary resource or to promote public use and understanding of a sanctuary resource. Special Use Permits may only be authorized if that activity is compatible with the purposes for which the sanctuary is designated and with protection of sanctuary resources; and that activities carried out under the permit be conducted in a manner that does not destroy, cause the loss of, or injure sanctuary resources. Consistent with the approach in the desalination guidelines discussed below, NOAA is currently considering comments on adding categories of SUPs that would be appropriate for this type of resource use.

On May 15, 2015, new federal regulations regarding introduced species became effective within MBNMS. These regulations prohibit introducing or otherwise releasing from within or into the Sanctuary an introduced species, except striped bass (*Morone saxatilis*) released during catch and release fishing activity. Federal regulation (15 CFR 922.132(a)(12)) prohibits the release of introduced species (including any biological matter capable of propagation from such species and genetically altered species).

Guidelines for Desalination Plants in MBNMS

In 2010, MBNMS in collaboration with the CCC, RWQCB, and NOAA Fisheries, published a report titled *Guidelines for Desalination Plants in Monterey Bay National Marine Sanctuary* (MBNMS, 2010), which implements the desalination action plan included in the MBNMS Final Management Plan (described above). The report includes non-regulatory guidelines that were developed to help ensure that any future desalination plants in the sanctuary would be sited, designed, and operated in a manner that results in minimal impacts on the marine environment. The Guidelines address numerous issues associated with desalination including site selection, construction and operational impacts, monitoring and reporting, plant discharges, and intake systems.

The following Guidelines are pertinent to the analysis in Section 4.5.

Guidelines for Construction

- Identify potential impacts from the construction process on the marine and coastal environment.
- Best Management Practices should be developed and adhered to in order to avoid or minimize impacts on the marine environment during construction and the use of materials and practices that minimize disturbances to the environment to the maximum extent practicable should be included.

Guidelines for Brine Discharge

- All desalination plants should be designed to minimize impacts from the discharge. Desalination project proponents should investigate the feasibility of diluting brine effluent by blending it with other existing discharges. The proponent should evaluate the use of measures to minimize the impacts from desalination plant discharges including discharging to an area with greater circulation or at a greater depth, increasing in the number of

diffusers, increasing the velocity while minimizing the volume at each outlet, diluting the brine with seawater or another discharge, or use of a subsurface discharge structure. The project proponent should provide a detailed evaluation of the projected short-term and long-term impacts of the brine plume on marine organisms based on a variety of operational scenarios and oceanographic conditions.

- A continuous monitoring program should be implemented to verify the actual extent of the brine plume, when deemed necessary (see Monitoring on page 4.3-13) and to determine if the plume is impacting EFH, critical habitat, or sanctuary resources. If it is, then mitigation for the EFH impact will be required.

Guidelines for Entrainment and Impingement

- All desalination plants should be designed and sited to avoid and minimize impingement and entrainment to the extent feasible.

Guidelines for Plant Site Selection

- Desalination plant intakes should be sited to avoid sensitive habitats.
- Desalination plant discharges should not be located in or near ecologically sensitive areas, including Areas of Special Biological Significance as designated by the State Water Resources Control Board, EFH Habitat Areas of Particular Concern as designated by the Pacific Fishery Management Council, and Marine Protected Areas designated under the Marine Life Protection Act.

Guidelines for Monitoring

For all desalination projects, an ongoing monitoring program must be developed to evaluate the extent of impacts from the plant's intake and discharge operations on marine biological resources. The monitoring program should:

- Develop a statistically acceptable baseline for the project area,
- Monitor source water for potential contaminants that may require additional treatment,
- Monitor the effluent prior to discharge to ensure it is in compliance with the California Ocean Plan
- Monitor the effects of the effluent on marine organisms within the plume,
- Monitor any required mitigation for unavoidable impacts to ensure the mitigation is performing as intended.

The issues discussed in the Guidelines relating to siting, constructing, and operating a desalination facility within MBNMS and the recommendations for reducing, avoiding, and minimizing impacts on sanctuary resources are reflected in the requirements of the California Ocean Plan (described in detail under State Regulations in Section 4.3.2.2, below). The Ocean Plan was recently amended (effective January, 2016) to specifically control potential adverse impacts on marine life associated with desalination facility intakes using seawater as source water and brine discharges. Further, the Ocean Plan includes specific enforceable numeric water quality objectives and other requirements pertaining to siting, constructing, and operating a desalination facility that are consistent with the Guidelines. The requirements set forth in the Ocean Plan were informed by the SWRCB

collaborating with the Southern California Coastal Water Research Project to evaluate methods of brine disposal and monitoring strategies. Additionally, the amendments to the Ocean Plan were assessed in a SWRCB staff report analyzing desalination facility intakes and brine discharges which provides the rationale for how implementing such measures reduce potential environmental impacts from desalination facilities (SWRCB, 2015). To reflect this evolution of regulatory requirements supported by evidence based research, the Ocean Plan requirements are used, in part, as key thresholds of significance in the evaluation criteria for assessing impacts. The Ocean Plan requirements are generally more stringent and have more specificity regarding assessment and monitoring requirements than the Guidelines. As such, the Ocean Plan requirements are substantially consistent with the Guidelines. Impacts on sanctuary resources from brine discharges are discussed in detail in **Impact 4.3-4** and **Impact 4.3-5** as well as in Section 4.5, Marine Biological Resources. Section 6.4 includes a comprehensive list of Guideline recommendations and summarizes the proposed project's consistency with those guidelines.

NOAA (MBNMS) Memorandum of Agreement with State and Federal Agencies

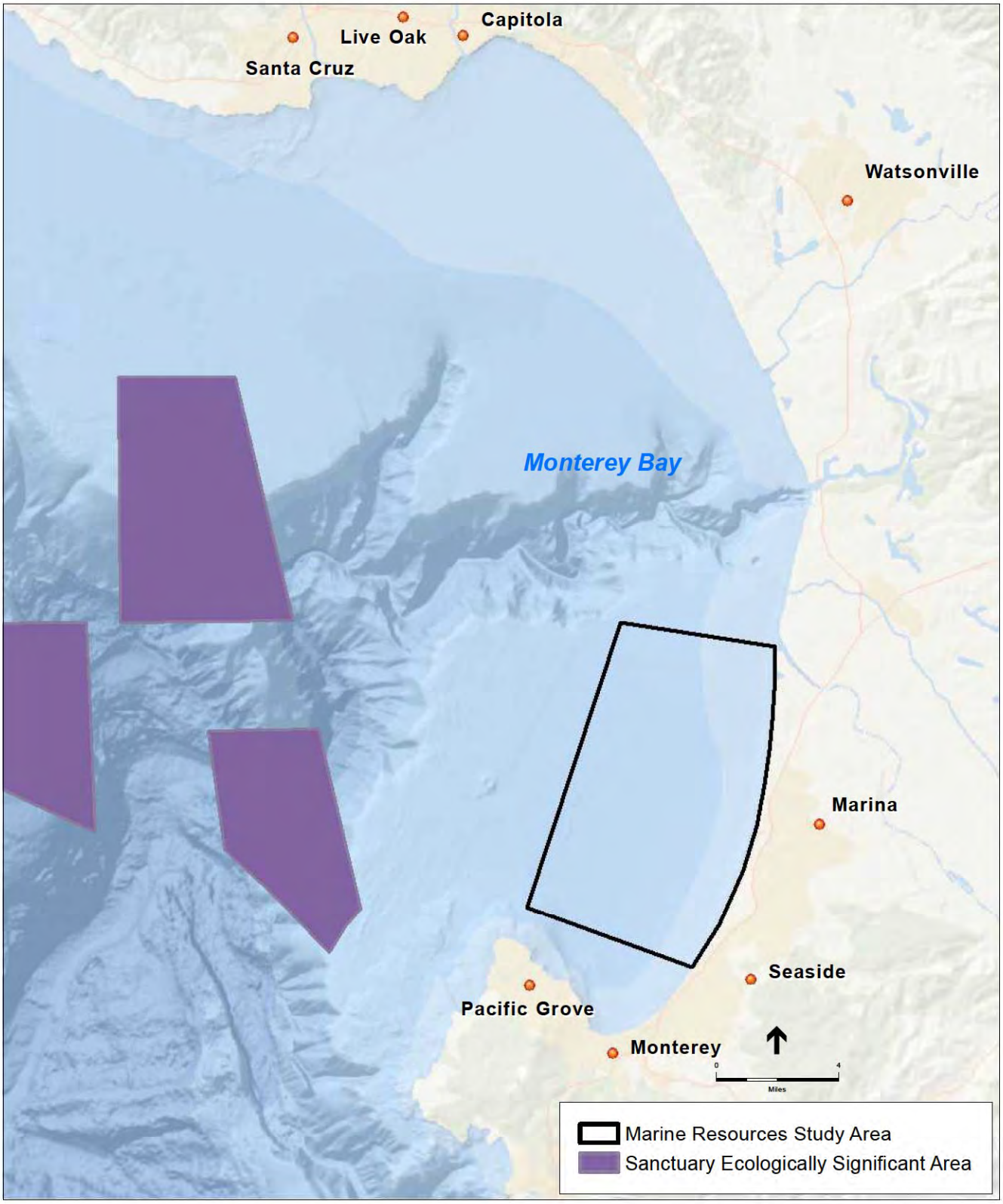
NOAA (MBNMS) entered into a Memorandum of Agreement (MBNMS et al., 2015c) with the State of California, USEPA, and the Association of Monterey Bay Area Governments, which addresses the process for implementing the following water quality regulations applicable to State waters within the MBNMS:

- NPDES permits issued by the State of California under Section 13377 of the California Water Code; and
- Waste Discharge Requirements issued by the State of California under Section 13263 of the California Water Code.

The Memorandum of Agreement specifies how the review process for applications for leases, licenses, permits, approvals, or other authorizations will be administered within State waters in the MBNMS in coordination between the State and the Sanctuary's permit programs. The MBNMS Superintendent develops and follows a management plan that ensures protection of these resources, provides for research and education, and facilitates recreational and commercial uses, which are compatible with the primary goal of resource protection. MBNMS also implements the Water Quality Protection Program to enhance and protect the chemical, physical, and biological integrity of the sanctuary. The program is a partnership of many local, state, and federal government agencies and calls for education, funding, monitoring, and development of treatment facilities and assessment programs to protect water quality (MBNMS et al., 2015c).

MBNMS has also partnered with research and management agencies to establish Sanctuary Ecologically Significant Areas in MBNMS (see **Figure 4.5-5**). These areas have been demonstrated to have "remarkable, representative and/or sensitive marine habitats, communities and ecological processes" (MBNMS, 2016d).

The discharge of brine effluent to sanctuary is a prohibited activity and has the potential to injure sanctuary resources, and as such, the proposed project is potentially inconsistent with the NMSA. Effects of discharges are discussed in Impact 4.5-4.



SOURCE: NOAA, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.5-5

Sanctuary Ecologically Significant Areas Designated in MBNMS

National Invasive Species Act

Under the National Invasive Species Act of 1996, the United States Coast Guard (USCG) established national voluntary ballast water guidelines. The USCG published regulations on June 14, 2004, establishing a national ballast water management program with mandatory requirements for all vessels equipped with ballast water tanks that enter or operate in U.S. waters. The regulations carry mandatory reporting requirements to aid in the USCG's responsibility, under the National Invasive Species Act, to determine patterns of ballast water movement. The regulations also require ships to maintain and implement vessel-specific ballast water management plans.

The MPWSP would be consistent with the National Invasive Species Act because the construction and operational impacts of the proposed project do not involve the use of vessels or other potential vectors for the introduction or transplantation of non-native, invasive species. Any maintenance of the existing MRWPCA outfall would be similar to or less than currently occurring maintenance and would utilize local vessels.

4.5.2.2 State Regulations

California Endangered Species Act

Under CESA, CDFW maintains lists of threatened and endangered species, candidate species, and species of special concern. Marine species that are protected by CESA and have the potential to occur in the study area are listed in **Table 4.5-1**. The MPWSP components proposed for the marine environment would be consistent with CESA because their construction and operation are not expected to result in the take of any State protected species. Additional discussion of MPWSP effects related to CESA and the terrestrial environment is provided in Section 4.6, Terrestrial Biological Resources.

Fish and Game Code Sections 3503, 3511, 4700, 5050, and 5515

CESA-listed endangered and threatened species may not be taken or possessed at any time without a permit from CDFW (Fish and Game Code Section 3511 Birds, Section 4700 Mammals, Section 5050 Reptiles and Amphibians, and Section 5515 Fish).The MPWSP components proposed for the marine environment would be consistent with Fish and Game Code Sections 3503, 3511, 4700, 5050, and 5515 because their construction and operation are not expected to result in the take or possession of any State protected species. Additional discussion of MPWSP effects on CESA-listed species of the terrestrial environment is provided in Section 4.6, Terrestrial Biological Resources.

Marine Life Protection Act

The objective of the Marine Life Protection Act (MLPA) is protection of ecosystem structure and function. Specific mandates of the MLPA are to sustain, conserve, and rebuild depleted populations. The MLPA works in concert with the Marine Life Management Act. Within California, most of the legislative authority over fisheries management is enacted within the MLPA. This law directs CDFW and the Fish and Game Commission to issue sport and

commercial harvesting licenses, as well as license aquaculture operations. CDFW, through the commission, is the State's lead biological resource agency and is responsible for enforcement of the State endangered species regulations and the protection and management of all State biological resources. A very important part of MLPA enactment has been the establishment of Marine Protected Areas (MPAs) along the California coast. Fishing and other consumptive activities are strictly regulated in MPAs in order to provide refuges within which healthy stocks can be maintained to ensure propagation along the entire coast. See **Figure 4.5-6**.

The MPWSP would be consistent with the MLPA because the construction and operational impacts of the proposed project are not expected to result in any degradation of ecosystem structure and function within Monterey Bay or to reduce the efficacy of MPAs within the Bay.

Marine Life Management Act

The Marine Life Management Act works in concert with the MLPA by advancing fishery management as an important element of ecosystem integrity and sustainability. Under the MLMA, implementation of the California Nearshore Fisheries Management Plan (NFMP) and the California Market Squid Fisheries Management Plan (MSFMP) affect species found in Monterey Bay (see **Table 4.5-4**).

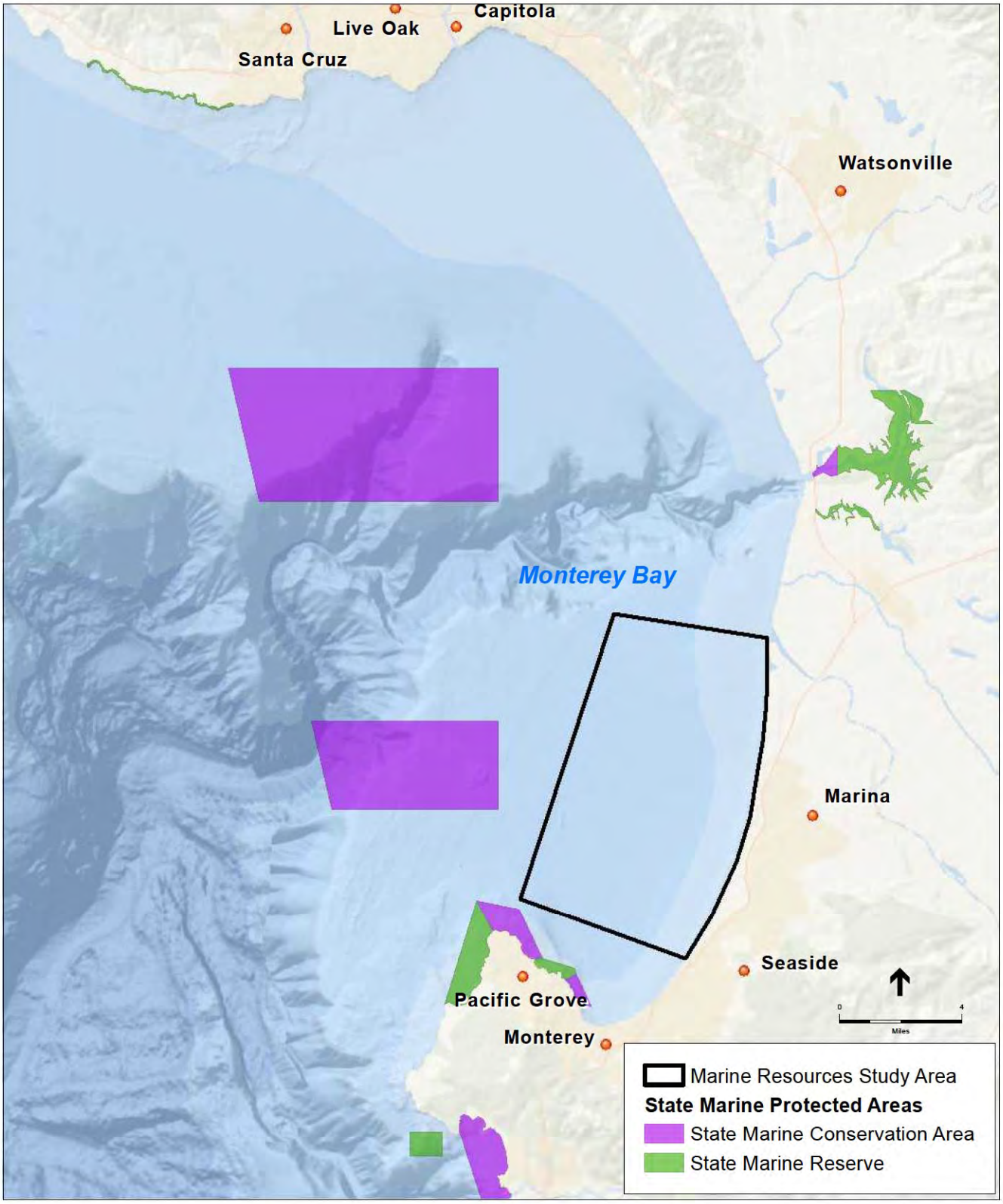
Nearshore Fisheries Management Plan

The five goals of the Nearshore Fishery Management Plan (NFMP) are to ensure long-term resource conservation and sustainability, to employ science-based decision-making, to increase constituent involvement in management, to balance and enhance socio-economic benefits, and to identify implementation costs and sources of funding. The following measures are employed to meet the primary goal of sustainability: a fishery control rule including size limits, time/area closures, or gear restrictions, regional management tailored to conditions specific to each of four regions, marine protected areas, restricted fishery access, and allocation of total allowable catch (CDFG, 2002). All of the species regulated by the NMFP are primarily associated with rocky substrate.

Market Squid Fisheries Management Plan

The Market Squid Fishery Management Plan (MSFMP) establishes a management program for California's market squid (*Doryteuthis opalescens*) resource. The goals of the MSFMP are to manage the market squid resource to ensure long term resource conservation and sustainability, reduce the potential for overfishing, and institute a framework for management in light of potential environmental and socioeconomic changes. The tools implemented to accomplish these goals include fishery control rules (e.g., seasonal catch limits, weekend closures), creation of a restricted access program, and establishment of a seabird closure restricting the use of attracting lights for commercial purposes (CDFG, 2005).

The MPWSP would be consistent with the MLMA because the construction and operational impacts of the proposed project are not expected to substantially affect rocky substrate habitat or interfere with management of the nearshore or market squid fisheries.



SOURCE: NOAA, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.5-6

Marine Protected Areas along the California Coast

California Ocean Plan

The California Ocean Plan (Ocean Plan) is described in Section 4.3, Surface Water Hydrology and Water Quality. The Ocean Plan establishes water quality objectives and beneficial uses for waters of the Pacific Ocean within 3 miles of the California Coast (SWRCB, 2012). NPDES waste discharge permits set discharge limits that are required to prevent exceedances of the water quality objectives in the Ocean Plan. The proposed project would discharge into Monterey Bay and therefore is subject to all Ocean Plan water quality objectives and NPDES requirements. The most relevant water quality objectives include:

- Marine communities, including vertebrate, invertebrate, and plant species shall not be degraded;
- Waste management systems that discharge into the ocean must be designed and operated in a manner that will maintain the indigenous marine life and a healthy and diverse marine community; and
- Waste discharged to the ocean must be essentially free of substances that will accumulate to toxic levels in marine waters, sediments or organisms.

The basis for water quality objectives established in the Ocean Plan is the protection of beneficial uses designated for each section of coastline by Regional Water Quality Control Boards (see **Table 4.3-3** in Section 4.3, Surface Water Hydrology and Water Quality). The designated beneficial uses relevant to marine biological resources in the study area are as follows:

- **Marine Habitat** – Uses of water that support marine ecosystems including, but not limited to, preservation or enhancement of marine habitats, vegetation such as kelp, fish, shellfish, or wildlife (e.g., marine mammals, shorebirds).
- **Shellfish Harvesting** – Uses of water that support habitats suitable for the collection of filter- feeding shellfish (e.g., clams, oysters, and mussels) for human consumption, commercial, or sport purposes. This includes waters that have in the past, or may in the future, contain significant shellfisheries.
- **Commercial and Sport Fishing** – Uses of water for commercial or recreational collection of fish, shellfish, or other organisms including, but not limited to, uses involving organisms intended for human consumption or bait purposes.

Another relevant beneficial use is as follows:

- **Rare, Threatened, or Endangered Species** – Uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened, or endangered.

While not having been designated for coastal waters between Salinas River and Monterey Harbor, this beneficial use requires consideration here because it is known that Southern sea otters forage in the study area.

Operational discharges resulting from implementation of the MPWSP may be inconsistent with provisions of the California Ocean Plan. This issue is discussed further in Section 4.3, Surface Water Quality and Hydrology, Subsection 4.3.2.2 and Impact 4.3-5.

Marine Invasive Species Act

All shipping operations that involve major marine vessels are subject to the Marine Invasive Species Act of 2003 (Public Resources Code Sections 71200 through 71271), which revised and expanded the California Ballast Water Management for Control of Non-indigenous Species Act of 1999 (AB 703). This act is administered by the State Lands Commission. The act regulates the handling of ballast water from marine vessels arriving at California ports in order to prevent or minimize the introduction of invasive species from other regions.

The MPWSP would be consistent with the Marine Invasive Species Act because the construction and operational impacts of the proposed project would not involve the use of vessels or other potential vectors that could introduce or transplant non-native invasive species. Any maintenance of the existing MRWPCA outfall would utilize local vessels and would be similar to or less than what is already occurring.

California Coastal Act

The California Coastal Act (Public Resources Code Section 30000 et seq.) provides for the long-term management of lands within California's coastal zone boundary. Of primary relevance to marine biological resources are Coastal Act policies concerning: preservation and maintenance of marine biological resources; protection of the productivity and quality of coastal waters; prevention of oil and hazardous substance spills; minimization of continued movement of sediment and nutrients, and protection of recreational and commercial fisheries. A preliminary assessment of project consistency with this priority is provided here, however, a consistency certification will be provided to CCC as required by the Coastal Zone Management Act and its federal consistency regulations. The CCC will make the final decision as to whether the project is fully consistent.

With respect to preservation and maintenance of marine biological resources, construction and operation of the subsurface slant wells would have no effect. Sound generated by drilling operations would be greatly attenuated before reaching the water and the velocity of seawater pumped in through the intake wells would be so low that organisms would not be impinged on the sea floor. Operation of the brine discharge through the MRWPCA outfall would be managed to ensure that salinity, temperature and concentrations of other contaminants would remain within regulatory objectives and at levels known to be protective of marine organisms.

Concerning the productivity and quality of coastal waters, the MPWSP would not release any drilling fluids or other human-made materials during drilling or operation of the subsurface slant wells; nor would drilling affect natural water clarity. The discharge of brine and associated contaminants through the MRWPCA outfall would include only organic and inorganic constituents present in the source ocean water. While the brine discharge would increase salinities within the Zone of Initial Dilution around the diffuser, management of the brine discharge would ensure that salinities outside the Zone of Initial Dilution would not exceed 2 ppt above ambient salinities, in accordance with the Ocean Plan.

As for oil and hazardous substance spills, the MPWSP would be required to prepare and implement Hazardous Materials Business Plan and a Storm Water Pollution Prevention Plan and comply with the California Fire Code, as discussed more fully in Section 4.7, Hazards and Hazardous Materials. These measures would ensure that any spills would be contained onshore in the immediate vicinity of spillage. Operation of the Reverse Osmosis system would also ensure that any spills of petroleum or hazardous materials would be prevented from entering the brine discharge stream.

Regarding minimization of continued movement of sediment and nutrients, the drilling and operation of the subsurface slant wells would not alter the contour or character of the sea floor or shoreline environment. Onshore construction on the beach could temporarily re-suspend local beach sand but such an effect would be temporary and the beach contour would be returned to normal when construction is completed. Accordingly, drilling and operation of the subsurface slant wells would not restrict the movement of sediments or nutrients. The discharge of brine through the MRWPCA outfall and diffuser would also have no effect on the movement or character of sediments or nutrients beyond that which might already occur due to the physical structure of the outfall.

With respect to protection of recreational and commercial fisheries, the construction and operation of the subsurface slant wells would involve no changes to sea floor topography or overlying water quality. This means the project would produce no physical obstructions to fishing gear and have no effect on fish stocks. The concentrations of salts and contaminants in the brine discharge would be kept below those currently allowed for desalination systems and the existing MRWPCA municipal wastewater discharge, which would ensure no anticipated adverse effects on fish stocks.

For these reasons the project would not conflict with Coastal Act policies related to marine biological resources.

4.5.3 Evaluation Criteria

Impacts on marine biological resources would occur as a result of alterations to, or deterioration of marine aquatic habitats, which in turn would result in direct or indirect effects on marine taxa, communities, and food webs. Direct and indirect impacts on marine and aquatic taxa (i.e., plankton, fish, marine mammals, etc.) would not discriminate, and would affect all marine and aquatic taxa in the study area regardless of its species, whether it is listed as sensitive or not, or with which agency. The evaluation criteria therefore, consider the potential effects of the proposed project on habitat, special status species, and species considered in local, regional or federal resource management plans.

Implementation of the proposed project would have a significant impact on marine biological resources if it would:

- Have a substantial adverse effect, either directly or through habitat modifications, including direct disturbance, removal, filling, hydrological interruption, or discharge, on any species, natural community, or habitat, including candidate, sensitive, or special-status species identified in local or regional plans, policies, regulations or conservation plans (including

protected wetlands or waters, critical habitat, essential fish habitat (EFH)); or as identified by the CDFW, USFWS, or NMFS; or

- Threaten to eliminate a marine plant or animal wildlife community or cause a fish or marine wildlife population to drop below self-sustaining levels; or
- Interfere substantially with the movement of any native resident or migratory fish or marine wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native marine wildlife nursery sites.

Based on the location and nature of the proposed project, the following criteria are not considered in the impact analyses in Sections 4.5.5.1 and 4.5.5.2 for the reasons described below.

- ***Introduce or spread an invasive non-native species***. Implementation of the MPSWP would not involve any construction or operational activities that would require the use of ocean vessels, and would not involve the temporary or permanent placement of any facilities in the Monterey Bay or adjacent harbors. Therefore, implementation of the proposed project would not have a means of introducing or relocating non-native invasive marine species. This criterion is not applicable to the proposed project and is not discussed further.

4.5.4 Approach to Analysis

Three aspects of the proposed project have the potential to adversely affect marine biological resources: (1) noise from the construction of the subsurface slant wells; (2) operation of the subsurface slant wells as it relates to impingement; and (3) operational discharges of brine generated by the MPWSP desalination plant via the MRWPCA existing ocean outfall. As discussed in Chapter 3, Description of the Proposed Project, the proposed slant wells would be located approximately 2 miles south of the Salinas River in the CEMEX active mining area in northern Marina. Nine new permanent slant wells would be installed from the shore using a dual rotary drilling rig. The slant wells would extend beneath the coastal dunes, sandy beach, and sandy subtidal (surf zone)[7] habitats of Monterey Bay, terminating up to 350 feet seaward of mean high water (MHW) at a depth of 190 to 210 feet below the sea floor in the submerged lands of MBNMS.

The desalination process would generate an average of approximately 14 mgd of brine that would be discharged through the existing MRWPCA ocean outfall. The outfall currently is and would continue to be used to discharge treated wastewater effluent from the MRWPCA Regional Wastewater Treatment Plant. The outfall terminates at an underwater diffuser located approximately 2 miles offshore (relative to MHW) at 90 to 110 feet below mean sea level where a soft mud substrate predominates.

The evaluation of whether the proposed project would result in substantial adverse effects considers three principal factors:

- Magnitude and duration of the impact (e.g., substantial/not substantial);
- Rarity of the affected resource; and

[7] a high wave energy environment

- Susceptibility of the affected resource to disturbance.

The evaluation of significance must also consider the interrelationship of these three factors. For example, a relatively small magnitude effect on a state or federally listed species could be considered significant if the species is rare and highly susceptible to potential disturbances resulting from the proposed project. Conversely, for a natural community that is not considered rare or particularly sensitive to disturbance, such as soft substrate benthos, an impact of much larger magnitude and/or longer duration would be required to result in a significant impact determination.

Underwater noise generated during slant well construction could result in impacts on marine biological resources. The potential underwater noise impacts on marine biological resources from slant well drilling were evaluated based upon reported sensitivities of marine organisms to frequency (pitch) and amplitude (decibel) and the reported disturbances from other similar operations, compared to underwater noise that would be generated by the proposed project.

Impacts on marine biological resources arising from slant well operations due to potential impingement of marine organisms and particulate material were evaluated using reports on the speeds of wave-induced and ambient ocean currents, and the velocity of water being drawn through the sea floor to the slant wells. Ocean current and organism swimming speeds were compared to the anticipated velocity of the subsurface slant wells at the sea floor to determine the probability of impingement of organisms and particulate material against the sea floor.

Impacts from elevated salinity and shear stress on marine biological resources due to brine discharge were also evaluated. Predicted discharge salinities were evaluated against Ocean Plan (SWRCB, 2015) thresholds (salinity no more than 2 ppt above background at the edge of the BMZ) and the results of toxicity tests and other experiments, as well as the recommendations of various commissions and working groups convened to set guidelines for desalination facilities. Elevations in ocean salinities above ambient salinity levels due to the discharge of brine from the proposed project were evaluated using several models that predicted salinity at the edge of the Zone of Initial Dilution (ZID) and at the Brine Mixing Zone (BMZ) during three oceanographic seasons (Davidson, upwelling and oceanic) under generally prevailing water temperatures and salinities. See also Section 4.3, Surface Water Hydrology and Water Quality, for the complete discussion on the approach to this analysis, and the effects of the brine discharge on ocean water quality resulting from the proposed project. These modeled salinities were compared to studies on the effects of elevated salinity on marine organisms. Potential impacts on marine organisms due to shear stress associated with the brine discharge through the MRWPCA outfall were also evaluated based upon the hydrodynamics of the current and proposed discharge scenarios (see Appendix D1).

Potential impacts on marine taxa from exposure to elevated concentrations of other select constituents in the effluent estimated at the edge of the ZID, are based on published toxicity data and the Ocean Plan water quality objectives that specify concentrations above which marine life could be at risk. In cases where the estimated concentrations of the constituents in the discharge could be near or above Ocean Plan objectives, actual toxicity data were obtained from available

sources. Conservative estimates of contaminant concentrations were made using a combination of ocean water data obtained from the Central Coast Long-term Environmental Assessment Network (CCLEAN) and high-volume samples collected from the test slant well on the CEMEX property. Estimates based on CCLEAN data assumed the entire mass of contaminants in seawater drawn into the MPWSP Desalination Plant would be concentrated and returned to the ocean in the brine.

4.5.5 Direct and Indirect Effects of the Proposed Project

Direct and indirect effects of the proposed project are considered in the following sections. Consideration is given to those project elements that would have an effect on marine biological resources, marine habitats, and MBNMS resources as a result of the intake of desalination source water or the discharge of brine from the desalination process. Accordingly, drilling of the slant wells is the only construction activity that is considered here. The operational aspects considered are the operation of the wells and the discharge of brine. Impacts on marine biological resources that could result from implementation of water quality mitigation, such as retrofitting discharge diffuser ports to improve dilution, are discussed in Section 4.3, Surface Water Hydrology and Water Quality.

A summary of project impacts on marine biological resources is provided in **Table 4.5-5**.

TABLE 4.5-5
SUMMARY OF IMPACTS – MARINE BIOLOGICAL RESOURCES

Impacts	Significance Determinations
Impact 4.5-1: Result in a substantial adverse effect, either directly or through habitat modifications, including direct disturbance, removal, filling, hydrological interruption, or discharge, on any marine species, natural community, or habitat, including candidate, sensitive, or special-status species identified in local or regional plans, policies, regulations or conservation plans (including protected wetlands or waters, critical habitat, essential fish habitat (EFH); or as identified by the CDFW, USFWS, and/or NMFS during construction.	LS
Impact 4.5-2: Threaten to eliminate a marine plant or animal wildlife community or cause a fish or marine wildlife population to drop below self-sustaining levels during construction.	LS
Impact 4.5-3: Interfere substantially with the movement of any native marine resident or migratory fish or marine wildlife species or with established native resident or migratory marine wildlife corridors, or impede the use of native marine wildlife nursery sites during construction.	LS
Impact 4.5-4: Result in a substantial adverse effect, either directly or through habitat modifications, including direct disturbance, removal, filling, hydrological interruption, or discharge, on any marine species, natural community, or habitat, including candidate, sensitive, or special-status species identified in local or regional plans, policies, regulations or conservation plans (including protected wetlands or waters, critical habitat, essential fish habitat (EFH); or as identified by the CDFW, USFWS, and/or NMFS during operations.	LS
Impact 4.5-5: Threaten to eliminate a marine plant or animal wildlife community or cause a fish or marine wildlife population to drop below self-sustaining levels during operations.	LS
Impact 4.5-6: Interfere substantially with the movement of any native marine resident or migratory fish or marine wildlife species or with established native resident or migratory marine wildlife corridors, or impede the use of native marine wildlife nursery sites during operations.	LS
Impact 4.5-C: Cumulative impacts on marine biological resources.	LS

NOTES:
LS = Less than Significant

4.5.5.1 Construction Impacts

The subsurface slant wells are the only project components that would involve construction in or near the study area. Since none of the other project facilities would require construction in the study area, construction of the other project facilities would not directly or indirectly affect marine biological resources and are not discussed below. Marine birds, anadromous fish, and inland fish are addressed in Section 4.6, Terrestrial Biological Resources.

Impact 4.5-1: Result in a substantial adverse effect, either directly or through habitat modifications, including direct disturbance, removal, filling, hydrological interruption, or discharge, on any marine species, natural community, or habitat, including candidate, sensitive, or special-status species identified in local or regional plans, policies, regulations or conservation plans (including protected wetlands or waters, critical habitat, essential fish habitat (EFH); or as identified by the CDFW, USFWS, and/or NMFS during construction. ***(Less than Significant)***

Underwater noise from the drilling operation itself, the potential accidental release of drilling fluid, and the possible discharge of clarified[8] groundwater recovered during drilling operations are the only possible construction activities that could affect marine biological resources and habitats.

The directional drilling of the slant wells would generate some subterranean noise that would transmit into sea floor sediments, including into the submerged lands of the MBNMS. What little underground drilling or tunneling noise data that is available is for tunnel boring machines (TBM), which are used to dig large-diameter transportation and water conveyance tunnels and would not be used for slant well construction. TBM equipment is fully located within the borehole or tunnel and all noise generating equipment, including drilling motors, cutter heads, drilling fluid recirculating pumps, etc. are located within the tunnel as well. As discussed in Chapter 3, Description of the Proposed Project, most of the slant well noise-generating equipment would be located on the land surface outside of MBNMS, and the only down hole noise source would be the cutter head and drilling fluid recirculating pump. As a result, the noise generated from TBM operations can be expected to be substantially higher than that generated by the cutter head for the proposed subsurface slant wells.

The San Francisco Public Utilities Commission drilled a 5-mile-long, 9-foot-diameter tunnel under San Francisco Bay. A TBM was used to drill the tunnel located approximately 125 feet below the San Francisco Bay sea floor. Wilson, Ihrig, and Associates calculated noise levels generated by normal cutting operations from the TBM inside the tunnel to range between 122 to 129 decibels (dB) root-mean-square,[9] at a frequency of 30 to120 hertz (Hz), with occasional peak levels at 134 dB at the bottom of the bay (Wilson Ihrig, and Associates, et al 2009).

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8 Clarified Water: Water that has been processed to remove suspended sediments and is therefore “clear” and when discharged to the ocean will not result in increased turbidity.

9 Root-mean-square: The square root of the average over a period of time of the square of the amplitude. The root-mean-square level is often used to correlate the effects of sound and vibration on humans and mammals. Decibels reported in this section are hydroacoustic (underwater) decibels. Unlike airborne decibels used in the analysis of Section 4.12, Noise and Vibration, which are referenced to 20 micro Pascals, all underwater sound levels are referenced to 1 micro Pascal. Consequently, underwater sound levels are typically 26 dB higher than airborne levels because of the different reference levels as well as an additional 34 A-weighted decibels (dBA) higher due to the higher impedance of water.

The thickness of overlying sediments for the proposed project is greater than for the TBM operations under San Francisco Bay (i.e., 195 to 200 feet versus 125 feet in San Francisco Bay), and would act to further muffle transmitted underwater noise. Underwater noise attenuates through water-saturated sediments in proportion to the frequency of the sound waves (Hefner and Williams, 2004). Assuming a worst-case noise level equal to the noise generated by TBM (129 dB at 30 Hz) is emitted in a slant well, the drilling noise would attenuate at the rate of approximately 2.5 dB per meter (per 3.28 feet), potentially resulting in 144 dB of sound being attenuated through 190 feet (approximately 58 meters) and reaching zero by the time it reaches the sea floor surface. Measurements by Wilson et al (1997) found that underwater surf noise offshore of the former Fort Ord area in Monterey Bay, near the proposed slant well site, averaged 138 dB at 50 Hz and Farber and Wilson (1997).

In the event that some underwater noise reaches the sea floor surface, scientific investigations on the potential effect of underwater noise on fish indicate that sound levels below 183 to 187 dB do not appear to result in any acute physical damage or mortality to fish (barotraumas) depending on their size (Dalen and Knutsen, 1986; Caltrans, 2009). A startle response in salmon has been documented to occur at underwater sound levels of 140 to 160 dB (San Luis and Delta Mendota Water Authority and C.H. Hanson, 1996). Additionally, underwater noise levels greater than 160 dB are required to result in any behavioral effects on marine mammals (NOAA, 2013). **Table 4.5-6** provides a summary of some known acute and sub-lethal effects of underwater noise on fish and marine mammals. **Table 4.5-7** presents underwater noise levels at which NOAA has determined that both acute and sub-lethal effects occur for different groupings of marine mammals. Any of the drilling noise reaching overlying ocean waters is expected to be below background underwater noise levels and would have no effect on any marine organisms including special-status species.

TABLE 4.5-6
POTENTIAL EFFECTS OF VARYING UNDERWATER NOISE LEVELS ON FISH AND MARINE MAMMALS

Taxa	Sound Level (dB)	Effect	Reference
Fish			
All fish > 2 grams in size	206 peak 187 (SEL)	Acute Barotraumas	Fisheries Hydroacoustic Working Group, 2008 (Caltrans, 2009)
All fish < 2 grams	186 (SEL)	Acute Barotraumas	Fisheries Hydroacoustic Working Group, 2008 (Caltrans, 2009)
Pacific Herring	180-186	Avoidance behavior	Dalen and Knutsen, 1986
Salmon, steelhead	166	Avoidance behavior	Loeffelman et al., 1991
Salmon, Steelhead	140-160	Startle response	San Luis and Delta Mendota Water Authority and C.H. Hanson, 1996
Marine Mammals			
Marine Mammals	180-190	Level A[a] harassment out to 65 feet from sound source	NOAA, 2011
Harbor seals	180 at 12 kHz	Discomfort zone out to 4 miles	Kastelein et al., 2006
Harbor seals	166-195	Can be detected at distances up to 2.9 miles	Terhune et al., 2002
Marine Mammals	160 from impact hammer	Level B[b] harassment out 328 feet from sound source	NOAA, 2011

TABLE 4.5-6 (Continued)
POTENTIAL EFFECTS OF VARYING UNDERWATER NOISE LEVELS ON FISH AND MARINE MAMMALS

Taxa	Sound Level (dB)	Effect	Reference
Marine Mammals (cont.)			
Marine Mammals	120 from vibratory hammer	Level B[a] harassment out to 1.2 miles	NOAA, 2011
Harbor seals	> 155	Avoidance behavior	Terhune et al., 2002
Harbor seals	107 at 12 kHz	Discomfort zone out 20-meters from the sound source	Kastelein et al., 2006
Harbor seals	> 75	Threshold level of detection	Kastak and Schusterman, 1998

NOTES:
a Level A harassment is defined as any act of pursuit, torment, or annoyance with has the potential to injure a marine mammal or marine mammal stock in the wild.
b Level B harassment is defined as any act of pursuit, torment, or annoyance with has the potential to disturb a marine mammals or marine mammal stock in the wild.

TABLE 4.5-7
SUMMARY OF NOAA ESTABLISHED PERMANENT THRESHOLD SHIFT (PTS)[1] AND TEMPORARY THRESHOLD SHIFT (TTS)[2] SOUND LEVELS[3] FROM UNDERWATER NOISE LEVELS FOR MARINE MAMMALS

Hearing Group	Impulsive[4]	Non-impulsive[5]
Low-Frequency (LF) Cetaceans (Baleen whales)	$L_{pk, flat}$: 219 dB $L_{E,LF,24H}$: 183 dB	$L_{E,LF,24H}$: 199 dB
Mid-Frequency (MF) Cetaceans (Dolphins, toothed whales, beaked whales, bottlenose dolphins)	$L_{pk, flat}$: 230 dB $L_{E,LF,24H}$: 185 dB	$L_{E,LF,24H}$: 198 dB
High-Frequency (HF) Cetaceans (True porpoises, Kogia, river dolphins, cephalohynchid, Lageniorhynchus cruciger, and L. asustralis)	$L_{pk, flat}$: 202 dB $L_{E,LF,24H}$: 155 dB	$L_{E,LF,24H}$: 173 dB
Phocid Pinnipeds (True Seals) (Underwater)	$L_{pk, flat}$: 218 dB $L_{E,LF,24H}$: 185 dB	$L_{E,LF,24H}$: 201dB
Otariid Pinnipeds (Sea lions and fur seals) (Underwater)	$L_{pk, flat}$: 232 dB $L_{E,LF,24H}$: 203 dB	$L_{E,LF,24H}$: 219 dB

NOTES:
1 Permanent Threshold Shift is when a permanent reduction in hearing occurs or the frequencies at which sound can be detected is permanently reduced.
2 Temporary Threshold Shift is when a short-term (temporary) reduction in hearing or the frequency at which sound can be detected occurs.
3 Peak sound pressure (*L*pk) has a reference value of 1 μPa, and cumulative sound exposure level (*L*E) has a reference value of 1μPa^{2}s. In this Table, thresholds are abbreviated to reflect American National Standards Institute standards (ANSI 2013). However, peak sound pressure is defined by ANSI as incorporating frequency weighting, which is not the intent for this Technical Guidance. Hence, the subscript "flat" is being included to indicate peak sound pressure should be flat weighted or unweighted within the generalized hearing range. The subscript associated with cumulative sound exposure level thresholds indicates the designated marine mammal auditory weighting function (LF, MF, and HF cetaceans, and PW and OW pinnipeds) and that the recommended accumulation period is 24 hours. The cumulative sound exposure level thresholds could be exceeded in a multitude of ways (i.e., varying exposure levels and durations, duty cycle). When possible, it is valuable for action proponents to indicate the conditions under which these acoustic thresholds will be exceeded.
4 Impulsive noise is a category of noise which includes unwanted, almost instantaneous sharp sounds.
5 All noise not included in the definition of impulsive noise

SOURCE: NMFS, 2016

The degradation of water quality resulting from the discharge of water produced during well drilling and well development is addressed in Impact 4.3-2, in Section 4.3, Surface Water Hydrology and Water Quality. Drilling of the subsurface slant wells would involve the use of water, bentonite mud, and/or the use of environmentally inert biodegradable additives to push the drill rig through the uppermost layer of dry dune sands as described in Section 3.3.2.1. Once the drill bit reaches groundwater, the mud slurry from the upper 100 feet of drilling would be pumped out and put it in a storage container for offsite hauling and disposal. Beyond this point only the water already present in the sand and potable water would be used to circulate the drill cuttings. Once the borehole and the casing and gravel pack have been installed, potable water would be circulated through the well casing to develop the well. The effluent produced during well development, which may contain soil cuttings and formation water (water present at depth in geologic materials), would be pumped to baker tanks to allow sediment to settle out. The clarified effluent would then either be conveyed to the existing discharge pipeline for the test slant well and discharged to the ocean via the MRWPCA ocean pipeline and outfall in or percolated into the ground at the CEMEX active mining area. The discharge of any clarified waters from slant well drilling through the MRWPCA outfall would be in compliance with the existing NPDES permit and Ocean Plan water quality objectives for turbidity and would not cause any impact on marine biological resources or habitats, including special status species and sanctuary resources in MBNMS.

The potential for the inadvertent release of drilling fluids into ocean waters during drilling of the slant wells would be very low, because these environmentally inert, biodegradable drilling additives or sand-bentonite mud slurry would only be used while drilling the initial 100 feet of loose dry sand, above the water table. After that point in the HDD bore, only potable water would be used to circulate and remove drill cuttings. Since the risk of accidentally discharging drilling fluids to the marine environment from HDD slant wells would be very low and the use of these additives is common practice, the potential impact from HDD slant well drilling and circulation fluids would be less than significant. Moreover, the bentonite slurry would be contained and properly disposed of offsite, as discussed in Section 4.3, Surface Water Hydrology and Water Quality.

Impact Conclusion

Underwater noise generated during slant well drilling would have no impact during construction on marine biological resources in MBNMS. Additionally, because the drilling operation would be set back approximately 900 feet from MHW and the construction contractor would manage drilling muds and potential discharges of clarified groundwater in accordance with regulatory requirements, the potential for an accidental release of any hazardous drilling fluids into waters of MBNMS, or increased turbidity in Monterey Bay during slant well construction, would be less than significant. No impacts would occur from the construction of any other proposed facility because none occur within the marine biological resources study area. This impact is considered to be less than significant.

Mitigation Measures

None proposed.

Impact 4.5-2: Threaten to eliminate a marine plant or animal wildlife community or cause a fish or marine wildlife population to drop below self-sustaining levels during construction. *(Less than Significant)*

As discussed for Impact 4.5-1, the potential for underwater noise, ocean discharge of clarified groundwater, or the accidental release of well drilling fluids to result in effects on marine biological resources or habitats would be less than significant. These activities are not expected to cause a fish or marine wildlife population to drop below self-sustaining levels. Therefore, the evaluation of impacts from drilling fluids, discharge of clarified ground water, and noise on marine species in MBNMS would be the same as for Impact 4.5-1; less than significant.

Mitigation Measures

None proposed.

Impact 4.5-3: Interfere substantially with the movement of any native marine resident or migratory fish or marine wildlife species or with established native resident or migratory marine wildlife corridors, or impede the use of native marine wildlife nursery sites during construction. *(Less than Significant)*

As discussed for Impact 4.5-1, there is little to no potential for underwater noise, ocean discharge of clarified groundwater, or the accidental release of well drilling fluids to interfere with the movement of any native marine resident or migratory fish or marine wildlife species in MBNMS. Therefore, the impact would be less than significant.

Mitigation Measures

None proposed.

4.5.5.2 Operational and Facility Siting Impacts

Potential operational impacts on marine biological resources would be limited to adverse effects associated with operation of the subsurface slant wells and the discharge of brine generated at the proposed MPWSP desalination plant. Because none of the other project facilities would affect marine biological resources, none of the other facilities are discussed.

Impact 4.5-4: Result in a substantial adverse effect, either directly or through habitat modifications, including direct disturbance, removal, filling, hydrological interruption, or discharge, on any marine species, natural community, or habitat, including candidate, sensitive, or special-status species identified in local or regional plans, policies, regulations or conservation plans (including protected wetlands or waters, critical habitat, essential fish habitat (EFH); or as identified by the CDFW, USFWS, and/or NMFS during operations. *(Less than Significant)*

Impacts on marine species during MPWSP operations as a result of the impingement of organisms or through the accumulation of fine particulate material on the sea floor, from elevated salinity or other constituents in the brine, or from shear stress[10] on plankton from discharged brine were evaluated.

Impingement of Marine Organisms on the Sea Floor

A key and fundamental concern about desalination facilities is the potential for the impingement[11] and entrainment[12] of marine organisms during the intake of seawater. The MPWSP would utilize subsurface slant wells that would terminate 190 to 210 feet below the sea floor, eliminating the need for an open ocean intake. Subsurface intakes are thought to eliminate impingement impacts on marine biota by utilizing a broad surface of sea floor through which seawater is drawn at a slow rate (Foster et al, 2013). A Draft Staff Report prepared by the SWRCB in support of the proposed Ocean Plan amendment addressing desalination facilities notes:

> Subsurface intakes collect water through sand sediment, which acts as a natural barrier to organisms and thus eliminates impingement and entrainment (MWDOC 2010; Missimer et al. 2013; Hogan 2008; Pankratz 2004; Water Research Foundation 2011). This gives subsurface intakes a significant environmental advantage over surface (or open) water intakes because mitigation for surface intake entrainment will have to occur throughout the operational lifetime of the facility. (SWRCB, 2015)

The vertical infiltration rate at the sea floor for the proposed MPWSP was estimated by assuming the entire 24.1 mgd (3,222,000 cubic feet/day) of seawater required to operate the MPWSP plant would be drawn through the sea floor located directly above the screened segment of the slant wells. The length of shoreline spanned by intake slant wells would be approximately 2,000 feet. If the sea floor area of water intake extended 500 feet offshore, the area of sea floor through which seawater would be taken into the wells would be approximately 1,000,000 square feet. Through this area of sea floor, a maximum of 3,222,000 cubic feet (24.1 million gallons x 0.1337 cubic feet per gallon) of water would be pumped each day. The vertical infiltration rate through the sea floor would have to be 3.222 feet/day or 0.0000373 ft/sec (approximately 0.011 mm/sec). This calculation is very similar to the 0.000051 ft/sec (approximately 0.016 mm/sec) peak vertical infiltration rates estimated by Williams (2010) for the South Orange Coastal Desalination Project. In comparison, an open ocean intake equipped with a wedgewire screen would draw water in at a rate of 0.5 ft/sec (152.4 mm/sec). For the purposes of this assessment, it is assumed that the infiltration flow rate of seawater through sea floor sediments and into the slant wells would be approximately 0.011 to 0.016 mm/sec.

A review of published swimming speeds for plankton, larval invertebrates, and larval fish reveals that it is highly unlikely these small organisms would be impinged against the sea floor by

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10 Shear stress is a strain in the structure of a substance produced by pressure, when its layers are laterally shifted in relation to each other.
11 Impingement occurs when organisms are trapped by the force of the flowing source water.
12 Entrainment occurs when marine organisms enter the desalination plant intake, are drawn into the intake system, and pass through to the treatment facilities.

vertical infiltration of seawater during operation of the subsurface slant wells. Studies of invertebrate plankton have found swimming speeds that substantially exceed the estimated vertical infiltration rate for the MPWSP slant wells (see **Table 4.5-8**) by several orders of magnitude. Therefore, no impingement from slant well operations is expected to occur.

TABLE 4.5-8
SWIMMING SPEEDS OF PLANKTON, INVERTEBRATES, AND LARVAL FISH

Source	Organism	Swimming Speed[a]
Franks (1992)	Phytoplankton and Protozoa	M = 0.2 mm/sec
Buskey et al (2002)	Pelagic copepod	M = 500 mm/sec
Browman et al (2011)	Pelagic copepod	M = 48.9mm/sec A = 34.3 mm/sec
Gallager et al (2004)	Pelagic copepods and protozoa	M = 12.9 mm/sec
Torres and Childress (1983)	Euphausiid	R = 2.2 – 15.8 mm/sec
Chan et al (2013)	Gastropod larvae	R = 0.5 – 3.5 mm/sec
Paris et al (2013)	Reef fish larvae	A = 14.5 mm/sec
Humphrey (2011)	Larval lake trout	M = 150 – 250 mm/sec
Fisher (2005)	Larval reef fishes	R = 200 – 600 mm/sec

NOTES:
[a] = M = Maximum reported swimming speed, A = Average reported swimming speed, R = Range of reported swimming speeds

Impingement of Organic Material on the Sea Floor

Even though impingement of plankton and larval fish is not expected to occur from the intake of ocean water into the slant wells, the operation of the slants wells could impinge fine organic matter against the sea floor, cause a build-up and change the normal distribution of sediment grain size. The settlement of sediment particles is controlled by the size and density of the particles and the median grain size of ambient sediments is roughly proportional to local current speeds (Van Rijn, 2007; McCave, 2008). At infiltration rates greater than 30 cm/sec (0.98 ft/sec), sea floor sediments are very mobile and typically do not retain fine particle fractions (McCave, 2008). Various studies have documented that nearshore currents at the sea floor are dominated by the orbital velocities of waves. Graham et al (1997) reported estimated orbital velocities of ocean waters due to surface waves at three nearshore kelp forest sites around the Monterey Peninsula ranging between 500 cm/sec (16.4 ft/sec) and 280 cm/sec (9.2 ft/sec). Additionally, wave orbital velocities attenuate due to friction against the sea floor as the waves near the shore. Weltmer (2003) measured orbital velocities near the sea floor in the surf zone near Sand City between 250 cm/sec (8.2 ft/sec) and 600 cm/sec (19.7 ft/sec). Consequently, normal wave generated water velocities at the sea floor locations of the slant wells is predicted to be 8 to 20 times greater than that required for fine-grained material to accumulate on the sea floor over the subsurface slant wells. As a result, there would be no potential for the impingement of fine organic matter on the sea floor or changes to soft substrate habitat.

Potential Effects of Elevated Salinity

The desalination process would generate approximately 14 mgd of brine that would be discharged via the MRWPCA ocean outfall into the waters of MBNMS. The outfall is currently used to discharge secondary treated wastewater from the MRWPCA Regional Wastewater Treatment Plant. The comingling and discharge of this brine could have an effect on special-status species that frequent the study area (see **Table 4.5-1**), especially bottom dwelling or foraging fish, including MSA and state-managed commercial fish species (see **Table 4.5-4**) and marine mammals such as the Southern sea otter and California gray whale, that feed on benthic organisms. The discharged brine, if concentrated enough, could also result in the loss of foraging habitat if the benthic infauna and macrofauna populations decline. Additionally, comments received on the April 2015 Draft EIR expressed concerns over the potential for hypoxia[13] to occur near the seabed as a result of proposed MPWSP operational discharges. Specifically, there was concern that high salinity discharges from the MRWPCA outfall would restrict oxygen supply near the seabed and result in stress or mortality to benthic organisms and other marine biological resources. This issue is discussed in detail in Section 4.3, Surface Water Hydrology and Water Quality, and a summary of the impact conclusions is provided below.

As explained in detail in Section 4.3, the seawater in Monterey Bay is a mixture of water masses from different parts of the Pacific Ocean with warmer, saltier water from the equatorial zone and colder, fresher water from the arctic regions. Near-shore surface salinities vary from 33.2 practical salinity units (psu) to 34.0 psu when upwelling is strong. Streams and rivers can locally affect salinity, but even during flood conditions, when fresh water inputs to Monterey Bay peak, the salinity of Monterey Bay surface waters does not fall below 31 psu (MBNMS, 2013). Bograd and Lynn (2003) compared near-shore salinity and temperatures in Monterey Bay during two periods: 1950-1976 and 1977-1999, and found very little variation. The difference in near-shore salinities between the periods was approximately 0.2 parts per thousand (ppt) or psu and the difference in near-shore temperatures was approximately 1.4 °F. As such, the reported seasonal salinity and temperature is provided here as representative of baseline conditions. The 2015 Ocean Plan amendment established an allowable salinity increase of less than 2 ppt at the BMZ boundary (SWRCB, 2015). Exceeding this standard could result in a significant impact on fish and marine biota.

Dissolved Oxygen (DO) is typically used as a general index for the health of receiving waters (such as in the *Water Quality Control Plan for Ocean Waters of California* or Ocean Plan, discussed in Section 4.3.2.2). Adequate DO is vital for aquatic life and higher concentrations are generally considered to be desirable. Dissolved oxygen content in water is, in part, a function of water temperature and salinity, which affect the point at which water becomes saturated with DO. However, DO varies according to many other factors, including photosynthesis and biological and chemical oxygen demand associated with decomposition of organic material. Monterey Bay is a dynamic environment that includes variable concentrations of DO. Ambient DO levels in Monterey Bay at a depth of approximately 100 feet have ranged from 4.25 milligrams per liter

[13] Hypoxia, or oxygen depletion, is an environmental phenomenon where the concentration of dissolved oxygen in the water column decreases to a level that can no longer support living aquatic organisms. The impacts of hypoxia are often described as creating a so-called “dead zone” in the marine environment.

(mg/L) to 8.00 mg/L (KLI, 1998, 1999); typically, DO in the range of 5 to 8 mg/L is considered protective of fish and marine biota depending on the species and life-stage. The Ocean Plan limits dissolved oxygen decreases as a result of operational discharges to no more than 10 percent from that which occurs naturally. Exceeding this standard for dissolved oxygen could result in a significant impact on fish and marine biota.

Elevated salinity and subsequent degradation of the marine environment are among the major concerns associated with coastal desalination projects (Damitz et al, 2006). Numerous studies have been performed to evaluate the effects of elevated salinity on marine organisms found within and outside of the study area in MBNMS, which have used different methods to test the sensitivity of various species. These studies have demonstrated that salinity effects are species-specific (see **Table 4.5-9**). Review of published results from field surveys and laboratory experiments (Roberts et al, 2010) indicate no studies have examined the impacts from the small range of salinity increases anticipated from the MPWSP desalination plant. As analyzed in detail in Section 4.3, except for the area adjacent to the discharge ports, the predicted salinity increase due to the MPWSP would be less than 2 ppt above ambient (increasing salinity up to 36.8 ppt) and the other studies tested organisms at much higher salinities. Moreover, there were apparent contradictions among different studies. For example, one field experiment cited by Roberts et al (2010) indicated reduced survival, shoot production, and vigor of seagrass transplants at salinities at or above 39.2 ppt (4 percent above ambient), whereas a laboratory experiment found another species of seagrass to have greatest growth and production at a salinity of 42.5 ppt. Although seagrass is not found in the study area, these conflicting results exemplify the limited applicability of data from other areas. A study of salinity effects based on approved marine organism toxicity test protocols (Phillips et al, 2012) reported median effect concentrations (EC50) ranging from 36.8 ppt to 61.9 ppt on various physiological processes (see **Table 4.5-10**).

Studies of salinity tolerances of organisms not within the context of toxicity tests also inform this analysis of potential impacts associated with brine discharge. In particular, market squid, *Doryteuthis (Loligo) opalescens* must be considered because their egg masses rest on the sea floor. A review by Vidal and Boletzky (2014) recommends a salinity range of 34 to 38 ppt for successful laboratory culture of the market squid. In an earlier publication, Boletzky (2004) suggested an ideal range of 32 to 38 ppt for most cephalopods. Thus, market squid appear to have a broad tolerance to salinity. Other species of concern (see Table 4.5-2) are motile and would be able to avoid areas of elevated salinity in the immediate vicinity of the brine discharge.

The 2015 Ocean Plan amendment established an allowable salinity increase of less than 2 ppt at the BMZ boundary (SWRCB, 2015); this is comparable to other international regulatory guidelines (see **Table 4.5-11**). This incremental salinity increase limit, however, is a conservative threshold for marine organisms, as none of the studies reviewed in the discussion above (see **Table 4.5-9**) found adverse effects on survival, growth, or behavior at salinities as low as the Ocean Plan objective. For this analysis, salinity levels both within the ZID (i.e., (3 to 8.8 meters or 10 to 29 feet from the diffuser) and the BMZ (100 meters or 328 feet from the diffuser), as well as at the edge of these zones were evaluated for potential impacts on marine biological resources.

TABLE 4.5-9
RESULTS FROM STUDIES ON THE EFFECTS OF ELEVATED SALINITY ON MARINE ORGANISMS

Author, Year	Species	Salinity Tested	Results	Comments
Pantell, 1993	*Menidia beryllina* (inland silverside)	23:1 SF Bay water:Brine 20:1 POTW Effluent:Brine	Mortality observed at greater brine concentrations	Freshwater species, dilutions of ambient samples tested without absolute salinities reported
	Skeletonema costatum (diatom)	23:1 SF Bay water:Brine 20:1 POTW Effluent:Brine	Growth effects observed at greater brine concentrations	Marine species, test salinities not reported
	Bivalve larvae	23:1 SF Bay water:Brine 20:1 POTW Effluent:Brine	Development effects observed at greater brine concentrations	Species not specified, dilutions of ambient samples tested without absolute salinities reported
	Citharichthys stigmaeus (sand dab)	23:1 SF Bay water:Brine 20:1 POTW Effluent:Brine	Mortality observed at greater brine concentrations	Local sand bottom species, dilutions of ambient samples tested without absolute salinities reported
Gross, 1957	*Pachygrapsus* (rock crab)	61 ppt 56 ppt	Lethal in 2 hours Survived > 72 hours	Locally found, but only in rocky habitats
	Emerita analoga (sand crab)	50 ppt 44 ppt	Lethal in 2 hours Survived > 24 hours	Local sand bottom species
	Olivella pycna (olive snail)	33 to 48 ppt	Not lethal	Local sand-bottom species, report unavailable for this evaluation
Iso et al, 1994	*Venrupis philippinarum* (little neck clams)	Various up 70 ppt	Survived and behaved normally at 50 ppt, lethal at 60 ppt after 48 hours and at 70 ppt after 24 hours	Grown commercially in California
	Pagrus major (sea bream)	Various up 70 ppt	Survived well in 45 ppt, behaved normally at 40 ppt, > 70 ppt lethal in 1 hour	Not found locally
	Pseudopleuronectes yokohamae (marbled flounder)	Various up 70 ppt	Egg hatching delayed but successful up to 60 ppt, larvae survived up to 50 ppt, 55 ppt lethal after 140 hours	Not found locally
McMillan and Mosely, 1967	Seagrass	Up to 74 ppt	Four species grew	No seagrasses in vicinity of proposed project, reference unavailable for this review
Pillard et al, 1999	*Mysidopsis bahia*	43 ppt	LC50 = 48 hours	Estuarine species
	Cyrpinidon variegates	70 ppt	LC50 = 48 hours	Estuarine species
	Menidia beryllina	44 ppt	LC50 = 48 hours	Estuarine species
Voutchkov, 2006	*Dendraster excentricus* (sand dollar)	37 to 40 ppt	Survived for 5.5 months, no effects on growth or fertility	Local sand-bottom species, reference unavailable for this review
	Strongylocentrotus purpuratus (purple urchin)	37 to 40 ppt	Survived for 5.5 months, no effects on growth or fertility	Local, but only in rocky habitats, reference unavailable for this review
	Haliotus rufescens (red abalone)	37 to 40 ppt	Survived for 5.5 months, no effects on growth or fertility	Rare locally, only found in rock habitats, reference unavailable for this review

TABLE 4.5-9 (Continued)
RESULTS FROM STUDIES ON THE EFFECTS OF ELEVATED SALINITY ON MARINE ORGANISMS

Author, Year	Species	Salinity Tested	Results	Comments
Reynolds et al, 1976	*Leuresthes tenuis* (California grunion prolarvae)	41 ppt	LC50 = 24 hours	Southern California species
	Leuresthes tenuis (larvae)	40 ppt	LC50 = 18 hours	Southern California species
SCCWRP, 1993	*Macrocystis pyrifera* spores (giant kelp)	43 ppt	Germination and growth not affected	Locally found, but not found for miles around the proposed project
	Rhepoxynius abronius (amphipod)	38.5 ppt	Survived 10 days	Local
	Strongylocentrotus purpuratus (purple urchin)	90:10 Seawater:Brine	No effect on fertilization	Local, but only in rocky habitats, test salinities not reported
Thessen et al, 2005	*Pseudo-nitzschia* spp. (diatom)	Up to 45 ppt	7 clones of 3 species grew up to 45 ppt	Local, species of *Pseudo-nitzschia* cause domoic acid poisoning

SOURCE: Pantell, 1993; Gross, 1957; Iso et al, 1994; McMillan and Moseley, 1967; Pillard et al, 1999; Voutchkov, 2006; Reynolds et al, 1976; SCCWRP, 1993; Thessen et al, 2005.

TABLE 4.5-10
TOXICITY TEST RESULTS AND MEAN EFFECTIVE CONCENTRATIONS OF SALINITY TOXICITY

Protocol	Physiological Process Measured	Test	Measured Test Solution Salinities	EC50[a]
Red Abalone	Development	1 2	34, 35, 36, 37, 38, 39, 40 34, 35, 36, 37, 38, 39, 40	36.8
Purple Urchin	Fertilization	1 2	34, 36, 38, 39, 41, 43, 45, 46, 48 34, 38, 41, 42, 43, 44, 45, 46, 47	44.2
Purple Urchin	Development	1 2	34, 35, 36, 37, 38, 39, 40, 41, 42 34, 35, 36, 37, 38, 39, 40, 41, 42	38.1
Sand Dollar	Fertilization	1 2	35, 38, 39, 41, 43, 45, 47, 48, 50 34, 36, 38, 40, 41, 43, 45, 46, 48	40.3
Sand Dollar	Development	1 2	34, 35, 36, 37, 38, 39, 40, 41, 42 34, 35, 36, 37, 38, 39, 40, 41, 42	39.6
Mussel	Development	1 2	34, 40, 41, 42, 43, 44, 45, 46, 47 35, 40, 41, 42, 44, 45, 46, 47, 48	43.3
Mysid Shrimp	Survival	1 2	35, 41, 45, 50, 56, 61 37, 42, 45, 49, 53, 56	47.8
Mysid Shrimp	Growth	1 2	35, 41, 45, 50, 56, 61 37, 42, 45, 49, 53, 56	> 49.7
Giant Kelp	Germination	1 2	34, 45, 49, 54, 59, 64 35, 44, 49, 54, 59, 65	55.5
Giant Kelp	Growth	1 2	34, 45, 49, 54, 59, 64 35, 44, 49, 54, 59, 65	47.3
Topsmelt	Survival	1 2	35, 45, 50, 55, 60, 65, 70 35, 44, 50, 54, 60, 65, 70	61.9
Topsmelt	Biomass	1 2	35, 45, 50, 55, 60, 65, 70 35, 44, 50, 54, 60, 65, 70	59.3

NOTE:
[a] EC50 = median salinity at which an effect was observed

SOURCE: Phillips et al 2012

TABLE 4.5-11
SUMMARY OF INTERNATIONAL BRINE LIMITS

Region/Authority	Salinity Limit	Compliance Point	Source
USEPA	Increment ≤ 4 ppt	NA	NA
Carlsbad, CA	Absolute ≤ 40 ppt	1,000 feet	San Diego Regional Water Quality Control Board 2006
Huntington Beach, CA	Absolute ≤ 40 pt salinity (expressed as discharge dilution ratio of 7.5:1)	1,000 feet	Santa Ana Regional Water Quality Control Board 2012
Western Australia guidelines	Increment ≤ 5 ppt	NA	NA
Oakajee Port, Western Australia	Increment ≤ 1 ppt	NA	The Waters of Victoria State Environment Protection Policy
Perth, Australia/ Western Australia EPA	Increment ≤ 1.2 ppt and ≤ 0.8 ppt	50 m and 1,000 m	Wec 2002
Sydney, Australia	Increment ≤ 1 ppt	50 to 75 m	ANZECC 2000
Gold Coast, Australia	Increment ≤ 2 ppt	120 m	GCD Alliance 2006
Okinawa, Japan	Increment ≤ 1 ppt	Mixing zone boundary	Okinawa Bureau for Enterprises
Abu Dhabi	Increment ≤ 5 ppt	Mixing zone boundary	Kastner 2008
Oman	Increment ≤ 2 ppt	300 m	Sultanate of Oman 2005

SOURCE: Jenkins et al, 2012

As presented in Section 4.3, Surface Water Hydrology and Water Quality, the highest anticipated ambient salinity of 33.89 ppt is expected to occur during the upwelling season (see **Table 4.3-1**). This peak ambient salinity would also coincide with the proposed project's maximum concentrated brine discharge stream, when the brine would not be combined with treated wastewater effluent from the MRWPCA regional wastewater treatment plant, resulting in the maximum salinity at the edge of the ZID of any scenario analyzed under Impact 4.3-4. Under this brine-only discharge scenario, the maximum increase in salinity at the edge of the ZID would be 1.56 ppt above ambient (see Scenario 2 in **Table 4.5-12**). This maximum anticipated salinity at the edge of the ZID due to the brine discharge is less than the lowest mean effective salinity reported by Phillips et al (2012) (i.e., 36.8 ppt; see **Table 4.5-10**). It should be noted that this mean effective salinity was for the embryonic development of red abalone, which occurs only on rocky substrate associated with kelp miles from the edge of the ZID. Moreover, none of the modeling results based upon a continuous discharge suggest a re-concentration of salinity in the discharged brine along the sea floor. Elevated salinities in the discharge plumes will never exceed 2 ppt above ambient at the point of contact with the sea floor and those maximum salinities will continue to dilute through mixing and diffusion as they flow across the sea floor.

TABLE 4.5-12
DILUTION MODEL RESULTS FOR DENSE DISCHARGE SCENARIOS

		Model Results at Edge of ZID			Model Results at Edge of BMZ	
		Salinity			Salinity	
Scenario	No.	At seabed contact (ppt)	Increase Above Ambient (ppt)	Contact distance[a] (ft)	At seabed contact (ppt)	Increment (ppt)
Brine Only	2	35.45	1.56	10.3	35.19	1.30
Brine and Low (1 mgd) SE[b]	3	34.60	1.25	10.7	34.39	1.04
Brine and Low (2 mgd) SE	4	34.34	1.00	11.8	34.17	0.83
Brine and Moderate SE	5	33.39	0.05	29.0	33.38	0.04
Brine and High SE	6	-	-	-	-	-

NOTES:
[a] Contact distance = distance from diffuser port where discharged brine contacts the sea floor
[b] SE = secondary effluent

SOURCE: Roberts, 2016 (Appendix D1)

Due to the fact that the recommended salinity range for culturing squid is 34 to 38 ppt, and the salinity at the edge of the ZID and the BMZ would not exceed 35.45 ppt and 35.14 ppt, respectively, the area outside the ZID and within the BMZ would continue to be suitable for squid spawning.

An area within the ZID, however, could be unsuitable for squid spawning. The most straightforward way of estimating the impact is to compare the area within the ZID to the entire

area of suitable spawning habitat in Monterey Bay south of Monterey Submarine Canyon, which is the greatest focus of commercial fishing activities associated with spawning. The shelf area south of the Monterey Submarine Canyon is approximately 16 km (10 miles) long. The depth ranges for squid spawning (18 to 55 meters or 59 to 180 feet) spans approximately 3 km (1.8 miles) from shoreward to seaward edge, which covers 48 square kilometers (18 square miles). If the area between the diffuser port and the edge of the ZID on both sides of the outfall (i.e., 3 to 8.8 meters ([10 to 29 feet] wide by 335 meters [1,100 feet] long; on two sides) were to settle on the sea floor (which model results indicate it would not), approximately 2,010 to 5,900 square meters of sea floor (21,635 to 63,507 square feet) would be unsuitable for squid spawning. This area represents approximately 0.0042 to 0.0123 percent of the suitable spawning area on the sea floor south of Monterey Submarine Canyon.

There could be unanticipated effects on benthic and pelagic communities in the vicinity of the discharge. As discussed in Section 4.3, Surface Water Hydrology and Water Quality, the water-column salinity at the point of discharge would exceed 2 ppt within a very small volume of ocean water at each of the 129 open diffuser ports. For the worst-case brine-only discharge scenario, the volume of discharge with a salinity greater than 2 ppt above ambient would be approximately 2 feet in maximum diameter tapering at each end, and approximately 8 feet long, with a corresponding volume of 8.5 cubic feet of water mass at each of the open diffuser ports (see **Figure 4.3-10** in Section 4.3, Surface Water Hydrology and Water Quality). Extrapolation to all 129 open diffuser ports indicates a total volume of 1,100 cubic feet of water could exceed 2 ppt. The small volume of water that would be greater than 2 ppt above ambient salinity would not come into contact with any hard-substrate organisms inhabiting the ballast rock anchoring the outfall or benthic fauna located on the sea floor. Consequently, benthic communities near the outfall would not be affected by the increased salinity brine discharge. Compared to the total volume of water surrounding the diffuser to a height of 4 feet off the bottom (i.e., 3 to 8.8 meters ([10 to 29 feet] wide by 335 meters [1,100 feet] long by 1.2 meters [4 feet] high; on two sides = or 1,206 to 3,538 cubic meters or 88,000 to 255,200 cubic feet), this impact would involve 0.4 to 1.25 percent of the near-sea floor water in the vicinity of the discharge and contain approximately 10.9 to 41.4 million planktonic organisms. While mortality of small organisms could occur if they were entrained for more than a few seconds in the discharge plumes, the impact on pelagic organisms would result in a less-than-significant impact because of the small percentage of total habitat involved.

The Ocean Plan establishes receiving water salinity limitations for brine discharges from desalination facilities to protect the quality of ocean waters for beneficial uses, such as providing aquatic habitat. The impact analysis at 4.3.5.2 Operational and Facility Siting Impacts Impact 4.3-4, uses the Ocean Plan's receiving water salinity limitations as significance thresholds. The impact analysis estimates salinity levels within the BMZ, where salinity may exceed 2.0 ppt above natural background salinity, to determine the potential frequency and intensity of impacts on marine biological resources and beneficial uses. The impact analysis evaluates the salinity and dilution dynamics of a number of scenarios of operational discharges within the BMZ by determining the ZID for each discharge scenario and describes areas where salinity would exceed

2 ppt. Additionally, the analysis addresses the fate and travel path of the discharge plume beyond the BMZ and the potential for hypoxia to occur near the seabed.

The analysis of salinity levels indicates that for all discharge scenarios, and assuming a continuous discharge stream, the MPWSP brine and combined discharges would meet Ocean Plan salinity and dissolved oxygen standards and are not likely to result in hypoxia on the ocean floor. Specifically, the discharge would result in salinity less than 2 ppt above ambient salinity at the edge of the ZID, which means that salinity levels would not exceed 2 ppt above ambient salinity at the edge of the BMZ (328 feet) since the edge of the ZID is well within the BMZ under all scenarios. The proposed project would therefore not exceed or violate the Ocean Plan salinity standards or degrade water quality in terms of salinity. For all discharge scenarios involving dense, negatively buoyant plumes (worst case scenarios), the Ocean Plan salinity limit is met at the edge of the ZID, which ranges from 10 feet to 29 feet depending on discharge scenario. As the plumes discharged from each of the 129 outfall diffuser jets travel away from the ZID, they continue to dilute (further reducing salinity levels) and ultimately merge within the BMZ boundary. Salinity levels would exceed 2 ppt in a relatively small area, 8.5 cubic feet, adjacent to each of the 129 diffuser ports and above the sea floor, after which the discharge plumes would attenuate rapidly with distance from each port. The combined area of exceedances of 2 ppt is not likely to adversely impact the marine environment because it is a relatively small volume in the water column when considered in the context of the total volumes of Monterey Bay. Also, the salinity increases presented in the analysis represent conservative values and would occur only along the seabed. Modelling demonstrates that salinity plumes are not likely to travel, or become trapped, along the sea floor due to the Coanda effect. Hypoxia from salinity near the sea floor was demonstrated to be unlikely based on a mass-balance analysis, which demonstrated that the amount of oxygen supplied to the discharged plume by ambient seawater entrained during turbulent mixing and dilution is more than 30 times greater than that consumed by the sediments. As such, the concentration of dissolved oxygen in receiving ocean waters would not become depressed by more than 10 percent from that which occurs natural. For the majority of the water column, incremental salinities would be much lower than the reported values. Additionally, the analysis assumed zero ocean current; however, under actual ocean conditions, waves, tidal forces, and seasonal currents would increase mixing and dilution, thus reducing these assessed salinity levels. Therefore, operational discharges from the MPWSP would not increase salinity levels or impact DO in a manner that violates water quality objectives or waste discharge requirements or otherwise degrades the quality of receiving waters in Monterey Bay and MBNMS, and impacts on sanctuary marine biological resources would be less than significant.

Potential Effects of Other Brine Discharge Contaminants

In the irrigation season, brine-only would be discharged through the MRWPCA outfall. In the non-irrigation season, the brine would be combined with varying flows of secondary treated wastewater that would typically be buoyant when released into the ocean. But because the brine is denser than the wastewater flow, the brine could cause the wastewater to be less buoyant and various constituents in the wastewater may not adequately dilute as they do now.

Six contaminants (copper, ammonium (ammonia), chlordanes, DDT, PCBs, and toxaphene) were detected in the test slant well samples or in the MRWPCA wastewater in concentrations with a potential to exceed Ocean Plan objectives. Copper and ammonium have the potential to cause acute toxicity to marine organisms, whereas organic compounds (e.g., chlordanes, DDTs, PCBs, and toxaphene) are rarely acutely toxic but can accumulate in organisms through direct exposure or consumption of contaminated prey (bioaccumulation). To determine if exceedances of these contaminants would occur in the discharge, the concentrations of various contaminants were estimated at the edge of the ZID using the modeled dilutions of various brine and brine-with-wastewater scenarios, and compared against the Ocean Plan water quality objectives (see Section 4.3 and Appendices D1-D3).

None of the contaminants modeled are expected to exceed their respective Ocean Plan water quality objectives at the edge of the ZID. However, a compliance determination could not be made for numerous constituents due to insufficient available data. The modeled dilution factors for various scenarios of negatively buoyant plumes range from approximately 16:1 (seawater:effluent) at the diffuser port to 40:1 at the edge of the ZID. Concentrations within the ZID (the area in the plume between its contact with the sea floor and the diffuser port) would be gradually higher than at the edge of the ZID. While mortality of small organisms could occur if they were entrained in the higher concentration discharge, the impact on pelagic organisms would result in a less-than-significant impact because of the small percentage of total habitat involved and the limited exposure duration. Discharged contaminants also would have less than significant impacts on benthic organisms due to acute toxicity because the area affected by the discharge plumes would be very small. Using the diameter of the discharge plumes cited above (i.e., 1.5 feet; see **Figure 4.3-10** in Section 4.3, Surface Water Hydrology and Water Quality), each plume would affect 1.77 square feet of sea floor at the point of contact. The total area affected would be 1.77 square feet x 129 open diffuser ports = 228 square feet. This area is less than 1 percent of the total area within the ZID (i.e., 1,100 feet long x 21 feet wide = 23,100 square feet). Transfer of bioaccumulated contaminants from benthic infauna to higher trophic levels also would be limited by the very small area of sea floor affected. Transfer to predators in higher trophic levels would be proportional to the relative consumption of prey from within and outside of the affected sea floor area.

As discussed in Section 4.3, the implementation of **Mitigation Measure 4.3-4, Operational Discharge Monitoring, Analysis, Reporting, and Compliance**, would further ensure that brine constituents are discharged at concentrations below Ocean Plan requirements and further ensure compliance with the monitoring requirements and regulatory standards that are protective of the beneficial uses (including aquatic wildlife and habitat) of Monterey Bay. Mitigation Measure 4.3-4 requires CalAm to implement a comprehensive Monitoring and Reporting Plan (Plan), following review and approval by the RWQCB and MBNMS, that is consistent with the requirements of the Ocean Plan and that incorporates, at a minimum (but not limited to) monitoring guidelines detailed in the Ocean Plan. The monitoring program would ensure that adequate water quality and marine resource data are gathered to determine baseline conditions and compliance with Ocean Plan water quality limitations related to salinity as well as to determine any impacts on aquatic resources that occur in response to the introduction of operational discharges. The Plan would

include, at a minimum, appropriate performance standards, as well as corrective actions proposed in **Mitigation Measure 4.3-5, Implement Protocols to Avoid Exceeding Water Quality Objectives**, such as additional pre-treatment of source water to the Desalination Plant, treatment of discharge, retrofitting the existing outfall to increase dilution, and/or flow augmentation, that would be required if the acquired data indicated deleterious effects to receiving water quality or marine biological resources resulting from operational discharges. Impacts due to the discharge of other brine contaminants would be less than significant.

Potential Effects of Brine Discharge Shear Stress

Concern has been expressed that the jet velocities associated with brine discharges could cause damage in the discharge environment (SWRCB, 2014). Impacts due to shear stress caused by the brine discharge would be limited to plankton, because motile organisms would be able to avoid turbulence in the immediate vicinity of the brine discharge. Some laboratory studies have reported impacts on very small marine organisms caused by experimentally induced shear stress (Foster et al, 2013). In the case of the proposed MPWSP, such damage is highly unlikely. Modeling performed in support of a report submitted to the SWRCB that examined entrainment effects from desalination projects (Foster et al, 2013) provided formulae for determining the spatial scales of turbulent eddies that occur at different discharge velocities.[14] The minimum and maximum discharge velocities (7.4 ft/sec (2.26 m/sec) and 14.8 ft/sec (4.51 m/sec)) modeled across all scenarios for the proposed MPWSP (see Appendix D1) closely approximate the discharge velocities calculated by Foster. Foster (2013) concludes that, at these very small eddy scales: "Overall, the area of high shear impacted by the diffusers is relatively small and transit times through this region relatively short. Thus, it seems reasonable to expect that, while the larvae that experience the highest shear will most likely experience lethal damage, the overall increase in mortality integrated over the larger area will be low."

Plankton samples collected near the MRWPCA outfall (see **Table 4.5-1**) were used in a hydrodynamic model to provide a quantitative estimate of the effects of shear stress from the brine discharge on plankton (**Appendix D1**). The analysis found that a very small percentage of water passing over all of the outfall diffusers is entrained (i.e., 1.7 to 6.4 percent). The greatest shear gradients occur in very small turbulent eddies such that effects of shear stress would be concentrated on plankton smaller than 1.0 mm. Assuming that 50 percent of entrained organisms below 1 mm are killed by shear stress, roughly 0.23 to 0.86 percent of total numbers of plankton flowing over the diffuser could be killed by shear stress, estimated to be roughly 892 million organisms per day. This number seems substantial, but is a tiny fraction of the estimated total plankton abundances at any point in time in Monterey Bay.

The total area around the edge of Monterey Bay at the depth of the MRWPCA diffuser is approximately 215 square kilometers and the average depth is 35 meters. By applying the average number of planktonic organisms per cubic meter observed in the plankton tows (see Table 4.5-1;

[14] Foster concludes that higher strain rates and shear stresses are contained in smaller eddies. A discharge velocity of 2.9 m/sec (9.5 ft/sec) resulted in small eddies ranging from 0.03 mm (0.002 in) to 0.56 mm (0.02 in) at various locations in the discharge plume, from the diffuser port to the edge of the ZID. A discharge velocity of 4.6 m/sec (15.1 ft/sec) resulted in small eddies ranging from 0.02 mm (0.0008 in) to 0.63 mm (0.025 in).

4,357 organisms per cubic meter), the total number of organisms in the nearshore area of Monterey Bay would be 3.41×10^{13} at any given time. The percentage of total nearshore plankton killed in Monterey Bay by shear stress associated with the discharge of brine from the MPWSP project each day would be 0.00261 percent. The amount of annual organism productivity represented by this percentage can only be approximated because the numbers present on any given day, as indicated by the plankton samples, are the result of production minus predation and natural mortality, which are unknown. Nevertheless, a rough approximation is possible. Calanoid copepods, which were the most abundant organisms in the plankton samples (see Table 4.5-1), typically have annual lifecycles (Atkinson, 1998). If it can be assumed that all calanoids begin and end their lifecycles at the same time, a mortality of 0.00261 percent per day would result in a maximum annual loss of less than 1 percent. Moreover, because the baseline condition involves wastewater without brine, the higher wastewater flow in the non-irrigation season means that the water entrained over the ZID is greater and potential plankton mortality is greater with these higher flows than would be the case with the proposed project.

Impact Conclusion

Impacts on marine biological resources, including MBNMS resources, during operations of the proposed MPWSP would be less than significant. Impingement of plankton, larval fish and other organic matter on the sea floor from the operation of the slant wells is not likely because of the low intake velocities. The increased salinity and other constituents in the brine discharge are expected to meet Ocean Plan water quality objectives at the edge of the ZID and are therefore, not expected to cause any impairments to marine biological resources including special status species. Brine discharges also are not expected to significantly affect marine habitat by reducing dissolved oxygen content (hypoxia). Nevertheless, and as discussed in Section 4.3, Surface Water Hydrology and Water Quality, the implementation of **Mitigation Measure 4.3-4** would further ensure the brine is discharged at concentrations below Ocean Plan water quality objectives and further ensure compliance with the monitoring requirements and regulatory standards that are protective of the beneficial uses (including aquatic wildlife and habitat) of Monterey Bay.

Finally, impacts due to shear stress caused by the brine discharge would be limited to plankton, because motile organisms would be able to avoid turbulence in the immediate vicinity of the brine discharge and the impact would be less than significant because of the small percentage of plankton abundances potentially affected. Moreover, the Ocean Plan Provisions for Desalination Facilities require modeling and estimating of potential mortality due to shear stress entrainment, and require periodic re-evaluation to ensure the operational procedures employed result in acceptable plankton mortality (SWRCB, 2016).

Mitigation Measures

None proposed.

Impact 4.5-5: Threaten to eliminate a marine plant or animal wildlife community or cause a fish or marine wildlife population to drop below self-sustaining levels during operations. (*Less than Significant)*

As discussed for Impact 4.5-4, there are no anticipated occurrences of impingement of plankton and larval fish on the sea floor or a potential for deterioration of sea floor sediments and soft substrate benthic habitat from the operation of the MPWSP slant wells. Additionally, the discharge of elevated salinity brine is not expected to threaten to eliminate a marine plant or animal wildlife community or cause a marine population to drop below self-sustaining levels. Therefore, the evaluation of impacts from MPWSP operations, including slant well and brine discharge operations, would be the same as for Impact 4.5-4; the impact would be less than significant.

Mitigation Measures

None proposed.

Impact 4.5-6: Interfere substantially with the movement of any native marine resident or migratory fish or marine wildlife species or with established native resident or migratory marine wildlife corridors, or impede the use of native marine wildlife nursery sites during operations. (*Less Than Significant)*

As discussed for Impact 4.5-4, there are no anticipated occurrences of impingement of plankton and larval fish on the sea floor or a potential for deterioration of sea floor sediments and soft substrate benthic habitat from the operation of the MPWSP slant wells. The analysis of impacts on the movement of native resident or migratory fish or marine wildlife species, including market squid, or interference with established native resident or migratory wildlife corridors or native marine wildlife nursery sites is identical to the analysis presented for **Impact 4.5-4**.

Additionally, the discharge of brine is not expected to interfere with the movement of native resident or migratory fish or marine wildlife species. Therefore, the evaluation of impacts from MPWSP operations, including slant well and brine discharge operations, would be the same as for Impact 4.5-4; the impact would be less than significant.

Mitigation Measures

None proposed.

4.5.6 Cumulative Effects of the Proposed Project

Impact 4.5-C1: Cumulative impacts on marine biological resources. (*Less than Significant*)

The geographic scope for the cumulative analysis of impacts on marine biological resources encompasses the nearshore waters (within 5 miles from shore) of Monterey Bay and extends from north of Moss Landing Harbor southward to the northern limits of Sand City, including the subtidal and intertidal habitats contained therein, and all marine biological communities. Beyond this area, other projects would be too distant from the MPWSP to result in any combined salinity or elevated brine constituent plumes, or to combine in any other way that may cause a cumulative effect on marine biological resources.

The cumulative projects listed in **Table 4.1-2** that are located within the geographic scope and whose impacts could overlap with those of the MPWSP include Test Slant Well (No. 47), RUWAP Desalination Element (No. 31), and RUWAP Recycled Water Element (No. 35). In addition, it is expected that either the DeepWater Desal Project (No. 34) or The Peoples' Moss Landing Desal Project (No. 57), but not both, would be constructed and operated in the reasonably foreseeable future. With the exception of DeepWater Desal and Peoples' Project, all of these projects are either built (No. 47), not reasonably foreseeable in its current configuration (No. 31), or projected to have very localized construction impacts.

The test slant well (No. 47) was considered in the evaluation of the proposed project. The RUWAP Recycled Water Element (No. 35) would reduce wastewater flows to the MRWPCA ocean outfall. The impacts that would result from a range of brine with wastewater flows were evaluated for the proposed project under Impact 4.5-4 (see Table 4.5-12). The cumulative scenario that would result from the RUWAP Recycled Water Element in combination with the proposed project would be within the range analyzed under Impact 4.5-4; that impact was determined to be less than significant.

Both the DeepWater Desal and Peoples' Project propose to use new ocean water intakes and new brine discharge outfalls equipped with diffuser jets. The proposed intake and outfall pipes for both projects would be located offshore of Moss Landing Harbor. As proposed by its applicant, the Peoples' Project would develop supplemental water supplies to serve customers in CalAm's Monterey District service area. Since the Peoples' Project and the MPWSP would not both be implemented to serve the same customers, this EIR/EIS assumes the Peoples' Moss Landing Project is an alternative to the MPWSP (see Chapter 5). Therefore, it is not a reasonably foreseeable project in the cumulative scenario relevant to the MPWSP. It would also not be a reasonably foreseeable project in the cumulative scenario for any of the alternatives aimed at meeting the objectives of the MPWSP. Therefore, although acknowledged here as a reasonably foreseeable alternative to the proposed project (as described in Chapter 5), this project's contributions to cumulative impacts are not considered as part of the cumulative scenario relevant to the proposed project or another alternative. Accordingly, this analysis only considers implementation of the MPWSP and DeepWater Desal as DeepWater Desal is the largest of the

other two desal projects and further along in design and environmental review. See Section 4.1 for additional details on the cumulative scenario and the basis for this determination.

Construction Impacts

The proposed MPWSP would use subsurface slant wells in-lieu of an open ocean intake. As a result, there are no anticipated or proposed construction activities within the coastal waters of the MPWSP project area that are expected to result in disturbance or effects on marine biological resources. As discussed in Impact 4.5-1, potential impacts from construction-related underwater noise, the discharge of clarified water produced during well drilling and well development into the ocean, and the potential accidental release of drilling fluids would result in less-than-significant impacts on marine biological resources and habitats. Because any drilling noise reaching ocean waters overlying the slant wells is expected to be below background underwater noise levels, no noise generated by slant well drilling could combine with other sources of underwater noise generated by projects in the cumulative scenario to result in increased noise above ambient levels. The discharge of any clarified water to the ocean would be in compliance with Ocean Plan Water Quality standards for turbidity as stipulated in the revised NPDES permit. The NPDES permit requirements are themselves measures based, in part, on the consideration of cumulative effects on receiving waters; therefore, discharges would be within parameters considered not to result in a cumulatively considerable contribution to significant cumulative water quality impacts.

Impingement of Marine Organisms and Organic Material on the Sea Floor

As discussed under Impact 4.5-4, no impingement or entrainment of fish or invertebrate species would occur during MPWSP operations because the use of slant wells would result in a vertical infiltration rate that would be well below the swimming speeds of larval invertebrates and larval fish. Similarly, the low infiltration rate of the slant wells would not result in an accumulation of fine-grained organic materials on the sea floor. Therefore, the MPWSP could not contribute to any cumulative impacts related to the impingement or entrainment of fish or invertebrate species, or the impingement of fine organic matter.

Discharge of Brine and Other Brine-Associated Constituents

As discussed in Impact 4.5-4, the MPWSP would discharge a brine solution with an elevated salinity concentration as well as potential elevated concentrations of contaminants to the ocean through the existing MRWPCA ocean outfall. Based on modeling results, none of the constituents are expected to exceed Ocean Plan limits at the edge of the ZID, and the area within the ZID that would exceed 2 ppt is expected to be less than significant

The DeepWater Desal project, in order to be viable and permitted, would have to implement operational actions that ensure its brine discharges also achieve the Ocean Plan water quality objectives. The distance between the DeepWater Desal proposed outfall and the existing outfall proposed for use by the MPWSP (i.e., 31,511 feet; 9,605 meters) leads to the determination that there is no expectation of the two BMZs reaching each other or intermixing discharge waters. The area within the BMZ for the MPWSP that could exceed 2 ppt is estimated at a total volume of

approximately 31 cubic meters (1,100 cubic feet) of pelagic habitat and associated marine taxa, including special status fish, invertebrate, and marine mammal species. Since the DeepWater Desal project proposes to discharge more brine than the MPWSP, its BMZ would be larger than that of the MPWSP. Depending on operating conditions, the DeepWater Desal project could result in approximately 150 to 1,500 cubic meters (5,300 to 53,000 cubic feet) of pelagic habitat exceeding 2 ppt around the diffuser structure. Thus, the potential cumulative area of coastal Monterey Bay pelagic habitat affected by salinity exceeding 2 ppt could be up to approximately 1,532 cubic meters (54,100 cubic feet) depending on operating conditions, which it is an infinitesimally small amount of water when compared to the volume of nearshore pelagic habitat in the study area (i.e., 215 square kilometers x 35 meters average depth = 7.5 billion cubic meters or 265 billion cubic feet). Therefore, based on the comparative scale of the volume of pelagic habitat that could exceed 2 ppt salinity as compared to the nearshore pelagic habitat available in Monterey Bay, there would be no cumulatively considerable contribution to any cumulative impact in Monterey Bay regardless of other external stressors. Monterey Bay in MBNMS is resource rich (not resource constrained) and most special status fish, invertebrates, and marine mammal species that would encounter the increased area of salinity are motile, they would behaviorally avoid the area and would find other areas to inhabit. Therefore, the cumulative effect of the two projects from increased salinity concentrations in their brine discharges on marine biological resources, including special status fish, invertebrates, and marine mammal species, would be less than significant.

The proposed MPWSP discharge is expected to meet all Ocean Plan water quality objectives at the edge of the ZID. The constitution of the brine that would be discharged from the DeepWater Desal project is currently unknown. This analysis assumes that at a minimum, contaminants detected in the ocean water (CCLEAN, 2015) that currently exceed Ocean Plan water quality objectives (PCBs) would in all likelihood also exceed Ocean Plan water quality objectives at the edge of the DeepWater Desal ZID. If there are no operational actions available for dilution of the brine from the DeepWater Desal project, or feasible mitigation actions to reduce potential increased PCB concentrations, and therein reduce the potential impact on pelagic marine biological resources, then the potential impact on marine biological resources inhabiting pelagic habitat within the ZID of the DeepWater Desal project would be significant and unavoidable. However, since the MPWSP would be using subsurface intakes, the PCBs drawn into the source water through the ocean floor would be less than ambient ocean water and would not exceed Ocean Plan objectives at the edge of the ZID. The implementation of **Mitigation Measure 4.3-4 (Operational Discharge Monitoring, Analysis, Reporting, and Compliance)** would ensure that brine constituents from the MPWSP, such as ammonia and PCBs, are discharged at concentrations below Ocean Plan requirements. Thus, the MPWSP would not have a cumulatively considerable contribution to a potential significant cumulative impact related to PCB concentrations.

Brine Discharge Shear Stress

As discussed in Impact 4.5-4, impacts on marine organisms caused by shear stress would be concentrated on plankton smaller than 1.0 mm and would be less than significant

(0.00261 percent of nearshore planktonic organisms killed). At present, only a preliminary assessment of potential shear stress impacts on planktonic organisms has been performed for the DeepWater Desal project. However, the assessment of potential brine discharge effects on planktonic organisms relative to the volume of the MPWSP brine discharge (Impact 4.5-4) can be used as a basis for estimating similar impacts from the DeepWater Desal project. If the MPWSP and DeepWater Desal were both built and operated, DeepWater Desal is estimated to have a brine discharge of approximately 27 mgd, in comparison to the MPWSP's 14 mgd brine discharge. Assuming that the DeepWater Desal diffuser jets would cause no greater shear impact than the diffusers used on the MRWPCA outfall, DeepWater Desal brine discharges are estimated to cause plankton mortality rates of approximately 447 million individuals per day, assuming plankton densities similar to those measured at the MRWPCA outfall (see Table 4.5-1). As a result, the estimated potential cumulative effect of brine discharge shear stress on planktonic organisms less than 1 mm in size would be approximately 3.8 billion planktonic organisms per day or 0.011 percent of the potential nearshore plankton in Monterey Bay, a small fraction of the plankton less than 1 mm in size inhabiting the nearshore waters near the ocean outfalls. Additionally, the Ocean Plan water quality objectives for brine discharges require modeling and estimating of potential mortality due to shear stress entrainment and require periodic re-evaluation to ensure the operational procedures employed result in acceptable plankton mortality (SWRCB, 2016). No significant cumulative impact from brine discharge shear stress would occur as a result of the MPWSP and DeepWater Desal project.

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4.6 Terrestrial Biological Resources

Sections		Figures	
4.6.1	Setting/Affected Environment	4.6-1a – 4.6-1o	Vegetation Communities and Potential Wetlands and Waters in the Terrestrial Biological Resources Study Area
4.6.2	Regulatory Framework	4.6-2a – 4.6-2c	CNDDB Occurrence Records
4.6.3	Evaluation Criteria	4.6-3	Designated Critical Habitat
4.6.4	Approach to Analysis		
4.6.5	Direct and Indirect Effects of the Proposed Project		
4.6.6	Cumulative Effects of the Proposed Project		

Tables			
4.6-1	Vegetation Community and Habitat Type Crosswalk	4.6-6	Special-Status Species and Sensitive Natural Communities that could be Significantly Impacted During Construction of the Proposed Facilities
4.6-2	Special-Status Species with the Potential to Occur at Project Facilities	4.6-7	Special-Status Species with Potential to Occur at Construction Staging Areas
4.6-3	Construction Staging Areas, Habitat Types, and Special-Status Species with Potential to Occur	4.6-8	Burrowing Owl Burrow Buffers
4.6-4	Applicable Regional and Local Plans and Policies Relevant to Terrestrial Biological Resources	4.6-9	Construction Staging Areas Sensitive Natural Community Impacts
4.6-5	Summary of Impacts – Terrestrial Biological Resources	4.6-10	Applicable Local Plans, Policies, and Ordinances Related to Tree Removal

This section analyzes the potential for the Monterey Peninsula Water Supply Project (MPWSP or proposed project) to adversely affect biological resources and prescribes mitigation to reduce significant impacts. This section describes terrestrial biological resources in the Monterey region and provides detailed information regarding the resources that exist, or have the potential to exist, within a 50-foot buffer of the project area (the study area for terrestrial biological resources). The resources described include vegetation communities and associated wildlife, wetlands and other water bodies, freshwater and anadromous fisheries, and special-status plants and wildlife (federally and state-endangered, threatened, proposed, and candidate species; and state and local species of concern). Impacts on marine biological resources are discussed separately in Section 4.5, Marine Resources.

The CPUC received several comments pertaining to terrestrial biological resources during the public review period for the April 2015 Draft EIR. Comments on the April 2015 Draft EIR suggested that mapping of biological resources was at a scale that made it difficult to read or distinguish vegetation or wildlife habitat types, and that information on special-status species occurrences should have been included. New maps have been included in this EIR/EIS (See Appendix F) based on more detailed vegetation and habitat mapping that has been completed since the Draft EIR was published. Descriptive information about vegetation and wildlife habitats and special-status species is in Section 4.6.1.4 through Section 4.6.1.10.

Comments indicated that protocol surveys should have been included in the Draft EIR. Although this is not a CEQA or NEPA requirement, such surveys have been completed as part of the permitting process, and the results are reflected in Sections 4.6.1.8, Special-Status Species, and 4.6.1.9, Critical Habitat, of this EIR/EIS.

Comments suggested that the Draft EIR provided insufficient or deferred mitigation with regard to impacts on some biological resources, including special-status plants and silvery legless lizard. Mitigation measures in Sections 4.6.5.1 (Construction Impacts) and 4.6.5.2 (Operational and Facility Siting Impacts) have been revised based on input from regulatory agencies and improved species information resulting from more extensive surveys of biological resources. Mitigation for species listed by the state of California as Fully Protected Species also is addressed in these sections.

Several comments on the Draft EIR concerned use of western snowy plover occurrence data in the vicinity of the proposed subsurface slant wells, status of western snowy plover in the vicinity of this facility, and potential impacts of this facility on plovers. ESA requested western snowy plover occurrence data from Point Blue Conservation Science, but Point Blue Conservation Science was unable to provide this data prior to publication of this EIR/EIS. This EIR/EIS includes additional information and analysis in regards to western snowy plover in Sections 4.6.5.1 (Construction Impacts) and 4.6.5.2 (Operational and Facility Siting Impacts).

Comments on the Draft EIR suggested that impacts of reduced pumping on the riparian habitat of the Carmel River should be analyzed. This EIR/EIS concluded that since a primary purpose of the proposed project is to reduce pumping from the Carmel River to restore and increase flows, the effect of this project would be a beneficial effect on stream flows in the Carmel River and the river's aquatic and riparian biological resources. This is discussed further in Sections 4.3 (Surface Water Hydrology and Water Quality, and Section 4.6.1.2 (Information Sources and Survey Methodology).

Several comments on the Draft EIR were concerned with consistency of the proposed project with a mitigation monitoring plan for the CEMEX facility. This EIR/EIS relies on impact assessments and mitigation approaches developed in coordination with regulatory agencies taking current biological resource conditions into consideration. Comments on the Draft EIR also assert that no jurisdictional wetlands or other waters of the U.S. or of the state occur within the CEMEX property. This EIR/EIS continues to regard surface waters within the study area as potentially jurisdictional, except where noted in the discussion below, pending a jurisdictional determination made by the U.S. Army Corps of Engineers, Central Coast Regional Water Quality Control Board, or other regulatory agencies.

Comments on the Draft EIR also indicated that portions of the proposed project that would occur within Fort Ord Dunes State Park will require permits, coordination, and need to conform to a pending Habitat Conservation Plan (HCP) being prepared by FORA. Consistency of the proposed project with the existing HMP and Draft HCP is discussed in Sections 4.6.2.2, 4.6.5.1, and 4.6.5.2 of this EIR/EIS. Mitigation Measure 4.6-8 (Management Requirements within Borderland Development Areas along Natural Resource Management Area Interface) specifically addresses this issue.

Comments received on the Draft EIR concerned with local coastal planning issues requested that City of Marina Local Coastal Land Use Plan (LCLUP) primary and secondary habitat studies should be completed and these areas are mapped, and that the proposed project should be

consistent with LCLUP. Information on consistencies of habitat studies is in Sections 4.6.1.4, Vegetation Communities and Wildlife Habitats, 4.6.1.5, Sensitive Natural Communities, and 4.6.1.6, Wetlands and Other Waters. Information on LCLUP consistency is in Table 4.6-4 in Section 4.6.2.3, Local Regulations, and in Section 4.8, Land Use, Land Use Planning, and Recreation. Comments on the Draft EIR also recommended analysis of the effect of extraction wells on coastal dune and ESHAs. Information on the zone of influence of the extraction wells is located in Section 4.4, Groundwater Resources.

Some comments expressed concern about the authority of the Lead Biologist designated in the mitigation measures presented in the Draft EIR, and the role of that individual relative to the project proponent. This is further described in Section 4.6.5.2 under Mitigation Measure 4-6.1a.

4.6.1 Setting/Affected Environment

4.6.1.1 Definitions

Project area refers to the area where all construction-related disturbances would occur. All permanent footprints of the proposed facilities are within the project area.

Study area encompasses a 50-foot buffer around the project area. A 50-foot buffer around the project area was established as the survey area to ensure biological resources within the project area and immediate adjacent vicinity were assessed for potential direct and indirect project impacts. Reconnaissance-level biological field surveys conducted for the proposed project were generally consistent with the study area, with some exceptions (described in Section 4.6.1.2, below).

Special-status biological resources include special-status plants and animals,[1] sensitive natural communities, wetlands, and other waters of the United States and of the state, as defined by the U.S. Army Corps of Engineers (USACE), the U.S. Fish and Wildlife Service (USFWS), the National Marine Fisheries Services (NMFS), the California Department of Fish and Wildlife (CDFW), the California Coastal Commission (CCC), the California Regional Water Quality Control Board (RWQCB), and the California Native Plant Society (CNPS).

Special-status plant and animal species are defined as:

- Species listed under the Federal Endangered Species Act (FESA), Marine Mammal Protection Act, California Endangered Species Act (CESA), California Fish and Game Code, or Native Plant Protection Act as endangered, threatened, or depleted; species that are candidates or proposed for listing; or species that are designated as rare, species of special concern, or Fully Protected.
- Locally rare species defined in the CEQA Guidelines, which may include species that are designated as sensitive, declining, rare, or locally endemic, or as having limited or restricted distribution by various federal, state, and local agencies, organizations, and watch

[1] Several species known to occur within the general project area are accorded "special-status" because of their recognized rarity or vulnerability to habitat loss or population decline. Some of these species receive specific protection in federal and/or state endangered species legislation. Others have been designated as "sensitive species" or "species of special concern" on the basis of adopted policies of federal, state, or local resource agencies. These species are referred to collectively as "special-status species."

lists. This includes species ranked as California Rare Plant Rank (CRPR) 1A, 1B, 2A, 2B, 3 or 4 by the CNPS.[2]

Special-status plant and animal species are categorized as either listed or non-listed. Listed special-status species refers to those species that are listed as threatened or endangered under FESA and/or CESA. Non-listed special-status species refers to all other types of special-status species, as described above, that are not listed as threatened or endangered under FESA and/or CESA.

Sensitive natural community is a natural community that receives regulatory recognition from municipal, county, state, and/or federal entities, such as the CDFW in its California Natural Diversity Database (CNDDB), because the community is unique in its constituents, restricted in distribution, supported by distinctive soil conditions, and/or considered locally rare. (See Section 4.6.1.5 for a discussion of sensitive natural communities in the study area.)

Critical habitat is defined for listed species under FESA and consists of: (1) the specific areas within the geographical area occupied by the species at the time it is listed in accordance with the provisions of Section 4 of FESA, on which are found those physical or biological features (constituent elements) that are essential to the conservation of the species and that may require special management considerations or protection; and (2) the specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of Section 4 of FESA, upon a determination by the Secretary that such areas are essential for the conservation of the species.

Waters of the U.S. is defined in the Code of Federal Regulations (33 CFR 328.3[a]; 40 CFR 230.3[s]) as:

(1) All waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters that are subject to the ebb and flow of the tide;

(2) All interstate waters, including interstate wetlands;

(3) All other waters, such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce, including any such waters that are or could be used by interstate or foreign travelers for recreational or other purposes; or from which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or which are used or could be used for industrial purposes by industries in interstate commerce;

(4) All impoundments of waters otherwise defined as waters of the U.S. under the definition;

(5) The tributaries of waters identified in numbers (1) through (4), above;

(6) Territorial seas; and

[2] CNPS CRPR 1A is a plant that is presumed extinct in California. CRPR 1B is a plant that is rare, threatened, or endangered in California and elsewhere. CRPR 2A is presumed extirpated in California, CRPR 2B is a plant that is rare, threatened, or endangered in California but more common elsewhere. CRPR 3 is a plant about which more information is needed. CRPR 4 is a plant of limited distribution.

(7) Wetlands located adjacent to waters (other than waters that are themselves wetlands) identified in numbers (1) through (6), above.

Federal "Other Waters" is a type of water of the U.S. It includes all waters of the U.S. described above, except for features that meet the federal definition of a wetland.

Waters of the state are defined differently by three state agencies: RWQCB, CDFW, and CCC. Waters of the state are more broadly defined than waters of the U.S. as any surface water or groundwater, including saline waters, within the boundaries of the state of California. Boundaries of waters of the state are often determined on a case-by-case interpretation of data by the state agencies. The definition of waters of the state for each state agency is described in Section 4.6.2.2, State Regulations.

Environmentally Sensitive Habitat Area (ESHA) is a designated protected area within the Coastal Zone as defined in the California Coastal Act. The detailed definition of ESHAs is provided in Section 4.6.2.2, State Regulations.

4.6.1.2 Information Sources and Survey Methodology

The descriptions of vegetation communities, wildlife habitats, and potentially jurisdictional waters in this section are based on reconnaissance-level field surveys,[3] focused and protocol level field surveys,[4] review of available biological resources survey reports encompassing portions of the study area, review of relevant literature, and review of databases and inventories maintained by resource agencies. The impact analysis described in this section is based on special-status species observations available to Environmental Science Associates (ESA) as of June 20, 2016.

The study area was surveyed by ESA, Arcadis, and AECOM[5] between 2012 and 2016. ESA biologists conducted reconnaissance-level field surveys of previously proposed pipeline alignments and facility sites on May 17, June 5, and September 20, 2012 (ESA, 2012); March 6, 7, and 26, 2013, and May 9, 2013 (ESA, 2013); and April 24, 2014, and June 25, 2014 (ESA, 2014). Updated surveys for the majority of proposed pipeline alignments and facility components that are included as part of the proposed project analyzed in this EIR/EIS were conducted by ESA biologists on March 23, 24, and 25; April 7; and May 20, 21, and 22, 2016 (ESA, 2016). AECOM conducted focused and protocol-level surveys, including wetland delineation mapping, of the proposed pipeline and facility sites on September 3 through 5, 2013; March 17 through 21, April 21 through 25, May 20 through 22, and June 11 through 20, 2014; and March 17 and 18, April 7 through 9, June 10, June 15 through 18, 2015, and in 2016[6] (URS, 2014a; AECOM, 2016). The area where water produced during development of the ASR-5 and ASR-6 Wells was not accessed because of unexploded ordnance restrictions, but the majority of the site was

[3] Reconnaissance-level field surveys are conducted for the purpose of generally describing the vegetation communities present within a project area and assessing the potential for special-status species to occur within the project area plus a 50-foot buffer (i.e., the survey area).

[4] Focused surveys are conducted to determine the presence or absence of a certain species or habitat type. Protocol-level surveys are a type of focused survey using specific survey protocol as defined by a regulatory agency.

[5] URS conducted the surveys in September 2013, March 2014, April 2014, and June 2014, but AECOM acquired URS in 2014.

[6] Dates of the 2016 survey have not been provided.

visually surveyed from General Jim Moore Boulevard. The assessment of the Terminal Reservoir site is based on reconnaissance-level surveys conducted of the site by Arcadis and URS in September 2013, March 2014, April 2014, and June 2014 (URS, 2014a), and special-status plant and animal surveys, wetland delineation mapping, and vegetation mapping conducted by AECOM between 2013 and 2015 (AECOM, 2016).

During the 2016 surveys, ESA confirmed plant communities identified (inclusive of vegetation alliance) and wetland delineation mapping conducted by AECOM between 2013 and 2016 and by ESA between 2012 and 2015. ESA biologists also identified and mapped any new plant communities, habitat types, and potentially jurisdictional wetlands and drainages within the study area.

For this analysis, ESA biologists documented plant and wildlife species observed during reconnaissance-level, protocol-level, and focused surveys and evaluated the potential for sensitive natural communities, special-status plant and animal species, and wildlife movement corridors to occur within the study area.

Other key references used in the preparation of this section include, but are not limited to, aerial photographs, topographic maps, soil survey maps, geological maps, USFWS National Wetland Inventory (NWI) maps (USFWS, 2016b), climatic data, project plans, and the following:

- H. T. Harvey & Associates, 2005. *California American Water Company Monterey County Coastal Water Project Terrestrial Biological Resources Phase II Report*.
- Jones & Stokes, 2006. *Final Environmental Impact Report/Environmental Assessment for the Monterey Peninsula Water Management District Phase 1 Aquifer Storage and Recovery Project.* State Clearinghouse No. 2004121065. Prepared for the Monterey Peninsula Water Management District. Certified August 21, 2006.
- Fort Ord Reuse Authority, 2012. *Draft Installation-Wide Multispecies Habitat Conservation Plan*. Prepared by ICF International. March 2012.
- "Monterey Desal rare plant survey" email from Martha Lowe, Environmental Science Associates, to Erin Harwayne, Denise Duffy & Associates (ESA, 2010).
- Special-status plant surveys conducted on the CEMEX site on April 24, 2014 by ESA and Zander Associates (Zander Associates, 2014).
- Special-status plant and animal surveys, wetland delineation mapping, and vegetation mapping conducted in the study area between 2013 and March 13, 2016 (AECOM, 2016).
- Special-status plant surveys conducted by Denise Duffy & Associates, Inc. in 2010 (Denise Duffy & Associates, 2010a).

Other sources of information include: applicable literature on biological resources in the Monterey region; the Monterey County General Plan (Monterey County, 2010); the CNPS on-line Electronic Inventory (CNPS, 2016); the USFWS official list of species occurring in Monterey County (USFWS, 2016a); the CDFW's CNDDB special-status species records for the Moss Landing, Marina, Salinas, Seaside, Spreckels, Carmel Valley, Monterey, Mount Carmel, and Prunedale United States Geological Survey (USGS) 7.5-minute topographic quadrangles (CDFW, 2016); and Calflora (2016).

4.6.1.3 Regional Terrestrial Biological Resources

Monterey County is situated at the confluence of the San Francisco Bay, Central Coast, and South Coast Range floristic provinces. As a result, the flora of Monterey County is some of the most diverse in California. Monterey County represents the southern and northern population range limits of many rare species endemic to the northern and southern portions of the state, respectively.

The study area extends from Tembladero Slough to the Carmel River valley to the south. The proposed Castroville Pipeline traverses agricultural fields and a portion of the Salinas River. Some segments of the proposed pipeline alignments are located on stabilized back dune slopes on the west side of Highway 1, within incorporated areas generally bordering Highway 1 to the east. The proposed slant well site is located within the CEMEX active mining area in northern Marina. In the vicinity of the proposed ASR facilities and other proposed pipeline alignments, the former Fort Ord military base comprises extensive areas of relatively undisturbed maritime chaparral, a unique plant community associated with stabilized Pleistocene sand dunes. The proposed interconnection improvements for the Highway 68 satellite water systems are located within low-density residential and business areas in the forested hillsides above the Carmel River Valley.

Most of the study area is within 5 miles of the Pacific Ocean on level to gently sloped topography. With the exception of the proposed interconnection improvements along the Highway 68 corridor, which range between 400 and 800 feet in elevation, elevations within the other portions of the study area range from sea level to approximately 350 feet. Average annual precipitation in the city of Monterey is 20 inches; annual temperatures average 65 degrees Fahrenheit (NOAA, 2014).

4.6.1.4 Vegetation Communities and Habitat Types

The vegetation/habitat classification presented herein is based on *A Manual of California Vegetation* (Sawyer et al., 2009) and habitat mapping methods used in the *CalAm Coastal Water Project Final Environmental Impact Report* (CPUC, 2009). The majority of the study area was mapped in the field using vegetation alliances described in *A Manual of California Vegetation*. This mapping was conducted by AECOM between 2013 and 2015 in support of federal and state regulatory permit applications (AECOM, 2016). ESA verified this survey data in the field in 2016. For the purposes of this EIR/EIS, these vegetation alliances were combined into broader vegetation community types that correlate with wildlife habitat types. The description of the general vegetation types includes a listing of the finer-scale alliances that are either largely consistent with them or that are included within them. **Table 4.6-1** summarizes the broader vegetation types and their included alliances, and crosswalks these with wildlife habitats. This method supports consistency between this document, which focuses on the broader vegetation community types, and future regulatory permit applications, which may rely on vegetation alliance or wildlife habitat categories.

TABLE 4.6-1
VEGETATION COMMUNITY AND HABITAT TYPE CROSSWALK

Vegetation Community/ Habitat Type	Vegetation Alliance[a]	Wildlife Habitat[b]
Non-native Grassland	Annual brome grasslands California annual grassland	Annual Grassland
Central Dune Scrub	California buckwheat scrub California coffee berry scrub California sagebrush scrub Deerweed scrub Dune mat Island buckwheat scrub Sandmat manzanita chaparral Silver dune lupine-mock heather scrub	Coastal Scrub
Central Maritime Chaparral	Chamise chaparral alliance Maritime chaparral Sandmat manzanita chaparral Silver dune lupine-mock heather scrub Woolly-leaf manzanita chaparral Deerweed scrub	Mixed Chaparral
Northern Coastal Scrub	California sagebrush scrub California sagebrush-California buckwheat Scrub California sagebrush-California black sage Scrub Coastal brambles Deerweed scrub Poison oak scrub Yellow bush lupine scrub	Coastal Scrub
Coyote Brush Scrub	Coyote Brush Scrub	Coastal Scrub
Riparian Woodland and Scrub	Arroyo willow thickets Box-elder forest Fremont cottonwood woodland Shining willow groves	Valley Foothill Riparian
Freshwater Marsh	California bulrush marsh Cattail marshes Soft rush marsh Knotweed marsh	Freshwater Emergent Wetland
Coast Live Oak Woodland	Coast Live Oak woodland	Coastal Oak Woodland
Open Water	None	Riverine
Ice Plant Mats	Ice Plant Mats	None
Agricultural	None	Cropland
Ruderal	Perennial pepperweed patches	None
Developed/Landscaped	Eucalyptus groves Acacia shrubland Monterey cypress stands Monterey pine woodland	Urban Barren Eucalyptus

NOTES:
[a] Per protocol-level and focused surveys conducted by AECOM, which used the classifications from *A Manual of California Vegetation* [Sawyer et al., 2009]
[b] Classifications from *A Guide to Wildlife Habitats of California* [Mayer and Laudenslayer, 1988)

Figures 4.6-1a through **4.6-1o** provide maps of vegetation alliances, listed within their respective vegetation community/habitat type as described below, within the study area. The figures are intended as a general guide; additional and more detailed information is included in the discussion below.

Vegetation communities and habitat types within the project area include: non-native grassland, central dune scrub, central maritime chaparral, northern coastal scrub, coyote brush scrub, riparian woodland and scrub, freshwater marsh, coast live oak woodland, open water (includes pond, channel, river), ice plant mats, agricultural, ruderal, and developed/landscaped.

Non-Native Grassland

Non-native grassland occurs at various locations throughout the study area. It occurs as monotypic stands and also interspersed with several other vegetation communities, such as oak woodland, central maritime chaparral, central dune scrub, ice plant mats, and ruderal areas. It can support dominant plant species of other communities, and can provide habitat for special-status species that occur in these adjacent habitats. The largest expanses of non-native grassland within the project area occur north of the intersection of Del Monte Boulevard and Highway 1 in Marina, along the Monterey Peninsula Recreational Trail in the vicinity of Reservation Road, north of the intersection of Highway 1 and Nashua Road, and at the existing Monterey Regional Water Pollution Control Agency (MRWPCA) Regional Wastewater Treatment Plant, including the proposed Desalination Plant site and other lands north of Charles Benson Road. Within the study area this community comprises a variety of non-native annual grasses, introduced weedy forbs, and a few native grasses and forbs. Common dominants of non-native grassland in the study area include Italian ryegrass (*Festuca perennis*), ripgut brome (*Bromus diandrus*), annual fescue (*Festuca myuros*), hare barley (*Hordeum murinum* ssp. *leporinum*), and wild oat (*Avena fatua*). Associated forbs include filaree (*Erodium botrys*), English plantain (*Plantago lanceolata*), wild radish (*Raphanus sativus*), shortpod mustard (*Hirschfeldia incana*), prickly sow thistle (*Sonchus asper*), deerweed (*Acmispon glaber*), and iceplant (*Carpobrotus edulis, C. chilensis*). Occasional native grasses such as purple needlegrass (*Stipa pulchra*) and creeping wildrye (*Elymus triticoides*) also occur. Some shrubs and trees, including the native coyote brush (*Baccharis pilularis*), mock heather (*Ericameria ericoides*), Monterey cypress (*Hesperocyparis macrocarpa*), and non-native eucalyptus (*Eucalyptus globulus,* and others), also are found sporadically within the grasslands. In general, the diversity of plant species within non-native grassland varies greatly with levels of disturbance. Coastal prairie, a rare and sensitive plant community of relatively undisturbed sites and characterized by a high proportion of native perennial grasses, and a diversity of native forbs and several special-status species, was not observed within the study area.

Non-native grassland includes the following vegetation alliances as mapped by AECOM (2016):

- Annual brome grasslands (*Bromus* [*diandrus, hordeaceus*] - *Brachypodium distachyon* Herbaceous Semi-Natural Alliance)
- California annual grassland

Annual grassland provides little cover for wildlife, yet numerous species forage, and several species breed, in this community. Small mammals such as deer mice (*Peromyscus maniculatus*), California ground squirrels (*Spermophilus beecheyi*), and Botta's pocket gophers (*Thomomys bottae*) are common residents in annual grasslands in Monterey County. Larger mammals such as coyotes (*Canis latrans*) and bobcats (*Lynx rufus*) occasionally forage in this community as well.

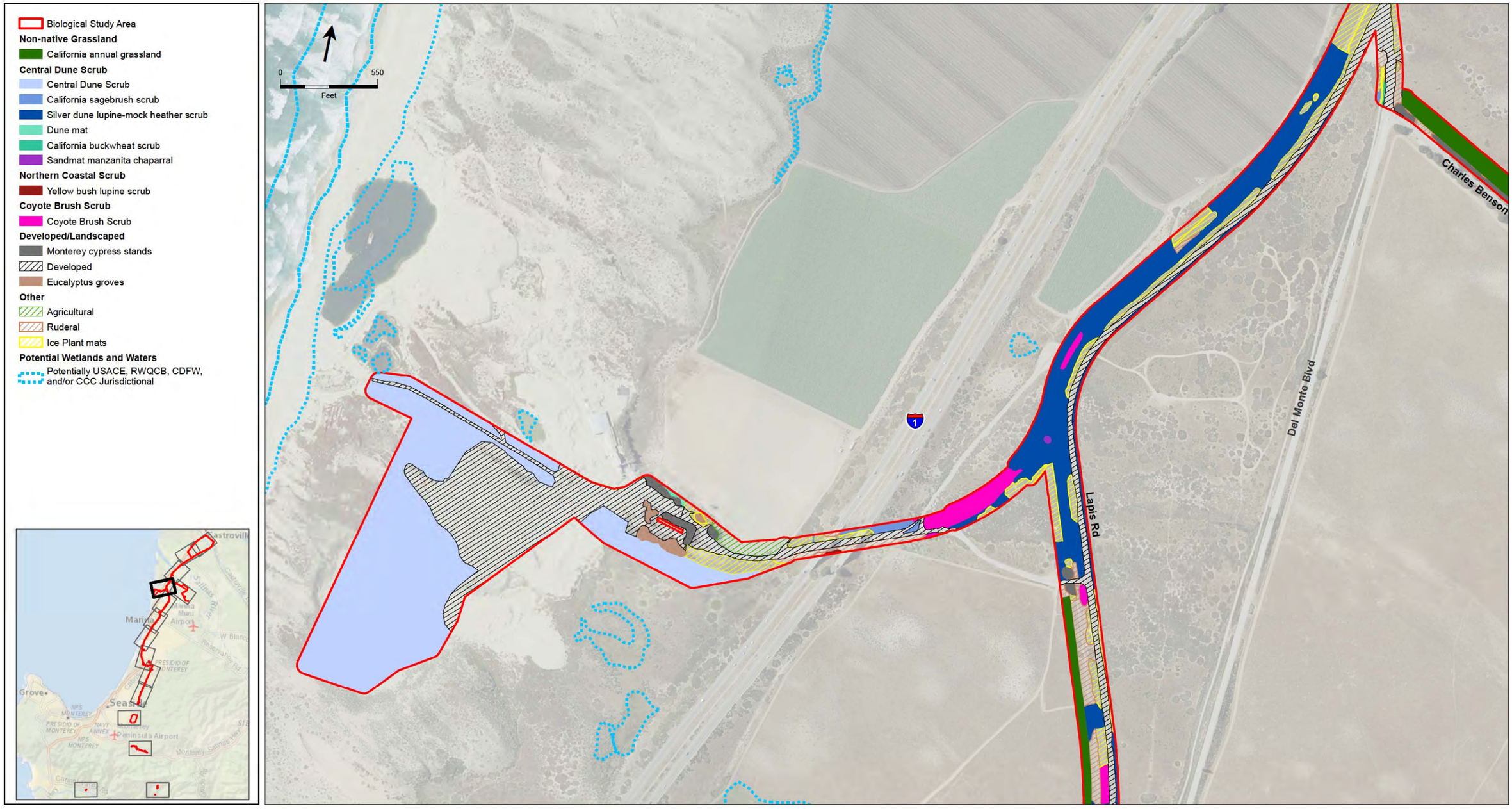
A variety of birds use annual grasslands as foraging habitat, including savannah sparrows (*Passerculus sandwichensis*), horned larks (*Eremophila alpestris*), western meadowlarks *(Sturnella neglecta*), lesser goldfinches *(Carduelis psaltria*), and barn swallows (*Hirundo rustica*). Western meadowlarks, horned larks, and mourning doves (*Zenaida macroura*) may nest in grasslands in the project area. Raptors, such as red-tailed hawks (*Buteo jamaicensis*) and northern harriers *(Circus cyaneus*), commonly forage over grasslands as well. Some species of raptors, such as red-tailed hawks and white-tailed kites (*Elanus leucurus*), may occasionally nest in trees within the grassland. Western fence lizards *(Sceloporus occidentalis*), gopher snakes (*Pituophis catenifer catenifer*), and other snakes are also likely to occur in this community in the project area.

Central Dune Scrub

Central dune scrub occurs extensively throughout most of the study area. This vegetation type generally exhibits some level of disturbance from past or present land use, dune instability, or invasive plant species, but the level of disturbance varies throughout the study area.

Central dune scrub occurs in the northern portion of the study area along Lapis Road and Del Monte Boulevard, along the Monterey Peninsula Recreational Trail between Marina and Seaside, in the dunes along the western boundary of the CEMEX active mining area (i.e., the vegetated patches between the active mining area and the beach), in undisturbed sections of the CEMEX active mining area, and along the CEMEX access road. These areas contain native dune scrub species, but also support a variety of non-native and invasive species and often include a substantial proportion of non-native and highly invasive ice plant. Typical native shrubs found throughout the disturbed dune scrub habitat include California sagebrush (*Artemisia californica*), coast buckwheat (*Eriogonum latifolium*), deerweed, California lilac (*Ceanothus* spp.), mock heather (*Ericameria ericoides*), silver dune lupine (*Lupinus chamissonis*), and sandmat manzanita (*Arctostaphylos pumila*). Non-native cover typically includes non-native grasses (wild oat, Mediterranean barley, and Italian ryegrass), iceplant, and other weedy species. Some typical foredune species, such as beach evening primrose (*Camissonia cheiranthifolia*) and sea rocket (*Cakile maritima*), occur along the CEMEX access road where the central dune scrub transitions to the beach.

The composition of dune scrub vegetation transitions throughout the study area from areas dominated by non-native species (within residential neighborhoods in Marina and between Imjin Parkway and Lightfighter Drive in Sand City) to areas with higher native cover in the dunes between the CEMEX active mining area and along the CEMEX access road, Lapis Road, Del Monte Boulevard north of Beach Road, and the Monterey Peninsula Recreational Trail between Imjin Parkway and approximately Reindollar Avenue.



SOURCE: ESA, 2016,AECOM, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.6-1a

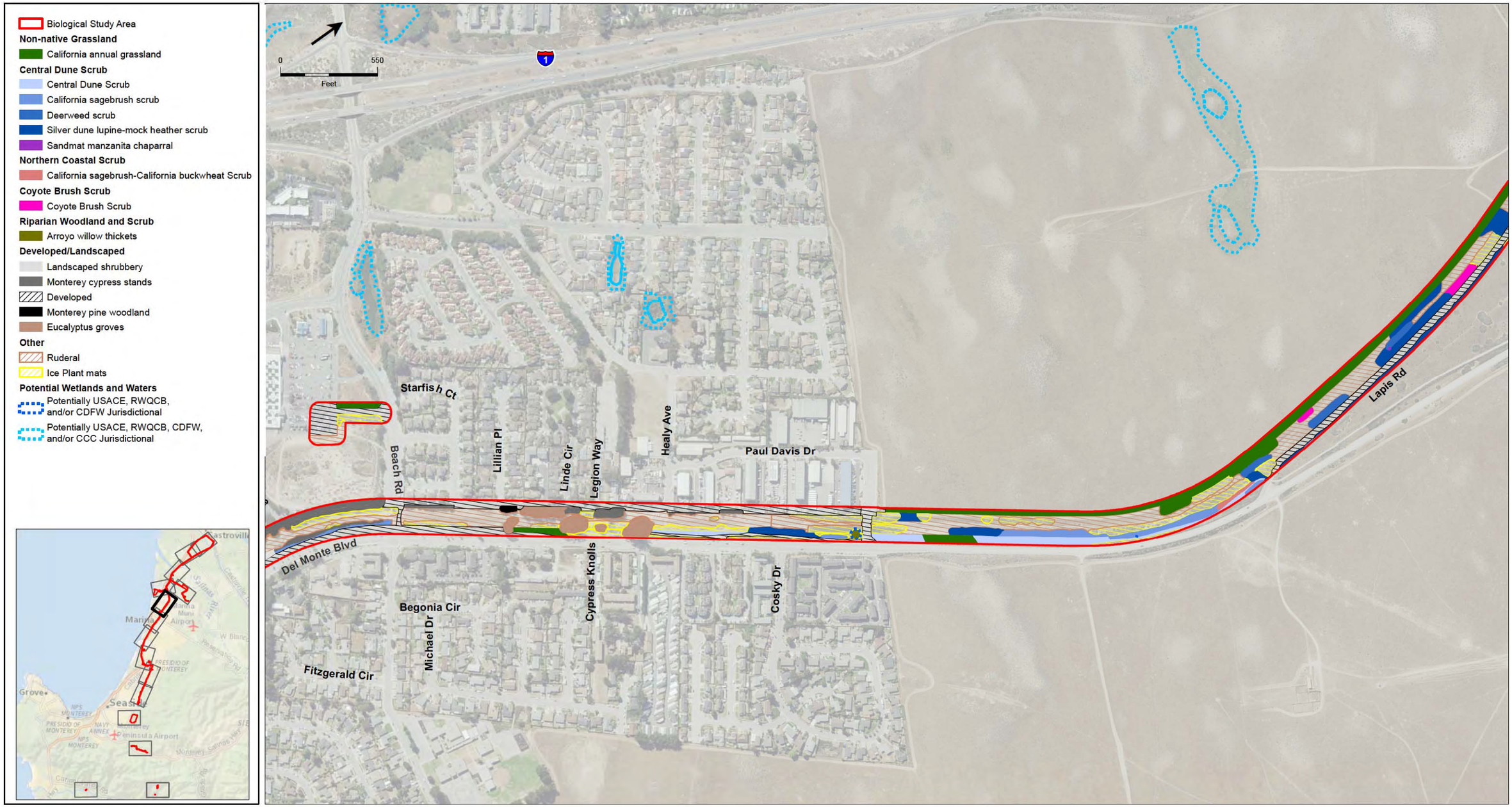
Vegetation Communities and Potential Wetlands and Waters in the Terrestrial Biological Resources Study Area

SOURCE: ESA, 2016,AECOM, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.6-1b

Vegetation Communities and Potential Wetlands and Waters in the Terrestrial Biological Resources Study Area



SOURCE: ESA, 2016,AECOM, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.6-1c

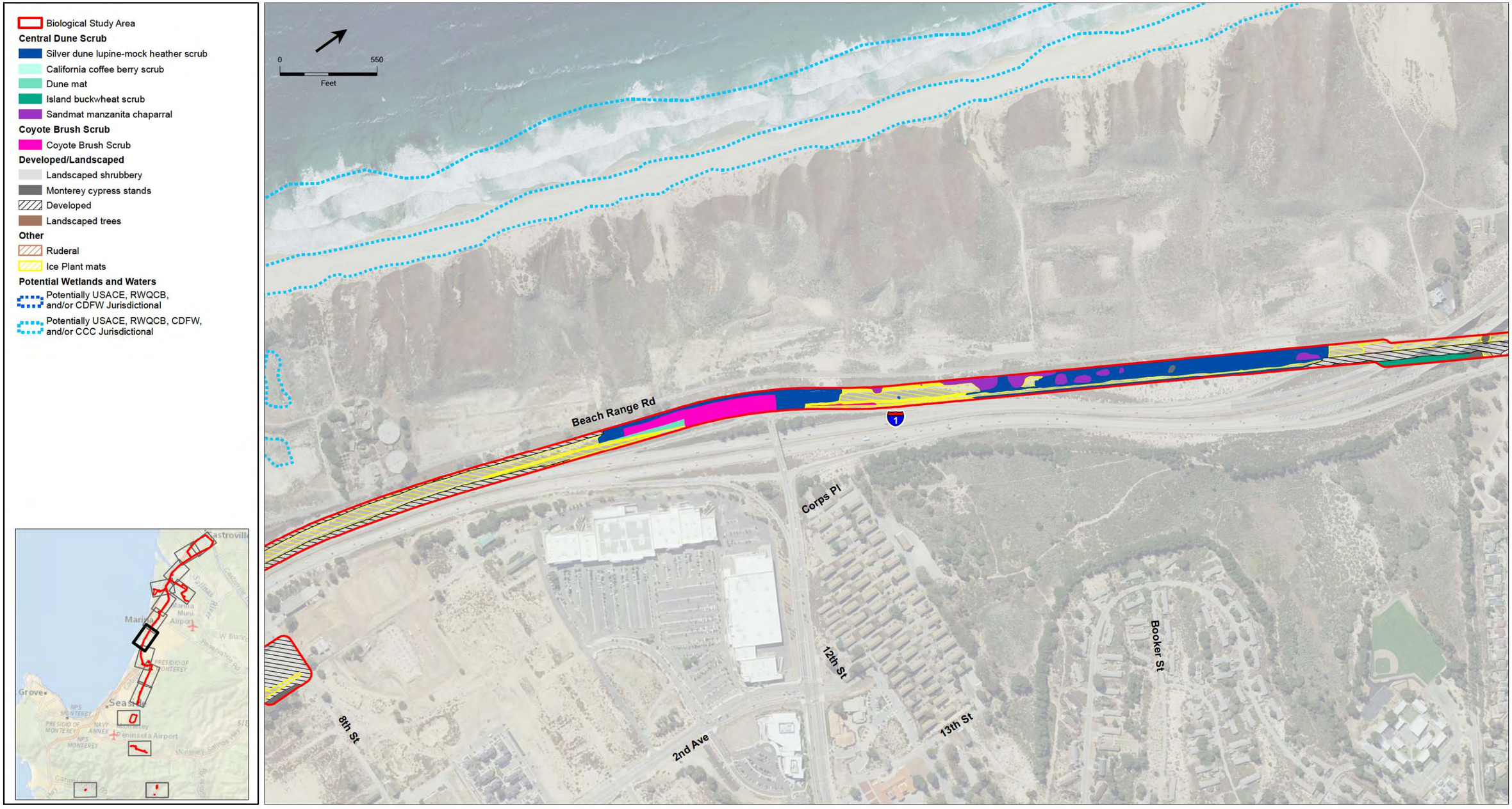
Vegetation Communities and Potential Wetlands and Waters in the Terrestrial Biological Resources Study Area

SOURCE: ESA, 2016,AECOM, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.6-1d

Vegetation Communities and Potential Wetlands and Waters in the Terrestrial Biological Resources Study Area

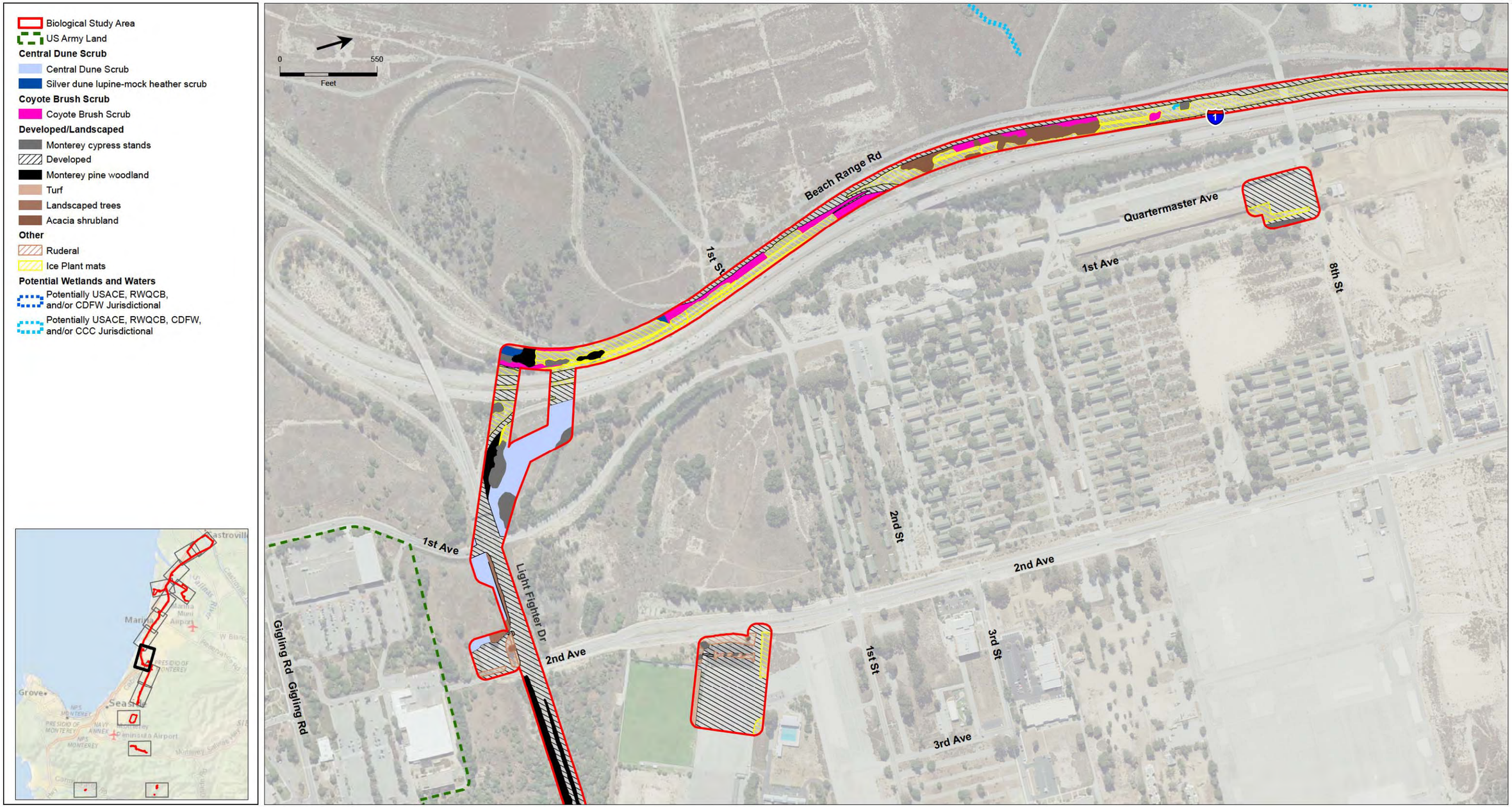


SOURCE: ESA, 2016,AECOM, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.6-1e

Vegetation Communities and Potential Wetlands and Waters in the Terrestrial Biological Resources Study Area

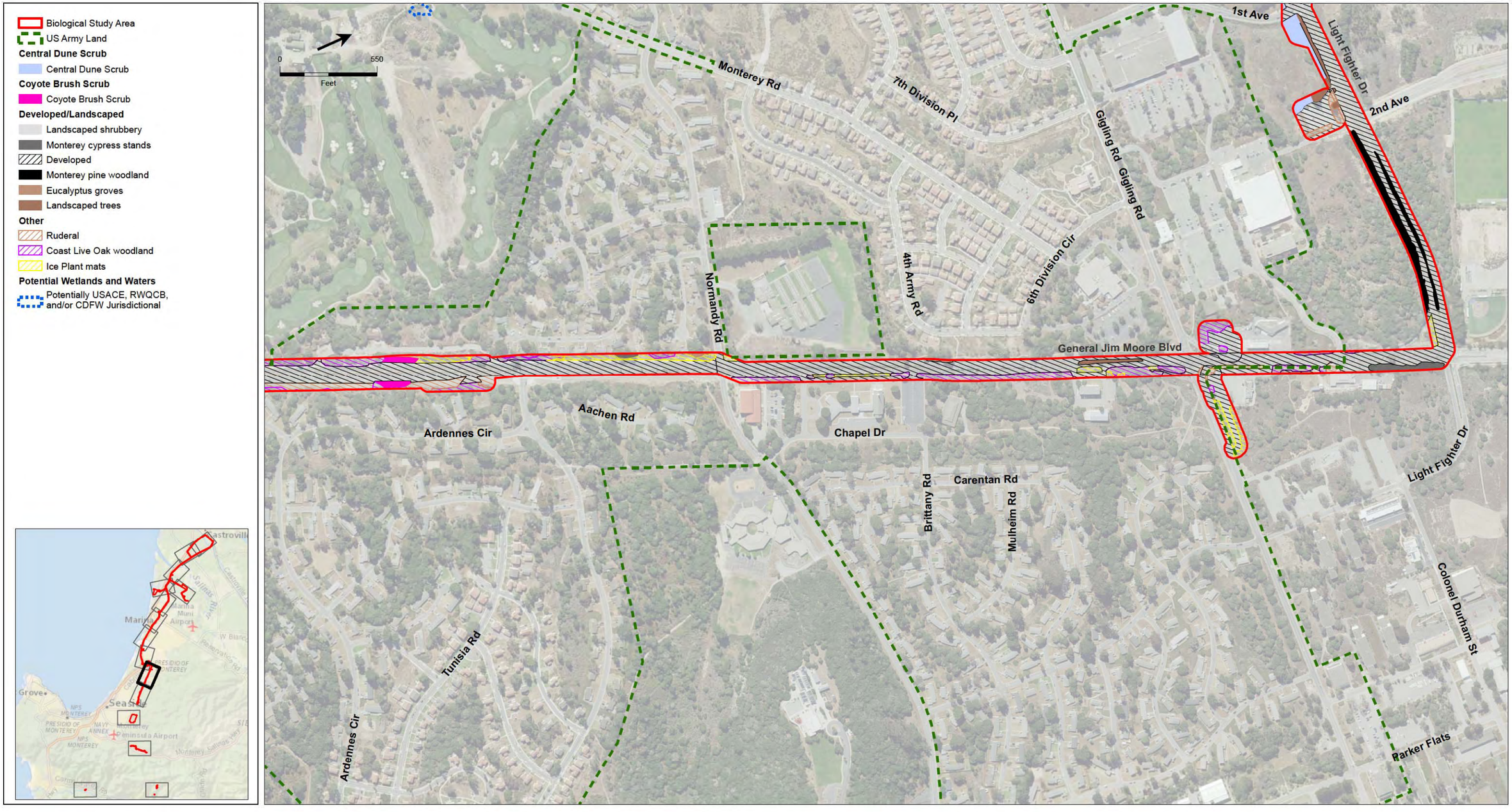


SOURCE: ESA, 2016,AECOM, 2016; US ARMY, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.6-1f

Vegetation Communities and Potential Wetlands and Waters in the Terrestrial Biological Resources Study Area

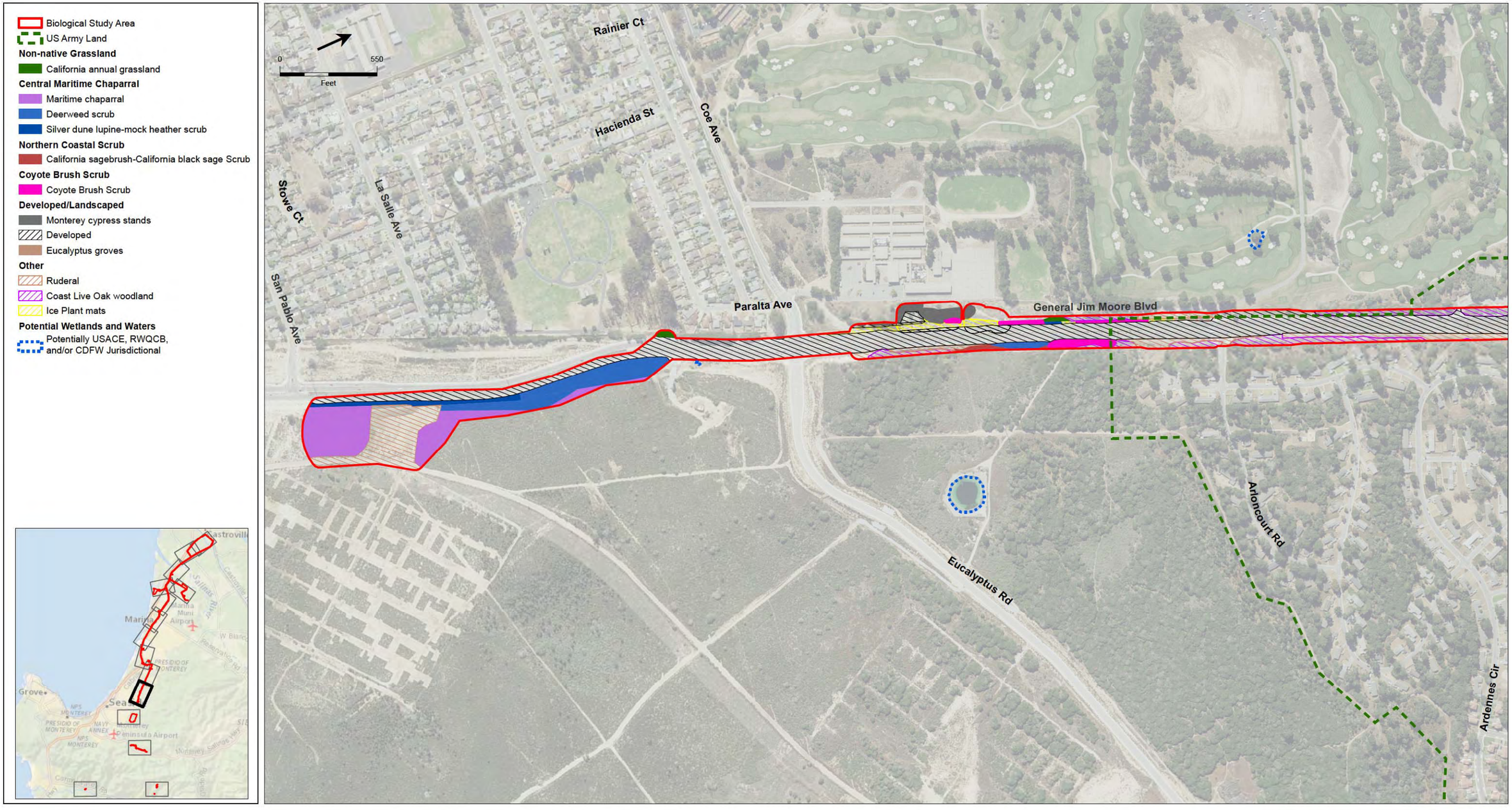


SOURCE: ESA, 2016,AECOM, 2016; US ARMY, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.6-1g

Vegetation Communities and Potential Wetlands and Waters in the Terrestrial Biological Resources Study Area



SOURCE: ESA, 2016,AECOM, 2016; US ARMY, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.6-1h

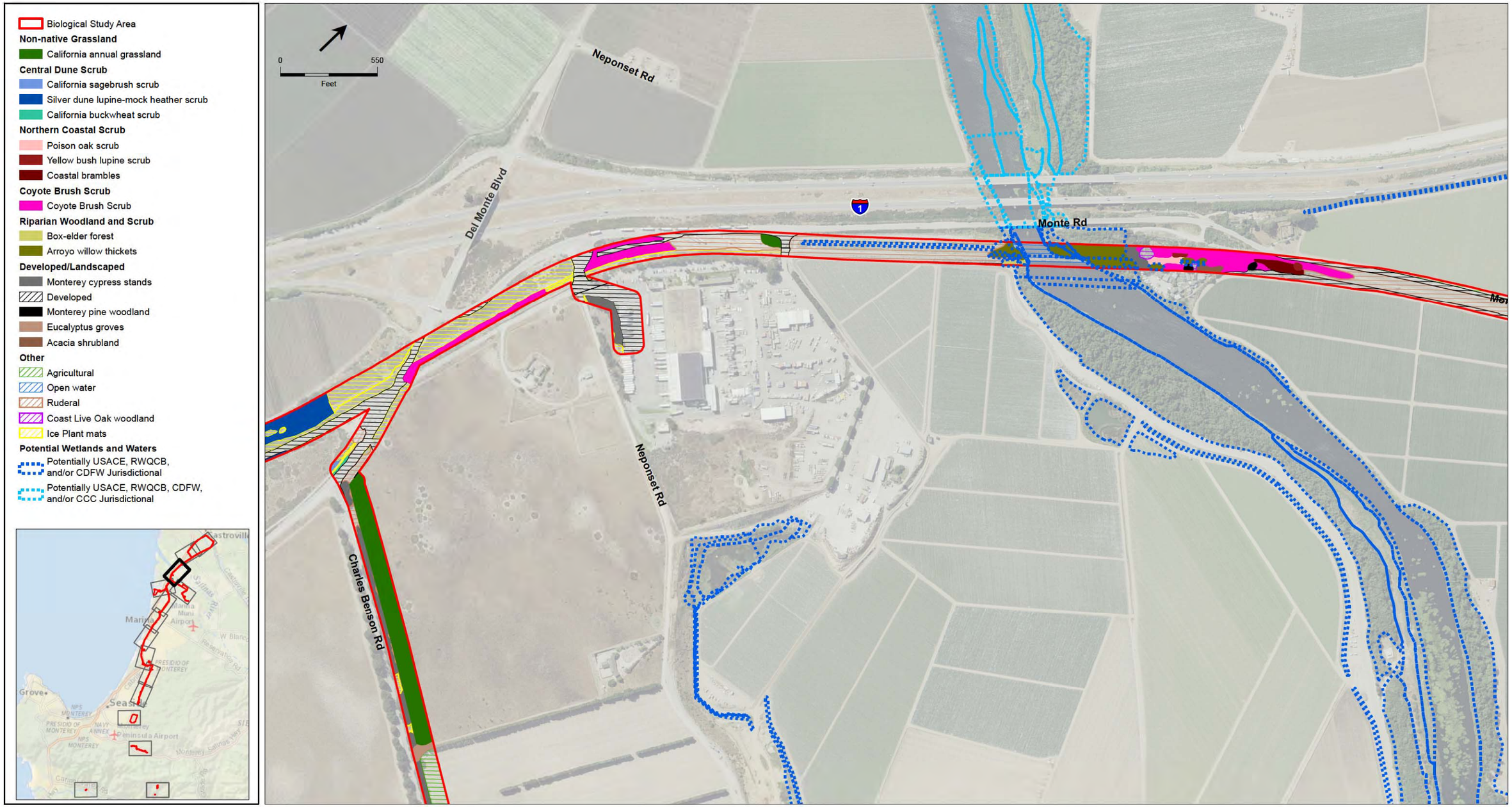
Vegetation Communities and Potential Wetlands and Waters in the Terrestrial Biological Resources Study Area

SOURCE: ESA, 2016,AECOM, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.6-1i

Vegetation Communities and Potential Wetlands and Waters in the Terrestrial Biological Resources Study Area

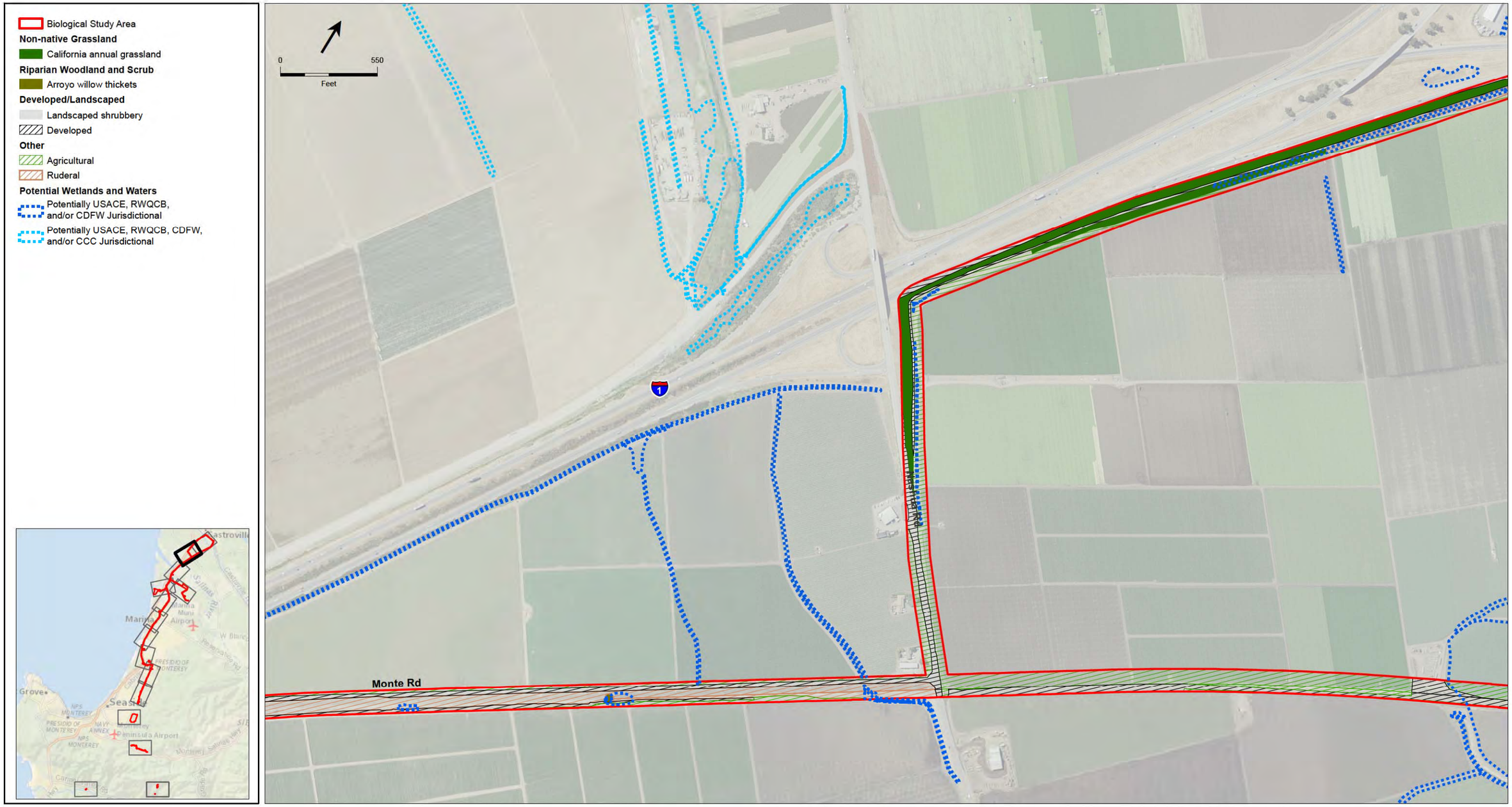


SOURCE: ESA, 2016,AECOM, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.6-1j

Vegetation Communities and Potential Wetlands and Waters in the Terrestrial Biological Resources Study Area

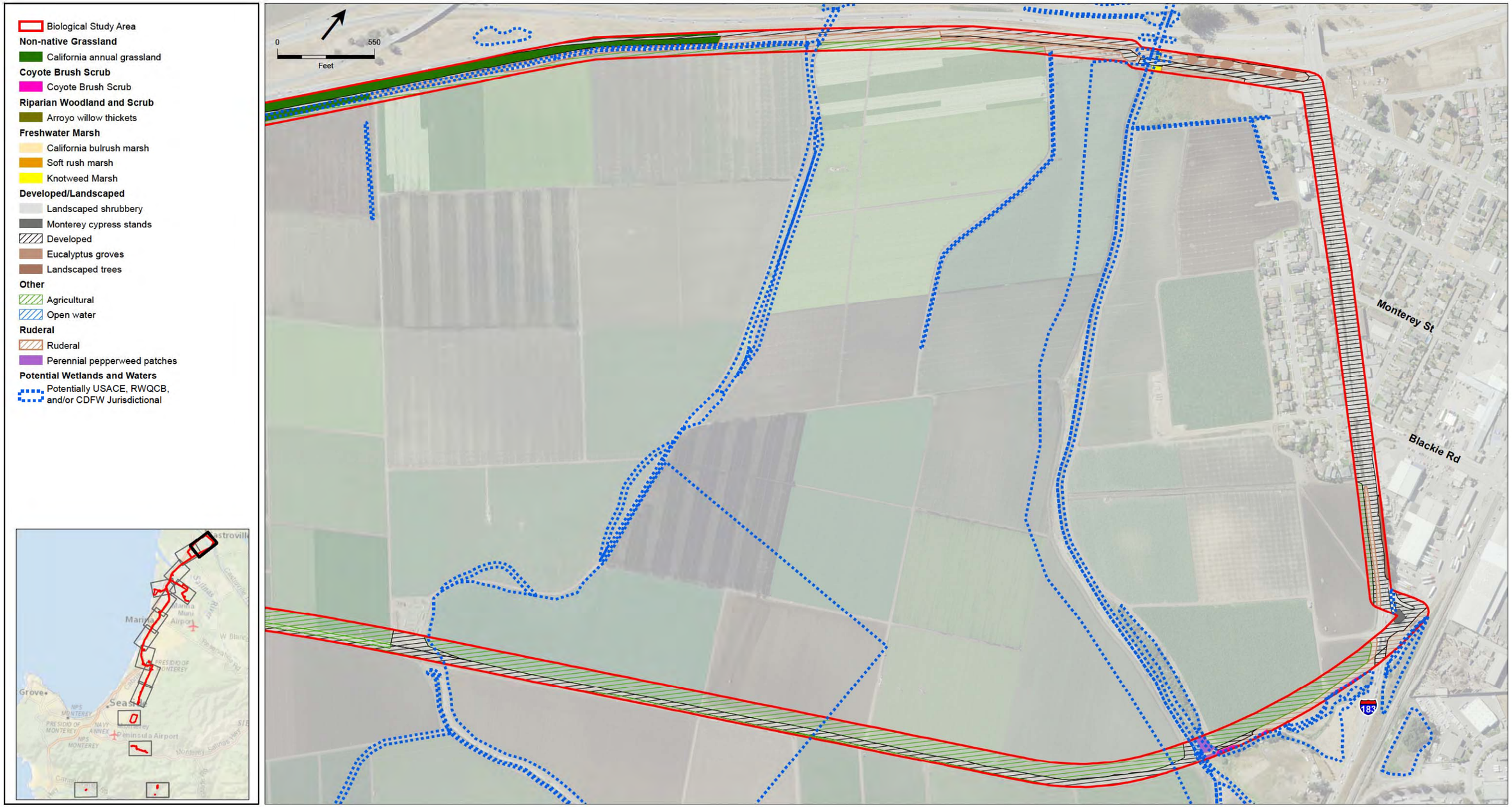


SOURCE: ESA, 2016,AECOM, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.6-1k

Vegetation Communities and Potential Wetlands and Waters in the Terrestrial Biological Resources Study Area

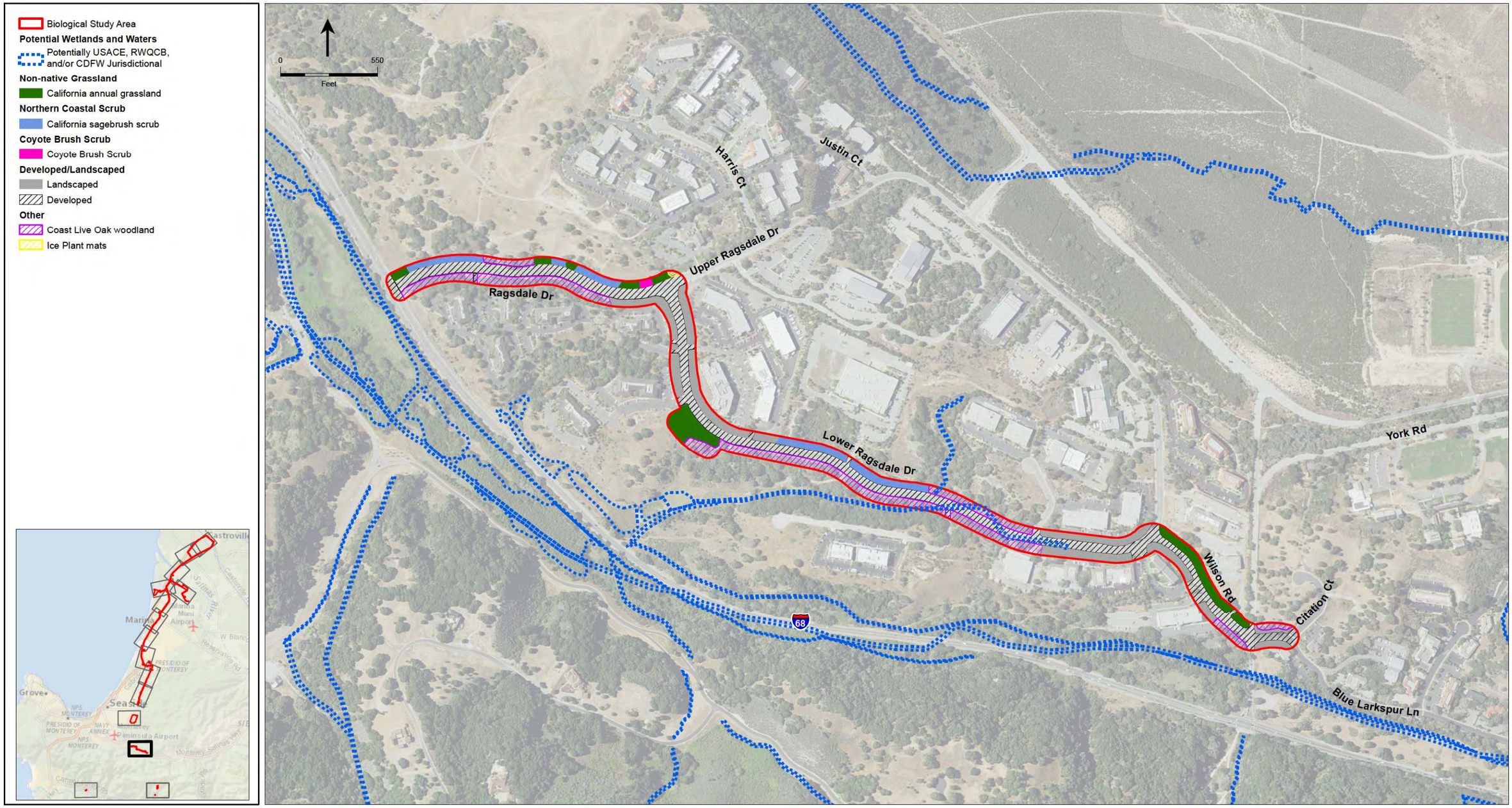


SOURCE: ESA, 2016,AECOM, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.6-1l

Vegetation Communities and Potential Wetlands and Waters in the Terrestrial Biological Resources Study Area

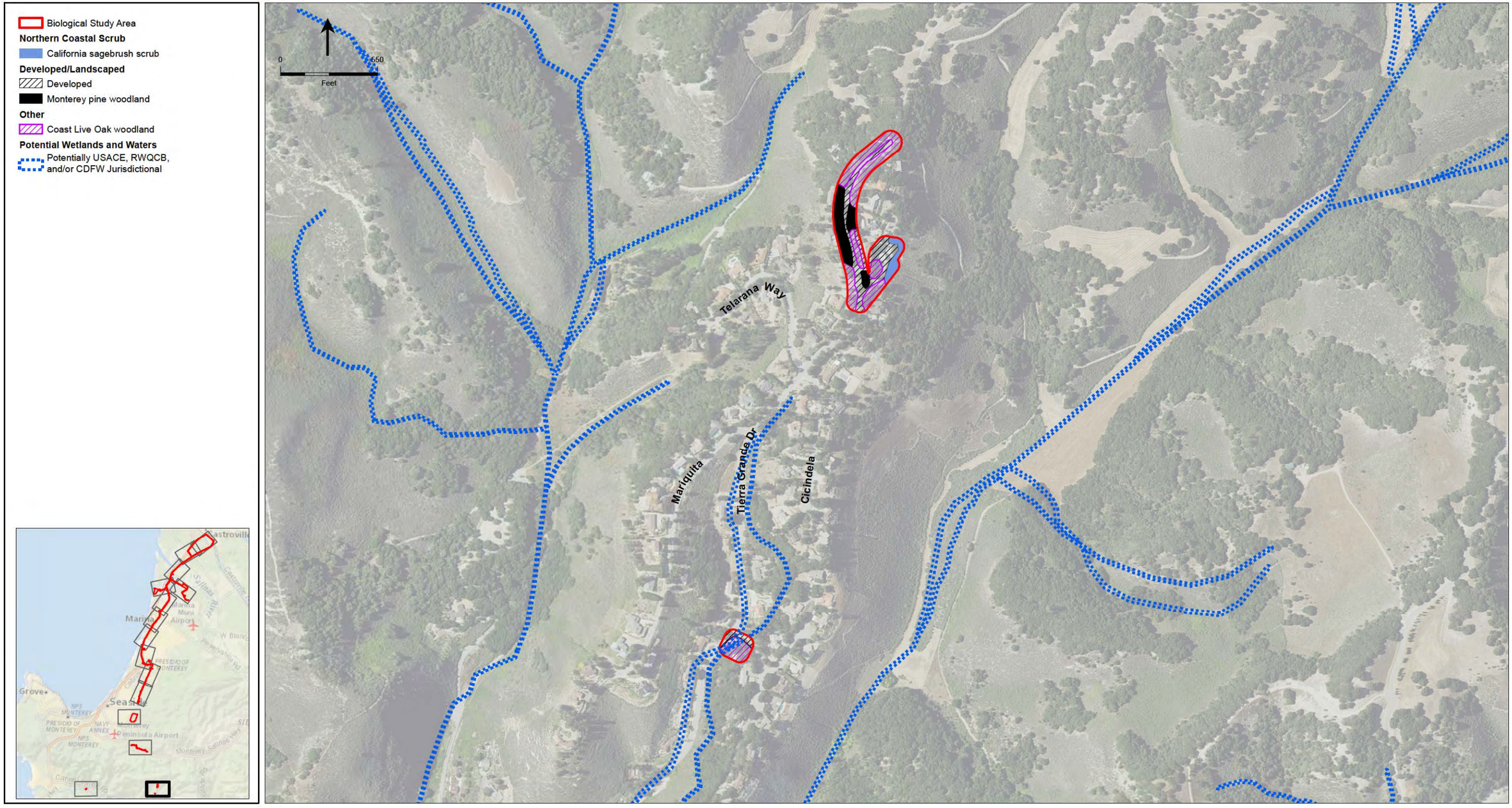


SOURCE: ESA, 2016,AECOM, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.6-1m

Vegetation Communities and Potential Wetlands and Waters in the Terrestrial Biological Resources Study Area

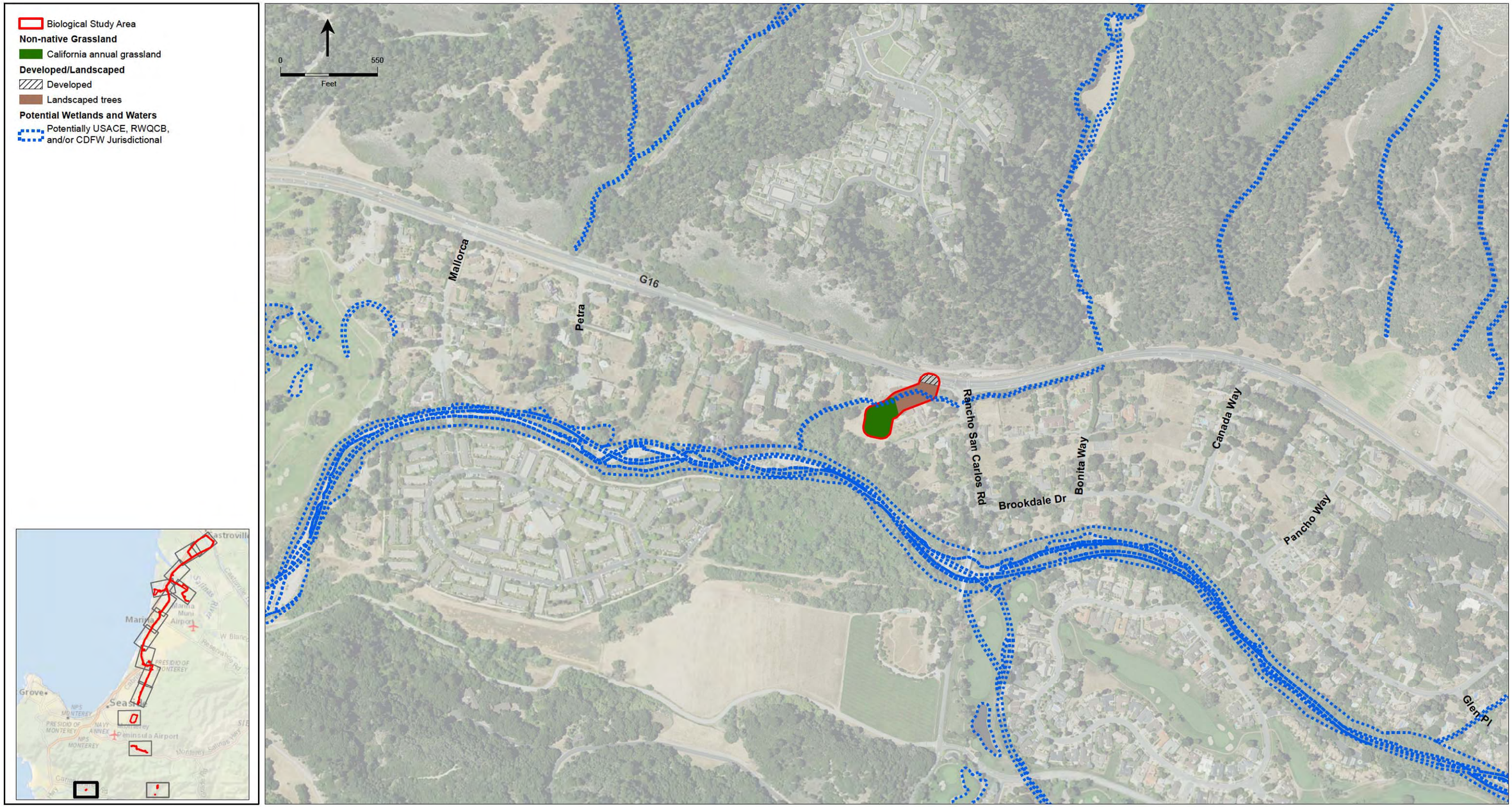


SOURCE: ESA, 2016,AECOM, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.6-1n

Vegetation Communities and Potential Wetlands and Waters in the Terrestrial Biological Resources Study Area



SOURCE: ESA, 2016,AECOM, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.6-1o

Vegetation Communities and Potential Wetlands and Waters in the Terrestrial Biological Resources Study Area

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The following vegetation alliances mapped by AECOM (2016) are included in the broad concept of Central dune scrub described above:

- California buckwheat scrub (*Eriogonum fasciculatum* Shrubland Alliance)
- California coffee berry scrub (*Frangula californica* Shrubland Alliance)
- California sagebrush scrub (*Artemisia californica* Shrubland Alliance)
- Deerweed scrub (*Lotus scoparius* Shrubland Alliance)
- Dune mat (*Abronia latifolia - Ambrosia chamissonis* Herbaceous Alliance)
- Island buckwheat scrub (*Eriogonum giganteum* Landscaped Scrub)
- Sandmat manzanita chaparral (*Arctostaphylos pumila* Provisional Shrubland Alliance)
- Silver dune lupine-mock heather scrub (*Lupinus chamissonis - Ericameria ericoides* Shrubland Alliance)

Within the study area, central dune scrub is likely to support several reptile species, including southern alligator lizards (*Elgaria multicarinata*), western fence lizards, and black legless lizards (*Anniella pulchra nigra*). Small mammals such as deer mice and brush rabbits (*Sylvilagus bachmani*) provide prey for nonnative red foxes (*Vulpes vulpes regalis*) that occur in this habitat. White-crowned sparrows (*Zonotrichia leucophrys*) are probably the most abundant breeding bird in this habitat. Horned larks and song sparrows (*Melospiza melodia*) are among other birds found in this habitat. Where its host plant (coast buckwheat) is present, Smith's blue butterfly (*Euphilotes enoptes smithi*) also may occur in central dune scrub.

Central Maritime Chaparral

Central maritime chaparral is a plant community limited to areas of sandy soils subject to summer fog. It is found in relatively small patches throughout its range along the central coast. It is dominated by endemic species of manzanita (*Arctostaphylos* spp.), California lilac (*Ceanothus* spp.), and chamise (*Adenostoma fasciculata*), and supports a high proportion of other rare and endangered plants and wildlife. The former Fort Ord military base encompasses some of the largest, most intact areas of maritime chaparral remaining on the central coast. Maritime chaparral in the study area is closely associated with relict sand dunes (i.e., paleodunes) of the mid-Pleistocene era, a geomorphic feature of very limited distribution within California that has been much reduced by urban development in the communities of Marina and Seaside. In addition, the overall viability of maritime chaparral is likely declining due to long-term suppression of fire and other natural disturbances, which help maintain the health and diversity of this plant community. Studies show that long-term absence of fire within central maritime chaparral may lead to the community's transition to oak woodland (Van Dyke et al., 2001). Many annual and herbaceous perennial species depend on fire and other disturbance to control encroachment of woody species.

Within the study area, central maritime scrub occurs along the east side of General Jim Moore Boulevard and south of Coe Avenue in the former Fort Ord military base; specifically, at the proposed Terminal Reservoir site and at the southern terminus of the construction area for the ASR facilities where water produced during development of the ASR wells would be conveyed and percolated. Within the study area, this community exists as a mosaic of disturbed and

undisturbed variations, with most of the disturbed areas located near General Jim Moore Boulevard and adjacent to existing access roads within the former Fort Ord military base. These areas were likely disturbed during road construction and military operations, and typically support deerweed scrub as an early successional response to the disturbance. The non-disturbed areas are dominated by shaggy-barked or woolly-leaf manzanita (*Arctostaphylos tomentosa* ssp. *tomentosa*), sandmat manzanita, sticky monkeyflower (*Mimulus aurantiacus*), chamise, black sage (*Salvia mellifera*), and poison oak (*Toxicodendron diversilobum*) with many other perennials and shrubs common throughout. The disturbed areas contain many of the same species but have higher cover of deerweed, iceplant, bush lupine (*Lupinus* spp.), and non-native grasses. Additionally, these disturbed areas contain higher cover of unvegetated sandy soil. A variety of special-status plants have been documented within the former Fort Ord military base in and around the proposed Terminal Reservoir site including sandmat manzanita, Monterey spineflower, seaside bird's-beak (*Cordylanthus rigidus* ssp. *littoralis*), Eastwood's goldenbush (*Ericameria fasciculata*), Kellogg's horkelia (*Horkelia cuneata* ssp. *sericea*), and sand gilia (*Gilia tenuiflora* ssp. *arenaria*) (Denise Duffy & Associates, 2010a; Fort Ord Reuse Authority, 2012).

Central maritime chaparral includes the following vegetation alliances as mapped by AECOM (2016):

- Chamise chaparral (*Adenostoma fasciculatum* Shrubland Alliance)
- Sandmat manzanita chaparral (*Arctostaphylos pumila* Provisional Shrubland Alliance)
- Woolly-leaf manzanita chaparral (*Arctostaphylos* [*crustacea*, *tomentosa*] Shrubland Alliance)
- Silver dune lupine-mock heather scrub (*Lupinus chamissonis* - *Ericameria ericoides* Shrubland Alliance)
- Deerweed Scrub (*Lotus scoparius* [=*Acmispon glaber*] Shrubland Alliance) – occurs as early seral stage in disturbed areas of former maritime chaparral.

Wildlife species likely to occur in maritime chaparral habitats include a variety of small reptiles, such as western fence lizards, alligator lizards, California horned lizards (*Phrynosoma blainvillii*), and California striped racers (*Coluber lateralis lateralis*), as well as a variety of small mammals, including deer mice, brush mice, and jackrabbits (*Lepus californicus*). Birds likely to occur here include California thrashers (*Toxostoma redivivum*), Western scrub-jays (*Aphelocoma californica*), wrentits (*Chamaea fasciata*), and Anna's hummingbirds (*Calypte anna*).

Northern Coastal Scrub

Northern coastal scrub occurs widely throughout the study area near the coast on sandy to clay soils, but typically more interior, developed, and stabilized soils than nearby active dunes. Within the study area, it occurs adjacent to the Salinas River, along General Jim Moore Boulevard within the some of the former Fort Ord lands, along Ragsdale and Lower Ragsdale Drive, and off of Tierra Grande Drive. Northern coastal scrub is associated with and transitions to grassland, maritime chaparral, coast live oak woodland, central dune scrub, and ice plant mats. The vegetation is characterized by sparse to dense cover of soft-leaved, low-stature shrubs such as

coyote brush, California sagebrush, and black sage. Northern coastal scrub often supports a well-developed annual herbaceous understory that includes native wildflowers, non-native grasses (wild oat, Mediterranean barley, and Italian ryegrass), iceplant, and other weedy species. Several special-status plants are documented from this plant community, including Monterey spineflower, Monterey ceanothus, and sandmat manzanita. Many different alliances of northern coastal scrub are recognized based on dominant species.

Northern coastal scrub includes the following vegetation alliances as mapped by AECOM (2016):

- California sagebrush scrub (*Artemisia californica* Shrubland Alliance)
- California sagebrush-California buckwheat Scrub (*Artemisia californica - Eriogonum fasciculatum* Shrubland Alliance)
- California sagebrush-California black sage Scrub (*Artemisia californica - Salvia mellifera* Shrubland Alliance)
- Coastal brambles (Rubus [*parviflorus, spectabilis, ursinus*] Shrubland Alliance)
- Deerweed scrub (*Lotus scoparius* [=*Acmispon glaber*] Shrubland Alliance)
- Poison oak scrub (*Toxicodendron diversilobum* Shrubland Alliance)
- Yellow bush lupine scrub (*Lupinus arboreus* Shrubland Alliance and Semi-Natural Alliance)

Wildlife using this habitat are similar to those species expected in the maritime chaparral, such as California quail, blue-gray gnatcatcher (*Polioptila caerulea*), Anna's hummingbird, Coast Range fence lizard, northern pacific rattlesnake, gopher snake, brush rabbit, and California ground squirrel.

Coyote Brush Scrub

Coyote brush scrub occurs extensively throughout the study area. It ranges from small patches to extensive stands where it is associated with non-native grassland species in the spaces between shrubs. The most extensive stands are located north of the Salinas River, along Monte Road north of Del Monte Boulevard, along the railroad tracks between Lapis Road and the CEMEX access road in Marina, and at various locations along the Monterey Peninsula Recreational Trail between 8th Street and Lightfighter Drive. It is usually situated adjacent to or integrated with grasslands, coastal scrub and ruderal areas (such as roadsides and railroad rights of way). Often it is indicative of previous disturbance that has subsequently been left undisturbed for more than several years, allowing coyote brush to invade and establish in large numbers. Alternatively, it may displace coastal grasslands where fire or grazing have been eliminated, eventually converting them to mosaics of scrub and grassland. Special status plant species are uncommon, but may include species also found in grasslands or northern coastal scrub.

Coyote brush scrub conforms to the following vegetation alliance as mapped by AECOM (2016):

- Coyote brush scrub (*Baccharis pilularis* Shrubland Alliance)

Wildlife occurring in coyote brush scrub is expected to be similar to northern coastal scrub and non-native grassland.

Riparian Woodland and Scrub

Riparian woodland and scrub is often associated with perennial water sources such as lakes and rivers. Within the study area riparian woodland and scrub generally occurs along the edges of the pond at Locke-Paddon Park in Marina and along Laguna del Rey in Seaside, at the Salinas River crossing, and in a roadside drainage crossing of Castroville Road/Highway 183. Willows (*Salix* spp.) are typically the dominant trees and shrubs at these locations. Numerous shrubs, herbs, and vines also occur in the understory of this community, including mulefat (*Baccharis salicifolia*) and native and non-native blackberries (*Rubus ursinus, R. armeniacus*).

Riparian woodland and scrub includes the following vegetation alliances as mapped by AECOM (2016):

- Arroyo willow thickets (*Salix lasiolepis* Shrubland Alliance)
- Box-elder forest (*Acer negundo* Forest Alliance)
- Fremont cottonwood woodland (*Populus fremontii* Forest Alliance)
- Shining willow groves (*Salix lucida* Woodland Alliance)

Riparian woodland and scrub habitats provide cover and resources for a variety of wintering and breeding birds, such as yellow-rumped warblers (*Dendroica coronata*), warbling vireos (*Vireo gilvus*), orange-crowned warblers (*Oreothlypis celata*), and Wilson's warblers (*Cardellina pusilla*). The mixed understory in this community supports a variety of small mammals and reptiles, including raccoon (*Procyon lot*or), deer mice, and coast garter snake (*Thamnophis elegans terrestris*). Several riparian sites are located in incorporated areas in park settings and are subject to disturbance from vehicle and pedestrian traffic. In contrast, the Salinas River crossing location is relatively remote and continuous along the riverbanks, and consists of trees with a dense and multi-layered canopy that provides high quality habitat.

Freshwater Marsh

Freshwater marshes are wetland plant communities with year-round or nearly year-round inundation or soil saturation that supports perennial emergent plants, typically dominated by bulrushes, rushes and cattails. Within the study area, freshwater marshes are located in small impoundments and drainages along the proposed Castroville Pipeline, along Tembladero Slough within the proposed Castroville Pipeline Optional Alignment 1, and along a pond near the intersection of Aquajito Road and Fremont Street in Monterey. Freshwater marsh also may occur as small or sparse understory patches within areas mapped as other more dominant vegetation types, such as riparian forest and scrub.

Freshwater marsh includes the following vegetation alliances as mapped by AECOM (2016):

- California bulrush marsh (*Schoenoplectus californicus* Herbaceous Alliance)

- Cattail marshes (*Typha* [*angustifolia, domingensis, latifolia*] Herbaceous Alliance)
- Knotweed marsh
- Soft rush marshes ((*Juncus effusus* Herbaceous Alliance)

Freshwater marshes are used by common wildlife species including waterfowl such as Canada goose, mallard, American coot, pied-billed grebe, and great egret (*Ardea alba*). Marsh wren (*Cistothorus palustris*) and song sparrow (*Melospiza melodia*) may nest in shoreline vegetation of project area freshwater marsh habitat with northern rough-winged swallow (*Stelgidopteryx serripennis*) foraging over the open water. This habitat may also be used by amphibians including the sierra treefrog (*Pseudacris sierra*) and American bullfrog (*Lithobates catesbeianus*).

Coast Live Oak Woodland

Within the study area, coast live oak woodland is located along General Jim Moore Boulevard between Ardennes Circle and Coe Avenue, and adjacent to the Salinas River. Coast live oak woodland also occurs within the study area of the proposed Ryan Ranch–Bishop and Main System–Hidden Hills Interconnection Improvements. In the vicinity of the project area, coast live oak woodland occurs in sandy soils and is dominated by coast live oak (*Quercus agrifolia*) with the occasional eucalyptus, Monterey pine (*Pinus radiata*), or Monterey cypress. The understory is typically non-native grassland or other herbaceous annuals such as miner's lettuce (*Claytonia perfoliata*) and hedgenettle (*Stachys bullata*). In the vicinity of General Jim Moore Boulevard, coast live oak woodland forms a mosaic with central maritime chaparral and coastal sage scrub communities, and shrub species typically found in these two communities also occur in the adjacent oak woodland.

Coast live oak woodland conforms to the following vegetation alliance as mapped by AECOM (2016):

- Coast live oak woodland (*Quercus agrifolia* Woodland Alliance)

In Monterey County, coast live oak woodlands support a considerable diversity of wildlife species. Mammals likely to be found here include western gray squirrels (*Sciurus griseus*) and Monterey dusky-footed woodrats (*Neotoma fuscipes luciana*) as well as other small rodents. Mule deer (*Odocoileus hemionus*) also occur in oak woodlands. Several avian species rely heavily on the acorns for food, including acorn woodpeckers (*Melanerpes formicivorous*), western scrub-jays, and California quails (*Callipepla californica*). Chestnut-backed chickadees (*Poecile rufescens*), oak titmice (*Baeolophus inornatus*), Hutton's vireos (*Vireo huttoni*), dark-eyed juncos (*Junco hyemalis*), ash-throated flycatchers (*Myiarchus cinerascens*), and Nuttall's woodpeckers (*Picoides nuttallii*) are among other birds that nest in this community. Several species of amphibians, such as arboreal salamanders (*Aneides lugubris*), can be found in coast live oak woodlands, in which moisture is retained under fallen wood and in crevices in the oaks. Reptiles may include ringneck snakes (*Diadophis punctatus*) and Skilton's skinks (*Plestiodon skiltonianus skiltonianus*).

Ice Plant Mats

Ice plant mats are relatively monotypic patches dominated by ice plant species (*Carpobrotus edulis, C. chilensis*; landscaped areas of cultivated ice plant, *Drosanthemum floribundum,* are mapped as "landscaped"). Ice plant mats are low-growing, dense or patchy, and spread by runners. The dense growth habitat precludes other species, though many coastal dune scrub and annual grassland species may occur in gaps in ice plant cover. Ice plants are aggressive invaders of coastal dune and scrub habitats. They are also used in low-maintenance garden landscaping, on roadsides and medians, and in parking lots and sidewalk verges. Ice plants were widely introduced in the region to stabilize sand dunes, and have colonized a significant portion of the coastal dune and paleodune plant communities. Ice plant mats also are a frequent target for removal and restoration of native coastal vegetation.

Ice plant mats conform to the following vegetation alliance as mapped by AECOM (2016):

- Ice plant mats (*Carpobrotus edulis* or Other Ice Plants Herbaceous Semi-Natural Alliance)

Ice plant mats are regarded as providing marginal wildlife habitat value, though may provide cover for some small rodents and reptiles. Seeds of iceplant are eaten by deer, jackrabbits, and brush rabbits, which may contribute to the spread of ice plant (D'Antonio, 1990).

Agricultural

Agricultural lands exist in the northern study area along Charles Benson Road, Lapis Road, Del Monte Boulevard, Monte Road, Nashua Road, Highway 1, Highway 156, and the dirt agricultural road located north of Monte Road/Nashua Road. These lands provide little or no habitat for native plants and wildlife as they are regularly manipulated as crops are planted, harvested, rotated, and irrigated, or the lands are grazed. Other than crops (e.g., strawberries and cut flowers), vegetation in these areas consists primarily of non-native species adapted to disturbance, such as wild oat, bromes, mustards (*Brassica nigra* and *Hirschfeldia incana*), mallows (*Malva* spp.), and filarees.

Agricultural areas can support wildlife species that have adapted to disturbance, but generally support few wildlife species because of their lack of diversity in vegetation and foraging opportunities. California ground squirrels often occur along margins of cropland, and raptors such as red-tailed hawks often forage for ground squirrels over agricultural lands. Fallow fields can attract other foraging birds, including Brewer's blackbird (*Euphagus cyanocephalus*) and killdeer (*Charadrius vociferus*).

Ruderal

Ruderal areas are not currently in active use, but have been subject to intense or recurring disturbance, generally through removal or other alteration of all native vegetation, alteration of topography, soil compaction, and the addition or removal of man-made features such as paving, buildings, and channelization of watercourses. Depending on the intensity and type of disturbance and time since disturbance, ruderal areas can remain relatively barren or become revegetated with primarily non-native weedy species. Within the project area, ruderal areas are generally located along Highway 1, Highway 156, and Highway 183, along Monte Road north of the Salinas River,

along the dirt agricultural road north of Tembladero Slough, within MRWPCA Regional Wastewater Treatment Plant, along Del Monte Boulevard at Reservation Road, and along Del Monte Boulevard at Canyon Del Rey Boulevard.

All ruderal areas are dominated by non-native weedy vegetation; however, the dominant species varies depending on the site characteristics at each location. Dominant species include field mustard (*Brassica rapa*), radish (*Raphanus sativus*), dwarf nettle (*Urtica urens*), and common chickweed (*Stellaria media*). Unidentifiable herbicide-treated weeds occur at the ruderal area near the intersection of Del Monte Boulevard and Canyon Del Rey Boulevard.

Ruderal includes the following vegetation alliance as mapped by AECOM (2016):

- Perennial pepper weed patches (*Lepidium latifolium* Herbaceous Semi-Natural Alliance)
- Ruderal

Ruderal communities do not support the diversity of native plant or wildlife that is characteristic of undisturbed natural communities, but many native wildlife species have adapted to ruderal areas: red-tailed hawk, American crow (*Corvus brachyrhynchos*), white-crowned sparrow (*Zonotrichia leucophrys*), American goldfinch (*Spinus tristis*), raccoon (*Procyon lotor*), and coyote (*Canis latrans*) are examples. Non-native animal species that are associated with ruderal communities include European starling (*Sturnus vulgaris*), rock dove (*Columba livia*), Virginia opossum (*Didelphis virginiana*), and Norway rat (*Rattus norvegicus*).

Developed/Landscaped

Developed and landscaped areas occupy much of the project area, particularly within the cities of Seaside and Monterey, and along Charles Benson Road in unincorporated Monterey County. Developed areas include paved and dirt roadways and trails, parking lots, buildings, and other manmade features. Landscaped features occur in association with these developed features and include gardens, parks, lawns, and landscaping trees and shrubs, such as planted stands of Monterey cypress and Monterey pine.

Developed and landscaped include the following vegetation alliances as mapped by AECOM (2016):

- Eucalyptus groves (*Eucalyptus* [*globulus, camaldulensis*] Woodland Semi-Natural Alliance)
- Acacia shrubland (Acacia Shrubland)
- Monterey cypress stands (*Hesperocyparis macrocarpa* Woodland Special Stands)
- Monterey pine woodland (*Pinus radiata* Forest Alliance)

As with agricultural areas, developed and landscaped areas can support wildlife species that have adapted to site disturbance but native plants are often absent and wildlife abundance and diversity are generally low. Striped skunks, raccoons, and Virginia opossums occur regularly in urban areas. Birds adapted to the urban landscape include house finches (*Haemorhous mexicanus*),

northern mockingbirds (*Mimus polyglottos*), mourning doves, European starlings, house sparrows (*Passer domesticus*), and rock doves.

Open Water

Non-vegetated waters include relatively permanently inundated rivers and streams, tidal sloughs, lakes, and ponds, and may also include some small drainages and ditches. Open water is typically bordered by one or more of the preceding wetland or riparian vegetation types. As habitat, they are occupied by fish, amphibians, and reptiles, and other aquatic organisms, and are accessed as water and food sources by birds and mammals.

4.6.1.5 Sensitive Natural Communities

Sensitive natural communities (or special-status native plant communities) are designated as such by various resource agencies, such as CDFW, or in local policies and regulations and are generally considered to have important functions or values for wildlife or humans and/or are recognized as declining in extent or distribution and are considered threatened enough to warrant some sort of protection. For example, many local agencies in California consider protection of oak woodlands important for their value as an ecosystem and federal, state, and most local agencies classify wetlands and riparian areas as sensitive communities. The CNDDB tracks communities that are considered to be important for habitat conservation; these sensitive natural communities are considered special-status for the purposes of this analysis.

Several of the vegetation communities that occur in the project area are considered sensitive natural communities for the purposes of this analysis for one or more of the following reasons: (a) they are considered a sensitive natural community by CDFW; (b) when they occur in the coastal zone, they are considered ESHA by the CCC, or are designated as ESHA in one or more of the applicable LCPs; and/or (c) they are considered a sensitive community by one or more of the affected local jurisdictions, or are designated as a sensitive community in one or more of the general plans applicable to the project area.

The following communities occur in the study area and are considered special-status natural communities for the purposes of this analysis: central dune scrub, central maritime chaparral, northern coastal scrub, riparian woodland and scrub, freshwater marsh, and coast live oak woodland. Section 4.6.1.10, Sensitive Terrestrial Biological Resources in the Study Area, below, describes the distribution of these communities in the study area.

4.6.1.6 Wetlands and Other Waters

Wetlands are ecologically productive habitats that support a rich variety of both plant and animal life. The importance and sensitivity of wetlands has increased as a result of their value as recharge areas and filters for water supplies and widespread filling and destruction to enable urban and agricultural development.

USACE jurisdiction typically extends to the limit of the wetland, as defined by the presence of hydrophytic vegetation, hydric soils, and wetlands hydrology. In contrast, CCC jurisdiction for

wetlands may extend to the limit of any one of the above parameters and therefore typically is much broader than USACE jurisdiction. However, the CCC only has jurisdiction over wetlands and waters located within the coastal zone. Additionally, the RWQCB also regulates wetlands, other waters of the U.S., and waters of the state. The main channels of the Elkhorn Slough are under the jurisdiction of the Monterey Bay National Marine Sanctuary. Federal and state definitions of wetlands and waters are further detailed in Section 4.6.2, Regulatory Framework.

Wetlands or waters potentially regulated by the USACE, RWQCB, and/or CCC within the study area were mapped by AECOM during field surveys conducted between 2013 and 2015 (AECOM, 2016); however a wetland delineation report has not been finalized for the proposed project. Additionally, ESA mapped any potentially jurisdictional wetlands or waters within the study area during field surveys conducted in 2013, 2014, and 2016 for the MPWSP (ESA, 2013, 2014, 2016). Many potentially jurisdictional wetlands and waters occur within the study area and include the following vegetation community/habitat types described in Section 4.6.1.4 above: riparian woodland and scrub, freshwater marsh, and open water, as well as a few small culverts and drainages present within the study area. These potential wetlands and waters are shown on **Figures 4.6-1a** through **4.6-1o**. A formal wetland delineation report would need to be prepared, and approved by the agencies, to determine the limits of jurisdictional wetlands and waters within the project area.

The USFWS NWI[7] was queried to identify wetlands and other surface waters that have been mapped within, or in close proximity to, the study area. The NWI data represents reconnaissance-level information on the location, type, and size of surface waters that was developed on-screen using digital datasets. Since this data is not collected in the field, and because the definition of wetlands can vary among regulatory agencies, a formal wetland delineation would need to be conducted to determine the limits of jurisdictional wetlands and waters mapped by the NWI. Several potentially jurisdictional wetlands and/or other waters have been mapped by the NWI within, or in close proximity to, the study area. These features are shown on **Figures 4.6-1a** through **4.6-1o** and include a variety of wetland and other water types such as estuarine and marine deepwater, estuarine and marine wetland, freshwater emergent wetland, freshwater forested/shrub wetland, freshwater pond, lake, and riverine.

Wild and Scenic Rivers

The federal Wild and Scenic Rivers Act was enacted by Congress in 1968 for the purpose of preserving the free-flowing characteristics and outstanding remarkable values of designated rivers while allowing uses compatible with the management goals of designated rivers. The categories of outstanding remarkable values include scenic, recreational, geologic, fish and wildlife, historic, and cultural values. The California Wild and Scenic Rivers Act of 1972 is modeled after the federal Wild and Scenic Rivers Act. There are no designated wild and scenic rivers within the study area.

[7] The NWI is a nationwide inventory of wetlands and other surface waters that is compiled by the USFWS to provide information on the distribution and type of wetlands and aid in conservation efforts.

4.6.1.7 Wildlife Movement Corridors

Wildlife movement corridors link together areas of suitable wildlife habitat that are otherwise separated by rugged terrain, changes in vegetation, or by areas of human disturbance or urban development. Topography and other natural factors in combination with urbanization have fragmented or separated large open space areas. The fragmentation of natural habitat creates isolated "islands" of vegetation that may not provide sufficient area to accommodate sustainable populations and can adversely impact genetic and species diversity. Movement corridors offset the effects of this fragmentation by allowing animals to move between remaining habitats, which in turn allows depleted populations to be replenished and promotes genetic exchange with separate populations.

The majority of the study area comprises developed areas, or adjacent to developed areas, such as roads and recreational trails, which do not serve as wildlife movement corridors. Although some common wildlife travel along developed areas, wildlife likely move parallel to these developed areas along relatively undeveloped stretches of beach and dune habitat located west and east of the project area. Lands north of Marina are used for agricultural purposes, but may serve as a movement corridor between coastal and inland areas for species adapted to agricultural disturbance such as raptors and songbirds. The Salinas River provides a wildlife movement corridor for fish, birds, and other species that migrate locally along riparian corridors.

4.6.1.8 Special-Status Species

For the purposes of this EIR/EIS, "special-status species" include threatened, endangered, candidate, and other sensitive species identified in local and regional plans, policies, and regulations, and by the CDFW, USFWS, and NMFS.[8] Special-status species include those species listed in Section 15380(b), Section 15380(c), and Section 15380(d) of the CEQA Guidelines. Special-status species include:[9]

- Plant and wildlife species listed as rare, threatened, and endangered under the FESA and CESA;
- Candidate species (species that are proposed for listing under either federal or state law);
- Species designated by CDFW as species of special concern or Fully Protected Species;

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8 Marine biological resources under NMFS authority are covered in Section 4.5, Marine Resources.

9 CEQA Guidelines Section 15380(b) states "A species of animal or plant is: (1) "endangered" when its survival and reproduction in the wild are in immediate jeopardy from one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, disease, or other factors; or (2) "rare" when either: (A) Although not presently threatened with extinction, the species is existing in such small numbers throughout all or a significant portion of its range that it may become endangered if its environment worsens; or (B) The species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range and may be considered "threatened" as that term is used in the Federal Endangered Species Act."

CEQA Guidelines Section 15380(c) states: "A species of animal or plant shall be presumed to be endangered, rare or threatened, as it is listed in: (1) Sections 670.2 or 670.5, Title 14, California Code of Regulations; or (2) Title 50, Code of Federal Regulations Section 17.11 or 17.12 pursuant to the Federal Endangered Species Act as rare, threatened, or endangered."

CEQA Guidelines Section 15380(d) states: "A species not included in any listing identified in subdivision (c) shall nevertheless be considered to be endangered, rare or threatened, if the species can be shown to meet the criteria in subdivision (b)."

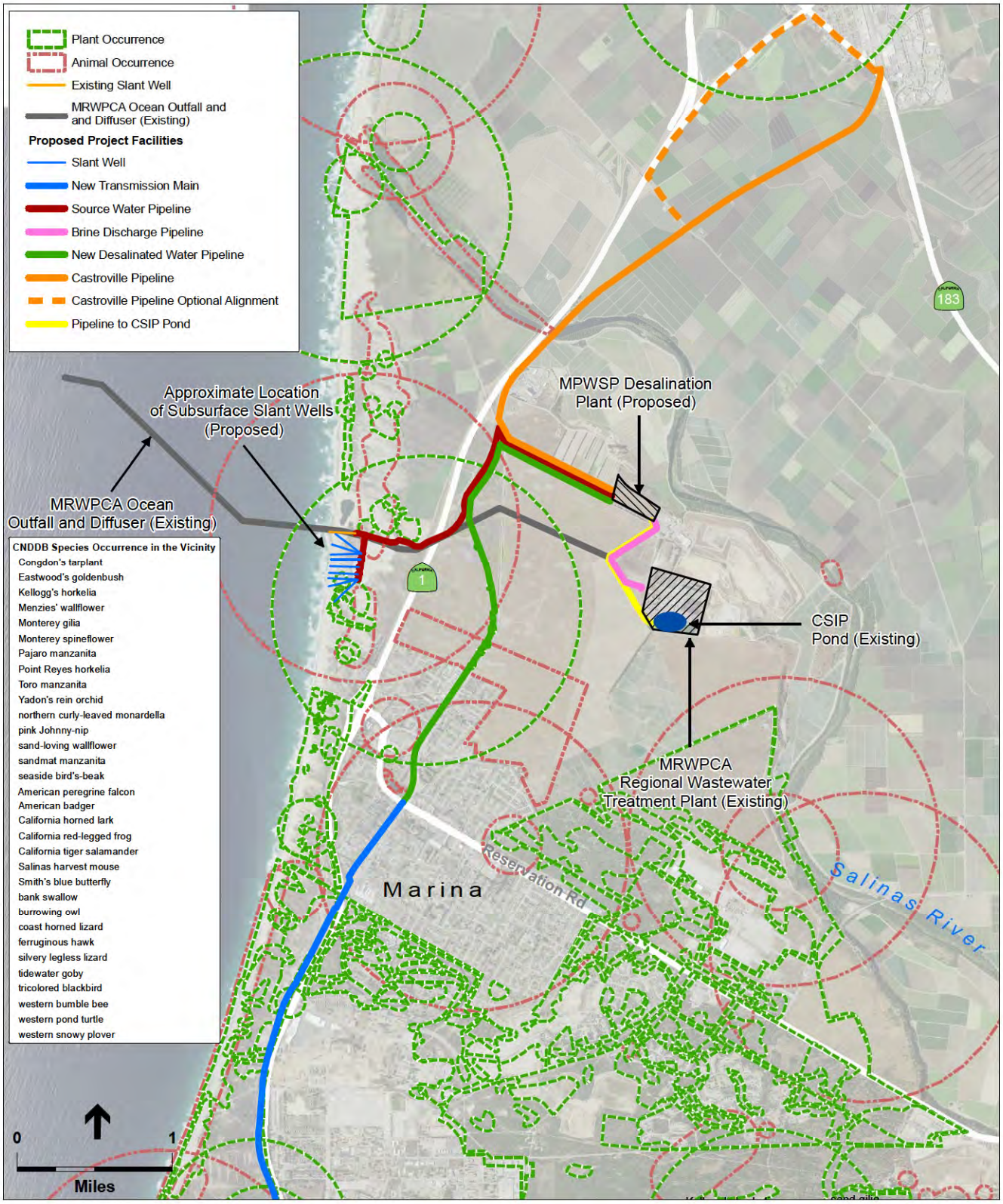
- Species protected by the federal Migratory Bird Treaty Act (MBTA) (16 USC §§ 703-711) and California Fish and Game Code;
- Bald and golden eagles protected by the federal Bald Eagle Protection Act (16 USC § 668); and
- Species that may be considered rare or endangered pursuant to Section 15380 of the CEQA Guidelines (including plants species with California Rare Plant Ranks of 1, 2, 3, or 4).

Data on species occurrence was obtained from the CDFW, the CNDDB, the CNPS Electronic Inventory, the USFWS species list, published biological literature of the region, and site surveys as described in Section 4.6.1.2 above.

Table F-1 in Appendix F lists the special-status plant and animal species that have been documented to occur or have the potential to occur in suitable habitat within the project area. The table also includes an assessment of potential to occur within the project area based on previous special-status record locations and current site conditions. Special-status species with a moderate or higher potential to occur within the project area are discussed in detail below.

Figures 4.6-2a, **4.6-2b**, and **4.6-2c** show the CNDDB occurrence records in the project vicinity.

Seven federal and/or state listed plant species occur in the project area or have a moderate to high potential to occur within the project area. These species include Monterey spineflower, robust spineflower (*Chorizanthe robusta* var. *robusta*), seaside bird's-beak, Menzies' wallflower (*Erysimum menziesii*), sand gilia, Yadon's rein orchid (*Piperia yadonii*), and Pacific Grove clover (*Trifolium polyodon*). Four federal and/or state listed animal species occur in or have a moderate to high potential to occur within the project area including Smith's blue butterfly, California tiger salamander (*Ambystoma californiense*), California red-legged frog (*Rana draytonii*), and western snowy plover (*Charadrius alexandrinus nivosus*). Twenty-two non-listed special-status plant species are either known to occur within the project area or have a moderate to high potential to occur within the project area. These include Hickman's onion (*Allium hickmanii*), Hooker's manzanita (*Arctostaphylos hookeri* ssp. *hookeri*), Toro manzanita (*Arctostaphylos montereyensis*), Pajaro manzanita (*Arctostaphylos pajaroensis*), ocean bluff milkvetch (*Astragalus nuttallii var. nuttallii*), sandmat manzanita, Monterey Coast paintbrush (*Castilleja latifolia*), Monterey ceanothus (*Ceanothus rigidus*), Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*), branching beach aster (*Corethrogyne filaginifolia* [formerly *leucophylla*]), Eastwood's goldenbush, sand-loving wallflower (*Erysimum ammophilum*), Kellogg's horkelia, Carmel Valley bush-mallow (*Malacothamnus palmeri* var. *involucratus*), marsh microseris (*Microseris paludosa*), northern curly-leaved monardella (*Monardella sinuata* ssp. *nigrescens*), south coast branching phacelia (*Phacelia ramosissima* var. *austrolitoralis*), native stands of Monterey pine, Michael's rein orchid (*Piperia michaelii*), Santa Cruz microseris (*Stebbinsoseris decipiens*), and Santa Cruz clover (*Trifolium buckwestiorum*).

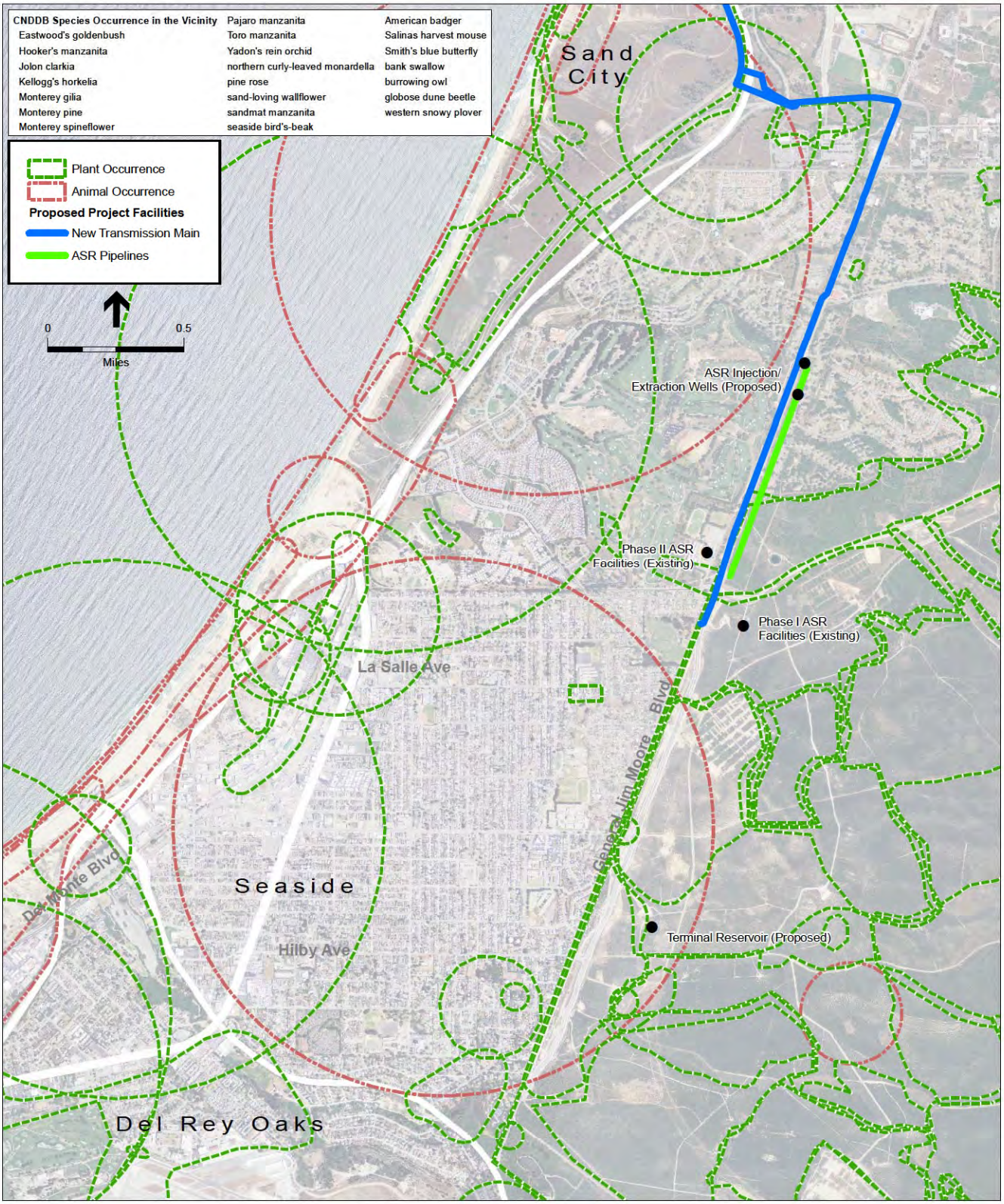


SOURCE: CDFW, 2016; ESA, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.6-2a

CNDDB Occurrence Records

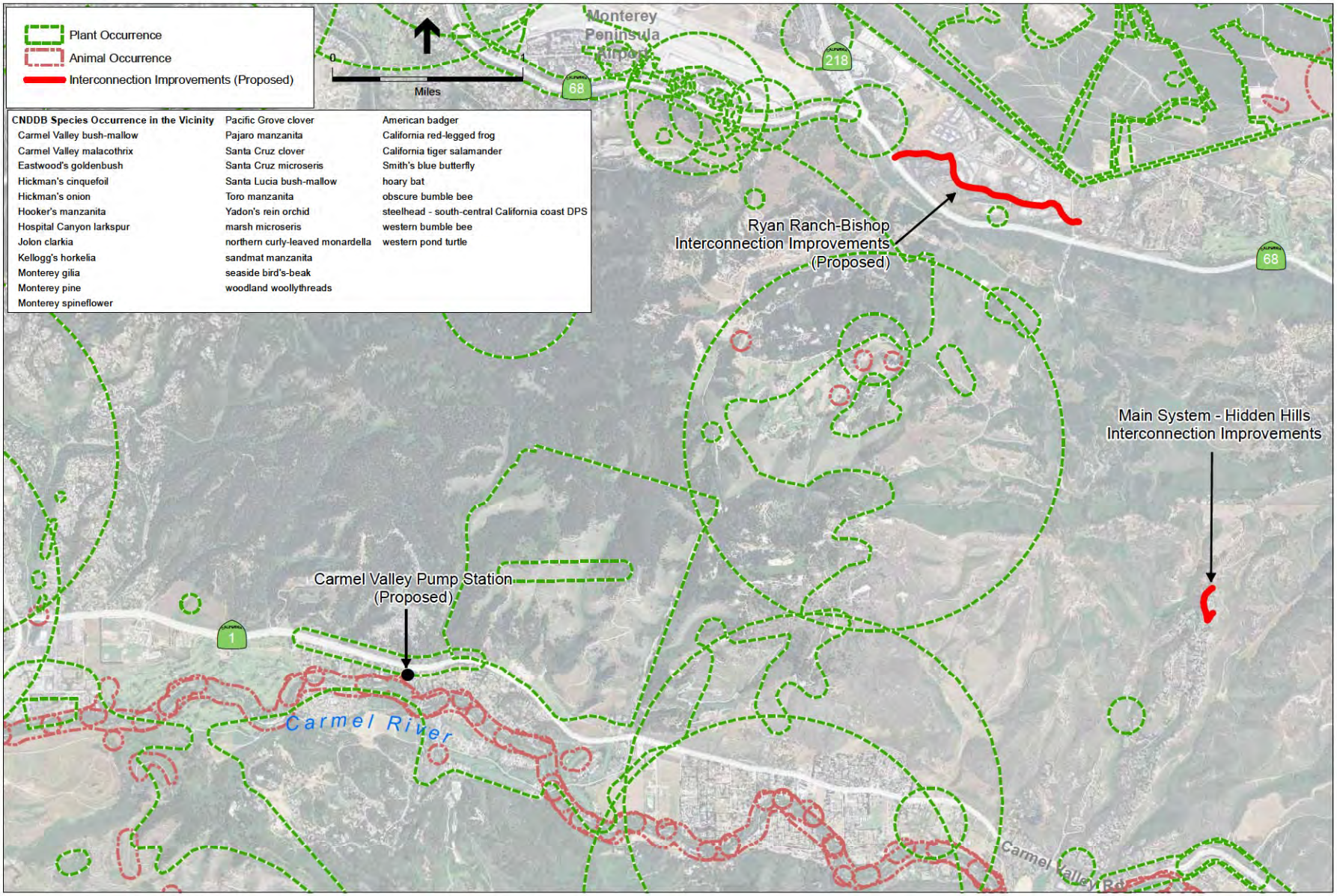


SOURCE: CDFW, 2016; ESA, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.6-2b

CNDDB Occurrence Records



SOURCE: CDFW, 2016; ESA, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.6-2c

CNDDB Occurrence Records

Twenty-three non-listed special-status animal species are either known to occur or have a moderate to high potential to occur within the project area. These include western pond turtle (*Actinemys marmorata*), black legless lizard, silvery legless lizard *(Anniella pulchra pulchra*), coast horned lizard (*Phrynosoma blainvillii*), Coast Range newt (*Taricha torosa*), tricolored blackbird (*Agelaius tricolor*), short-eared owl (*Asio flammeus*), western burrowing owl (*Athene cunicularia*), red-tailed hawk, red-shouldered hawk (*Buteo lineatus*), Ferruginous hawk (*Buteo regalis*), northern harrier (*Circus cyaneus*), white-tailed kite, California horned lark (*Eremophila alpestris actia*), American peregrine falcon (*Falco peregrinus*), American kestrel (*Falco sparverius*), loggerhead shrike (*Lanius ludovicianus*), California yellow warbler (*Setophaga petechia brewsteri*), pallid bat (*Antrozous pallidus*), western red bat (*Lasiurus blossevillii*), Monterey dusky-footed woodrat, Monterey shrew (*Sorex ornatus salaries*), and American badger (*Taxidea taxus*).

Numerous native birds also are likely to occur in the project area. These birds, protected under the MBTA and California Fish and Game Code, are likely to nest locally from March through August, with most nesting occurring April through July.

Federal and State Endangered and/or Threatened Species

Plants

Monterey spineflower (*Chorizanthe pungens* var. *pungens*). Monterey spineflower is federally listed as threatened and a CRPR 1B.2 taxon. It is a small, low-growing, annual herb in the buckwheat family (Polygonaceae) inhabiting the sandy soils of coastal and inland marine terraces in northern Monterey County. Monterey spineflower occurs in disturbed areas in grassland, such as road cuts and eroded areas, or in shifting sands of coastal dunes. It is also associated with sand blowouts in areas partially stabilized by iceplant. Monterey spineflower requires a relatively bare substrate for establishment and growth and is threatened by the encroachment of nonnative annual grasses and perennial weed species.

Populations of Monterey spineflower are known from a variety of locations within and adjacent to the project area. This species has been mapped widely within the former Fort Ord military base including the Fort Ord Dunes State Park near the new Transmission Main alignment south of Reservation Road, along General Jim Moore Boulevard near the new Transmission Main and ASR pipeline alignments, and proposed Terminal Reservoir site (USACE, 1997; Fort Ord Reuse Authority, 2012; CDFW, 2016). During botanical surveys conducted for the proposed project, ESA observed this species in disturbed coastal dune scrub north of Reservation Road along the proposed new Desalinated Water Pipeline alignment on Lapis Road and the west side of Del Monte Boulevard (ESA, 2012; 2016). A large population was also observed within the Terminal Reservoir site (Denise Duffy & Associates, 2010a; Fort Ord Reuse Authority, 2012). In 2010, Monterey spineflower was observed along the proposed Source Water Pipeline alignment along Lapis Road and the CEMEX access road (ESA, 2010). Additionally, Zander Associates biologists observed this species adjacent to the CEMEX access road in 2013 and 2014 at the proposed Source Water Pipeline alignment (Zander Associates, 2013; 2014). During botanical surveys conducted at the CEMEX sand mining facility in 2014 and 2016 in support of this project, ESA found Monterey spineflower in high densities scattered throughout portions of the active mining

area, including at the proposed subsurface slant well sites (ESA, 2014; 2016). Other populations have been observed within central dune scrub and disturbed areas east of Lapis Road and north of the CEMEX access road (CDFW, 2016). It was also observed within the Castroville Pipeline alignment (AECOM, 2016).

This species occurs in both undisturbed and disturbed central dune scrub, non-native grassland, central maritime chaparral, northern coastal scrub, and ice plant mat communities and has a moderate to high potential to occur along the east side of General Jim Moore Boulevard in the vicinity of the proposed ASR facilities and Terminal Reservoir site.

Robust spineflower (*Chorizanthe robusta* var. *robusta*). Robust spineflower is federally listed as endangered and a CRPR 1B.1 taxon. It is an annual herb that blooms from April through September. This species grows in sandy or gravelly soils of coastal dune scrub. Robust spineflower is threatened by development, mining, recreation, and non-native plants. According to USFWS, this species is currently limited to Santa Cruz County, but has been historically documented in Monterey County (USFWS, 2010a). This species was not observed within the project area during the botanical surveys conducted for the proposed project. Although this species is not currently known within Monterey County, it has been historically observed in the project vicinity and has potential to occur within central dune scrub and maritime chaparral at the CEMEX active mining area; along the Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main; and on the east side of General Jim Moore Boulevard in the vicinity of the proposed ASR facilities and Terminal Reservoir site.

Seaside bird's-beak (*Cordylanthus rigidus* var. *littoralis*). Seaside bird's-beak is state listed as endangered and a CRPR 1B.1 taxon. It is a relatively large, many-branched, annual herb in the broomrape family (Orobanchaceae) that blooms from May through October. This species grows in the sandy soils of stabilized dunes and is associated with Monterey pine forest, oak woodland, and maritime chaparral. Like other annual plants of sandy soils, seaside bird's-beak generally requires regular ground disturbance to maintain a bare substrate and control competition with non-native grasses and perennial species. According to the CNDDB, this species has been documented on sand dunes in Sand City, Marina, Seaside, and Monterey although these records are all prior to 1950 and populations in these areas may have been extirpated (CDFW, 2016). Seaside bird's beak has been observed at the Terminal Reservoir site (Denise Duffy & Associates, 2010a; Fort Ord Reuse Authority, 2012). This species may occur in suitable habitat, such as central dune scrub, maritime chaparral, and coast live oak woodland at the proposed subsurface slant well site (e.g., the CEMEX sand mining facility); along the Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main alignments; and at the ASR-5 Well and ASR-6 Well sites, along the ASR Conveyance Pipeline alignment, along the ASR Pump-to-Waste Pipeline and the ASR Recirculation Pipeline alignment.

Menzies' wallflower (*Erysimum menziesii*). Menzies' wallflower is federal and state listed as endangered and a CRPR 1B.1 taxon. Originally, it was thought that two subspecies (*Erysimum menziesii* ssp. *menziesii* and ssp. *yadonii*) occur within Monterey County, with subspecies *menziesii* occurring in a disjunct distribution in Monterey and Mendocino Counties and subspecies *yadonii* restricted to coastal dunes between the mouth of the Salinas River and the

former Fort Ord military base (USFWS, 2008). However, the most recent update to the Jepson Manual only recognizes the species and not these two subspecies (Jepson Flora Project, 2013). This species is a biennial or perennial plant in the mustard family and produces yellow flowers from June through August. It was observed within the new Transmission Main alignment near the intersection of Lightfighter Drive and Highway 1 during surveys conducted for the proposed project in 2014 (URS, 2014b). This species occurs at the foredunes north of the CEMEX sand mining facility (CDFW, 2016) and was observed in this same area during botanical surveys conducted for the proposed project in 2012 and 2016 (ESA, 2012; 2016). It also occurs in sand dunes north and south of the CEMEX facility (CDFW, 2016). This species has potential to occur in central dune scrub at the proposed subsurface slant well site and along the proposed Source Water Pipeline, and new Desalinated Water Pipeline alignments.

Sand gilia (*Gilia tenuiflora* ssp. *arenaria*). Sand gilia is federally listed as endangered, state listed as threatened, and a CRPR 1B.2 taxon. It is a small, erect annual in the phlox family (Polemoniaceae) blooming from April through June. A rare associate of the maritime chaparral, coastal scrub, and oak woodland communities of northern Monterey County, sand gilia favors bare substrates created by unstable soil conditions. Sand gilia often occurs with Monterey spineflower, which is a federally threatened and CRPR 1B.2 species,[10] with similar ecological requirements; however, a more common associate is wand woollystar (*Eriastrum virgatum*). Changes in dune vegetation have greatly reduced the amount of suitable habitat for these disturbance-dependent species, and many remaining populations are associated with roadsides, eroded drainages, and recently burned chaparral. This species has been observed in sand dunes throughout the project area. Within the immediate project vicinity it has been observed at Marina State Beach south of the CEMEX sand mining facility; in central dune scrub north of the CEMEX sand mining facility; within the proposed new Transmission Main alignment near the intersection of Imjin Parkway and Highway 1; in dune scrub west of Auto Center Parkway; at a location[11] east of General Jim Moore Boulevard in the vicinity of the ASR facilities; at a former Fort Ord military base property located approximately 1.2 miles south of the intersection of Del Monte Boulevard and Reservation Road and just east of Highway 1; and at Marina State Beach approximately 1.4 miles south of the intersection of Del Monte Boulevard and Reservation Road and just west of Highway 1 (CDFW, 2016). It has also been observed within the Terminal Reservoir site (Denise Duffy & Associates, 2010a; Fort Ord Reuse Authority, 2012). Based on the broad distribution of occurrence records within the project area, this EIR/EIS assumes sand gilia could potentially occur in central dune scrub and central maritime chaparral at the subsurface slant wells site, along the Source Water Pipeline, new Desalinated Water Pipeline, new Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline alignments, at the ASR-5 Well and ASR-6 Well sites, and at the Terminal Reservoir site.

Yadon's rein orchid (*Piperia yadonii*). Yadon's rein orchid is federally listed as endangered and a CRPR 1B.1 taxon. It is a slender perennial herb in the orchid family (Orchidaceae) that blooms

[10] CRPR 1B consists of plants that are rare, threatened, or endangered in California and elsewhere. The 0.2 extension indicates that the plant is "Moderately endangered in California" and reflects the level of threat to the species.

[11] As reported in the CNDDB (CDFW, 2016), the exact location of this occurrence record is unknown, but is mapped as a large polygon east of General Jim Moore Boulevard based on a map in "Flora and Fauna Baseline Study of Fort Ord."

from May through August. This species occurs in Monterey pine forest with a sparse understory, and along ridges and other areas of shallow soil within maritime chaparral. Unlike many other rare plants associated with maritime chaparral, Yadon's rein orchid does not colonize bare ground following disturbance events; instead, this species requires bare areas that remain relatively stable over time, allowing plants to form symbioses with host-specific mycorrhizal fungi. CNDDB occurrence records for this species in the project vicinity are mostly limited to areas south and west of the Monterey Regional Airport (CDFW, 2016). This species has been documented east of Highway 1 and north of Imjin Parkway (CDFW, 2016). It has also been documented approximately 0.3 mile north of the proposed Ryan Ranch-Bishop Interconnection Improvements (Fort Ord Reuse Authority, 2012). Yadon's rein orchid has the potential to occur near the Main System-Hidden Hills Interconnection Improvements site, and at the ASR-5 and ASR-6 Wells sites, along the ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline alignments, and at the Terminal Reservoir site.

Pacific Grove clover (*Trifolium polyodon*). Pacific Grove clover is state listed as rare and a CRPR 1B.1 taxon, though possibly of hybrid origin (Baldwin, et al, 2012). It is a small semi-prostrate annual plant in the pea family (Fabaceae) that flowers from April to June. Pacific Grove clover occurs on mesic sites in closed-cone coniferous forest (i.e., Monterey pine and cypress), and in grasslands, coastal prairie or meadow habitat on marine terraces, and in swales in dunes. It has been documented at several locations on the west side of the Monterey Peninsula, on Point Lobos, and in a few other locations near Jack's Peak and in Carmel Valley (CDFW, 2016). Historical records suggest it may once have been more widespread in the vicinity of Monterey and Pacific Grove, but has likely been displaced by residential and golf course development of marine terrace grasslands and forests (Jones & Stokes, 1996). Although it can occur on sites with some ongoing disturbance, the MPWSP facilities located closest to known or potential populations (Ryan Ranch-Bishop Interconnection Improvements and Main System-Hidden Hills Interconnection Improvements) would be in previously developed locations, such as roads.

Invertebrates

Smith's blue butterfly (*Euphilotes enoptes smithi*). Smith's blue butterfly is federally listed as endangered. It is a small butterfly endemic to the central coast of California. This species relies on two host plants—coast buckwheat and seacliff buckwheat (*Eriogonum parvifolium*)—during all of its life stages. These two host plant species are found in coastal sand dunes and chaparral. Smith's blue butterfly uses the flower heads of these plants for feeding, mating, and egg-laying. Adults emerge during summer (June through September), and live approximately one week, during which time they mate. Eggs hatch shortly thereafter, and the caterpillars feed on the host plant then pupate for about 10 months (typically in the leaf litter below the plant) before emerging as adults the next summer. Adults also occasionally feed on nectar from naked buckwheat (*Eriogonum nudum*).

Smith's blue butterfly has been documented at several locations containing central dune scrub in the vicinity of the project area, from the city of Monterey to the south to the Salinas River National Wildlife Refuge to the north (CDFW, 2016; USACE, 1997; Fort Ord Reuse Authority, 2012). There is also a historical record from chaparral near Carmel Valley Village and two records near the

Carmel school in Carmel Valley (CDFW, 2016). During 2012 botanical surveys conducted at the "north CEMEX site" located approximately 0.8 mile north of the CEMEX active mining area,[12] coast buckwheat, one of the two host plants for the Smith's blue butterfly, was observed in high densities in the sand dunes north of the CEMEX sand mining facility (ESA, 2012). Coast buckwheat was also observed in high densities along the CEMEX access road and in central dune scrub within the CEMEX active mining area and Smith's blue butterfly was observed in a mosaic of central dune scrub and ice plant mats during the 2016 botanical surveys of the CEMEX facility (Zander Associates, 2014; ESA, 2014; 2016). Coast buckwheat and seacliff buckwheat was found in central dune scrub along the new Transmission Main between Beach Road and Lightfighter Drive and coast buckwheat was observed along the Source Water Pipeline and new Desalinated Water Pipeline along Lapis Road. (AECOM, 2016; ESA, 2016). Smith's blue butterfly has the potential to occur at the locations where coast buckwheat has been observed.

Fish

South/central California coast steelhead (*Oncorhynchus mykiss irideus*). Steelhead (*Oncorhynchus mykiss irideus*) are federally listed as threatened and considered a California species of special concern. They are anadromous (sea-run) rainbow trout that spawn in freshwater, spend the first one to three years (or more) of life in freshwater, and then migrate to the ocean where they continue to grow and mature before returning to spawn in their natal streams. Steelhead populations within the Salinas River and Carmel River basins are part of the south-central California coast Distinct Population Segment (SCCC DPS) of the species. This DPS extends from the Pajaro River south to, but not including, the Santa Maria River. The Salinas River watershed is considered a part of the Interior Coast Range Biogeographic Population Group (BPG) and the Carmel River is included in the Carmel Basin BPG within the 2013 SCCC DPS Recovery Planning Area (NMFS, 2013).

Overall population of the SCCC DPS is understood to be extremely small (NMFS, 2013). Steelhead populations within the Salinas River watershed have not been well documented, like many watersheds within this DPS, but a few point estimates, summarized in NMFS (2007), are available:

- USFWS catch estimate of 3,600 adults in 1946
- USFWS average run-size estimate of 900 fish in 1951
- Kelley and Dettman estimate of less than 500 adults as of 1983

Based on the above trend and more recent population assessments conducted on the Arroyo Seco, NMFS (2007) concluded that the Salinas River run of steelhead has declined to an adult abundance averaging less than 50 fish and that this remnant population faces a host of risks intrinsic to the low abundance of various sub-populations within the watershed. Poor habitat conditions related to the majority loss of the Salinas River estuary, increase in erosion and

[12] This location corresponds with the subsurface intake system described in CalAm's January 2013 Supplemental Testimony, which included up to 10 subsurface slant wells at the north CEMEX site. After input from resource agencies in March 2013 regarding impacts on western snowy plover habitat at this site, the subsurface intake system for the MPWSP was moved south to its current location in the CEMEX active mining area (see Chapter 7, Alternatives, regarding Preliminary Intake Option 1 at the north CEMEX site for additional discussion).

sedimentation resulting from adjacent land uses (e.g. residential and agricultural development), water management and physical impediments (e.g. groundwater extraction and dams), and presence of invasive species (e.g., giant reed [*Arundo donax*] and striped bass [*Marone saxatilis*]) are considered the primary threats to the Interior Coast Range BPG population (NMFS, 2013). NMFS (2007) concluded that the Upper Salinas, Nacimiento/San Antonio, and Arroyo Seco River sub-populations face "very high", "high", and "fairly high" risks of extinction, respectively. Additional monitoring conducted at the Salinas River Weir between 2010 and 2014 to document steelhead passage counts, abundance, and migration timing detected 53 upstream passages in the most abundant monitoring season (2012-2013) (FISHBIO, 2014). Although there are no steelhead occurrences from the CNDDB in Tembladero Slough, steelhead have the potential to occur in that slough. The Castroville Pipeline would be installed beneath the Salinas River and Tembladero Slough via trenchless technologies.

Amphibians

California tiger salamander (*Ambystoma californiense*). California tiger salamander is federal and state listed as threatened. It is principally an upland species found in annual grasslands and in the grassy understory of valley-foothill hardwood communities in central and northern California. It requires underground refuges (usually ground squirrel or other small mammal burrows), where it spends the majority of its annual cycle. Between December and February, when seasonal ponds begin to fill, adult California tiger salamanders engage in mass migrations to aquatic sites during a few rainy nights to breed. Adult tiger salamanders have been documented at distances of two kilometers (1.2 miles) from breeding ponds (Orloff, 2007).

No potential breeding ponds were observed within the project area. There are few CNDDB records for California tiger salamander within the immediate project vicinity. The closest CNDDB records are from a stock pond located approximately 1 mile south of the Ryan Ranch–Bishop Interconnection Improvements site and 2 miles northwest of the Main System–Hidden Hills Interconnection Improvements site; and from a seasonal swale surrounded by annual grassland and strawberry fields located 1.5 miles northeast of the Castroville Pipeline alignment northern terminus where 33 California tiger salamander larva were captured in 2006 (CDFW, 2016). California tiger salamander larvae have also been documented at a vernal pool located approximately 1 mile northeast of the Ryan Ranch–Bishop Interconnection Improvements site (CDFW, 2016). A known breeding site is also located approximately 1.2 miles northeast of the Ryan Ranch-Bishop Interconnection Improvements site (Fort Ord Reuse Authority, 2012). This species has also been observed approximately 2 miles east of the proposed ASR facilities and the Terminal Reservoir site.

This species would have low potential to occur along the new Transmission Main Pipeline alignment as there are no recent observations in the vicinity of this alignment and this area is highly urbanized.

The MPWSP Desalination Plant site has previously been regularly mowed or disked; however, it currently provides non-native grassland with significant cover from ruderal species. The site is located within 250 feet of a drainage ditch connected to the Salinas River and a retention basin to the northeast of the site. There is some potential that California tiger salamander could occur in

this drainage ditch or retention basin and, if present, could utilize grassland at the MPWSP Desalination Plant as upland habitat.

Non-native grassland within the north portion of the proposed new Desalinated Water Pipeline and Source Water Pipeline alignments is located within 1.2 miles of the drainage ditch connected to the Salinas River. Additionally, a potential breeding pond surrounded by grassland and agricultural fields is located in Armstrong Ranch within 1.2 miles east of the new Desalinated Water Pipeline Alignment. The area surrounding the pond has recently been converted to agricultural, which could limit dispersal from the pond to the pipeline alignment. If present within the ditch and/or pond, California tiger salamander could disperse to grassland within the northern portion of the alignments and use these areas as upland habitat. This species would not be expected to occur at the pond at Locke-Paddon Park as the pond is isolated by development. Grassland located within the Pipeline to CSIP Pond and Brine Discharge Pipeline alignments are also located within 1.2 miles of the drainage ditch connected to the Salinas River and retention basin and California tiger salamander could utilize these areas as upland habitat.

With the exception of grassland located at Charles Benson Road and Del Monte Boulevard, the Castroville Pipeline is surrounded by agricultural or developed areas which provide marginal dispersal habitat for California tiger salamander. Agricultural drainage ditches along the alignment are regularly maintained, sparsely vegetated, shallow and unlikely to support breeding California tiger salamander. One pond located just over 1.2 miles northwest of the alignment among agricultural fields has potential to support breeding California tiger salamander; however CNDDB has no records of species occurrence at these locations (CDFW, 2016). A swale is located approximately 1.2 miles northeast of the Castroville Pipeline terminus. If California tiger salamanders are present in this swale, they could potentially disperse into the project area. Agricultural fields and the City of Castroville which occur between the Castroville Pipeline alignment and the swale provide low quality dispersal habitat unlikely to be used as upland habitat by California tiger salamander.

The grassland adjacent to Charles Benson Road is separated from the Armstrong Ranch grasslands to the south; however California tiger salamander could disperse into this area from the drainage ditch connected to the Salinas River and use this grassland as upland habitat.

According to mapping of potential California tiger salamander breeding and upland habitat conducted within the former Fort Ord (Fort Ord Reuse Authority, 2012), there are no potential breeding ponds located within 1.2 miles of the ASR-5 and ASR-6 Wells, ASR Conveyance Pipeline, ASR Recirculation Pipeline, or ASR Pump-to-Waste Pipeline, so this species would not be expected to occur at these sites. Potential breeding ponds have been mapped within the former Fort Ord within 1.2 miles of the Terminal Reservoir site (Fort Ord Reuse Authority, 2012). California tiger salamander have potential to use central maritime chaparral at the Terminal Reservoir site.

California tiger salamander has been observed within 1.2 miles of the Ryan Ranch-Bishop Interconnection Improvements site. There are also ponds located within 1.2 miles of the Main System-Hidden Hills Interconnection Improvements site that could support California tiger

salamander. The majority of the Ryan Ranch-Bishop Interconnection Improvements and Main System-Hidden Hills Interconnection Improvements sites are paved and would not support this species. However California tiger salamander could occur in the approximately 0.7 acre grassland area located within the proposed Ryan Ranch-Bishop Interconnection Improvements site and grassland or coast live oak woodland adjacent to both of these Interconnection Improvements sites.

The Carmel Valley Pump Station site consists of non-native grassland with coast live oak woodland fringe south of Carmel Valley Road and surrounded by residential development. California tiger salamander are not expected at this site. There are no CNDDB occurrence records for this species in the vicinity of the Carmel Valley Pump Station site and, from aerial photographs, suitable potential breeding habitat does not appear within 1.2 miles of the site.

California red-legged frog (*Rana draytonii*). California red-legged frog is federally listed as threatened and considered a California species of special concern. This species is principally a pond frog that can be found in quiet permanent waters of ponds, pools, streams, rivers, springs, marshes, and lakes. Moist woodlands, forest clearings, and grasslands also provide suitable habitat for this species in the non-breeding season. Adult frogs seek waters with dense shoreline vegetation, such as cattails (*Typha angustifolia, T. latifolia*), which provide good cover, but may also be found in unvegetated waters. California red-legged frogs breed from January to May. Eggs are attached to vegetation in shallow water and are deposited in irregular clusters. Tadpoles grow up to 3 inches in size before metamorphosing. California red-legged frogs are active year-round along the coast but inland populations may aestivate from late summer to early winter. Adults consume insects such as beetles, caterpillars, and isopods, while tadpoles forage on algae and detritus. Depending on environmental conditions, California red-legged frogs may frequently travel distances greater than 1.2 miles from breeding ponds, and some adults have been documented to travel more than 2 miles (USFWS, 2002). Typical dispersal distances are less than 0.3 mile, with few individuals dispersing up to 1.2 to 1.8 miles (Fellers, 2005). Dispersal habitat is defined in the Federal Register's designation of critical habitat for the California red-legged frog by the USFWS as "upland or riparian habitat within and between occupied or previously occupied sites located within 1 mile of each other (USFWS, 2010b)."

Potential California red-legged frog breeding habitat was not observed within the project boundary during reconnaissance surveys conducted for the proposed project. There are few California red-legged frog CNDDB occurrence records in the immediate project vicinity (CDFW, 2016). Most CNDDB records are limited to the Carmel River with one record from the Salinas River approximately 0.75 mile east of the proposed MPWSP Desalination Plant site (CDFW, 2016). There are some historical observations from 1856, 1891, and 1942 from the Pacific Grove and downtown Monterey area (AmphibiaWeb, 2016). It is unlikely that California red-legged frogs still occur in this area due to years of development and isolation from recent occurrence records. This frog is known to breed along the Carmel River and adults have been observed in artificially-maintained ponds at the Tehama Golf Course, which is located approximately 1.2 miles south of the Ryan Ranch-Bishop Interconnection Improvements and 2.1 miles west of the Main System-Hidden Hills Interconnection Improvements site (CDFW, 2016). Additionally,

there are several potential breeding ponds located within the former Fort Ord, east of, and within 2 miles of, the Terminal Reservoir site (Fort Ord Reuse Authority, 2012).

This species would have low potential to occur at the new Transmission Main as there are no recent observations in the vicinity and this area is highly urbanized.

The MPWSP Desalination Plant has previously been regularly mowed or disked; however, it currently supports non-native grassland with ruderal species cover. The site is located within 675 feet of the Salinas River, and 250 feet of a drainage ditch connected to the Salinas River and retention pond. Since the frog is known from the Salinas River, this species could potentially disperse through MPWSP Desalination Plant site and use non-native grassland as upland habitat.

Non-native grassland within the north portion of the proposed new Desalinated Water Pipeline and Source Water Pipeline is located within one mile of the Salinas River. Additionally a pond surrounded by grassland and agricultural fields is located in Armstrong Ranch within 1.2 miles east of the new Desalinated Water Pipeline Alignment. The area surrounding the pond has recently been converted to agricultural, which could limit dispersal from the pond to the pipeline alignment. If present within the Salinas River and/or pond, California red-legged frog could disperse to grassland within the northern portion of the alignments and use these areas as upland habitat. This species would not be expected to occur at the pond at Locke-Paddon park as it is surrounded by development and likely contains predatory fish. Non-native grassland located within the Pipeline to CSIP Pond and Brine Discharge Pipeline also is located within 1 mile of the Salinas River and California red-legged frog could disperse through these areas as well.

The Castroville Pipeline is surrounded by agricultural or developed areas which provide marginal upland habitat for California red-legged frog. Agricultural drainage ditches along the alignment are regularly maintained, sparsely vegetated, shallow and unlikely to support breeding California red-legged frog. The Salinas River, Tembladero Slough, and the freshwater marsh and riparian woodland and scrub north of Tembladero Slough provide potential aquatic habitat for California red-legged frog. Additionally, same as the Source Water Pipeline and new Desalinated Water Pipeline, potential breeding ponds are located within 1.2 miles of the non-native grassland located north of the 0.8-mile-long pipeline segment along Charles Benson Road. California tiger salamander and California red-legged frog could utilize these grasslands as upland habitat.

According to mapping of potential California red-legged frog breeding and upland habitat conducted within the former Fort Ord (Fort Ord Reuse Authority, 2012), there are no potential breeding ponds located within one mile of the ASR-5 and ASR-6 Wells, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, or ASR Recirculation Pipeline, so this species is not be expected to occur at these sites. Potential breeding ponds have been mapped within one mile of the Terminal Reservoir site in the former Fort Ord area (Fort Ord Reuse Authority, 2012). California red-legged frog has the potential to disperse through central maritime chaparral at the Terminal Reservoir site.

California red-legged frog has been observed within one mile of both the Ryan Ranch-Bishop and Main System-Hidden Hills Interconnection Improvements sites, and there are several drainages between the recorded sightings and these project improvements. Although most of the project

area associated with the Ryan Ranch-Bishop Interconnection Improvements and Main System-Hidden Hills Interconnection Improvements are paved, California red-legged frog could occur in the approximately 0.7-acre grassland area located within the proposed Ryan Ranch-Bishop Interconnection Improvements site and grassland or oak woodland that occurs adjacent to both of these sites.

The Carmel Valley Pump Station site consists of non-native grassland with coast live oak woodland fringe south of Carmel Valley Road and surrounded by residential development. The site is located on a lot adjacent to the Carmel River where CNDDB documents a breeding population of California red-legged frog between 1993 and 2003 (CDFW, 2016). However, groundwater pumping of the Carmel River in this area is reported to leave smaller tributaries and backwater pools dry and would influence use of this area for breeding on an annual basis (CDFW, 2016). California red-legged frog could use the Carmel Valley Pump Station site as upland refugia or during dispersal.

Birds

Western Snowy Plover (*Charadrius alexandrinus nivosus*). The western snowy plover is federally listed as threatened and considered a California species of special concern. It breeds primarily on coastal beaches from southern Washington to southern Baja California. The species breeds above the high tide line on coastal beaches, sand spits, dune-backed beaches, sparsely-vegetated dunes, beaches at creek and river mouths, and salt pans at lagoons and estuaries. Less common nesting habitat includes bluff-backed beaches, dredged material disposal sites, salt pond levees, dry salt ponds, and river bars. Snowy plover use areas with wide, sandy, dune-backed beaches for roosting and foraging during the nonbreeding season. This species forages above and below the mean high waterline, typically gathering food from the surface of the sand, wrack line, or low foredune vegetation.

Western snowy plover are known to nest in the beach and sand dunes between Reservation Road and the Salinas River National Wildlife Refuge (Page et al., 2015). In 2015 there were 469 individual snowy plovers in the Monterey Bay breeding population. During surveys conducted for the MPWSP in 2012 (ESA, 2012) and 2013 (ESA, 2013), western snowy plovers were observed at the beach located north and south of the CEMEX sand mining facility, respectively. Multiple western snowy plover nests have been observed on the beach and foredunes within and at the proposed northernmost subsurface slant well cluster in the CEMEX active mining area (PRBO, 2012 in Zander Associates, 2013). This species has also historically nested in the backdunes of the CEMEX active mining facility where the subsurface slantwells are proposed (Neuman, 2015). Several western snowy plovers were observed among the sparse central dune scrub and iceplant mats of the CEMEX active mining facility during reconnaissance surveys in May 2016 (ESA, 2016). Western snowy plover has a high potential to nest along the beach and foredunes in the vicinity of the northernmost subsurface slant well cluster at the western terminus of the proposed Source Water Pipeline alignment. Additionally, western snowy plover may use the beach and dunes within all subsurface slant well and Source Water Pipeline work areas for wintering, roosting, and foraging. Western snowy plover has potential to nest in the backdunes in the proposed subsurface slant well area.

Other Special-Status Species

Plants

Hickman's onion (*Allium hickmanii*). Hickman's onion is a CRPR 1B.2 taxon. It is a perennial, bulbiferous herb in the onion family (Alliaceae) that blooms during April and May. This species is most often associated with shallow, sandy, or otherwise unproductive soils, such as shale and clay hardpan. Hickman's onion is associated with a variety of plant species; most populations are associated with grassland species, but some occur at the grassland/chaparral ecotone or within open oak woodland areas. Plants favor slightly mesic microhabitats within these communities. Coastal influence, and the supplemental moisture associated with summer fog, may be the most important variable affecting population distributions. Remnant patches of coastal prairie typically receive summer fog and are particularly likely to support Hickman's onion. This species has been documented in a moist drainage area over hardpan near the proposed Ryan Ranch–Bishop Interconnection Improvements (CDFW, 2016). This species has not been observed during project-related botanical surveys, but has potential to occur in grassland or grassland understory of coast live oak woodlands alongside the Ryan Ranch-Bishop and Main System-Hidden Hills Interconnection Improvements sites.

Hooker's manzanita (*Arctostaphylos hookeri* ssp. *hookeri*). Hooker's manzanita is a CRPR 1B.2 taxon. One of several rare manzanita species endemic to the Monterey Bay region, Hooker's manzanita (heath family [Ericaceae]) is associated with sandy shale soils and sandstone outcrops. It is an uncommon component of the maritime chaparral community, and is differentiated from other local manzanitas by its short, low-growing stature and shiny green leaves. The distribution of this subspecies extends from the hills east of Watsonville to Carmel; other rare subspecies of *A. hookeri* occupy coastal habitat to the north and south. It is found in chaparral, coastal prairie, coastal scrub, and valley and foothill grassland communities. This species has been documented within maritime chaparral near the Ryan Ranch-Bishop Interconnection site (CDFW, 2016; USACE, 1997). During botanical surveys of the project area in 2016, Hooker's manzanita was observed in central dune scrub bordering the new Transmission Main Pipeline alignment along General Jim Moore Boulevard at Normandy Road (AECOM, 2016). This species has a potential to occur in maritime chaparral and northern coastal scrub (California sagebrush scrub alliance) communities near the Main System-Hidden Hills Interconnection Improvements site and along the east side of General Jim Moore Boulevard in the vicinity of the proposed ASR facilities, and in central dune scrub at the subsurface slant well site and along the Source Water Pipeline, new Desalinated Water Pipeline, new Transmission Main Pipeline, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to Waste Pipeline alignments, and at the Terminal Reservoir site.

Toro manzanita (*Arctostaphylos montereyensis*). Toto manzanita is a CRPR 1B.2 taxon. The species is identified by its short-haired glandular appearance and relatively long petioles. Toro manzanita is found in chaparral, woodland, and coastal scrub communities. Occurrence records for this species are located in maritime chaparral in the vicinity of both the Ryan Ranch-Bishop and Main System-Hidden Hills Interconnection Improvements sites, near the Monterey Regional Airport, and on the former Fort Ord military base (CDFW, 2016). Additionally, this species has previously been documented within the Terminal Reservoir site (USACE, 1997). It may occur in

coast live oak woodland, maritime chaparral, or northern coastal scrub (California sagebrush scrub alliance) in the vicinity of the Ryan Ranch-Bishop Interconnection Improvements site; Main System-Hidden Hills Interconnection Improvements site; along the east side of General Jim Moore Boulevard in the vicinity of the proposed ASR-5 and ASR-6 Wells and the three proposed ASR pipelines; along the proposed new Transmission Main; and at the Terminal Reservoir.

Pajaro manzanita (*Arctostaphylos pajaroensis*). Pajaro manzanita is a CRPR 1B.1 taxon. This species is an important component of maritime chaparral in the upper watershed of Elkhorn Slough and occurs with less frequency in the Marina and Seaside areas. It can also occur along the edges of oak woodland. Pajaro manzanita is readily distinguishable by its clasping, square-based leaves and mint green color. This species has been observed in the former Fort Ord military base near the intersection of General Jim Moore Boulevard and Broadway Avenue and near the intersection of Lightfighter Drive and Highway 1 near the northern entrance to the former Fort Ord military base (CDFW, 2016). This species has potential to occur in maritime chaparral, northern coastal scrub or coast live oak woodland communities along the new Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline alignments; at both the Ryan Ranch-Bishop and Main System-Hidden Hills Interconnection Improvements sites; at the Terminal Reservoir site; and at the ASR-5 and ASR-6 Well sites.

Sandmat manzanita (*Arctostaphylos pumila*). Sandmat manzanita is a CRPR 1B.2 taxon. It is a low-growing mounded shrub found in sand dunes. The leaves of sandmat manzanita are smaller than other locally occurring manzanitas. The bark is red and shredded. Sandmat manzanita is an important component of maritime chaparral in the former Fort Ord military base and is documented in the vicinity of General Jim Moore Boulevard, in coastal areas from Marina to Seaside, and near the Presidio of Monterey and the Monterey Airport (CDFW, 2016). During reconnaissance-level surveys conducted for this EIR/EIS, this species was observed in central dune scrub at multiple locations along the proposed new Transmission Main alignment between Marina and Lightfighter Drive (ESA, 2016). Two individuals were also observed along Lapis Road near the proposed new Desalinated Water Pipeline alignment during project related botanical surveys conducted in 2012 (ESA, 2012). A large population of this species has also been documented at the Terminal Reservoir site (Denise Duffy & Associates, 2010a; Fort Ord Reuse Authority, 2012). This species has potential to occur within central dune scrub and central maritime chaparral within the subsurface slant wells site, along the Source Water Pipeline alignment, along the new Desalinated Water Pipeline alignment, in the vicinity of the Main System-Hidden Hills Interconnection Improvements, and at the ASR-5 and ASR-6 Wells sites, along the ASR Conveyance Pipeline, ASR Recirculation Pipeline, and the ASR Pump-to-Waste Pipeline alignments.

Ocean bluff milkvetch (*Astragalus nuttallii* var. *nuttallii*). Ocean bluff milkvetch is a CRPR 4.2 taxon. It is a perennial herb of the pea family, endemic to the central coast of California where it grows in sandy soils and forms a thick, low clump of hairy stems and leaves. Flowers are dull cream-colored to violet and fruit is an inflated legume pod up to 6 centimeters in length containing many seeds in a single chamber. Observed during focused botanical surveys of the CEMEX active mining facility conducted in 2015 (AECOM, 2016). May occur in central dune scrub throughout the project area at the subsurface slant wells site, along the Source Water

Pipeline alignment, along the new Desalinated Water Pipeline alignment, the ASR-5 and ASR-6 Wells sites, along the ASR Conveyance Pipeline, ASR Recirculation Pipeline, and the ASR Pump-to-Waste Pipeline alignments, and at the Terminal Reservoir site.

Monterey coast paintbrush (*Castilleja latifolia*). Monterey Coast paintbrush is a CRPR 4.3 taxon. It is a hemiparasitic perennial herb in the broomrape family (Orobanchaceae) that typically blooms between February and September. It grows in sandy soils in closed-cone coniferous forest, coastal dunes, coastal scrub, and openings in cismontane woodland. Monterey Coast paintbrush has been observed in central dune scrub during reconnaissance surveys of the new Transmission Main Pipeline alignment between Reservation Road and Lightfighter Drive and at the CEMEX active mining facility (ESA, 2016; AECOM, 2016). Monterey Coast paintbrush has potential to occur in central dune scrub, central maritime chaparral, and coast live oak woodland at the subsurface slant well site, along the Source Water Pipeline, new Desalinated Water Pipeline, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline alignments, at the ASR-5 and ASR-6 Wells, and at the Terminal Reservoir site.

Monterey ceanothus (*Ceanothus rigidus*). Monterey ceanothus is a CRPR 4.2 taxon. It is a perennial evergreen shrub in the buckthorn family (Rhamnaceae) that typically blooms between February and June. This species is found in closed-cone coniferous forest, chaparral, and coastal scrub areas with sandy soils. It is found in Monterey, Santa Cruz, and San Luis Obispo Counties. Monterey ceanothus is known at the Terminal Reservoir site (Fort Ord Reuse Authority, 2012; AECOM, 2016). It was also observed within the new Transmission Main alignment and adjacent to the ASR Conveyance, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline alignments in 2014 during surveys conducted for the proposed project (URS, 2014b). Monterey ceanothus has potential to occur within central dune scrub and central maritime chaparral at the proposed subsurface slant wells site, along the Source Water Pipeline, new Desalinated Water Pipeline, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline alignments, and at the ASR-5 and ASR-6 Wells.

Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*). Congdon's tarplant is a CRPR 1B.1 taxon. This spiny, resinous, annual herb in the sunflower family (Asteraceae) occurs in grassland, particularly in areas with alkaline substrates, and in depressions or disturbed areas where water collects. The blooming period extends from June through November. The range of this species includes Alameda, Contra Costa, Monterey, Santa Clara, San Luis Obispo, and San Mateo counties. Congdon's tarplant has been observed in grassland and drainage ditches in the vicinity of Highway 68 east and northeast of both the Ryan Ranch-Bishop and Main System-Hidden Hills Interconnection Improvements. It has also been observed in mesic grassland areas at the Moss Landing Power Plant (CDFW, 2016). This species often occurs in disturbed areas and has potential to occur in slightly mesic, alkaline grassland and ruderal areas in the vicinity of the Ryan Ranch-Bishop and Main System-Hidden Hills Interconnection Improvements and at the MPWSP Desalination Plant site.

Branching beach aster (*Corethrogyne filaginifolia* [formerly *C. leucophylla*]). Branching beach aster is a CRPR 3.2 taxon. It is a perennial herb in the sunflower family. This species typically blooms between May and December and typically occurs in closed-cone coniferous

forest and coastal dune and dune scrub habitat in sandy soils between taller shrub cover. It was frequently observed within the Source Water Pipeline, new Desalinated Water Pipeline, Castroville Pipeline, and new Transmission Main alignments during surveys conducted for the proposed project (URS, 2014b; ESA, 2016).

Eastwood's goldenbush (*Ericameria fasciculata*). Eastwood's goldenbush is a CRPR 1B.1 taxon. It is a perennial yellow-flowering shrub in the sunflower family that blooms from July through October. This species occurs in sandy soils in openings in closed-cone coniferous forest, maritime chaparral, coastal dunes, and coastal scrub communities. Eastwood's goldenbush has been observed on the former Fort Ord military base in the vicinity of General Jim Moore Boulevard and between Patton Parkway and Imjin Road east of Highway 1 (CDFW, 2016). This species has also been documented within the Terminal Reservoir site (Denise Duffy & Associates, 2010a; Fort Ord Reuse Authority, 2012; AECOM, 2016). It has potential to occur in central dune scrub, maritime chaparral, and coastal sage scrub communities at the subsurface slant well site, along the Source Water Pipeline, new Desalinated Water Pipeline, new Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline alignments, in the vicinity of the Main System-Hidden Hills Interconnection Improvements, and at the ASR-5 Well and ASR-6 Well sites.

Sand-loving wallflower (*Erysimum ammophilum*). Sand-loving wallflower is a CRPR 1B.2 taxon. It is an annual yellow-flowered herb in the mustard family (Brassicaceae) that blooms February through June. This species is another rare associate of the maritime chaparral community, growing on loose sandy soils of coastal and inland dunes. This species was documented at the Terminal Reservoir site in 2010 (Denise Duffy & Associates, 2013). Populations of sand-loving wallflower are documented within Marina State Beach, Fort Ord Dunes State Park, on former Fort Ord lands in the vicinity of Marina, on the former Fort Ord military base in the vicinity of General Jim Moore Boulevard (including the Terminal Reservoir site), and in disturbed dunes north of the CEMEX sand mining facility (CDFW, 2016). Individuals of this species were observed in coastal dunes north of the CEMEX sand mining facility during project related botanical surveys conducted in 2012 (ESA, 2012). Additionally this species was observed in 2014 and 2016 during surveys conducted for the proposed project at the subsurface slant well site within central dune scrub at the CEMEX active mining facility (ESA, 2014; 2016). Sand-loving wallflower was also documented in central dune scrub along the new Transmission Main Pipeline between Patton Parkway and Imjin Parkway (AECOM, 2016). This species has potential to occur in central dune scrub and maritime chaparral along the Source Water Pipeline, new Desalinated Water Pipeline, new Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline alignments, and at the ASR-5 Well and ASR-6 Well sites.

Kellogg's horkelia (*Horkelia cuneata* ssp. *sericea*). Kellogg's horkelia is a CRPR 1B.1 taxon. A spreading perennial herb in the rose family (Rosaceae), Kellogg's horkelia is associated with relict dunes and old marine terraces from San Mateo County south to Santa Barbara County. Relatively recent (within the last 30 to 40 years) CNDDB occurrence records have documented this species within the former Fort Ord military base east of General Jim Moore Boulevard within the development water infiltration area that will be used during development of the ASR-5 Well

and ASR-6 Well, north of the Ryan Ranch-Bishop Interconnection Improvements site, and north of Imjin Parkway east of Highway 1 (CDFW, 2016). This species was observed along Del Monte Boulevard along the new Desalinated Water Pipeline alignment during project related botanical surveys conducted in 2012 and 2016 (ESA, 2012; 2016). Kellogg' horkelia has potential to occur in central dune scrub and maritime chaparral at the subsurface slant well site, along the Source Water Pipeline alignment, and at the Terminal Reservoir site.

Carmel Valley bush-mallow (*Malacothamnus palmeri* var. *involucratus*). Carmel Valley bush-mallow is a CRPR 1B.2 taxon. It is a shrub in the mallow family (Malvaceae), and is a fire-dependent species found on talus hilltops and slopes in chaparral, woodland, and coastal scrub communities. This variety is endemic to Monterey and San Luis Obispo Counties. In the vicinity of the project area, more recent observations have been documented in the vicinity of the Main System-Hidden Hills Interconnection Improvements and Ryan Ranch–Bishop Interconnection Improvements (CDFW, 2016). In 2002, Carmel Valley bush-mallow was observed approximately 0.2 mile southwest of the Main System–Hidden Hills Interconnection Improvements and in 2003 it was observed in coast live oak forest approximately 300 feet south of the Ryan Ranch–Bishop Interconnection Improvements (CDFW, 2016). Carmel Valley bush-mallow has potential to occur in central dune scrub, central maritime chaparral, northern coastal scrub, coast live oak woodland, and non-native grassland communities along the ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline alignments, at the Terminal Reservoir site, in the vicinity of the Main System-Hidden Hills Interconnection Improvements and Ryan Ranch–Bishop Interconnection Improvements, and at the ASR-5 Well and ASR-6 Well sites.

Marsh microseris (*Microseris paludosa*). Marsh microseris is a CRPR 1B.2 taxon. It is a perennial herb in the sunflower family that typically blooms between April and June, and uncommonly through July. It occurs in vernally wet areas within closed-cone coniferous forest, woodland, coastal scrub, and valley and foothill grasslands. It is found in the San Francisco Bay Area and along the central California coast. There are other historical records from the Del Monte Forest area. The most recent CNDDB observations of this species in the vicinity of the project area is from a 1997 observation located approximately 1.5 miles southwest of the Ryan Ranch–Bishop Interconnection Improvements (CDFW, 2016). This species has potential to occur within seasonally wet areas in the vicinity of both the Ryan Ranch–Bishop and Main System-Hidden Hills Interconnection Improvements sites.

Northern curly-leaved monardella (*Monardella sinuata* ssp. *nigrescens*). Northern curly-leaved monardella is a CRPR 1B.2 taxon. It is an annual herb in the mint family (Lamiaceae), found in chaparral, coastal dunes, coastal scrub, and lower montane coniferous forest. Northern curly-leaved monardella typically blooms between April and September. This species has been observed in suitable habitat at several locations within the project vicinity (CDFW, 2016). The two most recent observations are from the former Fort Ord east of the Terminal Reservoir site and in the vicinity of the Monterey Regional Airport. This species has potential to occur within central dune scrub, central maritime chaparral, and northern coastal scrub communities at the subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, new Transmission Main, ASR-5 and ASR-6 Wells, ASR Conveyance Pipeline, ASR Recirculation Pipeline, ASR Pump-to-Waste Pipeline, and the Terminal Reservoir.

South coast branching phacelia (*Phacelia ramosissima* var. *austrolitoralis*). South coast branching phacelia is a CRPR 3.2 taxon. It is a perennial herb in the forget-me-not family (Boraginaceae), found in chaparral, coastal dunes, coastal scrub, and coastal sandy (sometimes rocky) marshes and swamps. South coast phacelia typically blooms between March and August. This species was observed at the Terminal Reservoir site during surveys conducted for the proposed project in 2014 (URS, 2014b). South coast branching phacelia has potential to occur in central dune scrub, central maritime chaparral, and northern coastal scrub communities at the subsurface slant wells site, within the Source Water Pipeline, new Desalinated Water Pipeline, Castroville Pipeline, new Transmission Main, and Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline).

Monterey pine (*Pinus radiata*). Monterey pine is a CRPR 1B.1 taxon. It is a perennial evergreen tree in the pine family (Pinaceae). There are only three native stands in California: at Ano Nuevo, in Cambria, and on the Monterey Peninsula. This species has been widely introduced and used in landscaping in many other locations; however, Monterey pine trees planted in urban or streetscape locations typically are not considered special-status. The CNDDB reports two occurrences of this species in the vicinity of the project area. The occurrence records include the entire assumed historical range, which encompass much of the Monterey Peninsula and portions of the project area. In practice, individual or isolated trees that exist only in a landscaping context are not considered sensitive. However, the *Biological Assessment for the Monterey Bay Regional Desalination Project Monterey Presidio Project* concludes that Monterey pines within the Monterey Bay Regional Desalination Project Monterey Presidio Project area are considered special-status because they occur within the historic range of the species (Denise Duffy & Associates, 2010b). On a case-by-case basis, any Monterey pines present at the Terminal Reservoir site, at the Carmel Valley Pump Station, and both Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements sites may be considered special-status if they are within, or in close proximity to, the assumed historical range reported by the CNDDB.

Michael's rein orchid (*Piperia michaelii*). Michael's rein orchid is a CRPR 4.2 taxon. It is a perennial herb in the orchid family that typically blooms between April and August. It is found in coastal bluff scrub, closed-cone coniferous forest, chaparral, cismontane woodland, coastal scrub, and lower mountain coniferous forest. Michael's rein orchid was observed in several locations within the new Transmission Main pipeline alignment between Patton Parkway and Lightfighter Drive, along General Jim Moore Boulevard near San Pablo Avenue, and at one location within the Terminal Reservoir site during protocol level plant surveys conducted for the proposed project in 2014 (URS, 2014a). This species has potential to occur in central dune scrub and central maritime chaparral at the subsurface slant wells site, within the Source Water Pipeline, new Desalinated Water Pipeline, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline alignments, at the ASR-5 Well and ASR-6 Well, and in woodlands in the vicinity of the Ryan Ranch-Bishop and Main System-Hidden Hills Interconnection Improvements sites.

Santa Cruz microseris (*Stebbinsoseris decipiens*). Santa Cruz microseris is a CRPR 4.2 taxon. It is an annual herb in the sunflower family, found in open areas, sometimes in serpentine soils, in

broadleaf upland forest, chaparral, coastal prairie and scrub, and valley and foothill grassland communities. It occurs in Monterey, Santa Cruz, and Marin Counties. Santa Cruz microseris typically blooms in April and May. One CNDDB occurrence record for this species is located in the vicinity of the project area; in 1978 one plant was observed at the top of a roadcut outside of pasture just northeast of the Ryan Ranch–Bishop Interconnection Improvements (CDFW, 2016). This species has a potential to occur in coast live oak or grassland in the vicinity of both the Ryan Ranch-Bishop and Main System-Hidden Hills Interconnection Improvements sites.

Santa Cruz clover (*Trifolium buckwestiorum*). Santa Cruz clover is a CRPR 1B.1 taxon. It is an annual herb in the legume family that blooms April through October. It is typically found on margins of broadleaved upland forest, woodland, and coastal prairie. Its range includes Mendocino, Sonoma, San Mateo, Santa Cruz, and Monterey Counties. There are two CNDDB records for this species in the vicinity of the project area, both of which are from 1993 and are located near both the Ryan Ranch-Bishop Interconnection Improvements and Main System-Hidden Hills Interconnection Improvements sites (CDFW, 2016). This species has potential to occur within coast live oak woodland or non-native grassland in and around these two sites.

Reptiles

Western pond turtle (*Actinemys marmorata*). The western pond turtle is considered a California species of special concern. It is an aquatic turtle that usually leaves the aquatic site to reproduce, to aestivate, and to overwinter. This turtle requires some slack or slow water, although it occurs where enough food resources occur in faster moving water. Western pond turtle usually nest in hard-packed clay soil in upland areas from March to July. Hatchlings disperse from the nest with winter rains. Western pond turtles have been observed within the Carmel River, at a brackish water pond near the intersection of Beach Road and Reservation Road approximately 0.2 mile west of the proposed new Transmission Main Pipeline alignment (CDFW, 2016). This species has potential to occur within suitable aquatic habitat throughout the project area including Locke-Paddon Pond in Marina, Laguna del Rey Park in Monterey, the Salinas River, Tembladero Slough and freshwater marsh and riparian woodland and scrub north of Tembladero Slough.

Black legless lizard (*Anniella pulchra nigra*). Black legless lizard is considered a California species of special concern. They are found in sand dunes and sandy soils along the Monterey Bay. Black legless lizard typically inhabit dune areas with moist soil and bush lupine and mock heather as the dominant plants. They are fossorial animals that burrow in loose soil with a high sand content. This subspecies is typically black or dark brown above and yellow below. Some groups only recognize the species, California legless lizard (*Anniella pulchra*), and do not recognize this or other subspecies (i.e. silvery legless lizard described below). The specific CNDDB record locations for this species are suppressed by CDFW, but this species is known from sand dune communities, including both native and non-native plant dominant areas, at locations within the Marina, Seaside, Monterey, Moss Landing, and Watsonville West USGS 7.5 minute topographic quadrangles (CDFW, 2016). This species has potential to occur within central dune scrub, northern coastal scrub, and central maritime chaparral at the proposed subsurface slant well site; along the Source Water Pipeline, new Desalinated Water Pipeline, southwest portion of the Castroville Pipeline, new Transmission Main, ASR Conveyance Pipeline, ASR Recirculation

Pipeline, and ASR Pump-to-Waste Pipeline alignments; at the Terminal Reservoir site; and at the ASR-5 Well and ASR-6 Well sites.

Silvery legless lizard (*Anniella pulchra pulchra*). Silvery legless lizard is considered a California species of special concern. They are found in vegetation communities within sandy or loose loamy soils and sparse vegetation. Their range includes the coast and central valley of California from the southern San Francisco Bay Area to Baja California. This subspecies is silvery gray, or beige above and yellow below. As with the black legless lizard, some groups only recognize the species, California legless lizard, and do not recognize this or other subspecies. There is one CNDDB record for this subspecies in the vicinity of the project area; two individuals were observed in maritime chaparral near Reservation Road approximately 0.5 mile east of the project area (CDFW, 2016). The next closest CNDDB record is from sand dunes at Moss Landing approximately 5 miles northwest of the project area. Similar to the black legless lizard, this subspecies has potential to occur within central dune scrub, northern coastal scrub, and central maritime chaparral communities at the proposed subsurface slant well site; along the Source Water Pipeline, new Desalinated Water Pipeline, southwest portion of the Castroville Pipeline, new Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline alignments; at the Terminal Reservoir site; and at the ASR-5 Well and ASR-6 Well sites.

Coast horned lizard (*Phrynosoma blainvillii*). Coast horned lizard is considered a California species of special concern. They occupy loose sandy loam and alkaline soils in a variety of vegetation communities including chaparral, grasslands, saltbush scrub, coastal scrub, and clearings in riparian woodlands. Coast horned lizards primarily eat insects such as ants and beetles. Their population decline is mainly attributed to conversion of land for agricultural purposes. The human introduction of non-native Argentine ants, which tend to displace the native carpenter ants and do not provide enough nutrition for coast horned lizard, is another factor in their decline. Within the vicinity of the project area, coast horned lizards have been observed in grazed annual grasslands and coastal dune scrub north of Beach Road along the proposed new Desalinated Water Pipeline alignment (CDFW, 2016). They were also observed at the Terminal Reservoir site (URS, 2014a). Additionally, coast horned lizards have been observed at several locations approximately 1.5 miles east of the new Transmission Main alignment (CDFW, 2016). This species has potential to occur in sandy soils within grassland, central dune scrub, central maritime chaparral, and northern coastal scrub at the proposed subsurface slant well site; along the Source Water Pipeline, new Desalinated Water Pipeline, new Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline alignments; at the Terminal Reservoir site; and at the ASR-5 Well and ASR-6 Well sites.

Coast Range newt (*Taricha torosa*). Coast Range newt is considered a California species of special concern. Adult Coast Range newt habitat within central California includes grassland and woodland habitats. They breed in ponds, reservoirs and streams. Newts aestivate in terrestrial habitat during the dry summer and can migrate large distances between breeding and aestivation sites, however they may not migrate great distances if suitable aestivations sites are close to breeding sites. Coast Range newts have been observed in and around stock ponds located south of the Carmel River (CDFW, 2016). This species has potential to occur in ponds and streams and in

adjacent grassland and woodland habitat within the survey area including: MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Castroville Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, ASR Facilities, new Transmission Main, Terminal Reservoir, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and staging areas.

Birds

Tricolored blackbird (*Agelaius tricolor*). Tricolored blackbird is considered a California species of special concern. Tricolored blackbirds are found almost exclusively in the Central Valley and central and southern coastal areas of California. The tricolored blackbird is highly colonial and forms dense breeding colonies of up to tens of thousands of pairs. This species typically nests in tall, dense, stands of cattails or tules, but also nests in blackberry, wild rose bushes, and tall herbs. Nesting colonies are typically located near standing or flowing freshwater. Tricolored blackbirds form large, often multi-species, flocks during the nonbreeding period and range more widely during the nonbreeding period than during the reproductive season. This species has been observed at Locke-Paddon Park, less frequently at the Salinas River, northeast of the Salinas River, and at other locations in the vicinity of the survey area (CDFW, 2016; eBird, 2016). While this species may also forage in grassland and agricultural areas throughout the project area, Locke-Paddon Park and Laguna del Rey Park are the only areas in the project area that provide adequate potential nesting habitat.

Short-eared owl (*Asio flammeus*). Short-eared owl is considered a California species of special concern. This species inhabit densely vegetated grasslands, emergent wetlands, and shrublands along the coast with abundant prey (e.g., voles, other small mammals, birds, reptiles, amphibians, and arthropods). Short-eared owls require dense vegetative cover such as tall grasses and freshwater emergent vegetation for roosting and resting. Nesting occurs from April through July, with nests constructed on dry ground in depressions concealed by dense vegetation. In the project vicinity, short-eared owl has been observed at the Salinas River National Wildlife Refuge and Armstrong Ranch grasslands (eBird, 2016). This species could forage or nest in grassland, wetland, or northern coastal scrub habitat in the project area near the proposed Source Water Pipeline, new Desalinated Water Pipeline, Castroville Pipeline, and New Transmission Pipeline alignments, and near the proposed MPWSP Desalination Plant facility.

Western burrowing owl (*Athene cunicularia*). Western burrowing owl is considered a California species of special concern. It is a small, terrestrial owl of open country that favors flat, open grassland and sparse shrubland ecosystems. In California, western burrowing owls are found in close association with California ground squirrels. Ground squirrels provide western burrowing owls with nesting and refuge burrows, and maintain areas of short vegetation height, providing foraging habitat and allowing for visual detection of avian predators by burrowing owls. Burrowing owls are semi-colonial nesters, and group size is one of the most significant factors contributing to site constancy by breeding burrowing owls. The nesting season, as recognized by the CDFW, runs from February 1 through August 31. Within the project vicinity, wintering burrowing owls have been observed within coastal dune scrub near the U.S. Navy Post Graduate School and in grazed grassland north of Beach Road on either side of the new Transmission Main

Pipeline alignment (CDFW, 2016). ESA observed two burrowing owls in these grasslands between Highway 1 and Del Monte Blvd. during 2016 reconnaissance surveys (ESA, 2016). Burrowing owls were also historically observed in open valley fields on the former Fort Ord lands near Reservation Road (CDFW, 2016). No recent local breeding burrowing owl occurrence records are included in the CNDDB (CDFW, 2016). During biological surveys conducted for the proposed project numerous ground squirrels and ground squirrel burrows were observed within non-native grassland, central dune scrub, and ruderal areas (ESA, 2016). Both breeding and wintering burrowing owls have potential to occur in non-native grassland, central dune scrub, central maritime chaparral, and ruderal areas that support ground squirrel populations along the Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main Pipeline alignments and at the Terminal Reservoir site.

Red-tailed hawk (*Buteo jamaicensis*). Red-tailed hawks, their nests, and their eggs are protected under California Fish and Game Code 3503.5. This species is commonly found in woodlands and open country with scattered trees. These large hawks feed primarily on small mammals, but will also prey on other small vertebrates, such as snakes and lizards, as well as small birds and invertebrates. Red-tailed hawks nest in a variety of trees in urban, woodland, and agricultural areas. This species is commonly found throughout the project vicinity (eBird, 2016). Red-tailed hawks may forage within grassland and scrub communities within the project area and could potentially nest within mature trees or suitable structures throughout the project area.

Red-shouldered hawk (*Buteo lineatus*). Red-shouldered hawks, their nests, and their eggs are protected under California Fish and Game Code 3503.5. This species is another common raptor species typically found in a variety of woodlands with nearby open areas for foraging. This species has a highly varied diet of small mammals, snakes, lizards, amphibians, small or young birds, and large insects. Red-shouldered hawks build large stick nests in mature trees, including riparian woodland trees and large eucalyptus groves. This species has been observed at numerous locations throughout the project vicinity, most commonly within Laguna del Rey Park and El Estero Park (eBird, 2016). Red-shoulder hawks have potential to nest within riparian woodland, eucalyptus forest, oak woodland, and large groves of ornamental trees within the project area.

Ferruginous hawk (*Buteo regalis*). The ferruginous hawk is included on CDFW's watch list. This species is primarily a bird of the Great Plains and the Rockies, and only winters in California, typically in groups. This species forages over open country including grasslands, deserts, and sagebrush scrub, where it preys on small mammals. Ferruginous hawk has been observed near Moss Landing, on Former Fort Ord Base lands, Salinas River Water Treatment Plant, and at Armstrong Ranch (eBird, 2016). In 2004, four ferruginous hawks were observed wintering in the Armstrong Ranch grasslands (CDFW, 2016). This species could winter in grassland and forage over northern coastal scrub habitat in the project area near the proposed Source Water Pipeline, new Desalinated Water Pipeline, southwest portion of the Castroville Pipeline, and New Transmission Pipeline alignments, and near the proposed MPWSP Desalination Plant facility.

Northern harrier (*Circus cyaneus*). Northern harrier, its nests, and its eggs are protected under California Fish and Game Code 3503.5. This species forages over grasslands, wet meadows,

sloughs, and marshes, feeding on small mammals such as California vole, mice, birds, frogs, small reptiles, and insects. In western states, this species nests on the ground in dry uplands. Northern harrier has been observed near the mouth of the Salinas River, at Armstrong Ranch, Marina State Beach, Fort Ord Dunes State Park, and former Fort Ord base lands in the project vicinity (eBird, 2016). This species could forage over the dunes near the subsurface slantwells; forage or nest in grassland, wetland, northern coastal scrub or central maritime chaparral habitat in the project area near the proposed Source Water Pipeline, new Desalinated Water Pipeline, southwest portion of the Castroville Pipeline, and New Transmission Pipeline alignments; near the proposed MPWSP Desalination Plant facility; along the ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline alignments; at the Terminal Reservoir site; and at the ASR-5 Well and ASR-6 Well sites.

White-tailed kite (*Elanus leucurus*). White-tailed kite is a state Fully Protected species. These raptors forage for small rodents and other prey primarily in open grassy or scrubby areas. They nest in large shrubs or trees adjacent to this habitat. Kites are likely to be found foraging in a variety of vegetation communities throughout the project area such as grassland, northern coastal scrub, and central maritime chaparral. White-tailed kites have been observed throughout the project vicinity (eBird, 2016). Suitable nesting habitat in areas with low levels of human disturbance is found throughout the project area.

California horned lark (*Eremophila alpestris actia*). California horned lark is included on CDFW's watch list. California larks are a permanent resident in most of California except the Sierra during winter. This species is usually found in open habitat, such as grassland and agricultural areas, where trees and shrubs are absent and has been observed from sea level to above treeline in grasslands, deserts and alpine dwarf-scrub habitat. Horned lark uses grasses, shrubs, forbs, rocks, litter, clods of soil, and other surface irregularities for cover from predators. The California horned lark typically nests in dry grasslands and rangelands that provide low, sparse cover (e.g., grazed, mowed, or barren areas without trees and shrubs) between March and July. Foraging habitat includes open grasslands where insects and seeds are abundant. This species has been observed at the Salinas River National Wildlife Refuge, grasslands of Armstrong Ranch, and in former Fort Ord military base lands within the project vicinity (eBird, 2016). California horned lark may forage and nest in grassland near the new Desalinated Water Pipeline, Source Water Pipeline, south west portion of the Castroville Pipeline, new Transmission Main Pipeline near Lightfighter Drive, Pipeline to CSIP Pond, near the proposed MPWSP Desalination Plant facility, and near the Ryan Ranch Interconnection Improvement site.

American peregrine falcon (*Falco peregrinus*). Peregrine falcon is a federally and state delisted species and state Fully Protected. They are known throughout California and are year-around residents along the Pacific coast. The peregrine is a specialist, preying primarily on mid-sized birds in flight, such as pigeons and doves. Occasionally these birds will eat insects and bats. Although typical nesting sites for the species are tall cliffs, preferably over or near water, peregrines are also known to use urban sites, including bridges and tall buildings. Peregrine falcons have been observed at Laguna Grande Regional Park, near Armstrong Ranch, and along the coast between Marina and Monterey (eBird, 2016). A peregrine nest has been observed within the Moss Landing USGS 7.5 7.5-minute topographic quadrangle, although the exact location is

suppressed by the CNDDB (CDFW, 2016). Nesting habitat is absent from the project area, but this species may hunt and perch throughout the project area.

American kestrel (*Falco sparverius*). American kestrel, its nests, and its eggs are protected under California Fish and Game Code 3503.5. This species is a relatively small member of the falcon family that preys on small birds, mammals, lizards, and insects. The kestrel is found most commonly in open areas, such as grasslands and pastures. American kestrels nest primarily in tree cavities but may also nest in buildings. American kestrels have regularly been observed at Armstrong Ranch and Laguna Grande Park and occasionally at other locations in the project vicinity (eBird, 2016). Most documented sightings occurred in the non-breeding season. This species may nest in trees or buildings located adjacent to foraging habitat, such as grassland and agricultural fields, and forage throughout these open areas.

Loggerhead shrike (*Lanius ludovicianus*). Loggerhead shrike is considered a California species of special concern. They are year-round residents in grassland and scrub communities in California, where they forage primarily on large insects, lizards, and small mammals. Shrikes generally build their nests in shrubs in fairly open areas. This species has been observed at a few locations in the project vicinity including Armstrong Ranch, Fort Ord Dunes State Park, and Ryan Ranch in Del Rey Oaks (eBird, 2016). This species has potential to forage and nest in grassland, northern coastal scrub, and coast live oak woodland communities throughout the project area.

Mammals

Pallid bat (*Antrozous pallidus*). Pallid bat is considered a California species of special concern. They are pale to light brown in color and weighing about 1 ounce, the Pacific race is one of the state's largest bats. Coastal colonies commonly roost in deep crevices in rocky outcroppings, in buildings, under bridges, and in hollow trees. Colonies can range from a few individuals to over a hundred and are non-migratory. Some female and/or young colonies (typical of the coastal subspecies) may use their day roost for their nursery as well as for winter roosting. Pallid bats typically breed from March 15 through August 15. Although crevices are important for day roosts, night roosts often include porches, garages, barns, and highway bridges. Pallid bats may travel up to several miles for water or foraging sites if roosting sites are limited. Pallid bats prefer foraging on terrestrial arthropods in dry open grasslands, vineyards, orchards, or oaks near water and rocky outcroppings or old structures. Although the occurrence of pallid bat in the this part of Monterey County is not well-documented, the species could forage over a variety of communities in the project area and could potentially roost in human-made structures such as the Highway 1 overpasses or smaller bridge crossings in Castroville, Marina, Seaside, and Monterey and in trees throughout the project area.

Western red bat (*Lasiurus blossevillii*). Western red bat is considered a California species of special concern. In California, the western red bat is found in coastal areas south of the San Francisco Bay and in the Central Valley and surrounding foothills (Bolster, 1998). They roost in tree and shrub foliage, predominantly in edge habitats adjacent to streams and open fields. They are often associated with riparian habitats. The western red bat could occur in trees located throughout the project area, particularly those associated with riparian areas.

Monterey dusky-footed woodrat (*Neotoma fuscipes luciana*). Monterey dusky-footed woodrat is considered a California species of special concern. This species prefers hardwood forests, riparian communities, and brushlands and often forages above ground. Food includes berries, fungi, leaves, flowers, and nuts. Woodrats construct large nests of sticks. The breeding season of dusky-footed woodrat typically extends from February through November (Carraway and Verts, 1991). However, at the Hastings Reserve in the Upper Carmel Valley of Monterey County, reproduction is observed year-round, with the fewest pregnancies occurring during December and the most during February (Williams et al., 1992). During reconnaissance-level surveys conducted for the proposed project, woodrat nests were observed in riparian woodland adjacent to the Salinas River near the Highway 1 overcrossing, approximately 0.5 mile north of the project area. Woodrat nests have been observed at the Terminal Reservoir site (URS, 2014a). Woodrats could occur in oak woodland in the vicinity of both the Ryan Ranch-Bishop and Main System-Hidden Hills Interconnection Improvements sites. Woodrats could also occur in central maritime chaparral, northern coastal scrub, and coast live oak woodland communities along the ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline alignments, at the ASR-5 and ASR-6 Wells sites, at the Carmel Valley Pump Station site, and the Ryan Ranch-Bishop Interconnection Improvements site, and Main System-Hidden Hills Interconnection Improvements site

Monterey shrew (*Sorex ornatus salarius*). Monterey shrew is considered a California species of special concern. This species is found in coastal salt marshes and adjacent sand hills and riparian wetland, woodland, and upland communities in the vicinity of the Salinas River Delta. According to the *Draft Installation-Wide Multispecies Habitat Conservation Plan*, which covers the former Fort Ord military base lands (HCP), in 2005, shrews that were believed to be Monterey shrews were captured during California tiger salamander salvage surveys conducted at the East Garrison site on the eastern end of Reservation Road (Fort Ord Reuse Authority, 2012). The DNA analysis had not been completed at the time of the publication of the HCP but based on the location it is assumed that captured shrews were subspecies *salarius*. Between 2010 and 2011 shrews were also inadvertently captured during California tiger salamander surveys at the Fort Ord Natural Reserve, which is located on the east side of Del Monte Boulevard along Reservation Road. DNA analysis of these shrews was also not available at the time of publication of the HCP, however it is assumed that they are the subspecies *salarius* based on dentition and external morphology. These shrews were found in a variety of vegetation types including: shaggy bark manzanita, coastal scrub, under oak trees, sandmat manzanita, and non-native grassland. Based on the 2005 and 2010/2011 captures, Monterey shrew also potentially occur in coast live oak woodland, grasslands, northern coastal scrub, central maritime chaparral, and savanna vegetation. The HCP mapped potential habitat for the Monterey shrew. Based on that habitat mapping and onsite conditions, Monterey shrew has potential to occur along the new Transmission Main Pipeline, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline alignments along General Jim Moore Blvd.; at the Carmel Valley Pump Station; in the vicinity of the Ryan Ranch-Bishop Interconnection Improvements and Main System-Hidden Hills Interconnection Improvements; at the Terminal Reservoir site; and at the ASR-5 Well and ASR-6 Well sites.

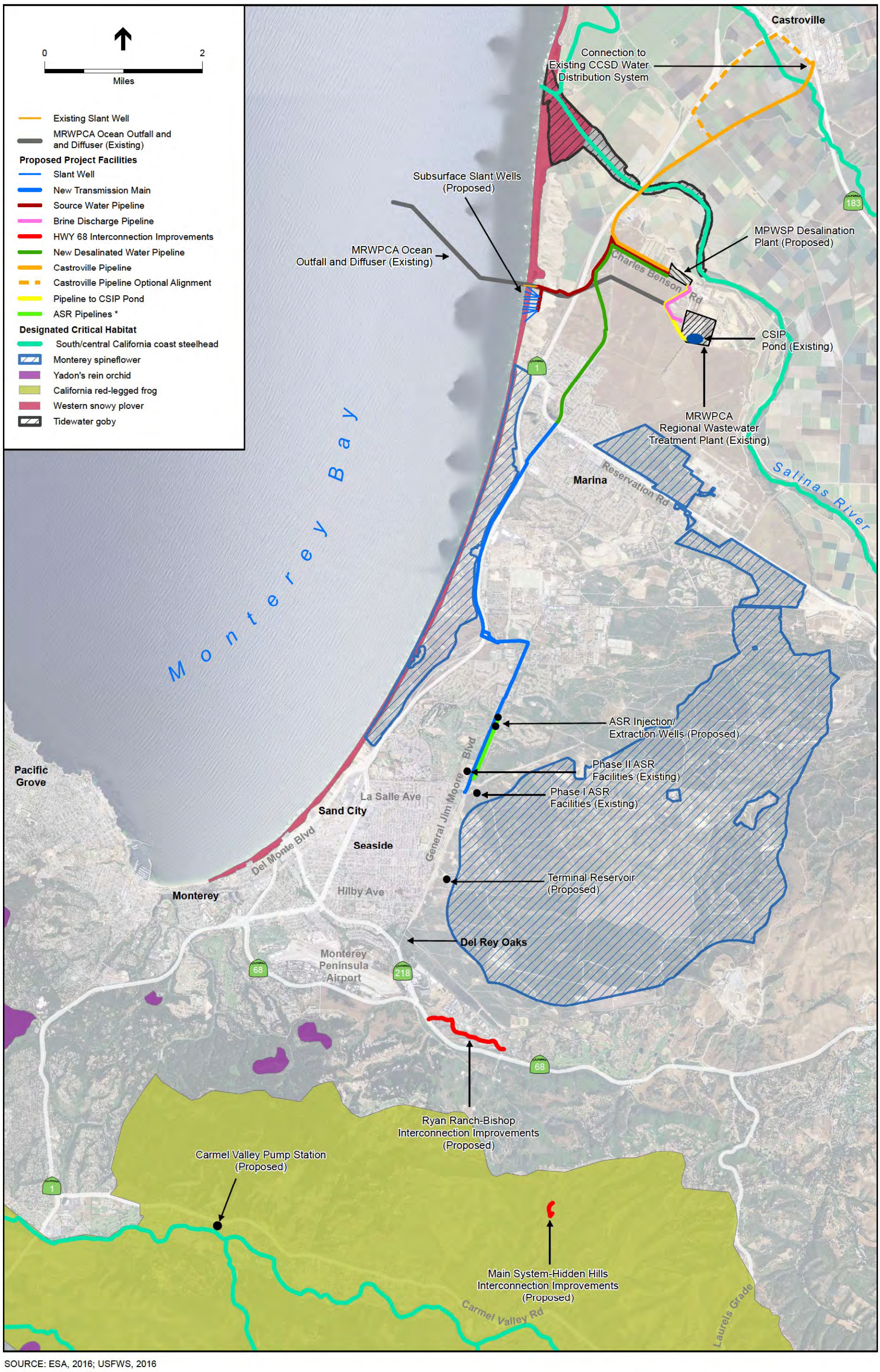
American badger (*Taxidea taxus*). American badger is considered a California species of special concern. In North America, American badgers occur as far north as Alberta, Canada and as far south as central Mexico. In California, American badgers occur throughout the state except in humid coastal forests of northwestern California in Del Norte and Humboldt Counties. The species has been decreasing in numbers throughout California over the last century. American badgers occur in a wide variety of open, arid vegetation communities but are most commonly associated with grasslands, savannas, mountain meadows, and open areas of desert scrub. The principal habitat requirements for this species appear to be sufficient food (burrowing rodents), friable soils, and relatively open uncultivated ground. American badgers are primarily found in areas of low to moderate slope. There is a historical CNDDB occurrence record for this species from the city of Marina. More recent records indicate the species was observed in grazed grassland in the vicinity north of the Ryan Ranch-Bishop and Main System-Hidden Hills Interconnection Improvements sites and in grasslands, oak savannas, and coast live oak woodland habitat at the former Fort Ord approximately 0.5 mile east of the Terminal Reservoir site (CDFW, 2016). This species has potential to occur in non-native grassland at the MPWSP Desalination Plant, along the Source Water Pipeline, new Desalinated Water Pipeline, Castroville and new Transmission Main alignments, at the Terminal Reservoir site, ASR-5 and ASR-6 Wells, ASR Conveyance Pipeline, ASR Recirculation Pipeline, and ASR Pump-to-Waste Pipeline alignment and in the vicinity of the Ryan Ranch-Bishop and Main System-Hidden Hills Interconnection Improvements sites.

4.6.1.9 Critical Habitat

Critical habitat for six federally listed species is designated either within or in close proximity to the proposed project. The species include Monterey spineflower, Yadon's rein orchid, south/central California steelhead, California red-legged frog, western snowy plover, and tidewater goby. **Figure 4.6-3** shows designated critical habitat for these species in the project vicinity.

Monterey Spineflower

Two Monterey spineflower critical habitat units occur in the project vicinity. Unit 3 (Marina) includes coastal beaches, dunes, and bluffs from the city of Marina south to the city of Seaside and Sand City and generally parallels the western side of the study area. An approximately 2-mile segment of the proposed new Transmission Main alignment is located parallel, and between 150 and 200 feet east, of the eastern boundary of Unit 3. Unit 8 (Fort Ord) includes grassland, maritime chaparral, coastal scrub, and oak woodland within the former Fort Ord military base east of General Jim Moore Boulevard. The Terminal Reservoir site and area where water produced during development of the ASR-5 and ASR-6 wells would be conveyed lie along a portion of the western boundary of Unit 8. The Federal Register listing notice for Monterey spineflower (73 FR 6) defines the primary constituent element for this species as a vegetation structure arranged in a mosaic with openings between the dominant elements (e.g., scrub, shrub, oak trees, or clumps of herbaceous vegetation) that changes in spatial position as a result of physical processes such as windblown sands and fire and that allows sunlight to reach the surface of the following sandy soils: coastal beaches, dune land, Baywood sand, Ben Lomond sandy loam, Elder sandy loam, Oceano loamy sand, Arnold loamy sand, Santa Ynez fine sandy loam, Arnold- Santa Ynez complex, Metz complex, and Metz loamy sand.



SOURCE: ESA, 2016; USFWS, 2016

NOTE:
*The ASR Pipelines are the ASR Conveyance Pipeline, the ASR Pump-to-Waste Pipeline, and the ASR Recirculation Pipeline. See Figure 3-9a for the individual pipeline alignments.

205335.01 Monterey Peninsula Water Supply Project

Figure 4.6-3
Designated Critical Habitat

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Yadon's Rein Orchid

Multiple Yadon's rein orchid critical habitat units are located in the project vicinity. Units 4a and 4b (Aguajito), 5 (Old Capitol), and 6a and 6e (Monterey Peninsula) are all located within 2 miles of the study area. Units 4a and 4b are located between 1.3 and 1.9 miles southeast of the Ryan Ranch–Bishop Interconnection Improvements, respectively. Units 4a and 4b contain a mix of Monterey pine forest and maritime chaparral communities. Unit 6a supports Monterey pine forest, Gowen cypress/Bishop pine forest, and maritime chaparral. Unit 6e supports a mix of coast live oak and Monterey pine forest. The area between Units 5, 6a, and 6e and the study area is generally developed. The area between Units 4a and 4b and the Ryan Ranch–Bishop Interconnection Improvements site is generally undeveloped and includes a mix of grassland and oak woodland communities. The Federal Register listing notice for Yadon's rein orchid (72 FR 205) defines the primary constituent elements for this species as:

1. A vegetation structure providing filtered sunlight on sandy soils:
    a. Coastal pine forest (primarily Monterey pine) with a canopy cover of 20 to 70 percent, and a sparse herbaceous understory on Baywood sands, Narlon loamy fine sands, Sheridan coarse sandy loams, Tangair fine sands, Santa Lucia shaly clay loams and Chamise shaley clay loams underlain by a hardpan; or
    b. Maritime chaparral ridges with dwarfed shrubs (primarily Hooker's manzanita) on Reliz shaly clay loams, Sheridan sandy loams, Narlon sandy loams, Arnold loamy sands and soils in the Junipero–Sur complex, Rock Outcrop–Xerorthents Association, and Arnold–Santa Ynez complex often underlain by rock outcroppings.
2. Presence of nocturnal, short-tongued moths in the families Pyralidae, Geometridae, Noctuidae, and Pterophoridae.

South/Central California Coast Steelhead

The study area is located between two critical habitat hydrologic units for south/central California coast steelhead: the Carmel River Hydrologic Unit and the Salinas Hydrologic Unit. Both the Salinas River and Tembladero Slough, which are within the Salinas Hydrologic Unit, are located within the Castroville Pipeline alignment. Tembladero Slough is also within the Castroville Pipeline optional alignment 1. The Carmel River, which is located within the Carmel River Hydrologic Unit, is located approximately 280 feet south of the proposed Carmel Valley Pump Station. The Federal Register listing notice for south/central California coast steelhead (70 FR 170) defines primary constituent elements for this species as: freshwater spawning sites, freshwater rearing sites, freshwater migration corridors, estuarine areas free of obstruction, and offshore marine areas with water quality and habitat conditions suitable to support this species.

California Red-Legged Frog

Both the Main System–Hidden Hills Interconnection Improvements site and Carmel Valley Pump Station site are located within California red-legged frog critical habitat Unit MNT-2 (Carmel River). The Ryan Ranch–Bishop Interconnection Improvements site is located approximately 1.0 mile north of this unit. Unit MNT-2 includes the Carmel River drainage and nearby San Jose

Creek. The Federal Register listing notice for California red-legged frog (75 FR 51) defines primary constituent elements for this species as:

1. Aquatic breeding habitat, which is described as standing bodies of fresh water including streams, pools, and other ephemeral or permanent water bodies;

2. Non-breeding aquatic and riparian habitat, which is described as freshwater pond or stream habitats that may not hold water long enough for the species to complete its life cycle, but could provide for shelter, foraging, predator avoidance, and aquatic dispersal of frogs;

3. Upland habitat, which is defined as upland areas adjacent to breeding or non-breeding aquatic habitat including various vegetation types such as grassland, woodland, forest, wetland, or riparian areas that provide shelter, forage, and predator avoidance for frogs. Upland habitat should include boulders, rocks and organic debris, small mammal burrows, or moist leaf letter; and

3. Dispersal habitat, which is defined as accessible upland or riparian habitat within and between occupied or previously occupied sites located within 1 mile of each other. Dispersal habitat does not include moderate- to high-density urban or industrial developments with large expanses of asphalt or concrete, or other areas that do not contain features identified in 1, 2, or 3 above.

Western Snowy Plover

Western snowy plover critical habitat Unit CA 22 (Monterey to Moss Landing) includes beaches from Moss Landing south to Monterey. The northernmost slant well head and the western terminus of the Source Water Pipeline alignment are located approximately 240 feet east of, and outside of, this critical habitat unit. The remaining slant well heads are approximately 600 feet east of the critical habitat unit. Portions of the new Transmission Main, and new Desalinated Water Pipeline alignments run roughly parallel and east of this unit and are located a minimum of 0.2 to 0.6 mile from the unit. The Federal Register listing notice for western snowy plover (77 FR 118) defines the primary constituent elements for the western snowy plover as sandy beaches, dune systems immediately inland of an active beach face, salt flats, mudflats, seasonally exposed gravel bars, artificial salt ponds and adjoining levees, and dredge spoil sites, with:

1. Areas that are below heavily vegetated areas or developed areas and above the daily high tides;

2. Shoreline habitat areas for feeding, with no or very sparse vegetation, that are between the annual low tide or low water flow and annual high tide or high water flow, subject to inundation but not constantly under water, that support small invertebrates, such as crabs, worms, flies, beetles, spiders, sand hoppers, clams, and ostracods, that are essential food sources;

3. Surf- or water-deposited organic debris, such as seaweed (including kelp and eelgrass) or driftwood located on open substrates that supports and attracts small invertebrates described in (2) for food, and provides cover or shelter from predators and weather, and assists in avoidance of detection (crypsis) for nests, chicks, and incubating adults; and

4. Minimal disturbance from the presence of humans, pets, vehicles, or human-attracted predators, which provide relatively undisturbed areas for individual and population growth and for normal behavior.

Tidewater Goby

Tidewater goby (*Eucyclogobius newberryi*) critical habitat Unit MN-2 (Salinas River) includes the lower reach of the Salinas River. This unit is outside the geographical area occupied by the species and is not considered to be currently occupied. This unit is located within the proposed Castroville Pipeline alignment. The Federal Register listing notice for tidewater goby (78 FR 25) defines the primary constituent element for tidewater goby as follows:

1. Persistent, shallow (in the range of approximately 0.3 to 6.6 ft (0.1 to 2 m)), still-to-slow-moving lagoons, estuaries, and coastal streams with salinity up to 12 ppt, which provide adequate space for normal behavior and individual and population growth that contain one or more of the following:
    a. Substrates (e.g., sand, silt, mud) suitable for the construction of burrows for reproduction;
    b. Submerged and emergent aquatic vegetation, such as *Potamogeton pectinatus*, *Ruppia maritima*, *Typha latifolia*, and *Scirpus* spp., that provides protection from predators and high flow events; or
    c. Presence of a sandbar(s) across the mouth of a lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, thereby providing relatively stable water levels and salinity.

Smith's Blue Butterfly

Critical habitat for the Smith's blue butterfly was proposed in 1977; however, it has never been finalized. The proposed Smith's blue butterfly critical habitat includes coastal sand dunes from Del Rey Creek north to the Salinas River. The subsurface slant well site, portions of the new Source Water Pipeline alignment, and portions of the new Transmission Main are within the proposed critical habitat. The Federal Register listing notice for the proposed rule for Smith's blue butterfly (42 FR 26) does not include primary constituent elements for Smith's blue butterfly.

4.6.1.10 Sensitive Terrestrial Biological Resources in the Study Area

This section discusses the potential for sensitive terrestrial biological resources to occur at each facility in the study area. **Table 4.6-2** presents the occurrence potential for special-status species at the individual facility sites and pipeline alignments. (Refer to **Figures 3-2** through **3-13** in Chapter 3, Description of the Proposed Project, for the locations of the proposed facilities.) The list of special-status plant and animal species in **Table 4.6-2** was compiled from the CNPS on-line Electronic Inventory (CNPS, 2016); the USFWS official species list for the proposed project (USFWS, 2016a); and the CDFW's CNDDB special-status species records for the Moss Landing, Marina, Salinas, Seaside, Spreckels, Carmel Valley, Monterey, Mount Carmel, and Prunedale USGS 7.5-minute topographic quadrangles (CDFW, 2016). The occurrence potential for special-status species considers the habitat requirements and life history of the individual species, site-specific reconnaissance-level biological surveys (habitat assessments) of the project area, and

focused and protocol-level surveys of special-status species at select facility locations. As described in Section 4.6.4, Approach to Analysis, the impact analyses presented in Sections 4.6.5.1 and 4.6.5.2 consider only those species with a moderate to high potential to occur.

Subsurface Slant Wells

The subsurface slant wells include ten subsurface slant wells (the converted test slant well and nine new wells). The 10 slant wells would be located at six sites: four sites (the test slant well site and three new sites) would each have one slant well and two sites would have three slant wells at each (see **Figure 3-3a**). The well sites are numbered sequentially, with Site 1 being the northernmost site and Site 6 the southernmost site. Site 1 is located near the western terminus of the CEMEX access road, approximately 120 feet southeast of the CEMEX settling ponds. Site 1 is located along the CEMEX access road, but is situated at the approximate midpoint of the vegetated sand dunes. The remaining well clusters would be installed on the eastern side of the vegetated sand dunes. The construction footprint of the nine new permanent slant wells and conversion of the test slant well into a permanent well is approximately 9 acres. A portion of this construction footprint overlaps with a portion of the construction footprints for the Source Water Pipeline and Source Water Pipeline using the optional alignment.

The subsurface slant well construction area is comprised of areas of relatively undisturbed central dune scrub, formerly disturbed sand dunes that are revegetating with native and non-native dune scrub vegetation, and unvegetated disturbed sandy soil in actively mined areas. The areas of relatively intact scrub occurs along the western active mining area boundary (just east of the unvegetated beach area) and at the west end of the access road in the vicinity of the settling ponds. The current and recently disturbed areas occur east of the vegetated sand dunes and south of the CEMEX access road. Central dune scrub within the subsurface slant wells site and CEMEX active mining area includes iceplant and native plant species typically found in central dune scrub or foredune vegetation communities such as California sagebrush, coast buckwheat, mock heather, beach evening primrose, and sea rocket.

The majority of the subsurface slant well area would likely be considered “primary habitat” under the City of Marina’s LCLUP (City of Marina, 1982). Primary habitat is defined as all environmentally sensitive habitat areas in Marina. Secondary habitat is defined as areas adjacent to primary habitat areas within which development must be sited and designed to prevent impacts which would significantly degrade the primary habitat. A Rare and Endangered Species Habitat Assessment prepared for the CalAm test slant well project (SWCA, 2014) identified the CEMEX access road as secondary habitat. The area north, and just south of the access road was identified as primary habitat. The proposed sites for the nine new slant wells were outside of the mapped area in SWCA’s assessment. Habitat maps provided in the City of Marina’s LCLUP do not provide adequate detail to determine the exact limits of primary and secondary habitat within the project area. For the purpose of this analysis, it is assumed that primary habitat would include any central dune scrub habitat mapped within the CEMEX mining facility and secondary habitat would be any developed areas located within 100 feet of the central dune scrub. The limits of the primary and secondary habitat within the MPWSP project area would be determined through the Coastal Development permit process with confirmation from the City of Marina.

TABLE 4.6-2
SPECIAL-STATUS SPECIES WITH THE POTENTIAL TO OCCUR AT PROJECT FACILITIES

Species	Status (USFWS/ CDFW/ CRPR)	Subsurface Slant Wells	MPWSP Desalination Plant	Pipelines North of Reservation Road				Facilities and Improvements South of Reservation Road						Staging Areas
				Source Water Pipeline	New Desalinated Water Pipeline	Castroville Pipeline	Brine Discharge Pipeline, Pipeline to CSIP Pond	ASR-5 and ASR-6 Wells, ASR Conveyance Pipeline, ASR Recirculation Pipeline, ASR Pump-to-Waste Pipeline	New Transmission Main	Terminal Reservoir	Carmel Valley Pump Station	Ryan Ranch-Bishop Interconnection Improvements	Main System-Hidden Hills Interconnection Improvements	
Federal or State Listed Species														
Plants														
Monterey spineflower	FT/--/CRPR 1B.2	O	O	O	O	O	L	O	O	O	N	N	N	H
robust spineflower	FE/CRPR 1B.1	M	L	M	M	M	L	M	M	M	N	N	N	M
Seaside bird's-beak	SE/CRPR 1B.1	M	L	M	M	M	L	M	M	O	N	N	N	M
Menzies' wallflower	FE/SE/ CRPR 1B.1	M	N	M	M	M	N	N	O	N	N	N	N	L-M
sand gilia	FE/ST/ CRPR 1B.2	H	L	H	M	M	L	H	H	O	N	N	N	M
Yadon's rein orchid	FE/CRPR 1B.1	N	N	N	N	N	N	M	L	H	N	L	M	L-M
Invertebrates														
Smith's blue butterfly	FE/--	H	N	H	H	N	N	L	H	L	N	N	N	L-M
Fish														
South/central California coast steelhead	FT/CSSC	N	N	N	N	M	N	N	N	N	N	N	N	N
Amphibians														
California tiger salamander	FT/ST	N	L-M	L-M	L-M	L-M	L-M	L	L	M	N	L-M	L-M	L-M
California red-legged frog	FT/CSSC	N	M	L-M	L-M	L-M	L-M	L	L	M	H	L-M	L-M	L-M
Birds														
Western snowy plover	FT/CSSC	O	N	O	N	N	N	N	N	N	N	N	N	N
Other Special-Status Species														
Plants														
Hickman's onion	CRPR 1B.2	N	N	N	N	N	N	L	N	L	N	L-M	L-M	L
Hooker's manzanita	CRPR 1B.2	M	N	M	M	N	N	M	O	H	N	L	M	L-M
Toro manzanita	CRPR 1B.2	N	N	N	N	N	N	M	M	M	N	M	M	L
Pajaro manzanita	CRPR 1B.1	N	N	N	N	N	N	M	M	M	N	M	M	N
sandmat manzanita	CRPR 1B.2	M	N	H	H	N	N	O	O	O	N	L	M	H
ocean bluff milkvetch	CRPR 4.2	O	N	O	L	N	N	M	L	M	N	N	N	L
Monterey Coast paintbrush	CRPR 4.3	H	N	H	H	M	N	M	O	H	L	L	L	M
Monterey ceanothus	CRPR 4.2	M	N	M	M	N	N	O	O	O	N	N	N	O
Congdon's tarplant	CRPR 1B.1	N	L-M	L	L	L-M	L	L	L	N	N	M	M	L
branching beach aster	CRPR 3.2	H	N	O	O	O	N	L	O	L	N	N	N	H
Eastwood's goldenbush	CRPR 1B.1	M	N	L-M	L-M	L-M	N	M	M	O	N	L	M	L-M
sand-loving wallflower	CRPR 1B.2	O	N	M	M	M	N	M	O	O	N	N	N	L-M

Potential To Occur Codes:
N= Not expected to occur: No suitable habitat within project area; project area outside currently known distribution or elevation range; no nearby documented occurrences or nearby documented occurrences are historical only.
L = Low potential to occur: Potentially suitable habitat highly limited and/or of marginal quality; potentially suitable habitat present but species not documented nearby.
M = Moderate potential to occur: Low to moderate quality habitat present; species documented in the project vicinity.
H = High potential to occur: High quality suitable habitat present within project area; species documented in the project vicinity.
O = Observed: Species (or an indication that the species is present) was observed in the project area during field surveys conducted by ESA or others.

TABLE 4.6-2 (Continued)
SPECIAL-STATUS SPECIES WITH THE POTENTIAL TO OCCUR AT PROJECT FACILITIES

Species	Status (USFWS/ CDFW/ CRPR)	Subsurface Slant Wells	MPWSP Desalination Plant	Pipelines North of Reservation Road				Facilities and Improvements South of Reservation Road						Staging Areas
				Source Water Pipeline	New Desalinated Water Pipeline	Castroville Pipeline	Brine Discharge Pipeline, Pipeline to CSIP Pond	ASR-5 and ASR-6 Wells, ASR Conveyance Pipeline, ASR Recirculation Pipeline, ASR Pump-to-Waste Pipeline	New Transmission Main	Terminal Reservoir	Carmel Valley Pump Station	Ryan Ranch-Bishop Interconnection Improvements	Main System-Hidden Hills Interconnection Improvements	
Potential To Occur Codes: N= Not expected to occur: No suitable habitat within project area; project area outside currently known distribution or elevation range; no nearby documented occurrences or nearby documented occurrences are historical only. L = Low potential to occur: Potentially suitable habitat highly limited and/or of marginal quality; potentially suitable habitat present but species not documented nearby. M = Moderate potential to occur: Low to moderate quality habitat present; species documented in the project vicinity. H = High potential to occur: High quality suitable habitat present within project area; species documented in the project vicinity. O = Observed: Species (or an indication that the species is present) was observed in the project area during field surveys conducted by ESA or others.														
Other Special-Status Species (cont.)														
Plants (cont.)														
Kellogg's horkelia	CRPR 1B.1	M	N	H	O	M	N	O	O	H	N	L	L	M
Carmel Valley bush-mallow	CRPR 1B.2	N	N	N	N	N	N	M	N	M-H	N	M-H	M-H	L
marsh microseris	CRPR 1B.2	L	N	L	L	N	N	L	L	L	N	M	L-M	N
northern curly-leaved monardella	CRPR 1B.2	M	N	M	M	M	N	M-H	M-H	H	N	L	L	L-M
south coast branching phacelia	CRPR 3.2	H	N	H	H	M	N	H	M	O	N	N	N	L-M
Monterey pine	CRPR 1B.1	N	N	N	N	N	N	N	N	L-M	M	L-M	L-M	N
Michael's rein orchid	CRPR 4.2	M	N	H	H	M	N	H	O	O	L	L-M	L-M	L-M
Santa Cruz microseris	CRPR 1B.2	L	N	L	L	L	N	L	L	L	N	L-M	L-M	N
Santa Cruz clover	CRPR 1B.1	N	N	L	L	L	N	L	L	L	N	L-M	L-M	N
Pacific Grove clover	--/SR/CRPR 1B.1	N	N	L	L	L	N	L	L	L	N	L-M	L-M	N
Reptiles														
Western pond turtle	CSSC	N	N	N	M	L-M	N	N	N	N	N	N	N	N
black legless lizard	CSSC	M-H	L	M	M	L-M	N	H	M-H	H	N	N	N	M
silvery legless lizard	CSSC	M-H	L	M	M	L-M	N	H	M-H	H	N	N	N	M
coast horned lizard	CSSC	M-H	L	L-M	L-M	L	N	M	L-M	O	N	L	L	L-M
Coast Range newt	CSSC	N	L-M	L-M	L-M	L-M	L-M	L-M	L-M	L-M	L-M	L-M	L-M	L-M
Birds														
tricolored blackbird	CSSC (nesting)	N	L	N	O	L	N	L	M	L	L	L	L	L
short-eared owl	CSSC (nesting)	L	M	M	M	L-M	L	L	M	L	N	N	N	L-M
western burrowing owl	CSSC (nesting, wintering)	N	L	H	H	L	N	L	L-M	L-M	N	N	N	L-M
red-tailed hawk	3503.5	L	H	H	H	H	H	H	H	H	H	H	H	H
red-shouldered hawk	3503.5	L	M-H	M	M	L	M	H	H	M-H	H	H	H	H
Ferruginous hawk	WL (wintering)	N	L-M	H	H	L-M	N	L	L-M	L	N	N	N	L
Northern harrier	3503.5 (nesting)	L	M	M	M	L-M	L	L-M	M	L-M	N	N	N	M
White-tailed kite	--/FP (nesting)	L	M	M-H	M-H	L-M	M	M	M-H	M	L-M	L-M	L-M	M
California horned lark	WL	L	H	H	H	L-M	L	L	H	L	L	L-M	L	M
American peregrine falcon	FD/SD/FP	L	M	H	H	M	M	L-M	H	L-M	L-M	L-M	L-M	L
American kestrel	3503.5	L	M	H	H	L-M	M	M	H	M	M	M	M	M
loggerhead shrike	CSSC (nesting)	L	M	H	H	M	H	H	H	H	M	H	H	M

TABLE 4.6-2 (Continued)
SPECIAL-STATUS SPECIES WITH THE POTENTIAL TO OCCUR AT PROJECT FACILITIES

Species	Status (USFWS/ CDFW/ CRPR)	Subsurface Slant Wells	MPWSP Desalination Plant	Pipelines North of Reservation Road				Facilities and Improvements South of Reservation Road						Staging Areas
				Source Water Pipeline	New Desalinated Water Pipeline	Castroville Pipeline	Brine Discharge Pipeline, Pipeline to CSIP Pond	ASR-5 and ASR-6 Wells, ASR Conveyance Pipeline, ASR Recirculation Pipeline, ASR Pump-to-Waste Pipeline	New Transmission Main	Terminal Reservoir	Carmel Valley Pump Station	Ryan Ranch-Bishop Interconnection Improvements	Main System-Hidden Hills Interconnection Improvements	
Other Special-Status Species (cont.)														
Mammals														
pallid bat	CSSC	N	L-M	L-M	L-M	L-M	L-M	L-M	L-M	L-M	L-M	L-M	L-M	L-M
western red bat	CSSC	N	L-M	L-M	M	M	L-M	L-M	L-M	L-M	L-M	L-M	L-M	L-M
Monterey dusky-footed woodrat	CSSC	N	N	N	N	N	N	M	M	O	M	M	M	L-M
Monterey shrew	CSSC	N	L	N	N	L	N	M	M	M	L-M	M	M	L-M
American badger	CSSC	N	L-M	M	M	L-M	L	L-M	M	L-M	N	L-M	L-M	L-M

Potential To Occur Codes:
N= Not expected to occur: No suitable habitat within project area; project area outside currently known distribution or elevation range; no nearby documented occurrences or nearby documented occurrences are historical only.
L = Low potential to occur: Potentially suitable habitat highly limited and/or of marginal quality; potentially suitable habitat present but species not documented nearby.
M = Moderate potential to occur: Low to moderate quality habitat present; species documented in the project vicinity.
H = High potential to occur: High quality suitable habitat present within project area; species documented in the project vicinity.
O = Observed: Species (or an indication that the species is present) was observed in the project area during field surveys conducted by ESA or others.

SPECIAL-STATUS SPECIES CODE DESIGNATIONS:

Federal
FE = Federally listed as endangered
FT = Federally listed as threatened
FD = Federally delisted

State
SE = State listed as endangered
ST = State listed as threatened
SR = State listed as rare
SD = State delisted
FP = State Fully Protected
WL = State watch list
CSSC = California species of special concern
3503.5 = Section 3503.5 of the California Fish and Game Code prohibits take, possession, or destruction of any birds in the orders Falconiformes (hawks) or Strigiformes (owls), or of their nests and eggs.

California Rare Plant Rank (Formerly known as CNPS List):
1A = Plants presumed extinct in California.
1B = Plants rare, threatened, or endangered in California and elsewhere.
2A = Plants presumed extirpated in California.
2B = Plants rare, threatened, or endangered in California, but more common elsewhere.
3 = Plants about which more information is needed.
4 = Plants of limited distribution.

An extension reflecting the level of threat to each species is appended to each CRPR as follows:
.1 – Seriously threatened in California.
.2 – Moderately threatened in California.
.3 – Not very threatened in California.

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There are no potentially jurisdictional waters of the U.S. and/or waters of the state within the slant well study area, although a formal wetland delineation has not been prepared. MBNMS is not included in the LCLUP study area.

Table 4.6-2 presents the potential for special-status species to occur at the subsurface slant well site. Western snowy plover, ocean bluff milkvetch, Monterey spineflower, sand-loving wallflower, and coast buckwheat (host plant for Smith's blue butterfly) have been observed within the site (ESA, 2013, 2014, 2016; AECOM, 2016). Special-status plant and wildlife species that have not been observed at the site but that could potentially occur in central dune scrub at this site include robust spineflower, seaside bird's-beak, Menzies' wallflower, sand gilia, Smith's blue butterfly, Hooker's manzanita, sandmat manzanita, Monterey Coast paintbrush, Monterey ceanothus, branching beach aster, Eastwood's goldenbush, Kellogg's horkelia, northern curly-leaved monardella, south coast branching phacelia, Michael's rein orchid, black legless lizard, silvery legless lizard, and coast horned lizard.

MPWSP Desalination Plant

The proposed MPWSP Desalination Plant and associated facilities (including the pretreatment system, Reverse Osmosis system, post-treatment system, chemical storage, and administrative building) are located on the upper terrace (approximately 25 acres) of a 46-acre vacant parcel on the north side of Charles Benson Road and approximately 675 feet south of the Salinas River. Approximately 25 acres would be developed.

The majority of the proposed MPWSP Desalination Plant site is comprised of non-native annual grassland. Although this area contains non-native grassland species as dominants, there is significant cover from ruderal species such as field mustard, radish, dwarf nettle, and chickweed. Site soils are sandy. A small patch of yellow bush lupine scrub is located in the northeastern corner of the site.

There are no potentially jurisdictional waters of the U.S. or waters of the state within the MPWSP Desalinated Plant study area, although a formal wetland delineation has not been prepared.

Monterey spineflower was observed during botanical surveys of the proposed MPWSP Desalinated Plant (AECOM, 2016). This site could support Congdon's tarplant, a species that can be found in disturbed vegetation communities. Although the site does not contain high quality upland habitat for California red-legged frog, this species has been observed in the Salinas River, approximately 0.75 mile east of the site, and could occur in grassland at the MPWSP Desalination Plant site. Similarly, the site does not contain high quality upland habitat for California tiger salamander. However, if California tiger salamander are present in a drainage ditch or retention pond located approximately 250 feet from the site, they could occur in grassland at the MPWSP Desalination plant site. Similarly, if Coast Range newt occur in the Salinas River, drainage ditch or retention pond, they have potential to occur in grassland at the site. Additionally, American badger could occur at the site.

Table 4.6-2 lists the potential for special-status species to occur at the MPWSP Desalination Plant site. Several mature ornamental eucalyptus and Monterey cypress trees border the site along

its southern and western boundaries. These trees may provide potential nesting habitat for raptors such as red-tailed hawk, red-shouldered hawk, and American kestrel and special-status bat species. Short-eared owl, northern harrier, white-tailed kite and American peregrine falcon could forage over the site. The entire site provides nesting habitat for California horned lark and loggerhead shrike and common passerines protected under the MBTA.

Pipelines and Other Conveyance Facilities North of Reservation Road

Pipelines north of Reservation Road include the Source Water Pipeline, Source Water Pipeline Optional alignment, new Desalinated Water Pipeline, new Desalinated Water Pipeline Optional alignment, Castroville Pipeline, Castroville Pipeline Optional alignment, Brine Discharge Pipeline, and Pipeline to CSIP Pond.

Source Water Pipeline

The Source Water Pipeline extends east from the subsurface slant wells in the CEMEX active mining area, along the CEMEX access road, Lapis Road, and, parallel and north of Charles Benson Road, to the MPWSP Desalination Plant site. The construction footprint is approximately 16.4 acres. A portion of this footprint overlaps with a portion of the construction footprints for the subsurface slant well, Castroville Pipeline, Castroville Pipeline using the optional alignment 1, Castroville Pipeline using the optional alignment 2, the new Desalinated Water Pipeline, and the new Desalinated Water Pipeline using the optional alignment. The optional alignment for the Source Water Pipeline would be identical to the alignment described above, except that the 0.8-mile-long segment that runs along Charles Benson Road would be installed within the paved Charles Benson Road right-of-way (as opposed to north of and outside of the right-of-way). The construction footprint for the Source Water Pipeline using the optional alignment is approximately 16.5 acres. A portion of the construction footprint for the Source Water Pipeline using the optional alignment overlaps with a portion of the construction footprints for the subsurface slant well, Castroville Pipeline, Castroville Pipeline using the optional alignment 1, Castroville Pipeline using the optional alignment 2, the new Desalinated Water Pipeline, and the new Desalinated Water Pipeline using the optional alignment.

The study area within this alignment contains central dune scrub along the developed CEMEX access road and a mix of central dune scrub, comprised of silver dune lupine-mock heather scrub and California sagebrush scrub alliances, coyote brush scrub, ice plant mats, agricultural and ruderal areas from the CEMEX entrance to the intersection of Lapis Road and Del Monte Boulevard. Central dune scrub within the CEMEX active mining area along the access road contains relatively high cover of native dune scrub species. Central dune scrub and coyote brush scrub communities east of the CEMEX active mining area are moderately disturbed and include non-native invasive species such as radish, mustard, and iceplant. The developed CEMEX entrance is surrounded by large eucalyptus and Monterey cypress trees. From Lapis Road the Source Water Pipeline alignment extends through non-native grassland and agricultural fields to the MPWSP Desalination Plant site. A mix of Monterey cypress stands, Eucalyptus groves, ruderal areas, and iceplant mats which border Charles Benson Road to the north. The 0.8-mile-long segment of the proposed pipeline alignment north of and outside of the Charles Benson Road right-of-way would be located along the north side of the row of trees and along the

southern boundary of agricultural lands. The Source Water Pipeline Optional Alignment would be installed entirely within the paved Charles Benson Road right-of-way, outside of the agricultural lands and on the south side of the row of trees.

As described for the subsurface slant wells approximately 0.3 mile of the Source Water Pipeline alignment in the CEMEX active mining area is considered "secondary habitat" areas under the City of Marina's LCLUP. Adjacent areas are considered "primary habitat." These areas were mapped by SWCA for the CalAm test slant well project (SWCA, 2014). Central dune scrub outside of the City of Marina, but within the coastal zone, may be designated as ESHA under the North County Land Use Plan Local Coastal Program and/or by the CCC.

There are no potentially jurisdictional waters of the U.S. or waters of the state along the Source Water Pipeline (including the Source Water Pipeline Optional Alignment) alignment, although a formal wetland delineation has not been prepared.

Table 4.6-2 lists all special-status species with potential to occur along the Source Water Pipeline alignment. Monterey spineflower was observed along the CEMEX access road within the active mining area (Zander, 2013; 2014). Branching beach aster has been observed along Lapis Road and the CEMEX access road during protocol level plant surveys conducted for the proposed project (URS, 2014b). Coast buckwheat, the host plant for Smith's blue butterfly, has been observed along the CEMEX access road within the CEMEX active mining facility (Zander, 2014) and Smith's blue butterfly has potential to occur in this area. Western snowy plover is known to nest in the beach and foredunes at the western edge of the proposed Source Water Pipeline alignment (PRBO, 2012 in Zander Associates, 2013). Ocean bluff milkvetch has been observed along the proposed Source Water Pipeline alignment within the CEMEX active mining area during botanical surveys of the project area in 2015 (AECOM, 2016). Robust spineflower, seaside bird's beak, Menzies' wallflower, sand gilia, Hooker's manzanita, sandmat manzanita, Monterey Coast paintbrush, Monterey ceanothus, Eastwood's goldenbush, sand-loving wallflower, Kellogg's horkelia, northern curly-leaved monardella, south coast branching phacelia, and Michael's rein orchid have potential to occur within central dune scrub in the project area. California red-legged frog, California tiger salamander, and Coast Range newt have potential to occur in non-native grassland in the northern portion of the pipeline alignment during dispersal. Reptiles that are known to occur in scrub communities with sandy soils, such as black legless lizard, silvery legless lizard, and coast horned lizard, could potentially occur within central dune scrub in this area. American badger may occur within non-native grassland. Wintering western burrowing owls and Ferruginous hawk have also been observed on the Armstrong Ranch property (CDFW, 2016) and could occur within grassland in or adjacent to the pipeline alignment. Pallid bat has a low to moderate potential to roost within crevices underneath the Highway 1 overpass. Raptors such as red-tailed hawk, white-tailed kite, short-eared owl, northern harrier, California horned lark, and loggerhead shrike could potentially nest and/or forage throughout the pipeline alignment and special-status bat species could roost within trees in the alignment.

New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment

The new Desalinated Water Pipeline would extend from the MPWSP Desalination Plant west, north of and parallel to Charles Benson Road, then turn north on Del Monte Boulevard for approximately 800 feet to Lapis Road, then continue south along Lapis Road to another Lapis Road/Del Monte Boulevard intersection, then turn south and continue south along Del Monte Boulevard to Reservation Road. The construction footprint is approximately 35.4 acres. A portion of the construction footprint for the new Desalinated Water Pipeline overlaps with a portion of the construction footprints for the Source Water Pipeline, Source Water Pipeline using the optional alignment, Castroville Pipeline, Castroville Pipeline using the optional alignment 1, and Castroville Pipeline using the optional alignment 2. The new Desalinated Water Pipeline Optional alignment would be identical to the alignment described in the paragraph above, except that the 0.8-mile-long segment that runs along Charles Benson Road would be installed within the Charles Benson Road paved right-of-way (as opposed to north of and outside of the right-of-way). The construction footprint for the new Desalinated Water Pipeline using the optional alignment is approximately 35.5 acres. A portion of the construction footprint for the new Desalinated Water Pipeline using the optional alignment overlaps with a portion of the construction footprints for the Source Water Pipeline, Source Water Pipeline using the optional alignment, Castroville Pipeline, Castroville using the optional alignment 1, and Castroville Pipeline using the optional alignment 2.

The alignment north of Charles Benson Road is the same as that described above for the Source Water Pipeline; it includes non-native annual grassland and agricultural land bordered on the south by Monterey cypress and eucalyptus trees. As described for the New Source Water Pipeline Optional alignment, the new Desalinated Water Pipeline Optional alignment would travel through the developed Charles Benson Road along this segment. The alignment from the intersection of Charles Benson Road and Del Monte Boulevard south to Marina Green Drive includes a mix of moderately disturbed central dune scrub, including silver dune lupine-mock heather scrub, sandmat manzanita chaparral, California sagebrush-California buckwheat scrub, California sagebrush scrub and deerweed scrub alliances, coyote brush scrub, non-native annual grassland, ice plant mats, ruderal, and developed roadways. The segment between Marina Green Drive and Reservation Road is largely dominated by ruderal areas, developed/landscaped areas, and ice plant mats and is surrounded by urban development. Some native communities, such as central dune scrub, coyote brush scrub, and coast live oak woodland, occur within this segment, but they are highly disturbed. Several Monterey cypress stands and eucalyptus groves also occur within the segment between Marina Green Drive and Reservation Road. Riparian woodland and scrub communities associated with Locke-Paddon Park occurs near Reservation Road within the alignment.

Areas west of Del Monte Boulevard between Beach Road and Reservation Road are located within the coastal zone. Riparian woodland and scrub, central dune scrub, and coast live oak woodland within the coastal zone may be considered primary and secondary habitat under the City of Marina Coastal Land Use Plan, and may be designated as ESHA under the North County Land Use Plan Local Coastal Program and by the CCC.

Riparian woodland and scrub at Locke-Paddon Park and an isolated willow thicket near the intersection of Marina Green Drive and Del Monte Boulevard are potentially jurisdictional waters of the U.S./waters of the state.

Table 4.6-2 lists all potential special-status species with potential to occur along the Desalinated Water Pipeline alignment. Despite disturbance, Monterey spineflower and Kellogg's horkelia were observed within central dune scrub along Del Monte Boulevard during surveys conducted for the proposed project (ESA, 2012; 2016). Branching beach aster was observed along Del Monte Boulevard during protocol level plant surveys conducted for the proposed project (URS, 2014b). Robust spineflower, seaside bird's beak, Menzies' wallflower, sand gilia, Hooker's manzanita, sandmat manzanita, ocean bluff milkvetch, Monterey Coast paintbrush, Monterey ceanothus, south coast branching phacelia, Michael's rein orchid, Eastwood's goldenbush, sand-loving wallflower, northern curly-leaved Monardella, south coast branching phacelia, and Michael's rein orchid have potential to occur within suitable habitat in the project area. California red-legged frog and California tiger salamander have potential to occur in non-native grassland in the northern portion of the pipeline alignment. Coast Range newt have potential to occur in grassland and woodland habitat and adjacent to the pond at Locke-Paddon Park. Black legless lizard, silvery legless lizard, and coast horned lizard, could potentially occur within central dune scrub in this area. Western pond turtle may occur at the brackish water pond on Beach Road west of the pipeline. American badger may occur within the non-native grassland. Western burrowing owls and wintering Ferruginous hawks have also been observed on the Armstrong Ranch property (CDFW, 2016) and could occur within grassland in or adjacent to the pipeline alignment. Raptors such as red-tailed hawk, short-eared owl, northern harrier, white-tailed kite, and passerines such as California horned lark and loggerhead shrike, could potentially nest and/or forage throughout the pipeline alignment and special-status bat species could roost within trees in the alignment.

Riparian woodland and scrub adjacent to the pond in Locke-Paddon Park has the potential to support western pond turtle. Tricolored blackbird has been observed within Locke-Paddon Park (CDFW, 2016; eBird, 2016) and could occur along the pipeline alignment.

Castroville Pipeline and Castroville Pipeline Optional Alignments

The 4.5-mile-long Castroville Pipeline would extend west from the MPWSP Desalination Plant north of, and parallel to Charles Benson Road, to Del Monte Boulevard. The pipeline would travel north on Del Monte Boulevard for approximately 800 feet where it turns north along the TAMC right-of-way to the Salinas River. From the Salinas River it continues on the TAMC right-of-way to the intersection of Monte Road and Nashua Road. From this intersection the pipeline would extend north along an agricultural road to Highway 183, then would continue north on Del Monte Avenue for approximately 500 feet. The construction footprint is approximately 15.0 acres. A portion of the Castroville Pipeline construction footprint overlaps with a portion of the construction footprints for the Source Water Pipeline, Source Water Pipeline using the optional alignment, new Desalinated Water Pipeline, and new Desalinated Water Pipeline using the optional alignment. The Castroville Pipeline Optional alignment 1 would be identical to the Castroville Pipeline alignment except that at the intersection of Monte Road and Nashua Road the alignment would turn northwest along Nashua Road to the Monterey Peninsula Recreational Trail. The optional pipeline would continue northeast

along the Monterey Peninsula Recreational Trail for approximately 1.5 mile to Highway 183, then continue southeast on Highway 183 for approximately 0.7 mile. The construction footprint for the Castroville Pipeline using the optional alignment 1 is approximately 16.2 acres. A portion of the construction footprint for the Castroville Pipeline using the optional alignment 1 overlaps with a portion of the construction footprints for Source Water Pipeline, Source Water Pipeline using the optional alignment, new Desalinated Water Pipeline, and new Desalinated Water Pipeline using the optional alignment. The Castroville Pipeline Optional alignment 2 would be identical to the Castroville Pipeline alignment except, similar to the Source Water Pipeline and new Desalinated Water Pipeline Optional alignments, the 0.8 mile segment along the Charles Benson Road would be installed within the paved Charles Benson Road right-of-way (as opposed to north of and outside of the paved road right-of-way). The construction footprint for the Castroville Pipeline using the optional alignment 2 is approximately 15.1 acres. A portion of the construction footprint for the Castroville Pipeline using the optional alignment 2 overlaps with a portion of the construction footprints for the Source Water Pipeline, Source Water Pipeline using the optional alignment, new Desalinated Water Pipeline, and new Desalinated Water Pipeline using the optional alignment.

The alignment segment that parallels Charles Benson Road to the north is the same as that described above for the Source Water Pipeline and new Desalinated Water Pipeline; it includes non-native annual grassland and agricultural land bordered on the south by Monterey cypress and eucalyptus trees. As described for the Source Water Pipeline and new Desalinated Water Pipeline Optional alignments, the Castroville Pipeline Optional alignment 2 would travel through the developed Charles Benson Road along this segment. The Castroville Pipeline alignment then traverses through developed areas, ruderal areas, coyote brush scrub, and ice plant mats with a few isolated patches of central dune scrub and non-native grassland before crossing through agricultural lands, ruderal, and developed areas until it reaches the Salinas River. The Salinas River includes open water and adjacent riparian woodland and scrub, coyote brush scrub, and northern coastal scrub communities. North of the Salinas River the study area includes mostly agricultural, developed, and ruderal areas until it crosses over Tembladero Slough. North of Tembladero Slough, the alignment passes through a mix of agricultural, developed, ruderal, coyote brush scrub, riparian woodland and scrub and freshwater marsh communities. The Castroville Pipeline Optional alignment 1 would pass through similar habitat types, which include mostly agricultural, ruderal and developed areas and a few isolated freshwater wetlands and the open water of Tembladero Slough.

A small segment of the proposed Castroville Pipeline alignment is located within the coastal zone. Central dune scrub may be designated as ESHA under the North County Land Use Plan Local Coastal Program and by the CCC.

There are a few potentially jurisdictional waters of the U.S./water of the state within the Castroville Pipeline alignment which include the Salinas River, Tembladero Slough, riparian woodland and scrub communities, freshwater marsh communities, and a few culverts and ditches.

Table 4.6-2 lists all potential special-status species with potential to occur along the Castroville Pipeline alignment and the same species would be expected to occur along the Castroville Pipeline using the optional alignment 1 and using the optional alignment 2. Monterey spineflower

and branching beach aster have been observed within the alignment north of the intersection of Charles Benson Road and Del Monte Boulevard. Although these areas are fairly disturbed they have potential to support other special-status plants that occur in central dune scrub. California red-legged frog could occur in the Salinas River, Tembladero Slough and willow areas north of Tembladero Slough. California red-legged frog and California tiger salamander could occur in upland grassland areas within approximately 1.2 miles of potential breeding habitat. American badger could occur in non-native grassland. Coast Range newt could occur in and around Tembladero Slough and the Salinas River and in adjacent grassland areas. Black legless lizard, silvery legless lizard, and coast horned lizard, could potentially occur within the small areas of central dune scrub in this area. Red-tailed hawk, short-eared owl, northern harrier, white-tailed kite, American peregrine falcon, American kestrel, California horned lark, and loggerhead shrike could forage in the vicinity of the alignment. Common passerine birds such as northern rough-winded swallow (*Stelgidopteryx serripennis*) could nest in the riparian vegetation bordering the Salinas River or beneath the road crossings along the alignment. Special-status bat species could roost in trees and beneath bridge crossings along the alignment.

Brine Discharge Pipeline and Pipeline to CSIP Pond

The 1-mile-long Brine Discharge Pipeline and 1.2-mile-long Pipeline to CSIP Pond alignments extend between the MPWSP Desalination Plant site and the existing MRWPCA Regional Wastewater Treatment Plant. The pipelines would be installed along access roads and through mostly ruderal and developed areas within the MRWPCA Regional Wastewater Treatment Plant, although some patches of non-native grassland are present. These pipeline alignments are located adjacent to ornamental Monterey cypress stands present along the access roads. The construction footprint for both of these pipelines combined is approximately 6.6 acres.

There are no potentially jurisdictional waters of the U.S. or waters of the state within the Brine Discharge and Pipeline to CSIP Pond alignment study areas, although a formal wetland delineation has not been prepared. However, one potentially jurisdictional pond feature is located adjacent to the pipeline alignment study area.

Table 4.6-2 lists all potential special-status species with potential to occur along the Brine Discharge and Pipeline to CSIP alignments. California red-legged frog, California tiger salamander, and Coast Range newt have potential to occur in grassland and grazed grassland/agricultural areas within the pipeline alignment during dispersal. The mature Monterey cypress trees along Charles Benson Road and the access road to the MRWPCA Regional Wastewater Treatment Plant could provide roosting, foraging, and/or nesting habitat for loggerhead shrike, a variety of raptors such as red-tailed hawk and red-shouldered hawk, and provide roosting habitat for special-status bats. Additionally, passerines such as California horned lark may occasionally forage and nest within the grazing lands. Non-native grassland within the MRWPCA Regional Wastewater Treatment Plant site may provide nesting habitat for common passerines but does not generally provide suitable habitat for other special-status species due to its isolation from large expanses of non-native grassland.

Improvements to ASR System (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline)

The proposed ASR facilities include two new ASR injection/extraction wells (ASR-5 and ASR-6 Wells) and three parallel 0.9-mile-long, 30-inch-diameter ASR pipelines (ASR Recirculation Pipeline, ASR Conveyance Pipeline, and ASR Pump-to-Waste Pipeline). The pipelines would be located within General Jim Moore Boulevard between Ardennes Circle and Coe Avenue. The construction footprint for all three ASR pipelines is approximately 8.8 acres. A portion of the construction footprint for the ASR pipelines overlaps with a portion of the construction footprints for the new Transmission Main and the new Transmission Main using the optional alignment. The ASR-5 and ASR-6 Wells would be located east of General Jim Moore Boulevard near Ardennes Circle. Each ASR well would be housed in a permanent 900-square foot concrete pump house. Chain-link fencing would encompass an approximately 0.4-acre and 0.5-acre area around the ASR-5 and ASR-6 Wells, respectively. Therefore, the construction footprint for both of the ASR Wells is expected to be approximately 0.9 acre. Additionally, water produced during development of the ASR-5 and ASR-6 Wells would be conveyed to a natural depression located east of General Jim Moore Boulevard near San Pablo Avenue. The construction footprint of the area where water would be conveyed is approximately 7.0 acres.

The ASR-5 and ASR-6 Well sites are located between General Jim Moore Boulevard and single family residences. The sites contain a mix of coast live oak woodland, coyote brush scrub, and ruderal areas. The pipelines would be installed within developed General Jim Moore Boulevard. The northern end of the pipeline alignments are bordered by a mix of single family residences and moderately disturbed coast live oak woodland, coyote brush scrub, ice plant mats, and ruderal areas, while the southern end of the alignments are bordered by relatively undisturbed northern coastal scrub and coast live oak woodland on former Fort Ord lands. The area where water produced during development of the ASR-5 and ASR-6 wells would be conveyed is located on former Fort Ord lands and contains a mix of central maritime chaparral and ruderal areas.

There are no potentially jurisdictional waters of the U.S. or waters of the state within the ASR Facilities study areas, although a formal wetland delineation has not been prepared.

Table 4.6-2 lists all potential special-status species with potential to occur at the ASR facilities. Kellogg's horkelia has been observed within the development water infiltration area that will be used during development of the ASR-5 and ASR-6 Wells (CDFW, 2016). Monterey spineflower, sandmat manzanita, Kellogg's horkelia, and Monterey ceanothus were observed along the pipeline alignment during reconnaissance surveys and focused botanical surveys of the project area along General Jim Moore Boulevard (ESA, 2016; AECOM, 2016). Additionally, a variety of special-status plant species known to occur in scrub communities with sandy soils could potentially occur along this stretch of General Jim Moore Boulevard including Monterey spineflower, robust spineflower, seaside birds-beak, sand gilia, Yadon's rein orchid, Hooker's manzanita, Toro manzanita, Pajaro manzanita, ocean bluff milkvetch, Monterey Coast paintbrush, Monterey ceanothus, Eastwood's goldenbush, sand-loving wallflower, Kellogg's horkelia, Carmel Valley bush-mallow, northern curly-leaved monardella, south coast branching phacelia, and Michael's rein orchid.

Silvery legless lizard, black legless lizard, and coast horned lizard could potentially occur within central dune scrub, northern coastal scrub, and coyote brush scrub, in sandy soils within the grassland, or on edges of the coast live oak woodland habitat. Coast Range newt could occur in woodland areas. Raptors such as red-tailed hawk, red-shouldered hawk, northern harrier, white-tailed kite, American kestrel, and loggerhead shrike have potential to nest and forage within or adjacent to the project area. Special-status bats have potential to roost in trees within the project area. Northern coastal scrub and coast live oak woodland also provide potential habitat for Monterey dusky-footed woodrat, Monterey shrew, and American badger.

Pipelines and Other Conveyance Facilities South of Reservation Road

Facilities and improvements south of Reservation Road include the new Transmission Main, new Transmission Main Optional alignment, Terminal Reservoir, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, and Main System-Hidden Hills Interconnection Improvements.

New Transmission Main and New Transmission Main Optional Alignment

The new 6-mile-long, 36-inch-diameter Transmission Main pipeline alignment begins at Reservation Road and continues south along the west side of Del Monte Boulevard between the Monterey Peninsula Recreational Trail and TAMC right-of-way to a point approximately 750 feet north of the Highway 1/ Lightfighter Drive interchange. From the interchange it travels east through undeveloped areas, then along Lightfighter Drive to General Jim Moore Boulevard. It then travels south along General Jim Moore Boulevard to the existing Phase I ASR Facilities near the intersection of General Jim Moore Boulevard and Coe Avenue. The construction footprint is approximately 27.1 acres. A portion of the new Transmission Main construction footprint overlaps with a portion of the ASR pipelines construction footprint. The optional alignment for the new Transmission Main would be identical to the alignment described above, except that it would turn southeast toward Lightfighter Drive in a slightly different location than the new Transmission Main alignment. The construction footprint for the new Transmission Main using the optional alignment is 26.8 acres. A portion of the construction footprint for the new Transmission Main using the optional alignment overlaps with a portion of the construction footprint for the ASR pipelines.

The pipeline segment between Reservation Road and the Highway 1 overcrossing is fairly disturbed and includes ice plant mats and ruderal areas with a few Monterey cypress stands and eucalyptus groves. South of the Highway 1 overcrossing the alignment follows the back of the dunes associated with Fort Ord Dunes State Park. These back dune areas contain low to moderately disturbed central dune scrub (including silver dune lupine-mock heather scrub, sandmat manzanita, and island buckwheat scrub alliances), ice plant mats, coyote brush scrub, and some ruderal and developed areas. Once the segment heads east along Lightfighter Drive it runs within the developed Lightfighter Drive and General Jim Moore Boulevard. These roadways are surrounded by a mix of single family residences coast live oak woodland, coyote brush scrub, ice plant mats, and ruderal areas, with some areas of northern coastal scrub.

The pipeline segment between the Highway 1 overcrossing and the Highway 1/Lightfighter Driver interchange is located within the coastal zone. Central dune scrub within the coastal zone may be considered primary and secondary habitat under the City of Marina LCLUP, and may be designated as ESHA by the City of Seaside Local Coastal Program Land Use Plan and by the CCC.

There is one potentially jurisdictional water of the U.S. and/or water of the state within the new Transmission Main study area; an ephemeral drainage located adjacent to the project boundary south of the 8th Street overpass.

Table 4.6-2 lists the special-status species that could potentially occur along the new Transmission Main alignment. Sandmat manzanita was observed in scattered stands through this segment during reconnaissance level surveys conducted for the proposed project in 2013 (ESA, 2013). Monterey spineflower and Kellogg's horkelia have also been observed along this pipeline alignment (USACE, 1997; Fort Ord Reuse Authority, 2012; CDFW, 2016; and Denise Duffy & Associates, 2013, respectively). Menzies' wallflower, branching beach aster, Monterey Coast paintbrush, Monterey ceanothus, south coast branching phacelia, and Michael's rein orchid were observed within the new Transmission Main alignment during protocol level plant surveys conducted for the proposed project in 2014 (URS, 2014b). Sandmat manzanita was observed in central dune scrub along General Jim Moore Boulevard during botanical surveys in 2016 (AECOM, 2016).

A variety of special-status plant species associated with central dune scrub could occur along this pipeline corridor including robust spineflower, seaside bird's-beak, sand gilia, Hooker's manzanita, Toro manzanita, Pajaro manzanita, ocean bluff milkvetch, Eastwood's goldenbush, northern curly-leaved monardella, and sand-loving wallflower. Coast buckwheat was observed in high densities within the proposed Transmission Main alignment during reconnaissance level surveys conducted in 2013 for the proposed project (ESA, 2013). Therefore, for the purposes of this analysis, it is assumed Smith's blue butterfly could occur along the new Transmission Main alignment.

Black legless lizard, silvery legless lizard, and coast horned lizard could potentially occur within central dune scrub along this alignment. Coast Range newt could occur in oak woodland. Ground squirrels and their burrows were observed in central dune scrub and grassland communities throughout the alignment and western burrowing owl and American badger could occur in these areas. Additionally, raptors such as red-shouldered hawk, red-tailed hawk, white-tailed kite, short-eared owl, northern harrier, American peregrine falcon, and loggerhead shrike could nest and forage within this area. Tricolored blackbird could nest at Locke-Paddon Park in the vicinity of the alignment. Pallid bat has some potential to roost within crevices underneath the Highway 1 overpasses and pallid bat and red bat have potential to roost in trees within the alignment. Northern coastal scrub and coast live oak woodland also provide potential habitat for Monterey dusky-footed woodrat and Monterey shrew.

Terminal Reservoir

The Terminal Reservoir site is located east of General Jim Moore Boulevard in the former Fort Ord military base. The construction footprint for the Terminal Reservoir is approximately 6 acres. Central maritime chaparral occurs throughout the site with a few patches of coast live oak woodland and ice plant mats. The site is located at the eastern edge of a large expanse of

relatively intact maritime chaparral, also within the former Fort Ord lands. Portions of maritime chaparral within the project area are somewhat disturbed from the use of access roads, but the Terminal Reservoir site is largely undisturbed.

One potentially jurisdictional water of the U.S. and/or water of the state, a wetland mapped by the NWI, occurs within the Terminal Reservoir site.

Table 4.6-2 lists all potential special-status species with potential to occur at the Terminal Reservoir site. Many special-status plants species have been observed within the Terminal Reservoir site including Monterey spineflower, sand gilia, seaside bird's beak, sandmat manzanita, and Eastwood's goldenbush (Denise Duffy & Associates, 2010a), sand-loving wallflower (Denise Duffy & Associates, 2013), Monterey ceanothus (Fort Ord Reuse Authority, 2012; AECOM, 2016), south coast branching phacelia, and Michael's rein orchid (URS, 2014a). Other special-status plant species with potential to occur onsite include robust spineflower, Yadon's rein orchid, Toro manzanita, Pajaro manzanita, Hooker's manzanita, ocean bluff milkvetch, Monterey Coast paintbrush, Kellogg's horkelia, Carmel Valley bush-mallow, northern curly-leaved monardella, and native stands of Monterey pine.

California tiger salamander, California red-legged frog, and Coast Range newt have potential to occur in upland areas at this site. Black legless lizard, silvery legless lizard, and coast horned lizard have potential to occur within maritime chaparral. Coast horned lizard has been observed during focused surveys of the Terminal Reservoir site (AECOM, 2016). Monterey dusky-footed woodrat, Monterey shrew, and American badger may also occur onsite in dense chaparral. Monterey dusky-footed wood rat middens were observed during surveys at the Terminal Reservoir site (AECOM, 2016). Western burrowing owls has potential to occur in chaparral where ground squirrel burrows are present. Raptors such as American kestrel may nest within the site and others such as red-tailed hawk, white-tailed kite, and northern harrier may forage onsite. Special-status bats have potential to roost in trees at the site.

Carmel Valley Pump Station

The Carmel Valley Pump Station is located near the intersection of Carmel Valley Road and Rancho San Carlos Road. The site includes the proposed pump station, which would be enclosed within a 500-square-foot single-story building, a 100-square-foot electrical control building, as well as the proposed inlet and outlet pipelines that would connect to existing facilities at Carmel Valley Road. The construction footprint for the pump station and associated pipelines is approximately 0.2 acre. The site includes non-native annual grassland, landscaped, and developed areas bordered by coast live oak woodland.

There is a potentially jurisdictional wetland mapped by the NWI within the Carmel Valley Pump Station study area.

Table 4.6-2 lists all potential special-status species with potential to occur at the Carmel Valley Pump Station site. Native stands of Monterey pine may occur in the vicinity of this site. California red-legged frog are known to breed in the Carmel River and small tributaries and backpools in the vicinity of the proposed Carmel Valley Pump Station (CDFW, 2016). This

species could use non-native grassland at the site as upland habitat. Coast Range newt could occur in non-native grassland or surrounding woodland. Raptors such as red-tailed hawk, red-shouldered hawk and American kestrel may nest in trees surrounding the site. Loggerhead shrike and common passerines may also nest in trees or shrubs in the site vicinity. Special-status bats have potential to roost in trees surrounding the site and Monterey dusky-footed woodrat may occur in the coast live oak woodland understory.

Ryan Ranch-Bishop Interconnection Improvements

The Ryan Ranch–Bishop Interconnection Improvements site is located along Ragsdale Drive, Lower Ragsdale Drive, and Wilson Road just north of Highway 68. The site is located within an existing road within a business park with existing stands of coast live oak woodland, northern coastal scrub, and non-native grassland interspersed throughout the buildings, roads, parking lots, and landscaping located adjacent to the roadway. The 1.1-mile-long, 8-inch-diameter Ryan Ranch–Bishop Interconnection Improvements pipeline would extend between an existing interconnection at Highway 68 and Ragsdale Avenue and a new connection to the Bishop system. The construction footprint is approximately 7.3 acres. Although the proposed improvements would be constructed within the existing paved roadway, there is one area of non-native grassland adjacent to the road within the project area.

The NWI has mapped a wetland drainage that appears to pass through a culvert underneath Lower Ragsdale Drive near the intersection of Lower Ragsdale Drive and Ryan Court within the Ryan Ranch-Bishop Interconnection Improvements site. This drainage may be considered a water of the U.S./waters of the state.

Table 4.6-2 lists all potential special-status species with potential to occur in the vicinity of the Ryan Ranch-Bishop Interconnection Improvements site. Although most of construction would include work within existing developed roadways, some work would occur in non-native grassland. Furthermore, special-status plant species could occur in coast live oak woodland or non-native grassland adjacent to the roadway including Hickman's onion, Toro manzanita, Pajaro manzanita, Congdon's tarplant, Carmel Valley bush-mallow, marsh microseris, Michael's rein orchid, Santa Cruz microseris, Santa Cruz clover, Pacific Grove clover, and native stands of Monterey pine. Coast Range newt, Monterey dusky-footed woodrat, Monterey shrew, American badger, and special-status bats may also occur in suitable habitat within or adjacent to the Ryan Ranch-Bishop Interconnection Improvements site. Raptors such as red-tailed hawk, red-shouldered hawk, white-tailed kite, American peregrine falcon and American kestrel may forage in the site vicinity and/or nest in nearby oak woodland. California horned lark and common passerines may also forage and/or nest in the non-native grassland, northern coastal scrub, and coyote brush scrub in site vicinity.

Although California tiger salamander breeding habitat is absent from the Ryan Ranch-Bishop Interconnection Improvements site, California tiger salamander breeding ponds exist within 1.2 miles of the Ryan Ranch–Bishop Interconnection Improvements (CDFW, 2016) and this species has potential to occur onsite in the upland grassland. California red-legged frog aquatic habitat is absent from the site. This frog is known to breed within the Carmel River (CDFW,

2016) and could utilize other aquatic sites between the Carmel River and the Ryan Ranch-Bishop Interconnection Improvements site if suitable habitat is present. Due to the presence of several drainages between the Carmel River and the Ryan Ranch-Bishop Interconnection Improvements site, there is a potential for California red-legged frog to occur in the grassland while dispersing.

Main System-Hidden Hills Interconnection Improvements

The Main System-Hidden Hills Interconnection Improvements site is located along Tierra Grande Drive in a low-density residential area north of Carmel Valley Road. The existing interconnection between the main CalAm distribution system and the Hidden Hills system would be improved by installing approximately 1,200 feet of 6-inch-diameter pipeline along the northern extent of Tierra Grande Drive. Additionally, the existing pump capacity at the Upper Tierra Grande Booster Station and the Middle Tierra Grande Booster Station would be upgraded. The construction footprint for the Main System-Hidden Hills Interconnection Improvements is 1.1 acre. The improvements would be constructed within the developed roadway and within the existing Middle Tierra Grande Booster Station, but coast live oak woodland, Monterey pine woodland, and northern coastal scrub are located adjacent to the road edges.

A wetland drainage, mapped by the NWI, is located approximately 600 feet downslope of the majority of the Main System-Hills Interconnection Improvements study area, but appears to run either beneath or adjacent to the Middle Tierra Grande Booster Station. This wetland feature could be considered a water of the U.S./water of the state.

Table 4.6-2 lists all potential special-status species with potential to occur in the vicinity of the Main System-Hidden Hills Interconnection Improvements site. Although most of construction would include work within existing developed roadways, some special-status plant species could occur in coast live oak woodland, non-native grassland, or scrub communities adjacent to the roadway including Yadon's rein orchid, Hickman's onion, Hooker's manzanita, Toro manzanita, Pajaro manzanita, sandmat manzanita, Congdon's tarplant, Eastwood's golden bush, Carmel Valley bush-mallow, marsh microseris, Santa Cruz microseris, Michael's rein orchid, Santa Cruz clover, Pacific Grove clover, and native stands of Monterey pine. Raptors such as red-tailed hawk, red-shouldered hawk and loggerhead shrike may forage and nest in the vicinity of the interconnection improvement site. Coast Range newt, Monterey dusky-footed woodrat, Monterey shrew, American badger, and special-status bats may also occur in suitable habitat adjacent to this Interconnection Improvements site.

California red-legged frog aquatic habitat is absent from the Main System-Hidden Hills Interconnection Improvements site. This frog is known from the Carmel River, approximately 1 mile south of the site, and from artificial ponds located within the Tehama Golf Course approximately 2 miles northwest of the site (CDFW, 2016). Due to the presence of several drainages between the Carmel River and the Main System-Hidden Hills Interconnection Improvements site, there is a potential for California red-legged frog to occur in upland areas adjacent to the site, but would not be expected to utilize the facility site as it is developed. Stock ponds that could potentially support California tiger salamander are located within 1.2 miles of the site. If California tiger salamander are present in these ponds, they have potential to disperse through upland areas adjacent to the site.

Staging Areas

There are eight staging areas located throughout the project area. **Table 4.6-3** below lists the location of each staging area, a description of the site, size of the site, habitat types present, and the special-status species that occur or have potential to occur within or adjacent to the staging areas. **Table 4.6-2** lists all of the special-status species with potential to occur within the staging areas. The majority of the staging areas are located within developed or highly disturbed areas; however some are located adjacent to undisturbed habitat. Additionally, the proposed staging area on the west side of General Jim Moore Boulevard, near Seaside Middle School, in Seaside, does contain northern coastal scrub and coyote brush scrub communities. None of the staging areas contain potentially jurisdictional waters of the U.S./waters of the state within or adjacent to the study area.

The staging area at Beach Road in Marina is within the Coastal Zone and areas within the staging area may be considered Primary and/or Secondary Habitat under the City of Marina LCLUP.

4.6.2 Regulatory Framework

This section provides an overview of notable federal, state, and local environmental laws, policies, plans, regulations, and/or guidelines (hereafter referred to generally as "regulatory requirements") relevant to terrestrial biological resources. A brief summary of each is provided, along with a finding regarding the project's consistency with those regulatory requirements. The consistency findings concern the project as proposed, without mitigation. Where the proposed project would be consistent with the applicable regulatory requirement, no further discussion of consistency with that regulatory requirement is provided. Where the proposed project would be potentially inconsistent with the applicable regulatory requirement, the reader is referred to a specific impact discussion in Section 4.6.5, Direct and Indirect Effects of the Proposed Project, below, where the potential inconsistency is addressed in more detail. The regulatory framework for surface water hydrology and water quality and marine biological resources are described in Sections 4.3.2 and 4.5.2, respectively.

4.6.2.1 4.6.2.1 Federal Regulations

Federal Endangered Species Act (FESA)

The USFWS (jurisdiction over terrestrial and freshwater aquatic species) and National Marine Fisheries Service (NMFS; jurisdiction over most anadromous and marine fish, and mammals) oversee the FESA. The FESA prohibits the "take"[13] of any fish or wildlife species listed as threatened or endangered, including the destruction of habitat that could hinder species recovery. Section 7 of the Act mandates that all federal agencies consult with the USFWS and NMFS to ensure that federal agencies actions do not jeopardize the continued existence of a listed species or destroy or adversely modify critical habitat for listed species. The federal agency is required to consult with the USFWS and NMFS if it determines the proposed project "may affect" listed

[13] The definition of "take" pursuant to the FESA is to "harass, harm, pursue, hunt, shoot, wound, trap, capture, or collect, or to attempt to engage in any such conduct. The USFWS has also interpreted "harm" to include significant habitat modification or degradation that significantly impairs essential behavioral patterns of fish or wildlife.

TABLE 4.6-3
CONSTRUCTION STAGING AREAS, HABITAT TYPES, AND SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR

Location	Site Description	Staging Area Footprint (acre)	Habitat Types Present in Study Area	Special-Status Species with Potential to Occur within or Adjacent to the Staging Areas
Monte Road/ Neponset Road in unincorporated Monterey County	Paved parking lot (semi-trucks) at Dole Vegetable Processing Plant	0.7	Developed/ Landscaped, Ice Plant Mats, Ruderal	Habitat for California tiger salamander, California red-legged frog, Coast Range newt, black legless lizard, and silvery legless lizard occurs in the staging area vicinity. Nesting birds and roosting bats may occur in adjacent buildings and trees. Branching beach aster and Monterey spineflower documented nearby.
Beach Road in Marina	Paved parking lot at Walmart	0.4	Developed/ Landscaped, Ruderal, Ice Plant Mats, Non-native Annual Grassland	Habitat for black legless lizard, silvery legless lizard, coast horned lizard, and Coast Range newt occurs in the staging area vicinity. Nesting birds and roosting bats may occur in adjacent trees.
Highway 1/1st Street in Marina	Gated paved parking lot	1.2	Developed/ Landscaped, Ice Plant Mats	Habitat for black legless lizard, silvery legless lizard, and coast horned lizard occurs in the staging area vicinity. Nesting birds and roosting bats may occur in adjacent trees. Monterey spineflower, coast buckwheat and branching beach aster documented in nearby central dune scrub. Smith's blue butterfly may occur in vicinity.
2nd Avenue, between Lightfighter Drive and Divarty Street, in Seaside	Paved parking lot at the Cal State University at Monterey Bay Athletic Fields	3.2	Developed/ Landscaped, Ruderal, Ice Plant Mats	Habitat for black legless lizard, silvery legless lizard, and coast horned lizard occurs in the staging area vicinity. Nesting birds and roosting bats may occur in adjacent trees. Landscaped manzanita observed at the site during ESA's reconnaissance survey.
2nd Avenue/ Lightfighter Drive in Seaside	Paved parking lot.	0.5	Developed/ Landscaped, Ruderal, Central Dune Scrub	Habitat for black legless lizard, silvery legless lizard, coast horned lizard, and other special-status species with potential to occur in central dune scrub occurs in the staging area vicinity. Nesting birds and roosting bats may occur in adjacent trees
West side of General Jim Moore Boulevard, near Gigling Road, in Seaside	Paved parking lot	0.3	Developed/ Landscaped, Coast Live Oak Woodland	Habitat for black legless lizard, silvery legless lizard, coast horned lizard, and Coast Range newt occurs in the staging area vicinity. Nesting birds and roosting bats may occur in adjacent trees.
East side of General Jim Moore Boulevard, near Gigling Road, in Seaside	Paved parking lot	0.2	Developed/ Landscaped, Ice Plant Mats, Ruderal, Coast Live Oak Woodland	Habitat for black legless lizard, silvery legless lizard, coast horned lizard, and Coast Range newt occurs in the staging area vicinity. Nesting birds and roosting bats may occur in adjacent trees and buildings. Monterey spineflower documented in nearby central dune scrub (AECOM, 2016).
West side of General Jim Moore Boulevard, near Seaside Middle School, in Seaside	Sandy area	0.1	Northern Coastal Scrub, Ice Plant Mats, Coyote Brush Scrub, Developed/ Landscaped	Habitat for black legless lizard, silvery legless lizard, coast horned lizard, and Monterey shrew occurs in the staging area vicinity. Nesting birds and roosting bats may occur in adjacent trees and buildings. Monterey spineflower and branching beach aster (AECOM, 2016) documented in nearby central dune scrub. Monterey ceanothus documented within survey area (AECOM, 2016) and confirmed to be located on vegetated shoulder of paved area by ESA during reconnaissance surveys.

species or critical habitat. During consultation, the potential for take would be determined and, if take is expected to occur, the necessary conditions to allow the issuance of an incidental take permit would be imposed. As indicated in **Table 3-8** in Chapter 3, Description of the Proposed Project, consultation with the USFWS and NMFS is required for regulatory permits and approvals.

The proposed project has potential to result in take of federally threatened or endangered species, which would be inconsistent with FESA. This inconsistency is addressed under Impact 4.6-1 (*Result in substantial adverse effects on species identified as candidate, sensitive, or special-status, either directly or through habitat modification, during construction*) and Impact 4.6-6 (*Result in substantial adverse effects on candidate, sensitive, or special-status species during project operations*).

Federal Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (MBTA) affirms, or implements, a commitment by the United States to four international conventions (with Canada, Mexico, Japan, and Russia) for the protection of a shared migratory bird resource. The MBTA makes it unlawful to "pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, . . . or any part, nest, or egg of any such bird" (16 USC § 703) anywhere in the United States.

The proposed project has potential to result in the removal of nests occupied by migratory birds or in other impacts on migratory birds, which would be inconsistent with the MBTA. This inconsistency is addressed under Impact 4.6-1 (*Result in substantial adverse effects on species identified as candidate, sensitive, or special-status, either directly or through habitat modification, during construction*) and Impact 4.6-6 (*Result in substantial adverse effects on candidate, sensitive, or special-status species during project operations*).

U.S. Army Corps of Engineers and U.S. Environmental Protection Agency

Wetlands and other waters (e.g., rivers, streams, and natural ponds) are a subset of "waters of the U.S.," and receive protection under Section 404 of the Clean Water Act (CWA). The USACE has primary federal responsibility for administering regulations that concern waters of the United States. In this regard, the USACE acts under two statutory authorities: the Rivers and Harbors Act (Sections 9 and 10), which governs specified activities in "navigable waters,"[14] and the Clean Water Act (Section 404), which governs specified activities in waters of the United States, including wetlands. The construction of structures, such as tidegates, bridges, and piers, as well as construction activities that could interfere with navigation, such as dredging and stream channelization, may require a Section 10 permit. A Section 404 permit is required if the activity involves the discharge of fill into waters of the U.S. The United States Environmental Protection Agency (USEPA) has the ultimate authority for designating dredge and fill material disposal sites and can veto the Corp's issuance of a permit to fill jurisdictional waters of the United States.

[14] Navigable waters are defined as those waters that are subject to the ebb and flow of the tide or that are presently used, have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.

The USACE requires a permit if a project proposes placement of structures within navigable waters and/or alteration of waters of the U.S. Some classes of fill activities may be authorized under Regional General or Nationwide permits if specific conditions are met. Nationwide permits do not authorize activities that are likely to jeopardize the existence of a threatened or endangered species (listed or proposed for listing under the FESA). The Nationwide permit outlines general conditions and may specify project-specific conditions as required by the USACE during the Section 404 permitting process. When a project's activities do not meet the conditions for a Nationwide Permit, an Individual Permit may be issued by the USACE.

The federal government also supports a policy of minimizing "the destruction, loss, or degradation of wetlands." Executive Order 11990 (May 24, 1977) requires that each federal agency take action to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands.

Several Supreme Court cases have challenged the scope and extent of the USACE's jurisdiction over waters of the United States and have led to several reinterpretations of that authority. The most recent of these decisions are the case of Solid Waste Agency of Northern Cook County (SWANCC) v. the Army Corps of Engineers (January 9, 2001) and Rapanos v. United States (June 2006). The SWANCC decision found that jurisdiction over non-navigable, isolated, intrastate waters could not be based solely on the use of such waters by migratory birds. The reasoning behind the SWANCC decision could be extended to suggest that waters need a demonstrable connection with a navigable water to be protected under the CWA. The introduction of the term "isolated" has led to the consideration of the relative connectivity between waters and wetlands as a jurisdictionally relevant factor. The Rapanos case further questioned the definition of "waters of the United States" and the scope of federal regulatory jurisdiction over such waters but resulted in a split decision which did not provide definitive answers but expanded on the concept that a "significant nexus" with traditional navigable waters was needed for certain waters to be considered within the jurisdiction of the USACE.

On June 5, 2007 the USEPA and the USACE released guidance on CWA jurisdiction in response to the Rapanos Supreme Court decision, which can be used to support a finding of CWA coverage for a particular water body when either a) there is a significant nexus between the stream or wetland in question and navigable waters in the traditional sense; or b) a relatively permanent water body is hydrologically connected to traditional navigable waters and/or a wetland has a surface connection with that water. According to this guidance the USACE and the USEPA will take jurisdiction over the following waters:

1. Traditional navigable waters, which are defined as all waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
2. Wetlands adjacent to traditional navigable waters; including adjacent wetlands that do not have a continuous surface connection to traditional navigable waters;
3. Non-navigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow year-round or have continuous flow at least seasonally (e.g., typically three months);

4. Wetlands adjacent to non-navigable tributaries as defined above; that have a continuous surface connection to such tributaries (e.g. they are not separated by uplands, a berm, dike, or similar feature).

The USEPA and the USACE retain jurisdiction over the following waters, based on a fact-specific determination of significant nexus, as defined below, to a traditional navigable water: non-navigable tributaries that are not relatively permanent; wetlands adjacent to non-navigable tributaries that are not relatively permanent; and wetlands adjacent to but that do not directly abut a relatively permanent non-navigable tributary.

The USEPA and the USACE *generally* do not assert jurisdiction over the following features: swales or erosional features (e.g., gullies, small washes characterized by low volume, infrequent, or short duration flow); ditches (including roadside ditches) excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water.

The USEPA and the USACE have defined the significant nexus standard as follows:

1. A significant nexus analysis assesses the flow characteristics and functions of the tributary itself and the functions performed by all wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical and biological integrity of downstream traditional navigable waters;
2. Significant nexus analysis includes consideration of hydrologic and ecologic factors including:
    a. volume, duration, and frequency of flow, including consideration of certain physical characteristics of the tributary;
    b. proximity to a traditional navigable water;
    c. size of the watershed;
    d. average annual rainfall;
    e. average annual winter snow pack;
    f. potential of tributaries to carry pollutants and flood waters to traditional navigable waters;
    g. provision of aquatic habitat that supports a traditional navigable water;
    h. potential of wetlands to trap and filter pollutants or store flood waters; and
    i. maintenance of water quality in traditional navigable waters.

The proposed project has potential to result in fill of wetlands or other waters regulated under Section 404 of the CWA or activities in, over, or under navigable waters regulated under Section 10 of the Rivers and Harbors Act, which would be inconsistent with each of these regulations. This inconsistency is addressed under Impact 4.6-3 (*Result in substantial adverse effects on federal wetlands, federal other waters, and/or waters of the state during construction*) and Impact 4.6-8 (*Result in substantial adverse effects on federal wetlands, federal other waters, and waters of the state during project operations*).

Federal Policies on Riparian Communities in California

Riparian communities are associated with water and have a variety of functions, including providing high-quality habitat for resident and migrant wildlife, streambank stabilization, and runoff water filtration. Throughout the United States, riparian habitats have declined substantially in extent and quality compared with their historical distribution and condition. These declines have increased concerns about dependent plant and wildlife species, leading federal agencies to adopt policies to arrest further loss. USFWS Mitigation Policy identifies California's riparian habitats as belonging to resource Category 2, for which "no net loss" of existing habitat value is recommended (USFWS, 1981).

The proposed project has potential to result in loss of riparian habitat, which would be inconsistent with the USFWS Mitigation Policy. This inconsistency is addressed under Impact 4.6-2 (*Result in substantial adverse effects on riparian habitat, critical habitat, or other sensitive natural communities during construction*) and Impact 4.6-7 (*Result in substantial adverse effects on riparian habitat, critical habitat, or other sensitive natural communities during project operations*).

Executive Order 13112: Prevention and Control of Invasive Species

Enacted in February 1999, Executive Order (EO) 13112 calls for federal agencies to prevent and control the introduction of invasive species in a cost-effective and environmentally sound manner. This includes consideration of the potential effects of invasive species in NEPA analyses. The EO established an Invasive Species Council comprised of federal agencies and headed by the Secretary of the Interior with the responsibility to oversee implementation of the executive order.

The proposed project has potential to result in the introduction and spread of invasive species, which would be inconsistent with the EO. This inconsistency is addressed under Impact 4.6-5 (*Introduce or spread an invasive non-native species during construction*) and Impact 4.6-9 (*Introduce or spread an invasive non-native species during operations*).

4.6.2.2 State Regulations

California Coastal Act

The California Coastal Act (Public Resources Code Section 30000 et seq.) provides for the long-term management of lands within California's coastal zone boundary, as established by the Legislature and defined in Coastal Act. Of primary relevance to terrestrial biological resources are Coastal Act policies concerning environmentally sensitive habitat areas (ESHAs) and adjacent developments, and diking, filling, or dredging and continued movement of sediment and nutrients. A preliminary assessment of project consistency with these priorities is provided here. Final determinations regarding project consistency are reserved for the Coastal Commission.

With respect to Coastal Act policies related to ESHA and the diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes, the proposed project would be potentially inconsistent. These potential conflicts are addressed in Impact 4.6-2 (*Result in substantial adverse effects on riparian habitat, critical habitat, or other sensitive natural communities during*

construction), Impact 4.6-3 (*Result in substantial adverse effects on federal wetlands, federal other waters, and/or waters of the state during construction*), Impact 4.6-7 (*Result in substantial adverse effects on riparian habitat, critical habitat, or other sensitive natural communities during project operations*), and Impact 4.6-8 (*Result in substantial adverse effects on federal wetlands, federal other waters, and waters of the state during project operations*).

California Endangered Species Act

California implemented its own Endangered Species Act (CESA) in 1984. The state act prohibits the take[15] of state listed endangered and threatened species; however, habitat destruction is not included in the state's definition of take. Section 2090 of CESA requires state agencies to comply with endangered species protection and recovery and to promote conservation of these species. The CDFW administers the act and authorizes take through Section 2081 agreements (except for designated fully-protected species, as described below). Under CCR Title 14, Section 786.9(b), CDFW can also approve the take of state rare plants under Section 2081.

The proposed project has potential to result in take of state threatened or endangered species, or a rare plant, which would be inconsistent with CESA. This inconsistency is addressed under Impact 4.6-1 (*Result in substantial adverse effects on species identified as candidate, sensitive, or special-status, either directly or through habitat modification, during construction*) and Impact 4.6-6 (*Result in substantial adverse effects on candidate, sensitive, or special-status species during project operations*).

California Fish and Game Code

Section 2080 of the California Fish and Game Code states that "No person shall import into this state [California], export out of this state, or take, possess, purchase, or sell within this state, any species, or any part or product thereof, that the Commission [State Fish and Game Commission] determines to be an endangered species or threatened species, or attempt any of those acts, except as otherwise provided in this chapter, or the Native Plant Protection Act, or the California Desert Native Plants Act." Pursuant to Section 2081 of the code, CDFW may authorize individuals or public agencies to import, export, take, or possess state-listed endangered, threatened, or candidate species. These otherwise prohibited acts may be authorized through permits or Memoranda of Understanding if the take is incidental to an otherwise lawful activity, impacts of the authorized take are minimized and fully mitigated, the permit is consistent with any regulations adopted pursuant to any recovery plan for the species, and the project operator ensures adequate funding to implement the measures required by CDFW, which makes this determination based on available scientific information and considers the ability of the species to survive and reproduce.

Under Section 3503 of the California Fish and Game Code, it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. Section 3503.5 of the California Fish and Game Code prohibits

[15] Take, under the CESA, is defined as "to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill."

take, possession, or destruction of any birds in the orders Falconiformes (hawks)[16] or Strigiformes (owls), or of their nests and eggs.

California Fish and Game Code Sections 3511 [birds], 4700 [mammals], 5050 [reptiles and amphibians] and 5515 [fish] allows the designation of a species as Fully Protected. This is a greater level of protection than is afforded by the CESA, since such a "Fully Protected" designation means the listed species cannot be taken at any time.

Under the California Fish and Game Code Sections 1900-1913 the California Native Plant Protection Act (NPPA) requires all state agencies to use their authority to carry out programs to conserve endangered and rare native plants. Provisions of the NPPA prohibit the taking of listed plants from the wild and require notification of CDFW at least 10 days in advance of any change in land use. This allows CDFW to salvage listed plant species that would otherwise be destroyed. The project operator is required to conduct botanical inventories and consult with CDFW during project planning to comply with the provisions of this act and sections of CEQA that apply to rare or endangered plants.

The proposed project has potential to result in take or other impacts on plants or wildlife protected under California Fish and Game Code, which would be inconsistent with California Fish and Game Code. This inconsistency is addressed under Impact 4.6-1 (*Result in substantial adverse effects on species identified as candidate, sensitive, or special-status, either directly or through habitat modification, during construction*) and Impact 4.6-6 (*Result in substantial adverse effects on candidate, sensitive, or special-status species during project operations*).

CEQA Guidelines Section 15380

Although threatened and endangered species are protected by specific federal and state statutes, CEQA Guidelines section 15380 provides that a species not listed on the federal or state list of protected species may be considered rare or endangered if the species can be shown to meet certain specified criteria. These criteria have been modeled after the definition in the FESA and the section of the California Fish and Game Code dealing with rare or endangered plants or animals. This section was included in the Guidelines primarily to deal with situations in which a public agency is reviewing a project that may have a significant effect on, for example, a "candidate species" that has not yet been listed by either the USFWS or CDFW. Thus, CEQA provides an agency with the ability to protect a species from a project's potential impacts until the respective government agencies have an opportunity to designate the species as protected, if warranted.

As described in Section 4.6.1.8 Special-Status Species, for the purposes of this EIR/EIS "special-status species" includes those that may be considered rare or endangered pursuant to Section 15380 of the CEQA Guidelines (these include plant species with CRPR of 1, 2, 3, or 4 and candidate species).

[16] At the time Section 3503.5 was written, the order Falconiformes included diurnal birds of prey in the families Accipitridae (eagles, hawks, kites, harriers and others) and Falconidae (falcons and caracaras). In 2010, Accipitridae was placed in a new order, Acciptriformes, by the North American Classification Committee (NACC). However, for the purposes of this report, we interpret the reference to the order Falconiformes in Section 3503.5 to also include diurnal birds of prey in the order Accipitriformes.

As Section 15380 provides a definition of special-status species, the project would be consistent with this guideline. As described in other regulatory discussions for FESA, MBTA, CESA, and California Fish and Game Code, the project would be inconsistent with these other regulations that protect special-status species. These inconsistencies are addressed under Impact 4.6-1 (*Result in substantial adverse effects on species identified as candidate, sensitive, or special-status, either directly or through habitat modification, during construction*) and Impact 4.6-6 (*Result in substantial adverse effects on candidate, sensitive, or special-status species during project operations*).

State Regulation of Waters Including Wetlands

Regional Water Quality Control Board

Under Section 401 of the CWA, the RWQCB must certify that actions receiving authorization under Section 404 of the CWA also meet state water quality standards. The RWQCB also regulates waters of the state under the Porter-Cologne Act Water Quality Control Act (Porter-Cologne Act). Under the Porter-Cologne Act, the RWQCB must prepare and periodically update water quality control basin plans. Each basin plan sets forth water quality standards for surface water and groundwater, as well as actions to control nonpoint and point sources of pollution to achieve and maintain these standards. Projects that affect wetlands or waters of the state must meet waste discharge requirements of the RWQCB, which may be issued in addition to a water quality certification or waiver under Section 401 of the CWA.

The RWQCB requires projects to avoid impacts on wetlands if feasible and requires that projects do not result in a net loss of wetland acreage or a net loss of wetland function and values. In addition California defines wetlands by presence of one or more of the following three attributes in addition to wetland hydrology:

- At least periodically, the land supports predominantly hydrophytes (at least 50 percent of the aerial vegetative cover);
- The substrate is predominantly undrained hydric soil; and
- The substrate is not soil (such as a rocky shore) and is saturated with water or covered by shallow water at some time during the growing season of each year.

Under normal circumstances, the federal definition of wetlands requires all three wetland identification parameters to be met, whereas the California definition requires the presence of at least one of these parameters. For this reason, identification of wetlands by state agencies consists of the union of all areas with a non-soil substrate that are periodically inundated or saturated, or in which at least seasonal dominance by hydrophytes may be documented, or in which hydric soils are present.

The state issued the California Wetlands Conservation Policy (Executive Order W-59-93), commonly referred to as the “No Net Loss Policy” for wetlands. The Order aims to ensure no overall net loss, and long-term net gain in the quality, quantity, and performance of wetlands in California.

The proposed project has potential to result in fill of waters or wetlands regulated under Section 401 of the CWA and waters regulated under the Porter-Cologne Act, which would be inconsistent with each of these regulations. This inconsistency is addressed under Impact 4.6-3 (*Result in substantial adverse effects on federal wetlands, federal other waters, and/or waters of the state during construction*) and Impact 4.6-8 (*Result in substantial adverse effects on federal wetlands, federal other waters, and waters of the state during project operations*).

California Department of Fish and Wildlife

Under Sections 1600-1616 of the California Fish and Game Code, the CDFW regulates activities that would substantially divert, obstruct the natural flow of, or substantially change rivers, streams and lakes. CDFW's jurisdictional limits are defined in Section 1602 of the California Fish and Game Code as, "bed, channel, or bank of any river, stream, or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake…." The CDFW requires a Streambed Alteration Agreement for activities within its jurisdictional area. If CDFW determines that a project would result in substantial adverse effects on an existing fish or wildlife resource, CDFW would prepare a Lake or Streambed Alteration Agreement that includes reasonable measures to protect the resources.

The proposed project has potential to result in impacts on rivers or streams, which would be inconsistent with Sections 1600-1616 of the California Fish and Game Code. This inconsistency is addressed under Impact 4.6-3 (*Result in substantial adverse effects on federal wetlands, federal other waters, and/or waters of the state during construction*), Impact 4.6-2 (*Result in substantial adverse effects on riparian habitat, critical habitat, or other sensitive natural communities during construction*), Impact 4.6-7 (*Result in substantial adverse effects on riparian habitat, critical habitat, or other sensitive natural communities during project operations*), and Impact 4.6-8 (*Result in substantial adverse effects on federal wetlands, federal other waters, and waters of the state during project operations*).

Provisions and Policies Applying to Sensitive Communities in both Wetlands and Uplands

California Coastal Commission

The California Coastal Commission (CCC), in partnership with coastal cities and counties, plans and regulates the use of land and water in the coastal zone under the California Coastal Act (Coastal Act). On land the coastal zone varies in width from several hundred feet in highly urbanized areas to five miles in certain rural areas. Offshore the coastal zone encompasses a 3-mile-wide band of ocean. Development activities are broadly defined by the Coastal Act to include: the construction of buildings and structures, divisions of land, and activities that change the intensity of use of land or public access to coastal waters. A development activity within the coastal zone generally requires a coastal development permit from either the CCC, or from a local government with a certified Local Coastal Program (LCP), to ensure that the activity complies with the Coastal Act. The Coastal Act includes goals and policies that constitute the statutory standards that are applied to planning and regulatory decisions made by the CCC and by local governments.

The Coastal Act defines "environmentally sensitive habitat areas" (ESHAs) as "any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments" (Pub. Res. Code §30107.5). The CCC generally treats wetlands, streams, riparian habitats, and open coastal waters as ESHAs, although exceptions may exist where the definition of ESHA is not satisfied. Because the CCC typically defines wetlands based on a "one-parameter approach" CCC jurisdictional wetlands are typically greater in extent than those regulated by the USACE under the CWA. An ESHA may also be found in upland areas, for example stands of large, mature trees in an area otherwise lacking such habitat.

The principal Coastal Act policy pertaining to ESHAs is PRC Section 30240, which provides: "Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on such resources shall be allowed within such areas."

As discussed in connection with wetlands, above, the ESHA policy is applied by the CCC or by local agencies with approved LCPs. LCPs within the project area utilize the Coastal Act definition for ESHAs and some LCPs include additional guidance to determine ESHA boundaries within their respective LCP area.

The proposed project has potential to result in impacts on wetlands or ESHA regulated by the CCC, which would be inconsistent with the Coastal Act. This inconsistency is addressed under Impact 4.6-2 (*Result in substantial adverse effects on riparian habitat, critical habitat, or other sensitive natural communities during construction*), Impact 4.6-3 (*Result in substantial adverse effects on federal wetlands, federal other waters, and/or waters of the state during construction,* Impact 4.6-7 (*Result in substantial adverse effects on riparian habitat, critical habitat, or other sensitive natural communities during project operations*), and Impact 4.6-8 (*Result in substantial adverse effects on federal wetlands, federal other waters, and waters of the state during project operations*).

Habitat Management and Conservation Plans

1997 Installation-Wide Multispecies Habitat Management Plan for Former Fort Ord, California

The USACE developed a multispecies Habitat Management Plan for the former Fort Ord as a mitigation measure for impacts on vegetation and wildlife resources resulting from pre-disposal, disposal, and reuse actions, such as hazardous materials remediation. The 1997 Installation-Wide Multispecies Habitat Management Plan for Former Fort Ord, California (HMP; USACE, 1997) addresses those potential impacts and promotes preservation, enhancement, and restoration of habitat and populations of HMP covered species, while allowing development on selected properties.

For the most part, the proposed project will not occur in lands covered under the HMP. The exception to this would be the construction of the Terminal Reservoir, new Transmission Main, and Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline).

2012 Draft Installation-Wide Multispecies Habitat Conservation Plan for Former Fort Ord

FORA is preparing a Draft Habitat Conservation Plan for the former Fort Ord military base entitled *Draft Installation-Wide Multispecies Habitat Conservation Plan* (Draft HCP; Fort Ord Reuse Authority, 2012). The Draft HCP provides a framework for ensuring conservation and enhancement of 19 special-status plant and animal species and the natural communities that support them on the former Fort Ord military base that would contribute to species recovery and is based on the HMP described above. Once finalized, the HCP will serve as the basis for issuance of a base-wide Section 2081 (CESA) incidental take permit by CDFW and also as the basis for issuance of a base-wide Section 10(a)(1)(B) (FESA) incidental take permit by the USFWS. The Draft HCP incorporates all relevant information from the HMP described above issued by the USACE in April 1997, and, once finalized, will supersede it as the primary conservation planning document for non-federal recipients of the former Fort Ord lands.

Once finalized, the HCP will accompany applications to CDFW and USFWS for incidental take of species addressed in the HCP. USFWS will consider issuance of permits for all HCP species but CDFW can only issue permits for state-listed or candidate species. Upon approval of the applications, including the HCP and other supporting documentation, permits will be issued for a term of 50 years. The HCP is expected to be complete in late 2016.

Similar to the HMP, the majority of the proposed project will not occur in lands covered under the HCP. The exception to this would be the construction of the Terminal Reservoir, new Transmission Main, and proposed ASR facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline).

4.6.2.3 Applicable Regional and Local Land Use Plans and Policies

Table 4.6-4 identifies the regional and local land use plans, policies, and regulations pertaining to inland biological resources that are relevant to the MPWSP and that were adopted for the purpose of avoiding or minimizing an adverse environmental effect. Also included in Table 4.6-4 is an analysis of project consistency with such plans, policies, and regulations. Where the analysis concludes the proposed project would be consistent with the applicable plan, policy, or regulation, the finding is noted and no further discussion is provided. Where the analysis concludes the proposed project would be potentially inconsistent with the applicable plan, policy, or regulation, the reader is referred to Section 4.6.5, Direct and Indirect Effects of the Proposed Project. In that subsection, the significance of the potential conflict is evaluated. Where the effect of the potential conflict would be significant, feasible mitigation is identified to resolve or minimize that conflict.

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TABLE 4.6-4
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TERRESTRIAL BIOLOGICAL 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 and inland areas)	City of Marina General Plan	Community Land Use – Primary Policies	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 2.4.4:*** Wherever possible, lands with significant agricultural, natural habitat, or scenic value shall be retained and protected from degradation.	This policy is intended to preserve and protect sensitive natural communities.	Potentially Inconsistent: Installation of the subsurface slant wells, New Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main, and maintenance of the subsurface slant wells would occur within sensitive natural communities. This issue is addressed further in Impacts 4.6-2 and 4.6-7 and mitigation measures are provided to reduce or avoid any impacts.
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Community Design and Development	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 4.112***: The policies of the Community Land Use Element are designed to protect areas with significant agricultural or natural-habitat value from being displaced by development, and they are designed to protect and conserve air, water and energy resources.	This policy is intended to protect important agricultural, biological, air, water, and energy resources from impacts of development.	Potentially Inconsistent: Installation of the subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main, and maintenance of the subsurface slant wells would occur within and could disrupt sensitive natural communities (which may include wetlands and waters) and sites supporting special-status species. This issue is addressed further in Impacts 4.6-1, 4.6-2, 4.6-3, 4.6-6, 4.6-7, and 4.6-8 and mitigation measures are provided to reduce or avoid any impacts.
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Community Design and Development	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 4.114:*** Within areas identified as supporting sensitive habitat(s), the following requirements shall apply: 1. With the exceptions of areas where an approved Habitat Management Program (HMP) or Habitat Conservation Program (HCP) allows development without restrictions, and for structures erected to maintain, restore or enhance sensitive habitat and species, require discretionary approval for all new structural and road development proposed within sensitive habitat areas or on sites supporting sensitive species and habitat. 2. Site and design those new structures or roads which may be allowed within designated Habitat Reserves or other identified sensitive habitat areas so as to minimize adverse impacts upon habitat areas. This may entail site plan modification and/or the inclusion of appropriate mitigation measures developed by biologists, soils engineers, or hydrologists (e.g., erosion and storm-drainage controls, wildlife culverts, and grading limitations). (2006-243)	This policy is intended to protect sensitive natural communities (which may include wetlands and waters) and sites supporting special-status species.	Potentially Inconsistent: Installation of the subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main, and maintenance of the subsurface slant wells would occur within, and could disrupt, sensitive natural communities (which may include wetlands and waters) and sites supporting special-status species. This issue is addressed further in Impacts 4.6-1, 4.6-2, 4.6-3, 4.6-6, 4.6-7, and 4.6-8 and mitigation measures are provided to reduce or avoid any impacts.
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Community Design and Development	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 4.115:*** Within areas for which there is an approved (HMP) or (HCP) and where avoidance of significant impacts is not feasible as determined through discretionary review, a seasonal avoidance and/or salvage/relocation program for certain species and habitat areas should be established or undertaken, as appropriate, prior to site development.	This policy is intended to protect special-status species and sensitive natural communities within areas where there is an approved HMP or HCP.	Potentially Inconsistent: There are no approved HMPs or HCPs that cover the sites of the proposed subsurface slant wells, Source Water Pipeline, and new Desalinated Water Pipeline. However, the new Transmission Main is located within an approved HMP. Installation of the Transmission Main could disrupt special-status species and sensitive natural communities in an approved HMP area. This issue is further addressed in Impacts 4.6-1, 4.6-2, and 4.6-10.
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Community Design and Development	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 4.116:*** Where new development may remove all or a portion of identified sensitive habitat in an area not subject to an approved HMP or HCP, and where no less environmentally damaging alternative can be feasibly implemented, comparable habitat should be restored either onsite or offsite on a two-to-one basis (e.g., two acres of habitat shall be restored for every acre of habitat removed).	This policy is intended to protect sensitive natural communities (which may include wetlands and waters) in areas not subject to an approved HMP or HCP.	Potentially Inconsistent: Installation of the subsurface slant wells, Source Water Pipeline, and new Desalinated Water Pipeline, and maintenance of the subsurface slant wells would occur within, and could disrupt, sensitive natural communities (which may include wetlands and waters) outside of an approved HMP. This issue is addressed further in Impacts 4.6-2, 4.6-3, 4.6-7, and 4.6-8 and mitigation measures are provided to reduce or avoid any impacts.
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Community Design and Development	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 4.118:*** Where development sites are adjacent to areas designated as "Habitat Reserves" or other identified sensitive areas, site improvements and buildings shall be located and designed so as to avoid adverse impacts on the biological resource in question. Development shall be conditioned upon the incorporation of adequate mitigation measures in terms of site design. Such measures might include the following: a) providing an adequate buffer between new development and identified sensitive habitat; b) minimizing the need for grading that would substantially alter the existing topography; c) incorporating erosion- and sediment-control techniques during and after construction; d) establishing appropriate native landscaping between new development and sensitive habitat; and e) providing wildlife corridors or connections between the sensitive habitat and other natural open space areas.	This policy is intended to protect areas designated as Habitat Reserves" or other sensitive natural communities (which may include wetlands and waters).	Potentially Inconsistent: The subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main are proposed for sites in or adjacent to areas designated as "Habitat Reserves and Other Open Space." These Habitat Reserves are comprised of sensitive natural communities (which may include wetlands and waters). Installation of these facilities and maintenance of the subsurface slant wells could disrupt such communities. This issue is addressed further in Impacts 4.6-1, 4.6-2, 4.6-3, 4.6-6, 4.6-7, and 4.6-8 and mitigation measures are provided to reduce or avoid any impacts.

TABLE 4.6-4 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TERRESTRIAL BIOLOGICAL 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 and inland areas)	City of Marina General Plan	Community Design and Development	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 4.119:*** As part of any application package for development proposed on undeveloped lands in former Fort Ord or on the Armstrong Ranch, seasonally timed surveys for known or suspected sensitive or unique species and habitats shall be undertaken by a qualified biologist approved by the City Community Development Director (except in those areas where such species have already been addressed by approved habitat conservation/management plans or similar plans or agreements). This information shall be provided as part of a preliminary site and development review, and, for development on former Fort Ord, should be submitted to CRMP for review and recommendations. Where such species are found to occur, mitigation plans (or Habitat Management Plans) shall be prepared in coordination with the USFWS and CDFW unless approved habitat management plans are already in place.	This policy is intended to identify and protect special-status species and sensitive natural communities (which may include wetlands and waters) on undeveloped lands in former Fort Ord and on the Armstrong Ranch.	Potentially Inconsistent: Installation of the new Transmission Main would occur on undeveloped lands within the former Fort Ord that potentially support special-status species and sensitive natural communities (which may include wetlands and waters). Surveys to identify presence of these species, and then avoid impacts on these species, are not included as part of the proposed project. This issue is addressed further in Impacts 4.6-1, 4.6-2 and 4.6-3 and mitigation measures are provided to reduce or avoid any impacts.
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Community Design and Development	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 4.120:*** Oak woodland shall be protected to the greatest extent possible in recognition both of its relatively high biological and aesthetic resource value and its important role in California's and Monterey County's natural heritage. In areas supporting oak woodland, a site survey of this resource should be completed for all new subdivisions and commercial projects as part of a preliminary site and development review. All stands of oak woodland and individual specimens with a diameter of 6 inches or more when measured 4.5 feet from ground level should be identified on a base map. To the greatest extent possible, development plans shall then attempt to incorporate the oak woodland or individual specimens into the plan as an integral feature of the natural and built environment. All oak trees shall be replaced and maintained with new trees of the same stock as those found onsite or in the site vicinity according to the following replacement formula: a minimum one-for-one (one replacement tree for each tree removed) where replacement trees are proposed to be the same diameter or greater than those to be removed; a minimum three-to-one (three replacement trees for each tree removed) for replacement trees of lesser diameter than those proposed for removal, unless, as determined by arborist, the site's specific environmental conditions would not sufficiently support a healthy oak habitat. All diameter measurements shall be taken at 4.5 feet from ground level. Replacement trees shall be a mixture of sizes.	This policy is intended to protect oak woodlands and individual oak trees.	Potentially Inconsistent: Oak woodlands do not occur within the sites of the proposed subsurface slant wells, Source Water Pipeline, or new Transmission Main within the City of Marina. However, a tree survey has not been conducted at these sites and individual oak trees could occur within the Source Water Pipeline and new Transmission Main and be removed during construction. This issue is addressed further in Impact 4.6-4 and a mitigation measure is provided to reduce or avoid any impacts. Oak woodland occurs within the new Desalinated Water Pipeline. Oak woodlands and individual oak trees could be removed during construction of these facilities. This issue is addressed further in Impacts 4.6-2 and 4.6-4 and mitigation measures are provided to reduce or avoid any impacts.
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Community Design and Development	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 4.121:*** In those areas where the potential for vernal pools exists, a site survey shall be conducted by a qualified biologist. Any development or grading of a site found to have one or more vernal pools shall provide a wetland buffer of sufficient width and size, as determined by a qualified biologist, between the vernal pond habitat, including associated wetland vegetation, and the proposed or existing development to both protect those species most sensitive to development disturbances and complement the habitat value of the wetland resource. Structures allowed within the wetland buffer shall be limited to those required for providing public access and nature observation. Grading within identified vernal ponds shall be limited to that necessary for habitat restoration, enhancement and protection or as may otherwise be recommended by a qualified biologist. No soil disturbance shall occur during the rainy season within the designated vernal pond and buffer area. Grading within the drainage area of vernal ponds but outside the designated wetland buffer may be allowed in accordance with the provisions of an approved erosion control and landscape plan pursuant to Policy 4.125.1 of this plan with appropriate measures employed as needed to protect the wetland habitat.	This policy is intended to protect wetlands classified as vernal pools and/or vernal ponds.	Potentially Inconsistent: Vernal ponds (including the pond associated with Locke-Paddon Park) occur in the vicinity of the proposed new Desalinated Water Pipeline alignment and could be adversely affected by pipeline construction. This issue is addressed further in Impacts 4.6-3 and mitigation measures are provided to reduce or avoid any impacts.
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Community Design and Development	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 4.122:*** The City shall require that lighting of streets and other public areas in proximity to areas of natural open space be shielded and as unobtrusive as possible so as to direct light away from habitat reserve areas and other areas of natural open space. The same requirements shall follow for outdoor lighting on private development sites adjacent to such lands.	This policy is intended to protect sensitive natural habitats and species from impacts of nighttime lighting.	*MPWSP consistency with plans, policies, and ordinances related to nighttime lighting is presented Section 4.14, Aesthetic Resources.*
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Community Land Use	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 2.10:*** Lands designated as "Habitat Reserve and Other Open Space" are intended for permanent retention in open space to protect significant plants and wildlife inhabiting these areas. These lands consist of the following natural areas: 1. ***Riparian Habitat.*** Land occupied by riparian vegetation along the banks of the Salinas River shall be retained and the scarce riparian habitat preserved. Use of these lands for development purposes is further restricted by the potential for flooding. 2. ***Coastal Strand and Dunes.*** These lands adjacent to Monterey Bay provide habitat for rare, threatened wildlife and plant species. Approximately 1,600 acres west of Highway One are designated as habitat reserve for this purpose. Except for a limited number of areas where visitor-serving facilities and public park use is to be permitted, this entire area shall be retained as open space. As part of the "Habitat Reserve"	This policy is intended to protect significant plants and wildlife from impacts of development.	Potentially Inconsistent: The subsurface slant wells, Source Water Pipeline, and new Transmission Main are proposed for sites in or around areas designated as "Habitat Reserves and Other Open Space." These Habitat Reserves are comprised of sensitive natural communities (which may include wetlands and waters). Installation of the facilities and maintenance of the subsurface slant wells could disrupt such communities. This issue is addressed further under Impacts 4.6-1, 4.6-2, 4.6-3, 4.6-6, 4.6-7, and 4.6-8 and mitigation measures are provided to reduce or avoid any impacts.

TABLE 4.6-4 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TERRESTRIAL BIOLOGICAL 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 and inland areas) (cont.)				designation, a stand-alone State Park designation is recognized as an appropriate use by this plan for the 370 acre Lonestar property, with the condition that most of this site be provided with an implementing funding source for protection of its habitat values, and recreational uses be limited and subordinated to the habitat requirements of sensitive plant and wildlife species occurring here. On both public and privately owned lands, dune habitat shall be restored to a healthy condition. 3. ***Maritime Chaparral.*** Coastal Scrub, and Coast Live Oak Woodland. Approximately 1,160 acres of land within the Marina Planning Area is designated for permanent retention in open space so as to protect maritime chaparral, coastal scrub, and coast live oak woodlands and other plant and wildlife species that inhabit these areas. The designated lands include approximately 600 acres in the University of California Natural Reserve System located next to the Monterey Bay Educational, Science, and Technology Center; an adjoining 124-acre site occupying a combination of lands conveyed to the City as part of the transfer of the airport and adjacent land on Armstrong Ranch and 160 acres located within the larger East Garrison Reserve. Another 227-acre reserve is located south of Imjin Road. This area is a former landfill site that has been capped, and which will be restored as a natural habitat area. An additional 50 acres located along the east side of Highway One in the vicinity of the planned extension of Del Monte Boulevard is also a designated reserve. 4. ***Wetlands.*** An area of 80 acres on the Armstrong Ranch property between Del Monte Boulevard and Highway One is designated as Habitat Reserve due to the presence of vernal ponds. Additional small areas where vernal ponds occur may exist elsewhere on the Armstrong property. Prior to approval of development plans for this property, biological field surveys shall be conducted to determine if additional vernal ponds exist. If such surveys document the existence of such ponds, development plans must provide either for the preservation or replacement of this habitat.		
City of Marina (coastal zone)	City of Marina Local Coastal Land Use Plan	Policies	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 8:*** To prohibit further degradation of the beach environment and conserve its unique qualities.	This policy is intended to protect beach habitat.	Potentially Inconsistent: Installation of the subsurface slant wells and a portion of the Source Water Pipeline and maintenance of the subsurface slant wells may occur adjacent to, and could disrupt, beaches. This issue is addressed further in Impacts 4.6-2 and 4.6-8 and mitigation measures are provided to reduce or avoid any impacts.
City of Marina (coastal zone)	City of Marina Local Coastal Land Use Plan	Policies	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 19:*** To promote reclamation and protection of native dune habitat and vegetation except in areas presently being mined.	This policy is intended to protect native dune habitat, including vegetation.	Potentially Inconsistent: Installation of the subsurface slant wells and portions of the Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main, and maintenance of the subsurface slant wells would occur within, and could disrupt, native central dune scrub. This issue is addressed further in Impacts 4.6-2 and 4.6-7 and mitigation measures are provided to reduce or avoid any impacts.
City of Marina (coastal zone)	City of Marina Local Coastal Land Use Plan	Policies	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 23:*** To support continuation of the coastal-dependent sand mining operations as long as they are economically feasible and their operations are managed with sensitivity to the adjacent dune environment.	This policy is intended to ensure that continued coastal-dependent sand mining operations are protective of nearby dune environments.	Consistent: The proposed project does not include coastal-dependent sand mining operations.
City of Marina (coastal zone)	City of Marina Local Coastal Land Use Plan	Policies	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 24:*** To protect and encourage the restoration of the vernal ponds to their original state and allow only those uses adjacent which will reinforce and conserve the unique habitat qualities of these ponds.	This policy is intended to protect vernal ponds.	Potentially Inconsistent: Vernal ponds (including the pond associated with Locke-Paddon Park) occur in the vicinity of the proposed new Desalinated Water Pipeline alignment and could be adversely affected by pipeline construction. This issue is addressed further in Impact 4.6-3 and mitigation measures are provided to reduce or avoid any impacts.

TABLE 4.6-4 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TERRESTRIAL BIOLOGICAL 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)	City of Marina Local Coastal Land Use Plan	Policies	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 25:*** To protect the habitat of recognized rare and endangered species found in the Coastal dune area.	This policy is intended to protect special-status species habitat found in coastal dunes.	Potentially Inconsistent: Installation of the subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main, and maintenance of the subsurface slant wells would occur within, and could disrupt native central dune scrub, where special-status species are either known to occur or have potential to occur. This issue is addressed further in Impacts 4.6-1, 4.6-2, 4.6-6, and 4.6-7 and mitigation measures are provided to reduce or avoid any impacts.
City of Marina (coastal zone)	City of Marina Local Coastal Land Use Plan	Policies	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Policy 26:*** To regulate development in areas adjacent to recognized rare and endangered species or their habitats so that they will not threaten continuation of the species or its habitat.	This policy is intended to protect areas of rare and endangered species habitat (including wetlands) from impacts of development.	Potentially Inconsistent: Installation of the subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main, and maintenance of the subsurface slant wells would occur adjacent to, and could indirectly disrupt, special-status species habitat (including wetlands). This issue is addressed further in Impacts 4.6-1, 4.6-2, 4.6-3, 4.6-6, 4.6-7, and 4.6-8 and mitigation measures are provided to reduce or avoid any impacts.
City of Marina (coastal zone)	City of Marina Local Coastal Land Use Plan	Planning Guidelines	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	**Rare and Endangered Species: Habitat Protection.** In Marina's Coastal Zone, the foredune, dune and grassy inland areas all contain potential habitat for rare and endangered plants and animals. The precise range for each plant and animal is not known because intensive site-specific study throughout the area was not financially possible. However, the potential for various rare and endangered habitats has been identified and mapped (see Environmental Capability section) to provide a guide to the locations where more intensive study is required. Because a site-specific study is needed in many areas before any development can take place, the following policies apply to all of the areas indicated on the map[1] or meeting the definitions of Exhibit "A" as being potential habitats for rare and endangered plants and animals. ● Before any use or change in use, areas identified as potential habitat for rare and endangered plant or animal species shall be investigated by a qualified biologist to determine the physical extent of the primary habitat areas for the specific rare and endangered plants and animals on that site. ● Primary habitat areas shall be protected and preserved against any disruption of habitat values and only uses dependent on those resources shall be allowed within those areas. All development must be sited and designed so as not to interfere with the natural functions of such habitat areas. Management and enhancement opportunities should be incorporated into use or development proposals; potential impacts shall be fully mitigated, including the assurance of long-term mitigation and maintenance of habitat through the use of appropriate acreage replacement/restoration ratios for any unavoidable direct impacts on habitat areas. ● Potential secondary or support habitat areas to the primary habitats identified on the site should also be defined. Secondary habitat investigation should include identification of the role and importance of the secondary area to the primary habitat area and should stress the impact of use or development in the secondary area on the primary habitat. All development in this area must be designed to prevent significant adverse impacts on the primary habitat areas. In concert with State law, City Ordinances shall require environmental review and appropriate mitigation of identified impacts for all development in the Coastal Zone, including the assurance of long term mitigation and maintenance of habitat through the use of appropriate acreage replacement/restoration ratios for any unavoidable direct impacts on habitat areas. ● Development in wetlands shall be prohibited. Access for nature observation shall be the only exception; and this access should not be permitted unless a qualified biologist determines that the impacts of construction and human observation can be sufficiently mitigated to insure continuation of the rare and endangered species and/or its habitat. ● Available evidence indicates that dune vegetation is more resilient than previously thought, and areas damaged by illegal use or negligence shall be considered restorable and eligible for restoration.	This policy is intended to protect special-status species habitat (including wetlands), which includes primary habitat (defined as all of the environmentally sensitive habitat areas in Marina) and secondary habitat (defined as areas adjacent to primary habitat areas within which development must be sited and designed to prevent impacts which would significantly degrade the primary habitat).	Potentially Inconsistent: Installation of the subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main, and maintenance of the subsurface slant wells would occur within special-status species habitats (including wetlands and including those defined as primary and secondary habitat in the City of Marina LCLUP). This issue is addressed further in Impacts 4.6-1, 4.6-2, 4.6-3 4.6-4, 4.6-6, 4.6-7, and 4.6-8. Mitigation measures are provided to reduce or avoid impacts on special-status species habitats. However, as described in Impact 4.6-4, construction of these facilities, and maintenance of the subsurface slant wells, would be inconsistent with the City of Marina LCLUP, a significant and unavoidable impact.

TABLE 4.6-4 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TERRESTRIAL BIOLOGICAL 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) (cont.)				• Where habitats of rare and endangered species are located on any parcel, owners and/or operators shall, at such time that development is proposed, develop and execute a Management Plan which will protect identified rare and endangered plant and animal communities. Each plan should be drawn up by a qualified biologist in cooperation with the property owner developer. [1] Presumably this refers to the maps entitled "Natural Habitats" and "Potential Wildlife Habitats." [2] Exhibit 'A' Habitat Definitions: *Primary habitat*. This term includes all of the environmentally sensitive areas in Marina. These are as follows: 1. Habitat for all identified plant and animal species which are rare, endangered, threatened, or are necessary for the survival of an endangered species. These species will be collectively referred to as "rare and endangered". 2. Vernal ponds and their associated wetland vegetation. The Statewide Interpretive Guideline for Wetlands and Other Wet Environmentally Sensitive Habitat Areas (California Coastal Commission, February 14, 1981) contains technical criteria for establishing the inland boundary of wetland vegetation. 3. All native dune vegetation, where such vegetation is extensive enough to perform the special role of stabilizing Marina's natural sand dune formations. 4. Areas otherwise defined as secondary habitat that have an especially valuable role in an ecosystem for sensitive plant or animal life., as determined by a qualified biologist approved by the City. *Secondary habitat*. This term refers to areas adjacent to primary habitat areas within which development must be sited and designed to prevent impacts which would significantly degrade the primary habitat. The secondary habitat area will be presumed to include the following, subject to more precise determination upon individual site investigation: 1. The potential/known localities of rare and endangered plant species as shown on LUP page 71 ("Disturbed Vegetation" map). 2. The potential wildlife habitats as shown on LUP page 75 ("Potential Wildlife" map). 3. Any area within 100 feet of the landward boundary of a wetland primary habitat area. *Rare and endangered species*. In Marina, this term will apply to those plant and animal species which are rare, endangered, threatened or are necessary for the survival of such species. The Environmental Analysis Report prepared for this LUP identified such species in the dune habitat areas. While future scientific studies may result in addition or deletion of species, the list presently includes: 1. Smith's Blue Butterfly (Shijimiaeoides enoptes smithi) 2. Globose Dune Beetle (Coelus globosus) 3. Black Legless Lizard (Anniella pulchra nigra) 4. Salinas Kangaroo Ray (Dipodomys Heermanni Goldmani) 5. Seaside Painted Cup (Castilleja latifolia ssp. latifolia) 6. Monterey Spine Flower (Chorizanthe pungens var. pungens) 7. Eastwood's Ericameria (Ericameria fasciculata) 8. Coast Wallfower (Erysimum ammophilum) 9. Menzies' Wallflower (Erysimum menziesii) 10. Coastal Dunes Milk Vetch (Astragalus tener var. titi) 11. Dune Gilia (Gilia tenuiflora var. arenaria) 12. Wild Buckwheat (Erigonum latifolium)* 13. Wild Buckwheat (Erigonum parvifolium)* 14. Bush Lupine (Lupinus ssp.)+ *only within the range of Smith's Blue Butterfly. + only within the range of the Black Legless Lizard.		

TABLE 4.6-4 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TERRESTRIAL BIOLOGICAL 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)	City of Marina Local Coastal Land Use Plan	Planning Guidelines	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	**Wetlands Protection.** Despite their seasonal nature, the vernal ponds are considered to be coastal wetlands. There are several vernal ponds remaining in Marina's Coastal Zone; all but one supports a marsh. Most of the ponds are brackish and, except in the very wettest years, most are dry for some part of the year. The following shall be applied when planning in or near the vernal ponds: ● Because of their fragile geology, no new structures shall be allowed within the vernal pond itself. The only new structure allowed in the wetland area should be those designed for public access for nature observation. No access structure should be allowed without thorough investigation by a qualified biologist and geologist. Design should include mitigation for all impacts identified by these specialists. ● New development within the drainage areas of the natural Vernal Ponds shall be regulated to protect the vernal pond and its water quality. No development within the drainage area of a vernal pond should be approved without investigation by a qualified biologist as well as other necessary specialists. Grading setbacks, reduction of impervious surface coverage, siltation basins, and other appropriate measures shall be employed to protect the ponds and their wetlands. ● A 100 foot riparian setback shall be established from the edge of all wetlands. ● The City should encourage State participation in the preservation and restoration of the historic vernal ponds and their wetlands.	This policy is intended to protect vernal pools and their associated wetlands.	Potentially Inconsistent: Vernal ponds (including the pond associated with Locke-Paddon Park) occur in the vicinity of the proposed new Desalinated Water Pipeline alignment. Construction could occur within the 100-foot riparian setback of the edge of the vernal ponds and water quality within the vernal ponds could be adversely affected by pipeline construction. This issue is addressed further in Impact 4.6-3 and mitigation measures are provided to reduce or avoid any impacts.
City of Marina (coastal zone and inland areas)	Marina Municipal Code	Chapter 17.51 – Tree Removal, Preservation and Protection	Subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main	***Chapter 17.51 –*** Tree Removal, Preservation and Protection includes measures to preserve and maintain existing trees. This ordinance requires that a tree removal permit be obtained from the City for any tree that shall be removed or relocated.	This policy is intended to protect trees.	Potentially Inconsistent: Installation of the Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main could result in tree removal. This issue is addressed further in Impact 4.6-4 and a mitigation measure is provided to reduce or avoid any impacts. No trees occur at the subsurface slant well site.
Fort Ord Dunes State Park	Fort Ord Dunes State Park General Plan and Environmental Impact Report	Physical Resources	New Transmission Main	**BIO-8:** Preserve large areas of coastal dune habitat. Restore land that is in degraded condition, but includes some remaining native species, and is located adjacent to intact areas of coastal dune habitat in order to create large areas of connected, viable habitat of native plants and animals. Areas that serve to connect existing and potentially restored habitat areas should be considered as a very high priority, as these corridors will re-connect remnant habitats, creating what could become an extensive network of natural habitats within the park.	This policy is intended to preserve and restore coastal dune habitat.	Potentially Inconsistent: Installation of the new Transmission Main would occur within central dune scrub. This issue is addressed further in Impact 4.6-2 and mitigation measures are provided to reduce or avoid any impacts.
City of Monterey (inland areas)	Monterey City Code	Chapter 37 – Preservation of Trees and Shrubs	Ryan Ranch-Bishop Interconnection Improvements	***Chapter 37 –*** Preservation of Trees and Shrubs is intended to assure preservation of trees and replacement of trees when removal is unavoidable. A tree permit is required to be obtained from the City for removal or excessive pruning of any protected tree. Protected trees are defined as a) trees located on a vacant private parcel that are more than two inches (2") in diameter when measured at a point four feet six inches (4'6") above the tree's natural grade; and, b) trees located on a private, developed parcel that are more than six inches (6") when measured at a point four feet six inches (4'6") above the tree's natural grade. The City can also designate Local Landmark Trees, which is an outstanding, healthy, and prominent tree that is designated landmark in accordance to procedures established in the Municipal Code.	This policy is intended to preserve and mitigate for the loss of protected trees and Local Landmark Trees.	Potentially Inconsistent: Installation of the Ryan Ranch-Bishop Interconnection Improvements may require tree removal or tree trimming. This issue is addressed further in Impact 4.6-4 and mitigation measures are provided to reduce or avoid any impacts.
City of Seaside (coastal zone and inland areas)	Seaside General Plan	Conservation/Open Space	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline, Terminal Reservoir	***Policy COS-4.1:*** Preserve ecological and biological resources by maintaining these resources as open space.	This policy is intended to protect sensitive natural communities (which may include wetlands and waters).	Potentially Inconsistent: Installation of the new Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline, and Terminal Reservoir could occur within and disturb sensitive natural communities (which may include wetlands and waters) as listed in **Table 4.6-6**. This issue is addressed further in Impacts 4.6-2 and 4.6-3 and mitigation measures are provided to reduce or avoid any impacts.
City of Seaside (coastal zone and inland areas)	Seaside General Plan	Conservation/Open Space	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline, Terminal Reservoir	***Policy COS-4.2:*** Protect and enhance the creeks, lakes, and adjacent wetlands for their value in providing visual amenity, habitat for wildlife, and recreational opportunities.	This policy is intended to protect wetlands and waters.	Potentially Inconsistent: Installation of the Terminal Reservoir could occur within, and/or disturb, wetlands or waters. This issue is addressed further in Impact 4.6-3 and mitigation measures are provided to reduce or avoid any impacts.

TABLE 4.6-4 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TERRESTRIAL BIOLOGICAL 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 Seaside (coastal zone and inland areas) (cont.)						Potential wetlands or waters were not observed within the new Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline alignment within the City of Seaside.
City of Seaside (coastal zone and inland areas)	Seaside General Plan	Conservation/Open Space	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline, and Terminal Reservoir	***Policy COS-4.3:*** Encourage the preservation and enhancement of oak woodland elements in the natural and built environments.	This policy is intended to protect oak woodlands.	Potentially Inconsistent: Installation of the new Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline, and Terminal Reservoir could occur within and disturb oak woodlands. This issue is addressed further in Impact 4.6-2 and mitigation measures are provided to reduce or avoid any impacts.
City of Seaside (coastal zone and inland areas)	Seaside Municipal Code	Chapter 8.54 – Trees	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline, and Terminal Reservoir	***Chapter 8.54*** –Regulates and controls the planting, removal, protection and preservation of trees within the city. A permit is required for the removal or alteration of any tree on private property in the city without a permit issued as provided in this chapter. A permit is also required to plant any Coast Redwood, Blue Gum Eucalyptus, Willow, Cottonwood or Poplar within the city.	This policy is intended to protect trees.	Potentially Inconsistent: Installation of the new Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline, and Terminal Reservoir could result in removal or alteration of trees. This issue is addressed further in Impacts 4.6-1 and 4.6-4 and mitigation measures are provided to reduce or avoid any impacts.
County of Monterey (inland areas)	Carmel Valley Master Plan	Natural Resources	Carmel Valley Pump Station and Main System-Hidden Hills Interconnection Improvements	***Policy CV-3.7:*** Areas of biological significance shall be identified and preserved as open space. These include, but are not limited to: a. The redwood community of Robinson Canyon; b. The riparian community and redwood community of Garzas Creek; c. All wetlands, including marshes, seeps, and springs (restricted occurrence, sensitivity, outstanding wildlife value). d. Native bunchgrass stands and natural meadows (restricted occurrence and sensitivity). e. Cliffs, rock outcrops, and unusual geologic substrates (restricted occurrence). f. Ridgelines and wildlife migration routes (wildlife value).	This policy is intended to protect sensitive natural communities (which may include wetlands and waters) and wildlife corridors.	Potentially Inconsistent: Installation of the Carmel Valley Pump Station and Main System-Hidden Hills Interconnection Improvements could disturb sensitive natural communities (which may include wetlands and waters). This issue is addressed further in Impacts 4.6-2 and 4.6-3 and mitigation measures are provided to reduce or avoid any impacts.
County of Monterey (inland areas)	Carmel Valley Master Plan	Natural Resources	Carmel Valley Pump Station and Main System-Hidden Hills Interconnection Improvements	***Policy CV-3.8:*** Development shall be sited to protect riparian vegetation, minimize erosion, and preserve the visual aspects of the Carmel River. In places where the riparian vegetation no longer exists, it should be planted to a width of 150 feet from the river bank, or the face of adjacent bluffs, whichever is less. Density may be transferred from this area to other areas within a lot.	This policy is intended to protect sensitive natural communities and wetlands and waters of the Carmel River.	Consistent: The Carmel Valley Pump Station would not impact the Carmel River or associated riparian vegetation. The Main System- Hidden Hills Interconnection Improvements would not occur in the vicinity of the Carmel River.
County of Monterey (inland areas)	Carmel Valley Master Plan	Natural Resources	Carmel Valley Pump Station and Main System-Hidden Hills Interconnection Improvements	***Policy CV-4.1(b):*** Motorized vehicles shall be prohibited on the banks or in the bed of the Carmel River, except by permit from the Water Management District or Monterey County.	This policy is intended to protect sensitive natural communities and wetlands and waters of the Carmel River.	Consistent: Construction of the Carmel Valley Pump Station would not require use of motorized vehicles within the Carmel River. The Main System-Hidden Hills Interconnection Improvements would not occur in the vicinity of the Carmel River and therefore no motorized vehicles would be used within the Carmel River
County of Monterey (inland areas)	Carmel Valley Master Plan	Natural Resources	Carmel Valley Pump Station and Main System-Hidden Hills Interconnection Improvements	***Policy CV-3.10:*** b. Valley oaks should be incorporated on floodplain terraces. c. Weedy species such as pampas grass and genista shall not be planted in the Valley. e. The chaparral community shall be maintained in its natural state to the maximum extent feasible in order to preserve soil stability and wildlife habitat and also be consistent with fire safety standards.	This policy is intended to protect sensitive natural communities.	Consistent: Sensitive natural communities do not occur at the proposed Carmel Valley Pump Station and the Carmel Valley Pump Station does not include restoration of a floodplain terrace or planting weedy species. Installation of the Main System-Hidden Hills Interconnection Improvements is not located on a floodplain, does not including planting weedy species, and chaparral does not occur at the site.
County of Monterey (inland areas)	Carmel Valley Master Plan	Natural Resources	Carmel Valley Pump Station and Main System-Hidden Hills Interconnection Improvements	***Policy CV-3.11:*** The County shall discourage the removal of healthy native oak and madrone and redwood trees in the Carmel Valley Master Plan Area. A permit shall be required for the removal of any of these trees with a trunk diameter in excess of six inches, measured two feet above ground level. Where feasible, trees removed will be replaced by nursery-grown trees of the same species and not less than one gallon in size. A minimum fine, equivalent to the retail value of the wood removed, shall be imposed for each violation. In the case of	This policy is intended to protect native oak, madrone, and redwood trees.	Potentially Inconsistent: Installation of the Carmel Valley Pump Station and Main System-Hidden Hills Interconnection Improvements could result in the removal of native oak, madrone, and redwood trees. This issue is addressed further in Impact 4.6-4 and a mitigation measure is provided to reduce or avoid any impacts.

TABLE 4.6-4 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TERRESTRIAL BIOLOGICAL 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
County of Monterey (inland areas) (cont.)				emergency caused by the hazardous or dangerous condition of a tree and requiring immediate action for the safety of life or property, a tree may be removed without the above permit, provided the County is notified of the action within ten working days. Exemptions to the above permit requirement shall include tree removal by public utilities, as specified in the California Public Utility Commission's General Order 95, and by governmental agencies.		
County of Monterey (coastal zone and inland areas)	Greater Monterey Peninsula Area Plan	Conservation/Open space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy GMP-3.5:*** Removal of healthy, native oak, Monterey pine, and redwood trees in the Greater Monterey Peninsula Planning Area shall be discouraged. An ordinance shall be developed to identify required procedures for removal of these trees. Said ordinance shall take into account fuel modification needed for fire prevention in the vicinity of structures and shall include: a. Permit requirements. b. Replacement criteria c. Exceptions for emergencies and governmental agencies	This policy is intended to protect native oak, madrone, and redwood trees.	Potentially Inconsistent: Installation of the of the MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station could result in the removal of native oak, madrone, and redwood trees. This issue is addressed further in Impact 4.6-4 and a mitigation measure is provided to reduce or avoid any impacts.
County of Monterey (coastal zone and inland areas)	Greater Monterey Peninsula Area Plan	Conservation/Open space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy GMP-3.6:*** A 100-foot setback from all wetlands, as identified by a County-approved biologist, shall be provided and maintained in open space use. No new development shall be allowed in this setback area. No landscape alterations will be allowed in this setback area unless accomplished in conjunction with a restoration and enhancement plan prepared by a County-approved biologist and approved by the California Department of Fish and Wildlife.	This policy is intended to protect wetlands and waters.	Potentially Inconsistent t: Installation of the Brine Discharge Pipeline and Pipeline to CSIP Pond would occur within 100-feet of a potential wetland. The impact would be temporary and there would be no permanent aboveground facilities. After project construction, a 100-foot setback from the potential would remain. This issue is addressed further in Impact 4.6-3 and mitigation measures are provided to reduce or avoid any impacts. Installation of the MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station within the Greater Monterey Peninsula Area Plan area would not occur within 100-feet of potential wetland.
County of Monterey (coastal zone and inland areas)	Greater Monterey Peninsula Area Plan	Conservation/Open space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy GMP-3.9:*** Critical habitat areas should be preserved as open space. When an entire parcel cannot be developed because of this policy, a low intensity, clustered development may be approved. However, the development should be located on those portions of the land least biologically significant so that the development will not upset the natural function of the surrounding ecosystem.	This policy is intended to protect critical habitat, sensitive natural communities, and habitat for special-status species.	Potentially Inconsistent: Installation of the MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station could occur in or around critical habitat, sensitive natural communities, and/or habitat for special-status species. This issue is discussed in Impacts 4.6-1 and 4.6-2 and mitigation measures are provided to reduce or avoid any impacts.
County of Monterey (coastal zone and inland areas)	Monterey County Code	Chapter 21.64 – Special Regulations	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Section 21.64.260*** – Preservation of Oak and Other Protected Trees. In Monterey County oak trees within areas designated as Resource Conservation, Residential, Commercial, or Industrial cannot be removed without the approval of necessary permits. Exceptions include removal of oak trees pursuant to the purpose and standards required in areas designated as Agriculture, Industrial, and or Mineral Extraction. In addition, Title 20, Parts 2-5, addresses native tree removal and protection in the Coastal Zone and Title 21 outside the Coastal Zone. Chapter 16 of the Monterey County Municipal Code also addresses oak and other native tree protection. Native trees in Monterey County, as defined in the ordinance, include Santa Lucia fir, black cottonwood, Fremont cottonwood, box elder, willows, California laurel, sycamores, oaks and madrones. Trees must be at least six inches in diameter two feet above the ground level in order to be subject to these regulations. A landmark oak tree is defined as an oak tree that is 24 inches or more in diameter when measured two feet above ground level or one that is visually significant, historically significant, or exemplary of its species. Removal of any landmark tree is prohibited unless approved by the County Director of Planning and Building Inspection.	This policy is intended to protect oak and other native trees.	Potentially Inconsistent: Installation of the MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station could result in the removal of oak and other native trees. This issue is addressed further in Impacts 4.6-4 and a mitigation measure is provided to reduce or avoid any impacts.

TABLE 4.6-4 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TERRESTRIAL BIOLOGICAL 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
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy OS-4.1:*** Federal and State listed native marine and fresh water species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant shall be protected. Species designated in Area Plans shall also be protected.	This policy is intended to protect special-status species.	Potentially Inconsistent: As detailed in **Table 4.6-6**, special-status species could occur within the MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station sites. Construction of these facilities could result in impacts on special-status species. This issue is addressed further in Impact 4.6-1 and mitigation measures are provided to reduce or avoid any impacts.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy OS-5.1:*** The extent and acreages of critical habitat shall be inventoried to the extent feasible and mapped in GIS. Conservation of listed species shall be promoted.	This policy is intended to protect listed species and critical habitat.	Potentially Inconsistent: As detailed in **Table 4.6-6**, listed species and/or critical habitat occur or have potential to occur within the MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station sites. Construction of these project components may disrupt such species and/or critical habitat. This issue is addressed further in Impacts 4.6-1 and 4.6-2and mitigation measures are provided to reduce or avoid any impacts.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy OS-5.2:*** The extent and acreages of the potentially suitable habitat for listed species shall be inventoried to the extent feasible and mapped in GIS. Conservation of species shall be promoted as provided in the Area Plans.	This policy is intended to protect listed species and critical habitat.	Potentially Inconsistent: As detailed in **Table 4.6-6**, listed species and/or critical habitat occur or have potential to occur within the MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station sites. Construction of these project components may disrupt such species and/or critical habitat. This issue is addressed further in Impacts 4.6-1 and 4.6-2and mitigation measures are provided to reduce or avoid any impacts.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy OS-5.4:*** Development shall avoid, minimize, and mitigate impacts on listed species and critical habitat to the extent feasible. Measures may include but are not limited to: a. clustering lots for development to avoid critical habitat areas, b. dedications of permanent conservation easements; or c. other appropriate means. If development may affect listed species, consultation with USFWS and CDFW may be required and impacts may be mitigated by expanding the resource elsewhere onsite or within close proximity offsite. Final mitigation requirements would be determined as required by law.	This policy is intended to protect listed species and critical habitat.	Potentially Inconsistent: As detailed in **Table 4.6-6**, listed species and/or critical habitat occur or have potential to occur within the MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station sites. Construction of these project components may disrupt such species and/or critical habitat. This issue is addressed further in Impacts 4.6-1 and 4.6-2and mitigation measures are provided to reduce or avoid any impacts.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy OS-5.5:*** Landowners and developers shall be encouraged to preserve the integrity of existing terrain and native vegetation in visually sensitive areas such as hillsides, ridges, and watersheds. Routine and Ongoing Agricultural Activities shall be exempt from this policy.	This policy is intended to protect sensitive natural communities.	Potentially Inconsistent: As detailed in **Table 4.6-6**, sensitive natural communities occur or have potential to occur at the proposed MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Castroville Pipeline, Main System-Hidden Hills Interconnection Improvements sites. Construction of these facilities could affect sensitive natural communities. This issue is addressed further in Impact 4.6-2 and mitigation measures are provided to reduce or avoid any impacts. Sensitive natural communities do not occur at the Brine Discharge Pipeline, Pipeline to CSIP Pond, Ryan Ranch-Bishop Interconnection Improvements and Carmel Valley Pump Station sites in unincorporated Monterey County.

TABLE 4.6-4 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TERRESTRIAL BIOLOGICAL 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
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy OS-5.6:*** Native and native compatible species, especially drought resistant species, shall be utilized in fulfilling landscaping requirements.	This policy is intended to protect native plant species and prevent the introduction and spread of non-native and invasive plant species used in landscaping.	Potentially Inconsistent: Upon completion of construction, disturbed areas would be restored to their approximate pre-construction condition. Site restoration could involve the use of non-native plant species. This issue is addressed further in Impact 4.6-2 and mitigation measures are provided to reduce or avoid any impacts.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy OS-5.11:*** Conservation of large, continuous expanses of native trees and vegetation shall be promoted as the most suitable habitat for maintaining abundant and diverse wildlife.	This policy is intended to protect sensitive natural communities, trees, and wildlife corridors.	Potentially Inconsistent: As detailed in **Table 4.6-6**, sensitive natural communities and/or trees occur or have potential to occur at the proposed MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station. Construction of these facilities could affect sensitive natural communities and/or trees. This issue is addressed further in Impacts 4.6-2 and 4.6-4 and mitigation measures are provided to reduce or avoid any impacts. Construction of all of these facilities would not affect wildlife corridors.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy OS-5.13:*** Efforts to obtain and preserve natural areas of particular biologic, scientific, or educational interest, and restrict incompatible uses from encroaching upon them, shall be encouraged.	This policy is intended to protect sensitive natural communities.	Potentially Inconsistent: As detailed in **Table 4.6-6**, sensitive natural communities occur or have potential to occur at the proposed MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Castroville Pipeline, Main System-Hidden Hills Interconnection Improvements sites. Construction of these facilities could affect sensitive natural communities. This issue is addressed further in Impact 4.6-2 and mitigation measures are provided to reduce or avoid any impacts. Sensitive natural communities do not occur at the Brine Discharge Pipeline, Pipeline to CSIP Pond, Ryan Ranch-Bishop Interconnection Improvements and Carmel Valley Pump Station sites in unincorporated Monterey County.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy OS-5.16:*** A biological study shall be required for any development project requiring a discretionary permit and having the potential to substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, or substantially reduce the number or restrict the range of an endangered, rare, or threatened species. An ordinance establishing minimum standards for a biological study and biological surveys shall be enacted. A biological study shall include a field reconnaissance performed at the appropriate time of year. Based on the results of the biological study, biological surveys may be necessary to identify, describe, and delineate the habitats or species that are potentially impacted. Feasible measures to reduce significant impacts to a less than significant level shall be adopted as conditions of approval.	This policy is intended to protect sensitive natural communities, wetlands and waters, and special-status species.	Potentially Inconsistent: As detailed in **Table 4.6-6**, special-status species, sensitive natural communities, and/or wetlands and waters occur or have the potential to occur within, or in the vicinity of, the MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements and Carmel Valley Pump Station sites. Construction of these facilities could affect special-status species, sensitive natural communities, and/or wetlands and waters. These issues are addressed further in Impacts 4.6-1, 4.6-2, and 4.6-3 and mitigation measures are provided to reduce or avoid any impacts.

TABLE 4.6-4 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TERRESTRIAL BIOLOGICAL 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
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy OS-5.17:*** The County shall prepare, adopt, and implement a program that allows projects to mitigate the loss of critical habitat. The program may include ratios, payment of fees, or some other mechanisms in consultation with responsible state and/or federal regulatory agencies. Until such time as the program has been established, projects shall mitigate the loss of critical habitat on an individual basis in consultation with responsible state and/or federal regulatory agencies. A Community Plan or Rural Center Plan that includes a mitigation program shall not be subject to this policy.	This policy is intended to protect critical habitat.	Potentially Inconsistent: Critical habitat occurs within the vicinity of the Source Water Pipeline, Castroville Pipeline, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station sites and could be indirectly affected by these facilities. This issue is discussed in Impact 4.6-2 and mitigation measures are provided to reduce or avoid any impacts.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy OS-5.18:*** Prior to disturbing any federal or state jurisdictional areas, all applicable federal and state permitting requirements shall be met, including all mitigation measures for development of jurisdictional areas and associated riparian habitats.	This policy is intended to protect wetlands and waters.	Potentially Inconsistent: Installation of the Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, and Carmel Valley Pump Station could disturb wetlands and waters. This issue is addressed further in Impact 4.6-3 and mitigation measures are provided to reduce or avoid any impacts. Construction of the MPWSP Desalination Plant and the Main System-Hidden Hills Interconnection Improvements are not expected to impact waters or waters.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy OS-5.22:*** In order to preserve riparian habitat, conserve the value of streams and rivers as wildlife corridors and reduce sediment and other water quality impacts of new development, the county shall develop and adopt a Stream Setback Ordinance. The ordinance shall establish minimum standards for the avoidance and setbacks for new development relative to streams. The ordinance shall identify specific setbacks relative to the following rivers and creeks so they can be implemented in the Area Plans: Salinas, Carmel River, Arroyo Seco, Pajaro River, Nacimiento, San Antonio, Gabilan Creek, and Toro Creek. The ordinance may identify specific setbacks for other creeks or may apply generic setbacks based on the stream classification developed for the ordinance. The ordinance shall delineate appropriate uses within the setback area that shall not cause removal of riparian habitat, compromise identified riparian wildlife corridors, or compromise water quality of the relevant stream while also taking into consideration uses that serve health and safety purposes. The Stream Setback Ordinance shall apply to all discretionary development, County public projects, and to conversion of lands uncultivated for the previous 30 years, on normal soil slopes over 15% or on highly erodible soils on slopes over 10%.	This policy is intended to protect streams and associated riparian habitat.	Potentially Inconsistent: Installation of the Castroville Pipeline would occur approximately 150 feet of the Salinas River. Construction activities could indirectly impact this features. This issue is addressed further in Impact 4.6-3 and mitigation measures are provided to reduce or avoid any impacts. Installation of the Carmel Valley Pump Station would occur approximately 280 feet from the Carmel River. Project compliance with the NPDES project would ensure construction would not degrade water quality in the Rivers. Streams and associated riparian habitat do not occur in or around the MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Ryan Ranch-Bishop Interconnection Improvements, and Main System-Hidden Hills Interconnection Improvements sites.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy OS-5.23:*** The County shall prepare, adopt and implement a program that allows projects to mitigate the loss of oak woodlands, while also taking into consideration wildfire prevention/protection. Consistent with California Public Resources Code Section 21083.4, the program shall identify a combination of the following mitigation alternatives: a. Ratios for replacement, b. Payment of fees to mitigate the loss or direct replacement for the loss of oak woodlands and monitoring for compliance; and c. Conservation easements. The program shall identify criteria for suitable donor sites. Mitigation for the loss of oak woodlands may be either onsite or offsite. The program shall allow payment of fees to either a local fund established by the County or a state fund. Until such time as the County program is implemented consistent with Public Resources Code Section 21083.4(b), projects shall pay a fee to the state Oak Woodlands Conservation Fund (OWCF). Replacement of oak woodlands shall provide for equivalent acreage and ecological value at a minimum of 1:1 ratio. The program shall prioritize the conservation of oak woodlands that are within known wildlife corridors as a high priority. The oak woodlands mitigation program shall be adopted within 5 years of adoption of the General Plan.	This policy is intended to protect oak woodlands.	Potentially Inconsistent: Installation of the Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, and Main System-Hidden Hills Interconnection Improvements could disturb oak woodlands. This issue is addressed further in Impact 4.6-2 and mitigation measures are provided to reduce or avoid any impacts. Oak woodlands do not occur at the MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, and Carmel Valley Pump Station sites within unincorporated Monterey County.

TABLE 4.6-4 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TERRESTRIAL BIOLOGICAL 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
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy OS-5.24:*** The County shall require discretionary projects to retain movement corridors of adequate size and habitat quality to allow for continued wildlife use based on the needs of the species occupying the habitat. The County shall require that expansion of its roadways and public infrastructure projects provide movement opportunities for terrestrial wildlife and ensure that existing stream channels and riparian corridors continue to provide for wildlife movement and access.	This policy is intended to protect wildlife movement corridors.	Consistent: Installation of the MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements and Carmel Valley Pump Station would not substantially disrupt wildlife movement through wildlife corridors
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Conservation and Open Space	MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station	***Policy OS-5.25:*** Occupied nests of statutorily protected migratory birds and raptors shall not be disturbed during the breeding season (generally February 1 to September 15). The County shall: a. Consult, or require the developer to consult, with a qualified biologist prior to any site preparation or construction work in order to: 1. Determine whether work is proposed during nesting season for migratory birds or raptors, 2. Determine whether site vegetation is suitable to nesting migratory birds or raptors, 3. Identify any regulatory requirements for setbacks or other avoidance measures for migratory birds and raptors which could nest on the site, and 4. Establish project-specific requirements for setbacks, lock-out periods, or other methods of avoidance of disruption of nesting birds. b. Require the development to follow the recommendations of the biologist. This measure may be implemented in one of two ways: 1. Preconstruction surveys may be conducted to identify active nests and, if found, adequate buffers shall be provided to avoid active nest disruption until after the young have fledged; or 2. Vegetation removal may be conducted during the non-breeding season (generally September 16 to January 31); however, removal of vegetation along waterways shall require approval of all appropriate local, state, and federal agencies. This policy shall not apply in the case of an emergency fire event requiring tree removal. This policy shall apply for tree removal that addresses fire safety planning, since removal can be scheduled to reduce impacts on migratory birds and raptors.	This policy is intended to protect migratory birds and raptors during the breeding season.	Potentially Inconsistent: Installation of the MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements and Carmel Valley Pump Station could disturb migratory birds and raptors during the breeding season. This issue is addressed further in Impact 4.6-1 and mitigation measures are provided to reduce or avoid any impacts.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.2.1:*** With the exception of resource dependent uses, all development, including vegetation removal, excavation, grading, filling, and the construction of roads and structures, shall be prohibited in the following environmentally sensitive habitat areas: riparian corridors, wetlands, dunes, sites of known rare and endangered species of plants and animals, rookeries, major roosting and haulout sites, and other wildlife breeding or nursery areas identified as environmentally sensitive. Resource dependent uses, including nature education and research hunting, fishing and aquaculture, where allowed by the plan, shall be allowed within environmentally sensitive habitats only if such uses will not cause significant disruption of habitat values.	This policy is intended to protect environmentally sensitive habitats, wetlands and waters, and special-status species.	Potentially Inconsistent: Installation of the Source Water Pipeline and new Desalinated Water Pipeline would occur within central dune scrub. Central dune scrub would likely be considered an environmentally sensitive habitat. Additionally, several special-status species, as listed in **Table 4.6-6**, occur or have the potential to occur within these alignments. Construction of the above-referenced project components could disrupt these sensitive habitats and species. These issues are addressed further in Impacts 4.6-1 and 4.6-2 and mitigation measures are provided to reduce or avoid any impacts. No potential wetlands or waters were observed in or around the proposed Source Water Pipeline and new Desalinated Water Pipeline within the North County Land Use Plan area.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.2.2:*** Land uses adjacent to locations of environmentally sensitive habitats shall be compatible with the long-term maintenance of the resource. New land uses shall be considered compatible only where they incorporate all site planning and design features needed to prevent habitat impacts, upon habitat values and where they do not establish a precedent for continued land development which, on a cumulative basis, could degrade the resource.	This policy is intended to protect environmentally sensitive habitats (which may include wetlands and waters).	Potentially Inconsistent: Installation of the Source Water Pipeline and new Desalinated Water Pipeline would occur within and adjacent to central dune scrub. Central dune scrub would likely be considered an environmentally sensitive habitat. Construction of the above-referenced project components could disrupt this sensitive habitat. This

TABLE 4.6-4 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TERRESTRIAL BIOLOGICAL 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
County of Monterey (coastal zone) (cont.)						issue is addressed further in Impact 4.6-2 and mitigation measures are provided to reduce or avoid any impacts. No potential wetlands or waters were observed in or around the proposed Source Water Pipeline and new Desalinated Water Pipeline within the North County Land Use Plan are
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.2.3:*** New development adjacent to locations of environmentally sensitive habitats shall be compatible with the long-term maintenance of the resource. New subdivisions shall be approved only where significant impacts on environmentally sensitive habitats from development of proposed parcels will not occur.	This policy is intended to protect environmentally sensitive habitats (which may include wetlands and waters).	Potentially Inconsistent: Installation of the Source Water Pipeline and new Desalinated Water Pipeline would occur within and adjacent to central dune scrub. Central dune scrub would likely be considered an environmentally sensitive habitat. Construction of the above-referenced project components could disrupt this sensitive habitat. This issue is addressed further in Impact 4.6-2 and mitigation measures are provided to reduce or avoid any impacts. No potential wetlands or waters were observed in or around the proposed Source Water Pipeline and new Desalinated Water Pipeline within the North County Land Use Plan area.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.2.4:*** To protect environmentally sensitive habitats and the high wildlife values associated with large areas of undisturbed habitat, the County shall maintain significant and, where possible, contiguous areas of undisturbed land for low intensity recreation, education, or resource conservation use. To this end, parcels of land totally within sensitive habitat areas shall not be further subdivided. On parcels adjacent to sensitive habitats, or containing sensitive habitats as part of their acreage, development shall be clustered to prevent habitat impacts.	This policy is intended to protect environmentally sensitive habitats (which may include wetlands and waters).	Potentially Inconsistent: Installation of the Source Water Pipeline and new Desalinated Water Pipeline would occur within and adjacent to central dune scrub. Central dune scrub would likely be considered an environmentally sensitive habitat. Construction of the above-referenced project components could disrupt this sensitive habitat. This issue is addressed further in Impact 4.6-2 and mitigation measures are provided to reduce or avoid any impacts. No potential wetlands or waters were observed in or around the proposed Source Water Pipeline and new Desalinated Water Pipeline within the North County Land Use Plan area.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.2.5:*** Where private or public development is proposed in documented or potential locations of environmentally sensitive habitats – particularly those habitats identified in General Policy No. 1- field surveys by qualified individuals or agencies shall be required in order to determine precise locations and to recommend mitigating measures to ensure protection of any sensitive habitat present. The required survey shall document that the proposed development complies with all applicable environmentally sensitive habitat policies.	This policy is intended to protect environmentally sensitive habitats (which may include wetlands and waters).	Potentially Inconsistent: Installation of the Source Water Pipeline and new Desalinated Water Pipeline would occur within and adjacent to central dune scrub. Central dune scrub would likely be considered an environmentally sensitive habitat. Construction of the above-referenced project components could disrupt this sensitive habitat. This issue is addressed further in Impact 4.6-2 and mitigation measures are provided to reduce or avoid any impacts. No potential wetlands or waters were observed in or around the proposed Source Water Pipeline and new Desalinated Water Pipeline within the North County Land Use Plan area.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.2.6:*** The County shall ensure the protection of environmentally sensitive habitats through deed restrictions or dedications of permanent conservation easements. Where land divisions or development are proposed in areas containing environmentally sensitive habitats, such restrictions or easements shall be established through the development review process.	This policy is intended to protect environmentally sensitive habitats (which may include wetlands and waters).	Potentially Inconsistent: Installation of the Source Water Pipeline and new Desalinated Water Pipeline would occur within and adjacent to central dune scrub. Central dune scrub would likely be considered an environmentally sensitive habitat. Construction of the above-referenced project components could disrupt this sensitive habitat. This issue is addressed further in Impact 4.6-2 and mitigation measures are provided to reduce or avoid any impacts. No potential wetlands or waters were observed in or around the proposed Source Water Pipeline and new Desalinated Water Pipeline within the North County Land Use Plan area.

TABLE 4.6-4 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TERRESTRIAL BIOLOGICAL 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
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.2.8:*** Where development is permitted in or adjacent to environmentally sensitive habitat areas (consistent with all other resource protection policies), the County, through the development review process, shall restrict the removal of indigenous vegetation and land disturbance (grading, excavation, paving, etc.) to the minimum amount necessary for structural improvements.	This policy is intended to protect environmentally sensitive habitats (which may include wetlands and waters).	Potentially Inconsistent: Installation of the Source Water Pipeline and new Desalinated Water Pipeline would occur within and adjacent to central dune scrub. Central dune scrub would likely be considered an environmentally sensitive habitat. Construction of the above-referenced project components could disrupt this sensitive habitat. This issue is addressed further in Impact 4.6-2 and mitigation measures are provided to reduce or avoid any impacts. No potential wetlands or waters were observed in or around the proposed Source Water Pipeline and new Desalinated Water Pipeline within the North County Land Use Plan area.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.2.9:*** The County shall require the use of non-invasive plant species in proposed landscaping and should encourage the use of appropriate native species or species that are compatible with native plants.	This policy is intended to protect native plant species and prevent the introduction and spread of non-native and invasive plant species used in landscaping.	Potentially Inconsistent: Upon completion of construction, disturbed areas would be restored to their approximate pre-construction condition. Site restoration could involve the use of non-native plant species. This issue is addressed further in Impact 4.6-2 and mitigation measures are provided to reduce or avoid any impacts.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.2.10:*** Construction activities, industrial, and public and commercial recreational uses which would affect rare and endangered birds shall be regulated to protect habitats of rare, endangered, and threatened birds during breeding and nesting seasons. Regulations may include restriction of access, noise abatement, and restriction of hours of operation of public or private facilities. Regulations shall not prohibit emergency operation of service and public utility equipment. Access in such locations shall be confined to appropriate areas on designated trails and paths. No access shall be approved which results in significant disruption of habitat.	This policy is intended to protect breeding rare and endangered birds.	Potentially Inconsistent: Installation of the Source Water Pipeline and new Desalinated Water Pipeline could affect breeding rare birds. This issue is addressed further in Impact 4.6-1 and mitigation measures are provided to reduce or avoid any impacts. The Source Water Pipeline and new Desalinated Water Pipeline within the North County Land Use Plan area do not contain habitat for endangered birds.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.3.A2:*** Maritime chaparral is an uncommon, highly localized and variable plant community that has been reduced in North County by residential and agricultural development. Further conversion of maritime chaparral habitat to agricultural uses is highly discouraged. Where new residential development is proposed in chaparral areas, it shall be sited and designed to protect the maximum amount of maritime chaparral. All chaparral on land exceeding 25 percent slope should be left undisturbed to prevent potential erosion impacts as well as to protect the habitat itself.	This policy is intended to protect maritime chaparral.	Consistent: Maritime chaparral does not occur within the Source Water Pipeline and new Desalinated Water Pipeline.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.3.A4:*** Oak woodland on land exceeding 25 percent slope should be left in its native state to protect this plant community and animal habitat from the impacts of development and erosion. Development within oak woodland on 25 percent slope or less shall be sited to minimize disruption of vegetation and habitat loss.	This policy is intended to protect oak woodland	Consistent: Oak woodland does not occur within Source Water Pipeline and new Desalinated Water Pipeline.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.3.A6:*** Coastal dune habitats in areas shown as Resource Conservation or as Scenic and Natural Resource Recreation on the plan map shall be preserved and protected. Appropriate uses in such areas shall be limited to scientific, education and low intensity recreational uses, and within the Moss Landing area, essential utility pipelines where no feasible alternative exists. Disturbance or destruction of dune vegetation shall be prohibited, unless no feasible alternative exists, and then only if re-vegetation with similar species is made a condition of project approval. Any resulting dune disturbance shall be restored to the natural condition.	This policy is intended to protect coastal dune habitat within areas mapped as Resource Conservation or as Scenic and Natural Resource Recreation.	Consistent: The Source Water Pipeline and new Desalinated Water Pipeline are not proposed for areas mapped as Resource Conservation or as Scenic and Natural Resource Recreation.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.3.A9:*** Where major access routes are available or desirable through the dunes to the coast, boardwalks or other appropriate pathways constructed of permeable materials should be provided to protect the vegetation stabilizing the dunes. Other access routes through the dunes should be controlled and only allowed in limited circumstances.	This policy is intended to protect coastal dune habitat where access routes would pass through the dunes to the coast.	Consistent: Installation of the Source Water Pipeline and new Desalinated Water Pipeline within the North County Land Use Plan area would not include installation of an access route through the dunes to the coast.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.3.B1:*** Riparian plant communities shall be protected by establishing setback requirements consisting of 150 feet on each side of the bank of perennial streams, and 50 feet on each side of the bank of intermittent streams, or the extent of riparian vegetation, whichever is greater. In all cases, the setback must be sufficient to prevent significant degradation of the habitat area. The setback requirement may be modified if it can be conclusively demonstrated by a qualified biologist that a narrower corridor is sufficient or a wider corridor is necessary to protect existing riparian vegetation from the impacts of adjacent use.	This policy is intended to protect riparian plant communities associated with streams.	Consistent: Riparian plant communities associated with streams do not occur within or adjacent to the Source Water Pipeline and new Desalinated Water Pipeline within the North County Land Use Plan area.

TABLE 4.6-4 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TERRESTRIAL BIOLOGICAL 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
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.3.B2:*** All development, including dredging, filling, and grading within stream corridors, shall be limited to activities necessary for flood control purposes, water supply projects, improvement of fish and wildlife habitat, or laying of pipelines when no alternative route is feasible, and continued and future use of utility lines and appurtenant facilities. These activities shall be carried out in such a manner as to minimize impacts from increased runoff, sedimentation, biochemical degradation, or thermal pollution. When such activities require removal of riparian plant species, re-vegetation with native plants shall be required.	This policy is intended to protect stream corridors and associated riparian vegetation.	Consistent: Streams do not occur within or adjacent to the Source Water Pipeline and new Desalinated Water Pipeline within the North County Land Use Plan area.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.3.B3:*** The following activities shall be prohibited within intermittent and perennial stream channels: cultivated agriculture, pesticide applications, and installation of septic systems would not destroy vegetative ground cover of the stream channel.	This policy is intended to protect intermittent and perennial stream channels.	Consistent: Streams do not occur within or adjacent to the Source Water Pipeline and new Desalinated Water Pipeline within the North County Land Use Plan area.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.3.B4:*** A setback of 100 feet from the landward edge of vegetation of all coastal wetlands shall be provided and maintained in open space use. No permanent structures except for those necessary for resource-dependent use which cannot be located elsewhere shall be constructed in the setback area. Prior to approval of all proposed structures in the setback area, it must be demonstrated that the development does not significantly disrupt the habitat resource.	This policy is intended to protect coastal wetlands.	Consistent: Potential wetlands or waters do not occur in or around the proposed Source Water within the North County Land Use Plan area.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.3.B5:*** All wetland areas of the North County Coastal Zone shall be protected and preserved for their plant and wildlife values, including but not limited to McClusky Slough, Pajaro River, Salinas River, Salinas River Lagoon, Elkhorn Slough, Bennett Slough, and Moro Cojo Slough. The County's existing Non Pointsource Pollution Program shall be implemented.	This policy is intended to protect wetlands.	Consistent: Potential wetlands or waters do not occur in or around the proposed Source Water Pipeline within the North County Land Use Plan area.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.3.B6:*** Dredging or other major construction activities shall be conducted so as to avoid breeding seasons and other critical phases in the life cycles of commercial species of fish and shellfish and other rare, endangered, and threatened indigenous species.	This policy is intended to protect commercial species of fish and shellfish and other special-status species.	Potentially Inconsistent: Installation of the Source Water Pipeline and new Desalinated Water Pipeline could occur during the breeding season and other critical phases of special-status species as listed in **Table 4.6-6**. This issue is addressed further in Impact 4.6-1 and mitigation measures are provided to reduce or avoid any impacts. Impacts related to commercial species of fish and shellfish are discussed in EIR/EIS Section 4.5 Marine Resources.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.3.C1:*** Wildlife management considerations should be included in the evaluation of development proposals, particularly land division proposals. Large, and where feasible, contiguous areas or corridors of native vegetation should be retained in order to meet the various needs of those wildlife species requiring large areas of undisturbed habitat.	This policy is intended to protect wildlife corridors.	Consistent: Installation and maintenance of the Source Water Pipeline and new Desalinated Water Pipeline would not result in the loss of large contiguous areas or wildlife corridors.
County of Monterey (coastal zone)	North County Land Use Plan	Resource Management	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.3.C2:*** Critical wildlife habitat areas (refer to General Policy 2) shall be protected and an adequate distance based on a site-by-site analysis between such habitat and disturbed areas (e.g., building sites and roads) shall be maintained.	This policy is intended to protect sensitive natural communities and habitat for special-status species.	Potentially inconsistent: Installation of the Source Water Pipeline and new Desalinated Water Pipeline would occur within sensitive natural communities and known or potential habitat for special-status species as detailed in **Table 4.6-6**. This issue is addressed further in Impacts 4.6-1 and 4.6-2 and mitigation measures are provided to reduce or avoid any impacts.
County of Monterey (coastal zone)	North County Land Use Plan	Land Use and Development	Source Water Pipeline and new Desalinated Water Pipeline	***Key Policy 4.3.4:*** All future development within the North County coastal segment must be clearly consistent with the protection of the area's significant human and cultural resources, agriculture, natural resources, and water quality.	This policy is intended to provide long-term resource management and protection.	Potentially Inconsistent: Construction of the Source Water Pipeline and new Desalinated Water Pipeline could disrupt sensitive natural communities and/or species dependent upon those habitats. These issues are addressed further in Impacts 4.6-1 and 4.6-2 and mitigation measures are provided to reduce or avoid any impacts. Potential wetlands or waters do not occur in or around the proposed Source Water Pipeline within the North County Land Use Plan area.

TABLE 4.6-4 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TERRESTRIAL BIOLOGICAL 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
County of Monterey (inland areas)	North County Area Plan	Conservation/Open Space	Castroville Pipeline	***Policy NC-3.3:*** Conservation of North County's native vegetation shall be given high priority to: a. Retain the viability of threatened or limited vegetative communities and animal habitats, b. Promote the area's natural scenic qualities, and c. Preserve rare, endangered, and endemic plants for scientific study. d. Property owners shall be encouraged to cooperate with the County in establishing conservation easements over areas of native vegetation.	This policy is intended to protect special-status species and sensitive natural communities.	Potentially Inconsistent: Construction of the Castroville Pipeline could affect special-status species and sensitive natural communities. These issues are addressed further in Impacts 4.6-1 and 4.6-2 and mitigation measures are provided to reduce or avoid any impacts.
County of Monterey (inland areas)	North County Area Plan	Conservation/Open Space	Castroville Pipeline	***Policy NC-3.4:*** Removal of healthy, native oak and madrone trees in the North Monterey County Area shall be discouraged. An ordinance shall be developed to identify required procedures for removal of these trees. Said ordinance shall take into account fuel modification needed for fire prevention in the vicinity of structures and shall include: a. Permit requirements b. Replacement criteria c. Exceptions for emergencies and governmental agencies	This policy is intended to protect native oak and madrone trees.	Potentially Inconsistent: Construction of the Castroville Pipeline could require the removal of native oak or madrone trees. This issue is addressed further in Impact 4.6-4 and a mitigation measure is provided to reduce or avoid any impacts.
County of Monterey (inland areas)	North County Area Plan	Conservation/Open Space	Castroville Pipeline	***Policy NC-3.5:*** Critical habitat areas should be preserved as open space. When an entire parcel cannot be developed because of this policy, a low intensity, clustered development may be approved. However, the development should be located on those portions of the land least biologically significant so that the development will not upset the natural function of the surrounding ecosystem.	This policy is intended to protect critical habitat, sensitive natural communities, and habitat for special-status species.	Potentially Inconsistent: Construction of the Castroville Pipeline could sensitive natural communities and habitat for special-status species. This issue is addressed further in Impacts 4.6-1 and 4.6-2 and mitigation measures are provided to avoid any impacts. Construction of the Castroville Pipeline would comply with the NPDES program and would not alter critical habitat.
Fort Ord Reuse Authority (Seaside)	Fort Ord Reuse Plan	Conservation	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline, and Terminal Reservoir	***Biological Resources Policy A-2:*** The City shall ensure that measures are taken to prevent degradation and siltation of the ephemeral drainage that passes through the Planned Residential Extension District and Community Park in Polygon 24.	This policy is intended to protect a potential wetland.	Potentially Inconsistent: Construction of the Terminal Reservoir could affect the wetland located within Polygon 24. This issue is addressed further in Impact 4.6-3 and mitigation measures are provided to avoid any impacts.
Fort Ord Reuse Authority (Seaside)	Fort Ord Reuse Plan	Conservation	New Transmission Main ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline, and Terminal Reservoir	***Biological Resources Policy A-4:*** The City shall encourage the preservation of small pockets of habitat and populations of HMP species within and around developed areas. ***Program A-4.1:*** The City shall require project applicants who propose development in underdeveloped natural lands to conduct reconnaissance-level surveys to verify the general description of resources for the parcel provided in the biological resource documents prepared for the U.S. Army Corps of Engineers. The information gathered through these reconnaissance-level surveys shall be submitted as a component of the project application package. ***Program A-4.3:*** Where development will replace existing habitat which supports sensitive biological resources, the City shall encourage attempts to salvage some of those resources by collecting seed or cuttings of plants, transplanting vegetation, or capturing and relocating sensitive wildlife species.	This policy is intended to protect sensitive natural communities and special-status species.	Potentially Inconsistent: Installation of the new Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline, and Terminal Reservoir could occur within or adjacent to sensitive natural communities and/or habitat for special-status species as detailed in **Table 4.6-6**. These issues are further addressed in Impacts 4.6-1 and 4.6-2 and mitigation measures are provided to reduce or avoid any impacts.
Fort Ord Reuse Authority (Seaside)	Fort Ord Reuse Plan	Conservation	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline, and Terminal Reservoir	***Biological Resources Policy A-9:*** The County shall encourage the preservation of small pockets of habitat and populations of HMP species within and around developed areas. ***Program A-9.1:*** The County shall require project applicants who propose development in undeveloped natural lands to conduct reconnaissance-level surveys to verify the general description of resources for the parcel provided in the biological resource documents prepared for the U.S. Army Corps of Engineers. The information gathered through these reconnaissance-level surveys shall be submitted as a component of the project application package. ***Program A-9.3:*** Where development will replace existing habitat which supports sensitive biological resources, the County shall encourage attempts to salvage some of those resources by collecting seed or cuttings of plants, transplanting vegetation, or capturing and relocating sensitive wildlife species.	This policy is intended to protect special-status species.	Potentially Inconsistent: Installation of the new Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline, and Terminal Reservoir could occur within or adjacent to habitat for special-status species as detailed in **Table 4.6-6**. This issue is further addressed in Impact 4.6-1 and mitigation measures are provided to reduce or avoid any impacts.

TABLE 4.6-4 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TERRESTRIAL BIOLOGICAL 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 (Seaside)	Fort Ord Reuse Plan	Conservation	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline, and Terminal Reservoir	***Biological Resources Policy B-1:*** The City shall strive to avoid or minimize loss of sensitive species listed in Table 4.4-2 that are known or expected to occur in areas planned for development. ***Program B-1.2:*** If any sensitive species listed in Table 4.4-2 are found in areas proposed for development, all reasonable efforts should be made to avoid habitat occupied by these species while still meeting project goals and objectives. If permanent avoidance is infeasible, a seasonal avoidance and/or salvage/ relocation program shall be prepared. The seasonal avoidance and/or salvage/ relocation program for these species should be coordinated through the CRMP.	This policy is intended to protect special-status species.	Potentially Inconsistent: Installation of the new Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline, and Terminal Reservoir could occur within or adjacent to habitat for special-status species as detailed in **Table 4.6-6**. This issue is further addressed in Impact 4.6-1 and mitigation measures are provided to reduce or avoid any impacts.
Fort Ord Reuse Authority (Seaside)	Fort Ord Reuse Plan	Conservation	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline, and Terminal Reservoir	***Biological Resources Policy C-1:*** The City shall encourage that grading for projects in undeveloped lands be planned to complement surrounding topography and minimize habitat disturbance.	This policy is intended to protect sensitive natural communities.	Potentially Inconsistent: Installation of the new Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline, and Terminal Reservoir could occur within or adjacent to sensitive natural communities. This issue is further addressed in Impact 4.6-2 and mitigation measures are provided to reduce or avoid any impacts.
Fort Ord Reuse Authority (Seaside)	Fort Ord Reuse Plan	Conservation	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline, Terminal Reservoir	***Biological Resources Policy C-3:*** Lighting of outdoor areas shall be minimized and carefully controlled to maintain habitat quality for wildlife in undeveloped natural lands. Street lighting shall be as unobtrusive as practicable and shall be consistent in intensity throughout development areas adjacent to undeveloped natural lands.	This policy is intended to protect wildlife and their habitats from nighttime lighting.	Potentially Inconsistent: Operation of the Terminal Reservoir includes the use of outdoor lighting in undeveloped natural lands, which could disrupt wildlife in these areas. This issue is further addressed in Impacts 4.6-1 and 4.6-6 and mitigation measures are provided to reduce or avoid any impacts.
Fort Ord Reuse Authority (Seaside)	Fort Ord Reuse Plan	Conservation	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline, and Terminal Reservoir	***Biological Resources Policy D-1:*** The City shall require project applicants to implement a contractor education program that instructs construction workers on the sensitivity of biological resources in the vicinity and provides specifics for certain species that may be recovered and relocated from particular development areas.	This policy is intended to protect special-status species.	Potentially Inconsistent: Installation of the new Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline, and Terminal Reservoir could occur within or adjacent to habitat for special-status species as detailed in **Table 4.6-6**. This issue is further addressed in Impact 4.6-1 and mitigation measures are provided to reduce or avoid any impacts.
Fort Ord Reuse Authority (Monterey County)	Fort Ord Reuse Plan	Conservation	Ryan Ranch–Bishop Interconnection Improvements	***Biological Resources Policy A-9:*** The County shall encourage the preservation of small pockets of habitat and populations of HMP species within and around developed areas. ***Program A-9.1:*** The County shall require project applicants who propose development in undeveloped natural lands to conduct reconnaissance-level surveys to verify the general description of resources for the parcel provided in the biological resource documents prepared for the U.S. Army Corps of Engineers. The information gathered through these reconnaissance-level surveys shall be submitted as a component of the project application package. ***Program A-9.3:*** Where development will replace existing habitat which supports sensitive biological resources, the County shall encourage attempts to salvage some of those resources by collecting seed or cuttings of plants, transplanting vegetation, or capturing and relocating sensitive wildlife species.	This policy is intended to protect sensitive natural communities and special-status species.	Potentially Inconsistent: Installation of the Ryan Ranch-Bishop Interconnection Improvements could affect sensitive natural communities and special-status species. This issue is further addressed in Impacts 4.6-1 and 4.6-2 and mitigation measures are provided to reduce or avoid any impacts.
Fort Ord Reuse Authority (Monterey County)	Fort Ord Reuse Plan	Conservation	Ryan Ranch–Bishop Interconnection Improvements	**Biological Resources Policy B-1:** The County shall strive to avoid or minimize loss of sensitive species listed in Table 4.4-2 that are known or expected to occur in areas planned for development. ***Program B-1.2:*** If any sensitive species listed in Table 4.4-2 are found in areas proposed for development, all reasonable efforts should be made to avoid habitat occupied by these species while still meeting project goals and objectives. If permanent avoidance is infeasible, a seasonal avoidance and/or salvage/ relocation program shall be prepared. The seasonal avoidance and/or salvage/ relocation program for these species should be coordinated through the CRMP.	This policy is intended to protect special-status species.	Potentially Inconsistent: Installation of the Ryan Ranch-Bishop Interconnection Improvements could affect special-status species. This issue is further addressed in Impact 4.6-1 and mitigation measures are provided to reduce or avoid any impacts.

TABLE 4.6-4 (Continued)
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO TERRESTRIAL BIOLOGICAL 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 (Monterey County)	Fort Ord Reuse Plan	Conservation	Ryan Ranch–Bishop Interconnection Improvements	**Biological Resources Policy C-1:** The County of Monterey shall encourage that grading for projects be designed to complement surrounding topography, minimize habitat disturbance.	This policy is intended to protect sensitive natural communities.	Potentially Inconsistent: Installation of the Ryan Ranch-Bishop Interconnection Improvements could affect sensitive natural communities. This issue is further addressed in Impact 4.6-2 and mitigation measures are provided to reduce or avoid any impacts.
Fort Ord Reuse Authority (Monterey County)	Fort Ord Reuse Plan	Conservation	Ryan Ranch–Bishop Interconnection Improvements	***Biological Resources Policy C-3:*** Lighting of outdoor areas shall be minimized and carefully controlled to maintain habitat quality for wildlife in undeveloped natural lands. Street lighting shall be as unobtrusive as practicable and shall be consistent in intensity throughout development areas adjacent to undeveloped natural lands.	This policy is intended to protect wildlife and their habitats from nighttime lighting.	Consistent: Installation and operations of the Ryan Ranch-Bishop Interconnections Improvements facility would not include night lighting.
Fort Ord Reuse Authority (Monterey County)	Fort Ord Reuse Plan	Conservation	Ryan Ranch–Bishop Interconnection Improvements	***Biological Resources Policy D-1:*** The County shall require project applicants to implement a contractor education program that instructs construction workers on the sensitivity of biological resources in the vicinity and provides specifics for certain species that may be recovered and relocated from particular development areas. 1. In open coastal waters, other than wetlands, including streams, estuaries, and lakes, new or expanded boating facilities and the placement of structural pilings for public recreational piers that provide public access and recreational opportunities. 2. Incidental public service purposes, including but not limited to, burying cables and pipes or inspection of piers and maintenance of existing intake and outfall lines. 3. Mineral extraction, including sand for restoring beaches, except in environmentally sensitive areas. 4. Restoration purposes. 5. Nature study, aquaculture, or similar resource dependent activities.	This policy is intended to protect special-status species.	Potentially Inconsistent: Installation of the Ryan Ranch-Bishop Interconnection Improvements could affect special-status species. This issue is further addressed in Impact 4.6-1 and mitigation measures are provided to reduce or avoid any impacts.

SOURCES: California State Parks, 2004; City of Marina, 2000, 2013; City of Seaside, 2004; FORA, 1997; Monterey County 1982, 1985, 2010.

4.6.3 Evaluation Criteria

Implementation of the proposed project would have a significant impact related to terrestrial biological resources if it would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW, USFWS, or NMFS;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in federal, state, local, or regional plans, policies, regulations, or by the CDFW, USFWS, or NMFS;
- Result in a substantial adverse effect on critical habitat;
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- Result in a substantial adverse effect on federal "other waters" as defined in the Code of Federal Regulations (40 CFR 122.2);
- Result in a substantial adverse effect on waters of the state, as defined by the California Water Code Section 13050 [e], through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- Be inconsistent with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance;
- Introduce or spread an invasive non-native species; or
- Be inconsistent with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.

Based on the location and nature of the proposed project, the following criteria are not considered in the impact analyses in Sections 4.6.5.1 and 4.6.5.2 for the reasons described below.

Interfere substantially with the movement of native fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. As discussed in Section 4.6.1.7, Wildlife Movement Corridors, the majority of the site is located within or adjacent to developed areas, which do not serve as wildlife movement corridors. Although some wildlife move through these roadways and trails, they would likely travel in undisturbed areas located adjacent to these features and outside of the project area. Terrestrial wildlife habitat in the project area is fragmented by agricultural fields, residential developments, commercial/industrial developments, and roads. The majority of the construction disturbance involves temporary construction of pipelines in developed or disturbed areas, which would not substantially impede wildlife movement in undisturbed wildlife corridors. Although some wildlife may be deterred from movement through the construction site during construction, construction would largely

occur in areas that are subject to current development or disturbance. Additionally, project construction would be implemented in segments so only portions of the project site would be under construction at any one time. The proposed project does not include the permanent placement of structures within creeks, rivers, or other waterways and would not substantially impede the movement of native resident or migratory fish or wildlife corridors or impede the use of native wildlife nursery sites. Implementation of the proposed project would result in no impact relative to this criterion.

Impacts to special-status species are addressed in Impact 4.6-1 and 4.6-6 below.

No work would occur within the Carmel River so it was not included as part of this analysis. Implementation of the proposed project would comply with California State Water Resources Control Board (SWRCB) Order 95-10 as described in Section 1.3 in Chapter 1, Introduction and Background, and the proposed project would not increase the quantity of Carmel River water in CalAm's water supply portfolio for the Monterey District service area (Monterey District). As described in Section 3.2.4 in Chapter 3, Description of the Proposed Project, the proposed improvements to the Seaside Groundwater Basin ASR system would not affect CalAm's maximum allowable surface water diversions from the Carmel River for injection into the Seaside Groundwater Basin. Rather, project implementation would secure replacement water supplies for the Monterey District, enabling CalAm to reduce its current diversions from the Carmel River system to its legal right to 3,376 afy (equivalent to about 3 mgd). Therefore, implementation of the proposed project would have a beneficial effect on stream flows in the Carmel River and the river's aquatic and riparian biological resources.

4.6.4 Approach to Analysis

The following is a discussion of the approaches to, and definitions of, significance of impacts on terrestrial biological resources. General CEQA and NEPA guidance regarding significance of impacts is provided in Section 4.1.

In addition to the general guidance provided in Section 4.1, CEQA Guidelines Section 15065 includes specific references to biological resources and directs lead agencies to find that a project may have a significant effect on the environment if it has the potential to substantially degrade the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, or reduce the number or restrict the range of an endangered, rare, or threatened species. NEPA requires consideration of both context and intensity in assessing impacts, as outlined in detail in Section 4.1.

The potential impacts of the project on special-status species were assessed based on literature review, professional judgment, and the following considerations:

1. A determination of species occurrence. The determination of species occurrence was presented in Section 4.6.1, Setting, above. This determination evaluated each species: (a) potential occurrence within the project area (i.e., the area within which all construction-related disturbance would occur, includes facility footprints); (b) potential occurrence in the project vicinity (generally defined as the terrestrial and aquatic habitats of the areas adjacent to the project area); or (c) absence from the project area and project vicinity. This

determination was based on an analysis of life history and habitat requirements, as well as the suitability of habitat for the species found within and adjacent to the project area. If a species was determined unlikely to occur in the project area or project vicinity, or had a low potential to occur in the project area or project vicinity (for example, if no potential habitat exists for the species in the vicinity), then the species was given no further consideration. The impact analyses presented in Sections 4.6.5.1 and 4.6.5.2, below, consider only those species actually observed or with a moderate to high potential to occur in the project area and/or vicinity.

The results of this determination for each species for the project as a whole are provided in the "Potential for Species Occurrence" column of **Table F-1** located in **Appendix F** of this EIR/EIS. **Table 4.6-2**, above, provides the potential for each species considered to occur in habitat within, or adjacent to, each project facility.

2. A determination of impact. The determination of impact is presented under Section 4.6.5, Direct and Indirect Effects of the Proposed Project, within Section 4.6.5.1, Construction Impacts and Section 4.6.5.2, Operational and Facility Siting Impacts. If suitable habitat was determined to be present within the project area and the species has been documented in the project vicinity or has at least a moderate potential to occur, the analysis then considered whether project implementation would result in a substantial adverse effect on the species. Both direct effects (e.g., mortality attributable to construction activities, or displacement of habitat) and indirect effects (e.g., construction-related noise and dust emissions) were considered. In evaluating the likelihood and severity of an impact, the life history and habitat requirements of a species also were considered.

   For the purposes of this EIR/EIS, the definition of the word "substantial" as used in the significance criteria above has three principal factors:

   - Magnitude[17] or intensity and duration of the impact;
   - Rarity and context of the affected resource; and
   - Susceptibility of the affected resource to disturbance.

   The evaluation of significance must also consider the interrelationship of these three factors. For example, a relatively small-magnitude impact on a state- or federally listed species could be considered significant if the species is rare and highly susceptible to disturbance. Conversely, for a natural community such as California annual grassland, which is not necessarily considered rare or highly sensitive to disturbance, a much larger magnitude of impact might be required to result in a significant impact.

This project would require authorization from various regulatory agencies including the USACE, USFWS, NMFS, RWQCB, CDFW, and CCC. The mitigation measures prescribed below reflect the anticipated terms and conditions in the authorizations. Based on the professional judgment and experience of the biologists that conducted this analysis, the mitigation measures in this section (and their constituent requirements and performance standards) would minimize and avoid impacts to a less-than-significant level.

[17] Magnitude may include the aerial extent of impact, number of species affected, length of time, or intensity of impact.

4.6.5 Direct and Indirect Effects of the Proposed Project

TABLE 4.6-5
SUMMARY OF IMPACTS – TERRESTRIAL BIOLOGICAL RESOURCES

Impacts	Significance Determinations
Impact 4.6-1: Result in substantial adverse effects on species identified as candidate, sensitive, or special-status, either directly or through habitat modification, during construction.	LSM
Impact 4.6-2: Result in substantial adverse effects on riparian habitat, critical habitat, or other sensitive natural communities during construction.	LSM
Impact 4.6-3: Result in substantial adverse effects on federal wetlands, federal other waters, and/or waters of the state during construction.	LSM
Impact 4.6-4: Be inconsistent with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.	SU
Impact 4.6-5: Introduce or spread an invasive non-native species during construction.	LSM
Impact 4.6-6: Result in substantial adverse effects on candidate, sensitive, or special-status species during project operations.	LSM
Impact 4.6-7: Result in substantial adverse effects on riparian habitat, critical habitat, or other sensitive natural communities during project operations.	LSM
Impact 4.6-8: Result in substantial adverse effects on federal wetlands, federal other waters, and waters of the state during project operations.	LSM
Impact 4.6-9: Introduce or spread an invasive non-native species during project operations.	LSM
Impact 4.6-10: Be inconsistent with the provisions of an adopted Habitat Conservation Plan, natural community conservation plan or other approved local, regional, or state habitat conservation plan.	LSM
Impact 4.6-C: Cumulative impacts related to terrestrial biological resources.	SU

NOTES:
LS = Less than Significant impact, no mitigation required
LSM = Less than Significant impact with Mitigation
SU = Significant and Unavoidable impact for which no mitigation is available

The following impact analysis evaluates impacts of the proposed project as required by CEQA and NEPA. A Biological Assessment, which would evaluate the project's impacts on federally listed species, would be prepared in support of FESA Section 7 consultation between the ONMS and USFWS.

4.6.5.1 Construction Impacts

Impact 4.6-1: Result in substantial adverse effects on species identified as candidate, sensitive, or special-status, either directly or through habitat modification, during construction. (Less than Significant with Mitigation)

This impact addresses impacts on special-status species. As defined above in Section 4.6.1.8, Special-Status Species, special-status species includes listed as well as candidate and sensitive species, and Fully Protected Species.

Special-status plants and animals that could occur at the various proposed facility sites and pipeline alignments are summarized in **Table 4.6-2**, and those species with a moderate to high potential to occur at the project sites and that could be significantly impacted during construction are presented in **Table 4.6-6**. Construction activities could result in both direct and indirect adverse effects on special-status plants and animals. In general, construction in developed areas that have been surfaced, drained, and maintained free of vegetation would have a low potential to result in substantial adverse effects on special-status species. However, if construction were to extend into areas of undeveloped natural vegetation, substantial adverse effects could occur. Construction within or adjacent to natural, high-quality habitat would have a greater potential to result in significant impacts on special-status plants and animals and/or their habitat compared to facilities adjacent to developed or highly disturbed areas.

Impact acreages are provided below for each facility when appropriate and are provided as an approximation based on the current proposed project footprint. Since many of the facilities overlap, the impact acreages provided below may overlap with the impact acreages for other facilities and optional alignments. The final impact acreages for the entire project would be based on whether the proposed project uses the proposed alignments or optional alignments.

Overview of Potential Construction Effects on Plants

Site clearance, grading, excavation, and other earthmoving activities can cause direct mortality of individual special-status plants through soil disturbance and loss of habitat. Earthmoving activities can also eliminate soil seedbanks, potentially reducing the size of local rare plant populations and adversely affecting the viability of the population by reducing reproduction below sustainable levels. Permanent indirect impacts on special-status plant species may arise from population fragmentation and introduction of non-native weeds. Population fragmentation can affect pollinator activity and, hence, reproduction and gene flow. Introduction and establishment of invasive weeds within or adjacent to special-status plant populations can reduce species growth and recruitment. In addition, indirect impacts on special-status plant species located in offsite areas can arise from fugitive dust and increased soil erosion at construction work areas and the migration of sediment into adjacent habitat, or accidental offsite habitat use by construction workers. Fugitive dust and sediment can interfere with metabolic processes such as photosynthesis and respiration.

Overview of Potential Construction Effects on Wildlife

Special-status wildlife can be trampled by construction vehicles and heavy construction equipment or get trapped in trenches or other open excavations. Vegetation and tree removal can result in direct impacts on nesting birds through loss of nests and eggs or nestling mortality, and can reduce or fragment foraging and dispersal habitat. Even at sites that have little or no wildlife habitat, impacts can occur if wildlife from adjacent habitat areas enter or pass through the construction work area. Construction can result in the temporary or permanent loss of habitat for wildlife species. Construction activities can also result in indirect impacts on special-status wildlife related to disturbance or harassment of individuals. For example, construction noise, vibration, and nighttime lighting can cause special-status birds, bats, and other animals to abandon nests, roosts, or other breeding areas. Artificial lighting during nighttime construction

can also increase predation and disrupt reproductive behaviors. Introduced invasive non-native plant species can degrade habitat. Eroded sediment and hazardous construction chemicals from the construction work area can be transported offsite via site runoff and adversely affect receiving downstream water bodies and degrade habitat for both terrestrial and aquatic animals.

Subsurface Slant Wells

The subsurface slant wells include ten subsurface slant wells (the converted test slant well and nine new permanent wells). Site 1 is located along the CEMEX access road, but is situated at the approximate mid-point of the vegetated sand dunes. The remaining nine wells (Sites 2 through 6) would be installed on the eastern side of the vegetated sand dunes and constructed on concrete pads. The components of the proposed subsurface slant wells that would be below the mean high water line would be within the Monterey Bay National Marine Sanctuary (MBNMS). Impacts to marine biological resources from the slant well components that would be located within the MBNMS are described in Section 4.5, Marine Biological Resources. The facility components that are evaluated in this section would be located above the mean high water line and outside of the MBNMS.

Construction of the nine new permanent slant wells and conversion of the test slant well into a permanent well would disturb approximately 9 acres in the CEMEX active mining area. A portion of this construction footprint overlaps with a portion of the construction footprints for the Source Water Pipeline and Source Water Pipeline using the optional alignment. The 9 acres includes staging, materials storage, and stockpiling areas. Existing ground cover at the subsurface slant well site includes relatively undisturbed central dune scrub, formerly disturbed sand dunes that are revegetating with native and non-native dune scrub vegetation, and unvegetated disturbed sandy soil. The areas of relatively intact scrub occur along the western active mining area boundary (just east of the active beach area) and at the west end of the access road in the vicinity of the CEMEX settling ponds. The current and recently disturbed areas occur east of the vegetated sand dunes and south of the CEMEX access road. Slant well construction would take approximately 15 months to complete, and could take place any time throughout the overall 24-month construction duration for the proposed project.

Monterey spineflower, sand-loving wallflower, and ocean bluff milk vetch have been observed at the site (ESA, 2013; 2014; AECOM, 2016). Construction of the subsurface slant wells and associated aboveground facilities in the CEMEX active mining area has the potential to disturb documented populations of Monterey spineflower, sand-loving wallflower, and ocean bluff milkvetch. A variety of other special-status plant species, as listed in **Table 4.6-6**, are either known to occur or have a potential to occur in central dune scrub at the site, including robust spineflower, seaside bird's-beak, Menzies' wallflower, sand gilia, Hooker's manzanita, sandmat manzanita, Monterey Coast paintbrush, Monterey ceanothus, branching beach aster, south coast branching phacelia, Eastwood's goldenbush, Kellogg's horkelia, northern curly-leaved Monardella, and Michael's rein orchid. If these species are present within or adjacent to the construction work area for the subsurface slant wells, electrical control panel, and/or electrical control building, they could be directly or indirectly impacted by construction activities during the 15-month construction period as described above under the heading *Overview of Potential Construction Effects on Plants*. This would be a significant impact.

TABLE 4.6-6
SPECIAL-STATUS SPECIES AND SENSITIVE NATURAL COMMUNITIES THAT COULD BE SIGNIFICANTLY IMPACTED DURING CONSTRUCTION OF THE PROPOSED FACILITIES

			Pipelines North of Reservation Road				Facilities and Improvements South of Reservation Road						
Species or Resource	**Subsurface Slant Wells**	**MPWSP Desalination Plant**	**Source Water Pipeline**	**New Desalinated Water Pipeline**	**Castroville Pipeline**	**Brine Discharge Pipeline and Pipeline to CSIP Pond**	**ASR-5 and ASR-6 Wells, ASR Conveyance Pipeline, ASR Recirculation Pipeline, ASR Pump-to-Waste Pipeline**	**New Transmission Main**	**Terminal Reservoir**	**Carmel Valley Pump Station**	**Ryan Ranch-Bishop Interconnection Improvements**	**Main System-Hidden Hills Interconnection Improvements**	**Staging Areas**
Federal or State Listed Species													
Plants													
Monterey spineflower	X	X	X	X	X		X	X	X				X
robust spineflower	X		X	X	X		X	X	X				X
Seaside bird's-beak	X		X	X	X		X	X	X				X
Menzies' wallflower	X		X	X	X			X					X
sand gilia	X		X	X	X		X	X	X				X
Yadon's rein orchid							X		X			X	X
Pacific Grove clover											X	X	
Invertebrates													
Smith's blue butterfly	X		X	X	X			X					X
Fish													
South/central California coast steelhead					X								
Amphibians													
California tiger salamander		X	X	X	X	X			X		X	X	X
California red-legged frog		X	X	X	X	X			X	X	X	X	X
Birds													
Western snowy plover	X		X										
Other Special-Status Species													
Plants													
Hickman's onion											X	X	
Hooker's manzanita	X		X	X			X	X	X			X	X
Toro manzanita							X	X	X		X	X	
Pajaro manzanita							X	X	X		X	X	
sandmat manzanita	X		X	X			X	X	X			X	X
ocean bluff milkvetch	X		X				X		X				
Monterey Coast paintbrush	X		X	X	X		X	X	X				X
Monterey ceanothus	X		X	X			X	X	X				X
Congdon's tarplant		X			X						X	X	
branching beach aster	X		X	X	X			X					X
Eastwood's goldenbush	X		X	X	X		X	X	X			X	X
sand-loving wallflower	X		X	X	X		X	X	X				X
Kellogg's horkelia	X		X	X	X		X	X	X				X
Carmel Valley bush-mallow							X		X		X	X	
marsh microseris											X	X	

TABLE 4.6-6 (Continued)
SPECIAL-STATUS SPECIES AND SENSITIVE NATURAL COMMUNITIES THAT COULD BE SIGNIFICANTLY IMPACTED DURING CONSTRUCTION OF THE PROPOSED FACILITIES

			Pipelines North of Reservation Road				Facilities and Improvements South of Reservation Road						
Species or Resource	**Subsurface Slant Wells**	**MPWSP Desalination Plant**	**Source Water Pipeline**	**New Desalinated Water Pipeline**	**Castroville Pipeline**	**Brine Discharge Pipeline and Pipeline to CSIP Pond**	**ASR-5 and ASR-6 Wells, ASR Conveyance Pipeline, ASR Recirculation Pipeline, ASR Pump-to-Waste Pipeline**	**New Transmission Main**	**Terminal Reservoir**	**Carmel Valley Pump Station**	**Ryan Ranch-Bishop Interconnection Improvements**	**Main System-Hidden Hills Interconnection Improvements**	**Staging Areas**
Other Special-Status Species (cont.)													
Plants (cont.)													
northern curly-leaved monardella	X		X	X	X		X	X	X				X
south coast branching phacelia	X		X	X	X		X	X	X				X
Monterey pine									X	X	X	X	
Michael's rein orchid	X		X	X	X		X	X	X		X	X	X
Santa Cruz microseris											X	X	
Santa Cruz clover											X	X	
Reptiles													
Western pond turtle				X	X								
black legless lizard	X		X	X	X		X	X	X				X
silvery legless lizard	X		X	X	X		X	X	X				X
coast horned lizard	X		X	X			X	X	X				X
Coast Range newt		X	X	X	X	X	X	X	X	X	X	X	X
Birds													
tricolored blackbird				X				X					
short-eared owl		X	X	X	X			X					X
western burrowing owl			X	X				X	X				X
red-tailed hawk		X	X	X	X	X	X	X	X	X	X	X	X
red-shouldered hawk		X	X	X		X	X	X	X	X	X	X	X
Ferruginous hawk		X	X	X	X			X					
Northern harrier		X	X	X	X		X	X	X				X
White-tailed kite		X	X	X	X	X	X	X	X	X	X	X	X
California horned lark		X	X	X	X			X			X		X
American peregrine falcon		X	X	X	X	X	X	X	X	X	X	X	
American kestrel		X	X	X	X	X	X	X	X	X	X	X	X
loggerhead shrike		X	X	X	X	X	X	X	X	X	X	X	X
Mammals													
pallid bat		X	X	X	X	X	X	X	X	X	X	X	X
western red bat		X	X	X	X	X	X	X	X	X	X	X	X
Monterey dusky-footed woodrat							X	X	X	X	X	X	X
Monterey shrew							X	X	X	X	X	X	X
American badger		X	X	X	X		X	X	X		X	X	X

TABLE 4.6-6 (Continued)
SPECIAL-STATUS SPECIES AND SENSITIVE NATURAL COMMUNITIES THAT COULD BE SIGNIFICANTLY IMPACTED DURING CONSTRUCTION OF THE PROPOSED FACILITIES

			Pipelines North of Reservation Road				Facilities and Improvements South of Reservation Road						
Species or Resource	**Subsurface Slant Wells**	**MPWSP Desalination Plant**	**Source Water Pipeline**	**New Desalinated Water Pipeline**	**Castroville Pipeline**	**Brine Discharge Pipeline and Pipeline to CSIP Pond**	**ASR-5 and ASR-6 Wells, ASR Conveyance Pipeline, ASR Recirculation Pipeline, ASR Pump-to-Waste Pipeline**	**New Transmission Main**	**Terminal Reservoir**	**Carmel Valley Pump Station**	**Ryan Ranch-Bishop Interconnection Improvements**	**Main System-Hidden Hills Interconnection Improvements**	**Staging Areas**
Natural Communities													
central dune scrub	X		X	X	X			X					X
central maritime chaparral							X		X				
northern coastal scrub		X			X		X	X			X		X
riparian woodland and scrub				X	X								
freshwater marsh					X								
coast live oak woodland				X			X	X	X		X	X	X
Critical Habitat													
Monterey spineflower									X				
western snowy plover	X		X										
south/central California coast steelhead					X								
California red-legged frog										X		X	
Tidewater goby					X								
Potential Wetlands and Waters													
Potentially USACE, RWQCB, and/or CDFW jurisdictional					X	X			X	X	X	X	
Potentially USACE, RWQCB, CDFW, and/or CCC jurisdictional	X		X	X				X					X
Local Tree Policies or Ordinances													
		X	X	X	X	X	X	X	X	X	X	X	

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Coast buckwheat, host plant for Smith's blue butterfly, occurs within the proposed subsurface slant wells site (ESA, 2013; 2014). Smith's blue butterfly was observed in central dune scrub in the vicinity of the proposed subsurface slant wells during 2016 surveys of the CEMEX active mining area (ESA, 2016). Removal or impacts on these plants and associated soil during construction could impact individual adult butterflies, their eggs, or larvae, if present. Impacts to any life form of the Smith's blue butterfly would result in a significant impact. Construction of the subsurface slant wells has potential to temporarily impact approximately 1.6 acre of Smith's blue butterfly habitat, which would be a significant impact. The impact is considered temporary because coast buckwheat is relatively easy to cultivate and reestablish in dune scrub habitat, and would be returned to pre-construction conditions. However, some potential for permanent loss of the host plant remains, which would be a significant impact.

As described in Section 4.6.1.8, above, western snowy plover are known to nest and breed within the beach and foredunes located west of, and within the western portion of, the CEMEX active mining area. The beach and foredunes provide important breeding/nesting and wintering habitat for the western snowy plover. Surveys conducted during the 2015 nesting season identified multiple nests along the stretch of beach in the vicinity of the CEMEX active mining area (Page et al., 2015). Some nests have been found in the vicinity of the CEMEX settling ponds and adjacent to the CEMEX access road (Zander, 2013) and at the location of the northernmost well site. Nesting has also been documented in the backdunes of the CEMEX active mining area where the subsurface slant wells are proposed (Neuman, 2015). Typical wintering habitat in California includes sand spits and dune-backed beaches (USFWS, 2007) and most flocks of wintering plovers would likely occur along the beach, away from the back dunes. However, individual western snowy plovers may also use the entire subsurface slant well construction area for wintering.

Construction of the slant wells in the CEMEX active mining area could occur year-round. The nine-acre construction footprint for the subsurface slant wells is located within potential nesting habitat and construction of the nine subsurface slant wells and conversion of the test well to a permanent production well during the breeding season would result in the temporary loss of 8.0 acres (for temporary construction disturbance to areas that would be restored) and permanent loss of 1.0 acre (for new permanent above-ground facilities) of potential wintering habitat. A portion of this impact area may overlap with the Source Water Pipeline. Construction noise and vibration, earthmoving activities, vegetation clearance, and night lighting associated with installation of the nine subsurface slant wells during the snowy plover nesting season (typically defined as March 1 through September 30) could also impact plovers by causing temporary flight of breeding birds, nest abandonment, or nest failure. The impact to plover habitat and behavior from construction of the nine subsurface slant wells and conversion of the test well to a permanent well would be significant.

With respect to wintering birds, construction activities would be temporary and largely occur within the backdunes, away from the beach and foredunes where flocks of plovers are typically found in this season. However construction activities would be implemented in or around areas where plovers may occur during the winter. Construction activities associated with the conversion of the test slant well to a permanent well has the greatest likelihood of disturbing flocks of

wintering plovers as it is closest to the beach where wintering flocks typically occur. Although not typical habitat, plovers may winter in the backdunes and construction of the nine subsurface slant wells in this area may impact plovers. Construction during the snowy plover wintering season (October 1 through February 28) could directly or indirectly impact individual birds if present within or adjacent to the construction area. Human presence and construction noise and activities can cause roosting plovers to fly and disturb resting or foraging activities. This would be a significant impact.

Construction activities may also displace wintering birds that may utilize the beach in the vicinity of the slant well or in the backdunes. Wintering habitat is not dependent on specific and stationary locations, such as nest sites during breeding season, so there is a much greater availability of suitable habitat. Abundant wintering habitat is present within the extensive dune system along the Monterey Bay shoreline north and south of the subsurface slant wells site. The beach north and south of the site is subject to relatively little disturbance from humans or dogs, and birds can readily use these areas during construction. Although birds may be initially disturbed and temporarily displaced during construction, the majority of the site (8 acres) would be returned to pre-construction conditions and birds would be able to utilize the site following construction. Temporary and permanent impacts to plover habitat were described in the previous paragraph.

Construction and operation of the test slant well has been conducted at the same location of Site 1 of the proposed subsurface slant well and its impact analysis serves as a reference for the type of impact that may result from construction of the proposed subsurface slant wells. The USFWS issued a letter of concurrence for the test slant well as part of the test slant well's FESA Section 7 consultation (USFWS, 2014). With regard to western snowy plover, the letter concurred that although the test slant well project would disturb a small amount of habitat, the test slant well project was not likely to adversely affect western snowy plover with implementation of avoidance measures such as restoring the site, seasonal avoidance, and other avoidance measures. Construction and operation of the test slant well has been monitored and no direct take of western snowy plover has been observed (Jacob Martin, USFWS pers. comm., 2016). The scope of work for the test slant well is smaller than the scope of work for the proposed subsurface slant well. However, the analysis and findings from the test slant well support the conclusion that impacts to plovers can be reduced through implementation of avoidance and minimization measures.

Black legless lizard, silvery legless lizards, and coast horned lizard have potential to occur within the subsurface slant well site, and if present during construction, they could be directly or indirectly impacted by construction activities during the 15-month construction period as described above under the heading *Overview of Potential Construction Effects on Wildlife*. This would be a significant impact.

Other special-status birds protected by the federal MBTA and Section 3503 of the California Fish and Game Code, such as killdeer, may nest within or adjacent to the construction work areas for the slant wells and associated facilities. If nesting birds are present, construction activities could directly or indirectly impact these species during the 15-month construction period as described

above under the heading *Overview of Potential Construction Effects on Wildlife*. This would be a significant impact.

Impacts of subsurface slant well construction on central dune scrub habitat for black legless lizard, silvery legless lizard, coast horned lizard, and the special-status plant species listed above are addressed below under Impact 4.6-2.

A full list of special-status species that could be significantly impacted by subsurface slant well construction is provided in Table 4.6-6. Overall, the impact on special-status species during slant well construction would be significant. However, with implementation of **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures), 4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1d (Protective Measures for Western Snowy Plover)**, **4.6-1e (Avoidance and Minimization Measures for Special-status Plants)**, **4.6-1f (Avoidance and Minimization Measures for Smith's Blue Butterfly)**, **4.6-1g (Avoidance and Minimization Measures for Black Legless Lizard, Silvery Legless Lizard, and Coast Horned Lizard)**, **4.6-1i (Avoidance and Minimization Measures for Nesting Birds)**, **4.6-1n (Habitat Mitigation and Monitoring Plan)**, **4.6-1p (Control Measures for Spread of Invasive Plants), 4.12-1b (General Noise Controls for Construction Equipment)**, and **4.14-2 (Site-Specific Nighttime Lighting Measures)**, the impacts would be reduced to a less-than-significant level. These measures would reduce impacts on special-status species by designating a lead biologist to oversee and ensure implementation of special-status species protective measures; requiring worker training regarding special-status species potentially present to ensure that workers are aware of special-status species that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as installation of an exclusion fencing to ensure special-status species do not occur within the construction area, a trash abatement program to ensure special-status species predators are not attracted to the site, and other measures to avoid and minimize impacts on special-status species; requiring specific measures to avoid, minimize, and compensate for impacts on the western snowy plover such as avoiding the breeding season, installing a visual construction barrier for work conducted adjacent to breeding habitat during the breeding season to reduce human disturbance to plovers, conducting pre-construction surveys to determine if plovers are present and implementing minimization measures to minimize construction impacts on plovers, if present, and compensating for habitat loss to mitigate for temporary and permanent loss of habitat; requiring specific measures to avoid and minimize impacts on special-status plants such as avoiding individual plants to the extent feasible and compensating for temporary or permanent loss of special-status plants at a level acceptable to the applicable resource agencies; requiring specific measures to avoid and minimize impacts on Smith's blue butterfly such as avoiding host plants to the extent feasible to avoid impacts to individuals and providing compensatory mitigation for permanent impacts; requiring specific measures to avoid and minimize impacts on black legless lizard, silvery legless lizard, and coast horned lizard such as relocating individuals to areas outside of the construction area to avoid injury or mortality from construction; requiring specific measures to avoid and minimize impacts on nesting birds such as limiting construction to the non-nesting season when feasible to avoid impacts to active nests; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted

sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; requiring implementation of measures to reduce the introduction or spread of invasive species that may degrade habitat for special-status species; requiring implementation of noise controls for construction equipment to reduce noise impacts on special-status wildlife species; and requiring measures to minimize light spillover outside of the construction area to minimize construction lighting impacts on special-status wildlife species.

MPWSP Desalination Plant

The proposed MPWSP Desalination Plant described in Chapter 3, Description of the Proposed Project, Section 3.2.2 would be constructed on the upper terrace (approximately 25 acres) of a 46-acre vacant parcel on Charles Benson Road. This facility would be located outside of the MBNMS. Nighttime construction is anticipated at the MPWSP Desalination Plant site throughout the 24-month construction period. Construction activities would disturb approximately 25 acres and the MPWSP Desalination Plant would create approximately 15 acres of impervious surface within this 25-acre construction area. The 25 acres that would be disturbed during construction is mostly non-native grassland with a small patch of yellow bush lupine scrub. Google Earth aerial photography (Google Earth, 2016) indicates the site was disked and/or mowed regularly prior to 2013, but appears to have recently been left undisturbed. Adjacent land uses include the MRWPCA Regional Wastewater Treatment Plant, crop production, and grazing.

Table 4.6-6 identifies the special-status species that could be significantly impacted by construction at the site. As described in Section 4.6.1.10, Monterey spineflower has been observed at the MPWSP Desalination Plant site and the site could support Congdon's tarplant, a CRPR 1B.1 plant that can occur in disturbed habitats. If Monterey spineflower or Congdon's tarplant are present within the project construction work area, earthwork activities conducted during the 24-month construction period could significantly directly or indirectly impact Monterey spineflower and Congdon's tarplant as described above under the heading *Overview of Potential Construction Effects on Plants*. Additionally, California red-legged frog or California tiger salamander could disperse through the site. If individual California red-legged frogs or California tiger salamanders are present, construction of the MPWSP Desalination Plant could directly or indirectly impact these individuals during the 24-month construction period as described above under the heading *Overview of Potential Construction Effects on Wildlife*, a significant impact. The site does not provide high quality upland refugial habitat for these species. However, there is potential for California red-legged frog and California tiger salamander to breed in a drainage ditch or retention pond located approximately 250 feet from the site. If California red-legged frog and California tiger salamander occur in those aquatic features, then non-native grassland at the MPWSP Desalination Plant could be considered upland habitat for these species. Construction of the MPWSP Desalination Plant would result in the temporary loss of 10 acres and permanent loss of 15 acres of potential California red-legged frog and California tiger salamander upland habitat. The impact on California red-legged frog and California tiger salamander habitat would be a significant impact.

Coast Range newt and American badger could occur in grassland areas and be impacted by construction, a significant impact.

Mature ornamental eucalyptus and Monterey cypress trees planted along Charles Benson Road adjacent to the site may provide nesting and roosting habitat for raptors such as red-tailed hawk, red-shouldered hawk, and American kestrel and special-status bat species. The entire site provides potentially suitable nesting habitat for common passerines protected under the MBTA. Currently the site also provides potential foraging habitat for raptors and other birds. **Table 4.6-2** provides a complete list of special-status species with the potential to occur at the MPWSP Desalination Plant site. Nighttime construction lighting and both daytime and nighttime construction noise have the potential to disturb raptors and special-status passerines actively nesting in the trees along Charles Benson Road during the 24-month construction period as described above under the heading *Overview of Potential Construction Effects on Wildlife*, a significant impact. If nesting birds or roosting special-status bats are present within these trees, they could be harmed if the trees are removed, also a significant impact.

Steelhead are known to occur in the Salinas River (NMFS, 2007), which is located approximately 850 feet north of the MPWSP Desalination Plant site. A drainage ditch that flows into the Salinas River is located approximately 250 feet north and downslope of the MPWSP Desalination Plant site. Construction of the MPWSP Desalination Plant would not directly impact steelhead. However, soil-disturbing activities at the site could result in soil erosion and the migration of eroded soil and sediment downgradient towards the Salinas River. As discussed under Impact 4.3-1 in Section 4.3, Surface Water Hydrology and Water Quality, project construction activities that would disturb more than one acre would be subject to the National Pollutant Discharge Elimination System (NPDES) Construction General Permit requirements. Per the requirements, a Stormwater Pollution Prevention Plan (SWPPP) would be prepared by a Qualified SWPPP Developer and a Qualified SWPPP Practitioner would oversee its implementation. The SWPPP, which would include site-specific erosion and stormwater control measures (such as installing sediment barriers like silt fencing and fiber rolls and maintaining equipment and vehicles used for construction) to be implemented during construction of the MPWSP Desalination Plant, would reduce or eliminate the offsite migration of pollutants and sediment. Mandatory compliance with the NPDES Construction General Permit would avoid substantial adverse effects on the water quality of steelhead habitat along the Salinas River. Thus, the impact on steelhead within the Salinas River would be less than significant and no mitigation is necessary.

The construction-related effects on special-status species described above (Monterey spineflower, Congdon's tarplant, California red-legged frog, California tiger salamander, Coast Range newt, American badger, and special-status bats and nesting birds) would result in a significant impact. Implementation of following mitigation measures would ensure that impacts on sensitive species at this site are reduced to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1e (Avoidance and Minimization Measures for Special-status Plants), 4.6-1i (Avoidance and Minimization Measures for Nesting Birds)**, **4.6-1j (Avoidance and Minimization Measures for American Badger), 4.6-1l (Avoidance and Minimization Measures for Special-status Bats)**, **4.6-1n (Habitat Mitigation and Monitoring Plan)**, **4.6-1o (Avoidance and Minimization Measures for California Red-legged Frog and California Tiger Salamander)**, **4.6-1p (Control Measures for Spread of Invasive Plants)** and **4.14-2 (Site-**

Specific Nighttime Lighting Measures). These measures would reduce impacts on special-status species by designating a lead biologist to oversee and ensure implementation of special-status species protective measures; requiring worker training regarding special-status species potentially present to ensure that workers are aware of special-status species that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as installation of exclusion fencing to ensure special-status species are prevented from entering the construction area or can safely leave it, a trash abatement program to ensure special-status species predators are not attracted to the site, and other measures to avoid and minimize impacts on special-status species; requiring specific measures to avoid and minimize impacts on special-status plants such as avoiding individual plants to the extent feasible and compensating for temporary or permanent loss of special-status plants at a level acceptable to the applicable resource agencies; requiring specific measures to avoid and minimize impacts on nesting birds such as limiting construction to the non-nesting season when feasible to avoid impacts to active nests; requiring specific measures to avoid and minimize impacts on American badger such as conducting pre-construction surveys to identify whether any badger dens are present and avoiding and/or passively relocating badgers from dens as necessary to avoid and minimize impacts to badgers within active dens; requiring measures to avoid and minimize impacts on special-status bats such as limiting removal of trees or structures with potential bat roosting habitat to the time of year when bats are active to avoid disturbing bats during the maternity roosting season or months of winter torpor; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; requiring measures to avoid and minimize impacts on California red-legged frog and California tiger salamander such as pre-construction surveys to determine if these species are present and implementing minimization measures to minimize construction impacts on these species, if present, and compensating for permanent impacts; requiring implementation of measures to reduce the introduction or spread of invasive species that may degrade habitat for special-status species; and requiring measures to minimize light spillover outside of the construction area to minimize construction lighting impacts on special-status wildlife species.

Pipelines and Other Conveyance Facilities North of Reservation Road

Most pipeline segments would be installed using conventional open-trench technology; however, trenchless methods would be used when open-cut trenching is not feasible or desirable. The construction sequence would typically include clearing and grading the ground surface along the pipeline alignments; excavating the trench; preparing and installing pipeline sections; installing vaults, manhole risers, manifolds, and other pipeline components; backfilling the trench with non-expansive fills; restoring preconstruction contours; and revegetating or paving the pipeline alignments, as appropriate.

Source Water Pipeline

The Source Water Pipeline is described in Section 3.2.1.2 of Chapter 3, Description of the Proposed Project. This facility would be located outside of the MBNMS. Installation of the Source Water Pipeline is anticipated to take 6 months. Although not planned, nighttime installation of the Source Water Pipeline could be required to expedite the construction schedule. The construction footprint

is approximately 16.4 acres. A portion of this footprint overlaps with a portion of the construction footprints for the subsurface slant well, Castroville Pipeline, Castroville Pipeline using the optional alignment 1, Castroville Pipeline using the optional alignment 2, the new Desalinated Water Pipeline, and the new Desalinated Water Pipeline using the optional alignment.

Central dune scrub, coyote brush scrub, ice plant mats, and agricultural and ruderal areas exist along the proposed Source Water Pipeline alignment along the CEMEX access road and Lapis Road. From Lapis Road, the Source Water Pipeline alignment extends through non-native grassland and agricultural fields to the MPWSP Desalination Plant site. Monterey cypress and eucalyptus trees, which border Charles Benson Road, occur south of the pipeline alignment.

Monterey spineflower occurs in high densities along the CEMEX access road and in the surrounding sand dunes in the CEMEX active mining area (Zander Associates, 2013; 2014). Branching beach aster has been observed along Lapis Road and the CEMEX access road (URS, 2016). As indicated in **Table 4.6-2**, a number of other special-status plants may also occur in central dune scrub along this pipeline alignment. Construction of the Source Water Pipeline has potential to disturb Monterey spineflower, branching beach aster, and ocean bluff milkvetch. If other special-status plants, such as Menzies' wallflower, sand gilia, or other special-status plants listed in **Table 4.6-6**, are present within or adjacent to the project area, they could be directly or indirectly impacted by construction during the 6-month construction period as described above under the heading *Overview of Potential Construction Effects on Plants*, a significant impact.

Coast buckwheat (host plant for Smith's blue butterfly) occurs in high densities along the CEMEX access road and in the surrounding sand dunes in the CEMEX active mining area (Zander Associates, 2014), although few individuals were observed within the Source Water Pipeline alignment. If any life form of the butterfly is present on or around these host plants, removal of the plant would be a significant impact on Smith's blue butterfly. Additionally, installation of the Source Water Pipeline has potential to impact approximately 0.2 acre of Smith's blue butterfly habitat, a significant impact. This impact area overlaps with a portion of the new Desalinated Water Pipeline Smith's blue butterfly habitat impact area described below.

Western snowy plover are known to use the western portion of the Source Water Pipeline alignment year-round. This portion of the Source Water Pipeline alignment overlaps a portion of the subsurface slant well installation area, so the type of impact would be similar to impacts described above for the subsurface slant wells. Construction noise or activity associated with installation of the Source Water Pipeline during the western snowy plover breeding season could impact plovers by causing temporary flight of breeding birds and nest abandonment or failure, which would be significant. Construction work within the western end of the proposed Source Water Pipeline would result in the temporary (since the construction area would be returned to pre-construction conditions and birds may breed in the area following construction) loss of approximately 0.2 acre of potential nesting habitat (some of this area may overlap with the impact area for the subsurface slant wells as described above), a significant impact. The remainder of the Source Water Pipeline would be constructed away from the beach and foredunes where plovers typically nest and would not result in the temporary loss of plover breeding habitat. Construction noise or activity during the wintering season could directly or indirectly impact individual birds, a

significant impact. Construction activities may temporarily displace birds that typically winter along the beach near the western portion of the Source Water Pipeline. However, there is abundant, relatively undisturbed habitat, located on the beach and in the dunes north and south of the project that area that is available for wintering use during construction. Although birds may be initially disturbed and temporarily displaced during construction, the site would be returned to pre-construction conditions and birds would be able to utilize the site following construction. However, the net impact on the western snowy plover is anticipated to be significant.

A potential California tiger salamander breeding pond is located within 1.2 miles of the Source Water Pipeline alignment, and non-native grassland within 1.2 miles of a potential breeding pond provides potential California tiger salamander upland habitat. The Salinas River is located within one mile of the Source Water Pipeline and non-native grassland within one mile of the Salinas River provide potential California red-legged frog upland habitat. Construction of the Source Water Pipeline has potential to temporarily impact (the site would be restored following construction) approximately one acre of California tiger salamander and California red-legged frog upland habitat, a significant impact. If individual California red-legged frogs or California tiger salamanders are present, construction of the Source Water Pipeline could result in take of these individuals during the 6-month construction period as described above under the heading *Overview of Potential Construction Effects on Wildlife*, a significant impact. This impact area overlaps with the new Desalinated Water Pipeline and Castroville Pipeline.

Additionally, as described in Section 4.6.1.8, above, and as presented in **Table 4.6-6**, numerous other special-status wildlife species, including western burrowing owl and American badger, may inhabit non-native grassland, and black legless lizard, silver legless lizard, coast horned lizard may inhabit central dune scrub along this pipeline alignment. Coast Range newt may occur in non-native grassland. Special-status bats may roost within crevices underneath the Highway 1 overpass at the CEMEX access road and in trees within the alignment. Raptors such as red-tailed hawk, white-tailed kite, and loggerhead shrike, among others, could nest in trees and/or forage along both of these pipeline alignments. If black legless lizard, silvery legless lizard, coast horned lizard, Coast Range newt, burrowing owl, or American badger are present in suitable habitat in or around the pipeline alignment, special-status bats are roosting in or around the pipeline alignment, or special-status nesting birds are present in or around the pipeline alignment they could be directly or indirectly impacted by construction activities during the 6-month construction period as described above under the heading *Overview of Potential Construction Effects on Wildlife*.

Impacts of Source Water Pipeline construction on central dune scrub, which is habitat for the special-status plant species listed above, black legless lizard, silvery legless lizards, and coast horned lizard, are addressed in Impact 4.6-2. Impacts on special-status species during construction of the Source Water Pipeline as described above and as listed in **Table 4.6-6** would be significant. However, implementation of the following mitigation measures would ensure that impacts on special-status species at this site are reduced to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1d (Protective Measures for Western Snowy Plover)**, **4.6-1e (Avoidance and Minimization**

Measures for Special-status Plants), **4.6-1f (Avoidance and Minimization Measures for Smith's Blue Butterfly), 4.6-1g (Avoidance and Minimization Measures for Black Legless Lizard, Silvery Legless Lizard, and Coast Horned Lizard)**, **4.6-1h (Avoidance and Minimization Measures for Western Burrowing Owl)**, **4.6-1i (Avoidance and Minimization Measures for Nesting Birds)**, **4.6-1j (Avoidance and Minimization Measures for American Badger)**, **4.6-1l (Avoidance and Minimization Measures for Special-status Bats)**, **4.6-1n (Habitat Mitigation and Monitoring Plan)**, **4.6-1o (Avoidance and Minimization Measures for California Red-legged Frog and California Tiger Salamander), 4.6-1p (Control Measures for Spread of Invasive Plants)**, **4.12-1b (General Noise Controls for Construction Equipment)**, and **4.14-2 (Site-Specific Nighttime Lighting Measures)**. These measures would reduce impacts on special-status species by designating a lead biologist to oversee and ensure implementation of special-status species protective measures; requiring worker training regarding special-status species potentially present to ensure that workers are aware of special-status species that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as installation of an exclusion fencing to ensure special-status species do not occur within the construction area, a trash abatement program to ensure special-status species predators are not attracted to the site, and other measures to avoid and minimize impacts on special-status species; requiring specific measures to avoid, minimize, and compensate for impacts on the western snowy plover such as avoiding the breeding season, installing a visual construction barrier for work conducted adjacent to breeding habitat during the breeding season to reduce human disturbance to plovers, conducting pre-construction surveys to determine if plovers are present and implementing minimization measures to minimize construction impacts on plovers, if present, and compensating for habitat loss to mitigate for temporary and permanent loss of habitat; requiring specific measures to avoid and minimize impacts on special-status plants such as avoiding individual plants to the extent feasible and compensating for temporary or permanent loss of special-status plants at a level acceptable to the applicable resource agencies; requiring specific measures to avoid and minimize impacts on Smith's blue butterfly such as avoiding host plants to the extent feasible to avoid impacts to individuals and providing compensatory mitigation for permanent impacts; requiring specific measures to avoid and minimize impacts on black legless lizard, silvery legless lizard, and coast horned lizard such as relocating individuals to areas outside of the construction area to avoid injury or mortality from construction; requiring measures to avoid and minimize impacts on western burrowing owl such as conducting pre-construction surveys to determine if owls are present and implementing minimization measures to minimize construction impacts on owls, if present, and compensating for loss of habitat; requiring specific measures to avoid and minimize impacts on nesting birds such as limiting construction to the non-nesting season when feasible to avoid impacts to active nests; requiring specific measures to avoid and minimize impacts on American badger such as conducting pre-construction surveys to identify whether any badger dens are present and avoiding and/or passively relocating badgers from dens as necessary to avoid and minimize impacts to badgers within active dens; requiring measures to avoid and minimize impacts on special-status bats such as limiting removal of trees or structures with potential bat roosting habitat to the time of year when bats are active to avoid disturbing bats during the maternity roosting season or months of winter torpor; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that

temporary and permanent losses are fully compensated as required; requiring measures to avoid and minimize impacts on California red-legged frog and California tiger salamander such as pre-construction surveys to determine if these species are present and implementing minimization measures to minimize construction impacts on these species, if present, and compensating for permanent impacts; requiring implementation of measures to reduce the introduction or spread of invasive species that may degrade habitat for special-status species; requiring implementation of noise controls for construction equipment to reduce noise impacts on special-status wildlife species; and requiring measures to minimize light spillover outside of the construction area to minimize construction lighting impacts on special-status wildlife species.

The Source Water Pipeline using the optional alignment would impact approximately 0.2 acre of Smith's blue butterfly habitat, approximately 0.2 acre of western snowy plover nesting habitat, and 0.1 acre of non-native grassland, which provides potential California tiger salamander and California red-legged frog upland habitat. The Source Water Pipeline using the optional alignment would generally result in the same type of impact as described for the Source Water Pipeline. The same impact conclusion and mitigation measures would apply to the Source Water Pipeline using the optional alignment as apply to the Source Water Pipeline.

New Desalinated Water Pipeline

The new Desalinated Water Pipeline is described in Section 3.2.3.3 of Chapter 3, Description of the Proposed Project. This facility would be located outside of the MBNMS. Installation of both the new Desalinated Water Pipeline and new Transmission Main is anticipated to take 15 months. Although not planned, nighttime installation of the new Desalinated Water Pipeline could be required to expedite the construction schedule. The construction footprint is approximately 35.4 acres. A portion of the construction footprint for the new Desalinated Water Pipeline overlaps with a portion of the construction footprints for the Source Water Pipeline, Source Water Pipeline using the optional alignment, Castroville Pipeline, Castroville Pipeline using the optional alignment 1, and Castroville Pipeline using the optional alignment 2.

The segment of the new Desalinated Water Pipeline located between the intersection of Charles Benson Road and Del Monte Boulevard south to Marina Green Drive includes a mix of moderately disturbed central dune scrub, coyote brush scrub, non-native annual grassland, ice plant mats, ruderal, and developed roadways. The segment between Marina Green Drive and Reservation Road is largely dominated by ruderal areas, developed/landscaped areas, and ice plant mats and is surrounded by urban development. Some native communities, such as central dune scrub, coyote brush scrub, and coast live oak woodland, occur within this segment, but they are highly disturbed. Several Monterey cypress stands and eucalyptus groves also occur within the segment between Marina Green Drive and Reservation Road. Riparian woodland and scrub exists along the Desalinated Water Pipeline alignment at Locke-Paddon Park, near the intersection of Del Monte Boulevard and Reservation Road. Non-native grassland and agricultural land occur in the alignment north of Charles Benson Road.

Monterey spineflower and Kellogg's horkelia were observed in central dune scrub along Del Monte Boulevard during surveys conducted for the proposed project (ESA, 2012; 2016).

Branching beach aster was observed along Del Monte Road within the pipeline alignment during protocol level plant surveys conducted for the proposed project in 2014 (URS, 2014b). As indicated in **Table 4.6-2**, a number of other special-status plants may also occur along this pipeline alignment. Construction of the Desalinated Water Pipeline has potential to disturb Monterey spineflower and Kellogg's horkelia, a significant impact. If other special-status plants, such as Menzies' wallflower, sand gilia, or other special-status plants listed in **Table 4.6-6**, are present in suitable habitat within or adjacent to the project area, they could be directly or indirectly impacted by construction activities during the 15-month (in conjunction with the new Transmission Main) construction period as described above under the heading *Overview of Potential Construction Effects on Plants*, a significant impact.

A few small patches (approximately 0.2 acre in extent) of coast buckwheat (host plant for Smith's blue butterfly) occur within the new Desalinated Water Pipeline alignment (AECOM, 2016). If any life form of the butterfly is present on or around these host plants, removal of the plant would be a significant impact on Smith's blue butterfly. Additionally, installation of the new Desalinated Water Pipeline has potential to impact approximately 0.2 acre of Smith's blue butterfly habitat, a significant impact. This impact area overlaps with a portion of the Source Water Pipeline Smith's blue butterfly habitat impact area described above.

Two potential California tiger salamander breeding ponds are located within 1.2 miles of the new Desalinated Water Pipeline alignment and non-native grassland within 1.2 miles of a potential breeding pond provides potential California tiger salamander upland habitat. Additionally, the Salinas River and another potential breeding pond are located within 1.2 miles of the new Desalinated Water Pipeline. Non-native grassland within 1.2 miles of the Salinas River and the potential breeding pond provide potential California red-legged frog upland habitat. Construction of the new Desalinated Water Pipeline has potential to temporarily impact (the site would be restored following construction) approximately 1.4 acre of California tiger salamander and California red-legged frog upland habitat, which is a significant impact. If individual California red-legged frogs or California tiger salamanders are present, construction of the new Desalinated Water Pipeline could directly or indirectly impact these individuals during the 15-month (in conjunction with the new Transmission Main) construction period as described above under the heading *Overview of Potential Construction Effects on Wildlife*, a significant impact. Much of this impact area overlaps with the Source Water Pipeline and Castroville Pipeline.

As presented in **Table 4.6-6**, numerous special-status wildlife species including Coast Range newt, western burrowing owl, and American badger may occur in non-native grassland and black legless lizard, silvery legless lizard, and coast horned lizard may inhabit central dune scrub along the pipeline alignment. Riparian woodland and scrub located adjacent to the pond at Locke-Paddon Park and along the alignment has the potential to support western pond turtle and tricolored blackbird. Raptors such as red-tailed hawk, white-tailed kite, and loggerhead shrike, among others, could nest in trees and/or forage along the pipeline alignment. Special-status bats could roost in trees within the alignment. If burrowing owl, American badger, black legless lizard, silvery legless lizard, coast horned lizard, Coast Range newt, western pond turtle, tricolored blackbird, or special-status nesting birds or bats are present in or around the alignment, they could be directly or indirectly impacted by construction activities during the 15-month (in

conjunction with the new Transmission Main) construction period as described above under the heading *Overview of Potential Construction Effects on Wildlife.*

Impacts of new Desalination Water Pipeline construction on central dune scrub, which is habitat for the special-status plant species listed above, black legless lizard, silvery legless lizard, and coast horned lizard, and on riparian woodland and scrub, which is habitat for tricolored blackbird and western pond turtle, are addressed in Impact 4.6-2.

Impacts on special-status species during construction of the new Desalinated Water Pipeline would be significant. However, implementation of the following mitigation measures would ensure that impacts on special-status species at this site are reduced to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1e (Avoidance and Minimization Measures for Special-status Plants)**, **4.6-1f (Avoidance and Minimization Measures for Smith's Blue Butterfly), 4.6-1g (Avoidance and Minimization Measures for Black Legless Lizard, Silvery Legless Lizard, and Coast Horned Lizard)**, **4.6-1h (Avoidance and Minimization Measures for Western Burrowing Owl)**, **4.6-1i (Avoidance and Minimization Measures for Nesting Birds)**, **4.6-1j (Avoidance and Minimization Measures for American Badger)**, **4.6-1l (Avoidance and Minimization Measures for Special-status Bats)**, **4.6-1n (Habitat Mitigation and Monitoring Plan)**, **4.6-1o (Avoidance and Minimization Measures for California Red-legged Frog and California Tiger Salamander)**, **4.6-1p (Control Measures for Spread of Invasive Plants)**, and **4.14-2 (Site-Specific Nighttime Lighting Measures)**. These measures would reduce impacts on special-status species by designating a lead biologist to oversee and ensure implementation of special-status species protective measures; requiring worker training regarding special-status species potentially present to ensure that workers are aware of special-status species that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as installation of an exclusion fencing to ensure special-status species do not occur within the construction area, a trash abatement program to ensure special-status species predators are not attracted to the site, and other measures to avoid and minimize impacts on special-status species; requiring specific measures to avoid and minimize impacts on special-status plants such as avoiding individual plants to the extent feasible and compensating for temporary or permanent loss of special-status plants at a level acceptable to the applicable resource agencies; requiring specific measures to avoid and minimize impacts on Smith's blue butterfly such as avoiding host plants to the extent feasible to avoid impacts to individuals and providing compensatory mitigation for permanent impacts; requiring specific measures to avoid and minimize impacts on black legless lizard, silvery legless lizard, and coast horned lizard such as relocating individuals to areas outside of the construction area to avoid injury or mortality from construction; requiring measures to avoid and minimize impacts on western burrowing owl such as conducting pre-construction surveys to determine if owls are present and implementing minimization measures to minimize construction impacts on owls, if present, and compensating for loss of habitat; requiring specific measures to avoid and minimize impacts on nesting birds such as limiting construction to the non-nesting season when feasible to avoid impacts to active nests; requiring specific measures to avoid and minimize impacts on American badger such as conducting pre-construction surveys

to identify whether any badger dens are present and avoiding and/or passively relocating badgers from dens as necessary to avoid and minimize impacts to badgers within active dens; requiring measures to avoid and minimize impacts on special-status bats such as limiting removal of trees or structures with potential bat roosting habitat to the time of year when bats are active to avoid disturbing bats during the maternity roosting season or months of winter torpor; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; requiring measures to avoid and minimize impacts on California red-legged frog and California tiger salamander such as pre-construction surveys to determine if these species are present and implementing minimization measures to minimize construction impacts on these species, if present, and compensating for permanent impacts; requiring implementation of measures to reduce the introduction or spread of invasive species that may degrade habitat for special-status species; and requiring measures to minimize light spillover outside of the construction area to minimize construction lighting impacts on special-status wildlife species.

The new Desalinated Water using the optional alignment would impact approximately 0.2 acre of Smith's blue butterfly habitat and approximately 0.5 acre of non-native grassland, which provides potential California tiger salamander and California red-legged frog upland habitat. The new Desalinated Water Pipeline using the optional alignment would result in the same type of impact as described for the new Desalinated Water Pipeline. The same impact conclusion and mitigation measures would apply to the new Desalinated Water Pipeline using the optional alignment as apply to the new Desalinated Water Pipeline.

Castroville Pipeline

Construction of the 4.5-mile-long Castroville Pipeline would take approximately 4 months. This facility would be located outside of the MBNMS. Nighttime installation of the Castroville Pipeline could be required to meet the construction schedule. The construction footprint is approximately 15.0 acres. A portion of the Castroville Pipeline construction footprint overlaps with a portion of the construction footprints for the Source Water Pipeline, Source Water Pipeline using the optional alignment, new Desalinated Water Pipeline, and new Desalinated Water Pipeline using the optional alignment.

The alignment north of and parallel to, Charles Benson Road includes non-native annual grassland and agricultural land bordered on the south by Monterey cypress and eucalyptus trees. North of Charles Benson Road the alignment traverses developed areas, ruderal areas, coyote brush scrub, and ice plant mats with a few isolated patches of central dune scrub and non-native grassland before crossing through agricultural, ruderal, and developed areas until it reaches the Salinas River. The Salinas River includes open water and adjacent riparian woodland and scrub, coyote brush scrub, and northern coastal scrub communities. North of the Salinas River the alignment includes mostly agricultural, developed, and ruderal areas until it crosses over Tembladero Slough. North of Tembladero Slough, the alignment passes through a mix of agricultural, developed, ruderal, coyote brush scrub, riparian woodland and scrub and freshwater marsh communities before continuing back to developed and ruderal areas.

Monterey spineflower and branching beach aster were observed in and around central dune scrub north of the intersection of Del Monte Boulevard and Charles Benson Road during surveys conducted for the proposed project (AECOM, 2016). As indicated in **Table 4.6-2**, a number of other special-status plants may also occur along this pipeline alignment. Construction of the Castroville Pipeline has potential to disturb Monterey spineflower and branching beach aster, a significant impact. If other special-status plants, such as Menzies' wallflower, sand gilia, or other special-status plants listed in **Table 4.6-6**, are present in suitable habitat within or adjacent to the project area, they could be directly or indirectly impacted by construction activities during the 4-month construction period as described above under the heading *Overview of Potential Construction Effects on Plants*, a significant impact.

The Salinas River, Tembladero Slough, and freshwater marsh and riparian woodland and scrub located north of Tembladero Slough provide potential California red-legged frog aquatic habitat. Construction of the Castroville Pipeline would be installed beneath the Salinas River and Tembladero Slough and would not directly impact these areas. Pipeline construction would temporarily impact 0.06 acre of riparian woodland and scrub, which is potential aquatic habitat. Non-native grassland in the southern end of the Castroville Pipeline alignment is located within 1.2 miles of potential California tiger salamander and California red-legged frog breeding areas. This non-native grassland would provide upland habitat for California tiger salamander and California red-legged frog. Construction of the Castroville Pipeline has potential to temporarily impact approximately 1.1 acres of California tiger salamander and California red-legged frog upland habitat, which is a significant impact. Much of this impact area overlaps with the Source Water Pipeline and new Desalinated Water Pipeline. Temporary impacts on California tiger salamander and California red-legged frog habitat would be significant. If individual California red-legged frog or California tiger salamander are present, construction of the Castroville Pipeline could directly or indirectly impact these individuals during the 4-month construction period as described above under the heading *Overview of Potential Construction Effects on Wildlife*, a significant impact. As discussed under Impact 4.3-1 in Section 4.3, Surface Water Hydrology and Water Quality, project construction activities that disturb more than 1 acre are subject to the NPDES Construction General Permit requirements. Per the requirements, a SWPPP would be prepared by a Qualified SWPPP Developer and a Qualified SWPPP Practitioner would oversee its implementation. The SWPPP, which would include site-specific erosion and stormwater control measures to be implemented during construction of the Castroville Pipeline, would reduce or eliminate the offsite migration of pollutants and sediment. Mandatory compliance with the NPDES Construction General Permit would avoid substantial adverse effects on water quality in the Salinas River and Tembladero Slough. Thus, the indirect impacts on California red-legged frog habitat in the Salinas River and Tembladero Slough would be less than significant and no mitigation is necessary.

Steelhead are known from the Salinas River and have potential to occur in Tembladero Slough. The proposed Castroville Pipeline would be installed beneath the Salinas River and Tembladero Slough using HDD. There would be no direct impacts on the Salinas River or Tembladero Slough from construction and therefore, no direct impacts on steelhead from construction. The entry and exit pits would be located at least 150 feet from the main channel of the Salinas River and 40 feet from Tembladero Slough. Soil disturbing activities from installation of the Castroville Pipeline in the vicinity of the Salinas River and Tembladero Slough could result in soil erosion and the migration

of eroded soil and sediment downgradient towards the water features. Mandatory compliance with the NPDES Construction General Permit and implementation of the SWPPP would prevent indirect impact on steelhead habitat in the Salinas River and Tembladero Slough from upland soil erosion. Although not anticipated, there is potential for frac-outs[18] to occur using HDD. If a frac-out occurs, bentonite slurry could be released into the Salinas River and/or Tembladero Slough, which could degrade water quality and adversely impact steelhead habitat and/or individual fish by increasing suspended sediments that may inhibit fish respiration and degrade habitat, a significant impact.

As presented in **Table 4.6-6**, numerous special-status wildlife species including American badger may occur in non-native grassland and black legless lizard, silver legless lizard, and coast horned lizard may inhabit central dune scrub along the pipeline alignment. Coast Range newt may occur in aquatic habitat and adjacent upland and grassland areas. Riparian woodland and scrub located north of Tembladero Slough has the potential to support western pond turtle. Special-status raptors such as red-tailed hawk, white-tailed kite, and loggerhead shrike, among others, could potentially nest in trees and/or forage along the pipeline alignment. Special-status bats could roost in trees within the alignment. If black legless lizard, silvery legless lizard, coast horned lizard, Coast Range newt, American badger, western pond turtle, or special-status nesting birds or bats are present in or around the alignment, they could be directly or indirectly impacted by construction activities during the 4-month construction period as described above under the heading *Overview of Potential Construction Effects on Wildlife*.

Impacts of Castroville Pipeline construction on central dune scrub, which is habitat for black legless lizard, silvery legless lizard, and coast horned lizard, and on riparian woodland and scrub, which is habitat for western pond turtle, are addressed in Impact 4.6-2.

Impacts on special-status species during construction of the Castroville Pipeline would be significant. However, implementation of the following mitigation measures would ensure that impacts on special-status species at this site are reduced to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1e (Avoidance and Minimization Measures for Special-status Plants)**, **4.6-1g (Avoidance and Minimization Measures for Black Legless Lizard, Silvery Legless Lizard, and Coast Horned Lizard)**, **4.6-1i (Avoidance and Minimization Measures for Nesting Birds)**, **4.6-1j (Avoidance and Minimization Measures for American Badger)**, **4.6-1l (Avoidance and Minimization Measures for Special-status Bats)**, **4.6-1n (Habitat Mitigation and Monitoring Plan)**, **4.6-1o (Avoidance and Minimization Measures for California Red-legged Frog and California Tiger Salamander)**, **4.6-1p (Control Measures for Spread of Invasive Plants)**, **4.6-1q (Frac-out Contingency Plan)**, and **4.14-2 (Site-Specific Nighttime Lighting Measures)**.

These measures would reduce impacts on special-status species by designating a lead biologist to oversee and ensure implementation of special-status species protective measures; requiring worker training regarding special-status species potentially present to ensure that workers are

[18] A frac-out, or hydrofracture, is the inadvertent loss of drilling fluid from the borehole to the surrounding soil, surface, or waterbody, as a result of excess fluid pressure during directional drilling.

aware of special-status species that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as installation of an exclusion fencing to ensure special-status species do not occur within the construction area, a trash abatement program to ensure special-status species predators are not attracted to the site, and other measures to avoid and minimize impacts on special-status species; requiring specific measures to avoid and minimize impacts on special-status plants such as avoiding individual plants to the extent feasible and compensating for temporary or permanent loss of special-status plants at a level acceptable to the applicable resource agencies; requiring specific measures to avoid and minimize impacts on black legless lizard, silvery legless lizard, and coast horned lizard such as relocating individuals to areas outside of the construction area to avoid injury or mortality from construction; requiring specific measures to avoid and minimize impacts on nesting birds such as limiting construction to the non-nesting season when feasible to avoid impacts to active nests; requiring specific measures to avoid and minimize impacts on American badger such as conducting pre-construction surveys to identify whether any badger dens are present and avoiding and/or passively relocating badgers from dens as necessary to avoid and minimize impacts to badgers within active dens; requiring measures to avoid and minimize impacts on special-status bats such as limiting removal of trees or structures with potential bat roosting habitat to the time of year when bats are active to avoid disturbing bats during the maternity roosting season or months of winter torpor; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; requiring measures to avoid and minimize impacts on California red-legged frog and California tiger salamander such as pre-construction surveys to determine if these species are present and implementing minimization measures to minimize construction impacts on these species, if present, and compensating for permanent impacts; requiring implementation of measures to reduce the introduction or spread of invasive species that may degrade habitat for special-status species; requiring preparation of a Frac-out Contingency Plan and implementation of measures in the Plan to contain and clean-up any frac-outs in waterways to minimize impacts of frac-outs on special-status species and their habitat; and requiring measures to minimize light spillover outside of the construction area to minimize construction lighting impacts on special-status wildlife species.

The Castroville Pipeline using the optional alignment 1 would temporarily impact (the site would be returned to pre-construction conditions following construction) approximately 0.06 acre of riparian woodland and scrub and 0.01 acre of freshwater marsh and between approximately 1 and 2 acres of non-native grassland, which provides potential California tiger salamander and California red-legged frog upland habitat. The Castroville Pipeline using the optional alignment 2 would temporarily impact approximately 0.06 acre of riparian woodland and scrub and 0.1 acre of non-native grassland. However, the same impact conclusion and mitigation measures would apply to the Castroville Pipeline using both optional alignments as the Castroville Pipeline.

Brine Discharge Pipeline and Pipeline to CSIP Pond

Construction of the 1-mile-long Brine Discharge Pipeline would be completed in approximately 3 months and construction of the 1.2-mile-long Pipeline to CSIP Pond would be completed in approximately 2 months. These facilities would be located outside of the MBNMS. Nighttime

construction may be required to expedite construction. The construction footprint for both of these pipelines combined is approximately 6.6 acres.

The Brine Discharge Pipeline and Pipeline to CSIP Pond would be installed in paved access roads and ruderal areas with patches of non-native grassland. These pipeline alignments are located adjacent to ornamental Monterey cypress stands present along the access roads.

Table 4.6-2 presents the potential for special-status plant and wildlife species to occur along the Brine Discharge Pipeline and Pipeline to CSIP Pond alignments, and **Table 4.6-6** identifies the special-status plant and wildlife species that could be significantly impacted by project-related construction activities. As indicated in **Table 4.6-2**, special-status plants are not expected to occur along these pipeline alignments; therefore, no impact on special-status plants would result.

A potential California tiger salamander breeding pond is located within 1.2 miles of the Brine Discharge Pipeline and Pipeline to CSIP Pond alignments and non-native grassland within 1.2 miles of a potential breeding pond provides potential California tiger salamander upland habitat. The Salinas River is located within 1 mile of the Brine Discharge Pipeline and Pipeline to CSIP Pond and non-native grassland within 1 mile of the Salinas River provide potential California red-legged frog upland habitat. Construction of the Brine Discharge Pipeline and Pipeline to CSIP Pond has potential to temporarily impact approximately 0.2 acre each of California tiger salamander and California red-legged frog upland habitat, which is a significant impact. Coast Range newt also has potential to occur in grassland areas. If individual California red-legged frogs, California tiger salamanders, or Coast Range newt are present, construction of the Brine Discharge Pipeline and Pipeline to CSIP Pond could directly or indirectly impact these individuals during the 2-month construction period as described above under the heading *Overview of Potential Construction Effects on Wildlife*, a significant impact.

Planted Monterey cypress trees on the west side of the MRWPCA's access road provide roosting, foraging, and/or nesting opportunities for a variety of raptors and other birds and roosting habitat for special-status bats. Although these trees are not expected to be removed during pipeline installation activities, due to the proximity of construction, if raptors or special-status nesting passerines or roosting special-status bats are present during construction in or around the project area, construction activities could result in direct or indirect impacts on these species during the 2-month construction period as described under the heading *Overview of Potential Construction Effects on Wildlife*, which would result in a significant impact. Non-native grassland within the MRWPCA Regional Wastewater Treatment Plant site may provide nesting habitat for common passerines protected by the MBTA. If nesting birds are present within the grassland, they could be directly or indirectly impacted by construction activities, which would be a significant impact.

Implementation of the following mitigation measures would ensure that impacts on special-status species at this site would be reduced to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1i (Avoidance and Minimization Measures for Nesting Birds)**, **4.6-1l (Avoidance and Minimization Measures for Special-**

status Bats), **4.6-1o (Avoidance and Minimization Measures for California Red-legged Frog and California Tiger Salamander)**, and **4.14-2 (Site-Specific Nighttime Lighting Measures)**. These measures would reduce impacts on special-status species by designating a lead biologist to oversee and ensure implementation of special-status species protective measures; requiring worker training regarding special-status species potentially present to ensure that workers are aware of special-status species that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as installation of an exclusion fencing to ensure special-status species do not occur within the construction area, a trash abatement program to ensure special-status species predators are not attracted to the site, and other measures to avoid and minimize impacts on special-status species; requiring specific measures to avoid and minimize impacts on nesting birds such as limiting construction to the non-nesting season when feasible to avoid impacts to active nests; requiring measures to avoid and minimize impacts on special-status bats such as limiting removal of trees or structures with potential bat roosting habitat to the time of year when bats are active to avoid disturbing bats during the maternity roosting season or months of winter torpor; requiring measures to avoid and minimize impacts on California red-legged frog and California tiger salamander such as pre-construction surveys to determine if these species are present and implementing minimization measures to minimize construction impacts on these species, if present, and compensating for permanent impacts; and requiring measures to minimize light spillover outside of the construction area to minimize construction lighting impacts on special-status wildlife species.

Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline)

The proposed ASR Facilities are described in Chapter 3, Description of the Proposed Project, Section 3.2.4. These facilities include the ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline. These facilities would be located outside of the MBNMS. Each ASR well would be housed in a permanent 900-square foot concrete pump house. Chain-link fencing would encompass an approximately 0.4-acre and 0.5-acre area around the ASR-5 and ASR-6 Wells, respectively. Therefore, the construction footprint for both of the ASR Wells is expected to be approximately 0.9 acre. Water produced during development of the wells would be conveyed to a 1.4-acre natural depression located east of the intersection of San Pablo Avenue and General Jim Moore Boulevard and percolated into the ground. The construction footprint of the area where water would be conveyed is approximately 7.0 acres. Three parallel 0.9-mile-long, 30-inch-diameter ASR pipelines (ASR Recirculation Pipeline, ASR Conveyance Pipeline, and ASR Pump-to-Waste Pipeline) would extend along General Jim Moore Boulevard between the proposed ASR-5 and ASR-6 Wells at the Fitch Park military housing area and Coe Avenue/General Jim Moore Boulevard. The construction footprint for all three ASR pipelines is approximately 8.8 acres. A portion of the construction footprint for the ASR pipelines overlaps with a portion of the construction footprints for the new Transmission Main and the new Transmission Main using the optional alignment. Installation of the ASR pipelines would occur during daytime hours. Construction of the ASR-5 and ASR-6 wells would require nighttime construction.

The ASR-5 and ASR-6 Well sites contain a mix of coast live oak woodland, coyote brush scrub, and ruderal areas surrounded by single family residences. The ASR pipelines would be installed within developed General Jim Moore Boulevard, but are surrounded by a mix of single family residences and moderately disturbed coast live oak woodland, coyote brush scrub, ice plant mats, and ruderal areas, in the north with a border of undisturbed northern coastal scrub and coast live oak woodland on former Fort Ord lands at the southern end of the pipeline alignment. The area where water produced during development of the ASR-5 and ASR-6 wells would be conveyed is located on former Fort Ord lands and contains a mix of central maritime chaparral and ruderal areas.

Kellogg's horkelia has been observed within the development water infiltration area that will be used during development of the ASR-5 and ASR-6 Wells (CDFW, 2016). Monterey spineflower, Kellogg's horkelia, and Monterey ceanothus were observed along the ASR pipeline alignment during reconnaissance surveys and focused botanical surveys of the project area along General Jim Moore Boulevard (ESA, 2016; AECOM, 2016). As indicated in **Table 4.6-2**, there are several other special-status plant species that have a moderate to high potential to occur in or adjacent to the proposed ASR Facilities including robust spineflower, seaside birds-beak, sand gilia, Yadon's rein orchid, Hooker's manzanita, Toro manzanita, Pajaro manzanita, sandmat manzanita, ocean bluff milkvetch, Monterey Coast paintbrush, Eastwood's goldenbush, sand-loving wallflower, Carmel Valley bush-mallow, northern curly-leaved monardella, south coast branching phacelia, Michael's rein orchid, and others listed in **Table 4.6-2**. Installation of the ASR Facilities could result in direct or indirect impacts on special-status plant species during the 5-month construction period for the ASR pipelines and 12-month construction period for the ASR wells as described above under the heading *Overview of Potential Construction Effects on Plants* (see **Table 4.6-6** for a complete list of special-status species that could be significantly impacted by construction of the proposed ASR facilities).

Special-status wildlife with a moderate to high potential to occur at the ASR Facilities include silvery legless lizard, black legless lizard, coast horned lizard, Coast Range newt, red-tailed hawk, and Monterey dusky-footed woodrat. See **Table 4.6-2** for a complete list of special-status wildlife species and their potential to occur at the ASR facilities sites. If black legless lizard, silvery legless lizard, coast horned lizard, Coast Range newt, Monterey dusky-footed woodrat, Monterey shrew, or American badger are present in the construction area, or if raptors or other special-status nesting passerines or roosting special-status bats are present within or in close proximity to the construction area, those species could be directly or indirectly impacted by construction activities during the 5-month construction period for the ASR pipelines and 12-month construction period for the ASR wells as described above under the heading *Overview of Potential Construction Effects on Wildlife*.

Impacts to coast live oak woodland and central maritime chaparral, which are habitats for one or more of the special-status species listed above (including special-status plants, black legless lizard, silvery legless lizards, coast horned lizard, Coast Range newt, Monterey dusky-footed woodrat, Monterey shrew, and American badger) at this facility, is addressed in Impact 4.6-2. Substantial adverse effects on special-status species during construction of the ASR facilities, as described above, would result in a significant impact. Implementation of the following mitigation

measures would reduce impacts on special-status species at this site to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1e (Avoidance and Minimization Measures for Special-status Plants)**, **4.6-1g (Avoidance and Minimization Measures for Black Legless Lizard, Silvery Legless Lizard, and Coast Horned Lizard)**, **4.6-1i (Avoidance and Minimization Measures for Nesting Birds)**, **4.6-1j (Avoidance and Minimization Measures for American Badger)**, **4.6-1k (Avoidance and Minimization Measures for Monterey Dusky-Footed Woodrat)**, **4.6-1l (Avoidance and Minimization Measures for Special-status Bats)**, **4.6-1n (Habitat Mitigation and Monitoring Plan)**, **4.6-1p (Control Measures for Spread of Invasive Plants)**, and **4.14-2 (Site-Specific Nighttime Lighting Measures)**. These measures would reduce impacts on special-status species by designating a lead biologist to oversee and ensure implementation of special-status species protective measures; requiring worker training regarding special-status species potentially present to ensure that workers are aware of special-status species that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as installation of an exclusion fencing to ensure special-status species do not occur within the construction area, a trash abatement program to ensure special-status species predators are not attracted to the site, and other measures to avoid and minimize impacts on special-status species; requiring specific measures to avoid and minimize impacts on special-status plants such as avoiding individual plants to the extent feasible and compensating for temporary or permanent loss of special-status plants at a level acceptable to the applicable resource agencies; requiring specific measures to avoid and minimize impacts on black legless lizard, silvery legless lizard, and coast horned lizard such as relocating individuals to areas outside of the construction area to avoid injury or mortality from construction; requiring specific measures to avoid and minimize impacts on nesting birds such as limiting construction to the non-nesting season when feasible to avoid impacts to active nests; requiring specific measures to avoid and minimize impacts on American badger such as conducting pre-construction surveys to identify whether any badger dens are present and avoiding and/or passively relocating badgers from dens as necessary to avoid and minimize impacts to badgers within active dens; requiring measures to avoid and minimize impacts on Monterey dusky-footed woodrat such as relocating active nests within the construction area to areas outside of the construction area to minimize impacts to individual woodrats from construction activities; requiring measures to avoid and minimize impacts on special-status bats such as limiting removal of trees or structures with potential bat roosting habitat to the time of year when bats are active to avoid disturbing bats during the maternity roosting season or months of winter torpor; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; requiring implementation of measures to reduce the introduction or spread of invasive species that may degrade habitat for special-status species; and requiring measures to minimize light spillover outside of the construction area to minimize construction lighting impacts on special-status wildlife species.

Pipelines and Other Conveyance Facilities South of Reservation Road

New Transmission Main and New Transmission Main Optional Alignment

The new Transmission Main and new Transmission Main Optional alignments are described in Chapter 3, Description of the Proposed Project, Section 3.2.3.4. This facility would be located outside of the MBNMS. This 6-mile-long, 36-inch-diameter pipeline would extend from the Desalinated Water Pipeline at the intersection of Del Monte Boulevard and Reservation Road south to the existing Phase I ASR Facilities near the intersection of General Jim Moore and Coe Avenue. Construction of this pipeline and the new Desalinated Water Pipeline would take approximately 15 months to complete. Similar to the other pipelines, construction activities would occur during the daytime hours, except at a few locations where nighttime construction would be required to meet the project schedule. The construction footprint is approximately 27.1 acres. A portion of the new Transmission Main construction footprint overlaps with a portion of the ASR pipelines construction footprint.

As described in Section 4.6.1.10, habitat along the new Transmission Main alignment is variable and includes ice plant mats and ruderal areas with a few Monterey cypress stands and eucalyptus groves, central dune scrub along the back dunes of Fort Ord Dunes State Park, coyote brush scrub, and coast live oak woodland with some areas of northern coastal scrub in inland areas.

Table 4.6-2 presents the potential for special-status plant and wildlife species to occur along the new Transmission Main alignment, and **Table 4.6-6** identifies the special-status plant and wildlife species that could be significantly impacted by project-related construction activities. As indicated in **Table 4.6-2**, Sandmat manzanita, Monterey spineflower, Menzies' wallflower, Kellogg's horkelia, Monterey Coast paintbrush, branching beach aster, south coast branching phacelia, Michael's rein orchid, and Monterey ceanothus have been observed along the alignment (ESA, 2013; USACE, 1997; Fort Ord Reuse Authority, 2012; CDFW, 2016; Denise Duffy & Associates, 2013; and URS, 2016) and construction of the Transmission Main could result in direct and indirect impacts on these species during the 15-month construction period (in conjunction with the new Desalinated Water Pipeline) as described above under the heading *Overview of Potential Construction Effects on Plants*, a significant impact. Additionally, a number of other special-status plant species could occur within the alignment and, if present, could be directly or indirectly impacted by construction, which is a significant impact.

Coast buckwheat occurs along the alignment (ESA, 2013) and could support Smith's blue butterfly. If any life form of Smith's blue butterfly is present, removal or destruction of coast buckwheat and associated soil could result in injury or loss of Smith's blue butterfly. Construction of the new Transmission Main would temporarily impact approximately 0.3 acre of Smith's blue butterfly habitat. These impacts on Smith's blue butterfly would be significant. Although the habitat would only be temporarily impacted, because the site would be returned to pre-construction conditions, construction could result in the permanent loss of the host plant, a significant impact.

Black legless lizard, silvery legless lizard, coat horned lizard, Coast Range newt, western burrowing owl, American badger, tricolored blackbird, Monterey dusky-footed woodrat, and

Monterey shrew could occur along, or in the vicinity of, the alignment. Additionally, raptors and other birds protected by the MBTA could nest where suitable habitat occurs along the alignment. Special-status bats have some potential to roost within crevices underneath the Highway 1 overpass and in trees within the alignment. If present, these species could be directly or indirectly impacted by construction activities during the 15-month construction period (in conjunction with the new Desalinated Water Pipeline) as described above under the heading *Overview of Potential Construction Effects on Wildlife*. The impact on these special-status wildlife species is considered significant.

Impacts to sensitive natural communities, which are habitat for the special-status plant species listed above, black legless lizard, silvery legless lizards, coast horned lizard, and Coast Range newt, at this facility is addressed in Impact 4.6-2.

The overall construction-related impact on special-status plant and wildlife species during construction of the new Transmission Main would be significant. However, implementation of the following mitigation measures would ensure that these impacts are reduced to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1e (Avoidance and Minimization Measures for Special-status Plants)**, **4.6-1f (Avoidance and Minimization Measures for Smith's Blue Butterfly)**, **4.6-1g (Avoidance and Minimization Measures for Black Legless Lizard, Silvery Legless Lizard, and Coast Horned Lizard)**, **4.6-1h (Avoidance and Minimization Measures for Western Burrowing Owl)**, **4.6-1i (Avoidance and Minimization Measures for Nesting Birds)**, **4.6-1j (Avoidance and Minimization Measures for American Badger)**, **4.6-1k (Avoidance and Minimization Measures for Monterey Dusky-Footed Woodrat), 4.6-1l (Avoidance and Minimization Measures for Special-status Bats)**, **4.6-1n (Habitat Mitigation and Monitoring Plan)**, **4.6-1p (Control Measures for Spread of Invasive Plants)**, and **4.14-2 (Site-Specific Nighttime Lighting Measures)**. These measures would reduce impacts on special-status species by designating a lead biologist to oversee and ensure implementation of special-status species protective measures; requiring worker training regarding special-status species potentially present to ensure that workers are aware of special-status species that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as installation of an exclusion fencing to ensure special-status species do not occur within the construction area, a trash abatement program to ensure special-status species predators are not attracted to the site, and other measures to avoid and minimize impacts on special-status species; requiring specific measures to avoid and minimize impacts on special-status plants such as avoiding individual plants to the extent feasible and compensating for temporary or permanent loss of special-status plants at a level acceptable to the applicable resource agencies; requiring specific measures to avoid and minimize impacts on Smith's blue butterfly such as avoiding host plants to the extent feasible to avoid impacts to individuals and providing compensatory mitigation for permanent impacts; requiring specific measures to avoid and minimize impacts on black legless lizard, silvery legless lizard, and coast horned lizard such as relocating individuals to areas outside of the construction area to avoid injury or mortality from construction; requiring measures to avoid and minimize impacts on western burrowing owl such as conducting pre-construction surveys to

determine if owls are present and implementing minimization measures to minimize construction impacts on owls, if present, and compensating for loss of habitat; requiring specific measures to avoid and minimize impacts on nesting birds such as limiting construction to the non-nesting season when feasible to avoid impacts to active nests; requiring specific measures to avoid and minimize impacts on American badger such as conducting pre-construction surveys to identify whether any badger dens are present and avoiding and/or passively relocating badgers from dens as necessary to avoid and minimize impacts to badgers within active dens; requiring measures to avoid and minimize impacts on Monterey dusky-footed woodrat such as relocating active nests within the construction area to areas outside of the construction area to minimize impacts to individual woodrats from construction activities; requiring measures to avoid and minimize impacts on special-status bats such as limiting removal of trees or structures with potential bat roosting habitat to the time of year when bats are active to avoid disturbing bats during the maternity roosting season or months of winter torpor; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; requiring implementation of measures to reduce the introduction or spread of invasive species that may degrade habitat for special-status species; and requiring measures to minimize light spillover outside of the construction area to minimize construction lighting impacts on special-status wildlife species.

Since the new Transmission Main and new Transmission Main using the optional alignment would impact the same special-status species, the same impacts and mitigation measures would apply to the new Transmission Main using the optional alignment as apply to the new Transmission Main.

Terminal Reservoir

The proposed Terminal Reservoir is described in Chapter 3, Description of the Proposed Project, Section 3.2.3.5. This facility would be located outside of the MBNMS. Construction of the Terminal Reservoir is expected to take approximately 15 months to complete, with construction activities occurring only during daytime hours. The Terminal Reservoir would either include two 33-foot-high, 130-foot-diameter above ground concrete tanks on a 0.75 acre concrete pad or the tanks would be fully buried. Security fencing would enclose a 3.5-acre area around the Terminal Reservoir. The construction footprint for the Terminal Reservoir is approximately 6 acres.

Central maritime chaparral occurs throughout the site with a few patches of coast live oak woodland and ice plant mats. The site is located at the eastern edge of a large expanse of relatively intact maritime chaparral, also within the former Fort Ord lands. Portions of maritime chaparral within the project area are somewhat disturbed from the use of access roads, but the Terminal Reservoir site is largely undisturbed.

Table 4.6-6 lists all potential special-status species with potential to occur at the Terminal Reservoir site and be impacted by construction. Many special-status plant species have been observed within the Terminal Reservoir site including Monterey spineflower, sand gilia, seaside bird's beak, sandmat manzanita, and Eastwood's goldenbush (Denise Duffy & Associates, 2010a), sand-loving wallflower (Denise Duffy & Associates, 2013), Monterey ceanothus (Fort Ord Reuse Authority, 2012; AECOM, 2016), south coast branching phacelia, and Michael's rein

orchid (URS, 2014a). Other special-status plant species with potential to occur onsite include robust spineflower, Yadon's rein orchid, Toro manzanita, Pajaro manzanita, Hooker's manzanita, ocean bluff milkvetch, Monterey Coast paintbrush, Kellogg's horkelia, Carmel Valley bush-mallow, northern curly-leaved monardella, and native stands of Monterey pine. If any of these species, or others listed in **Table 4.6-6**, are present within or adjacent to the construction area, they could be directly or indirectly impacted by construction activities during the 15-month construction period as described above under the heading *Overview of Potential Construction Effects on Plants*, a significant impact.

Central maritime chaparral on the former Fort Ord lands is located within 1.2 miles of a potential California tiger salamander breeding pond and provides upland habitat for this species. Installation of the Terminal Reservoir aboveground tank option would result in the permanent loss of approximately 1 acre of central maritime chaparral from installation of the concrete pad for the Terminal Reservoir and a permanent access road. Additionally, construction of the facility would temporarily impact up to 5 additional acres of central maritime chaparral during construction. If the Terminal Reservoir is constructed in buried tanks, then there would be approximately 5.75 acres of temporary impacts on central maritime chaparral and there would be approximately 0.25 acre of permanent impact from the permanent access road. Temporary and permanent impacts on central maritime chaparral, which is considered California tiger salamander upland habitat at this site, is a significant impact. California red-legged frogs also have potential to disperse through the site since a potential breeding pond is located within one mile of site. If individual California red-legged frog or California tiger salamander are present, construction of the Terminal Reservoir could directly or indirectly impact these individuals during the 15-month construction period as described above under the heading "*Overview of Potential Construction Effects on Wildlife*," a significant impact.

Black legless lizard, silvery legless lizard, Monterey dusky-footed woodrat, and American badger may also occur on-site in the central maritime chaparral. Coast Range newt may occur in oak woodland. Additionally, special-status birds, such as western burrowing owl, raptors or nesting passerines, or roosting special-status bats may be present within the project area. If these wildlife species are present within or adjacent to the entire pipeline alignment, these species could be directly or indirectly impacted by construction activities during the 15-month construction period as described above under the heading *Overview of Potential Construction Effects on Wildlife*.

Impacts to central maritime chaparral, which is habitat for the special-status plant species listed above, black legless lizard, silvery legless lizards, coast horned lizard, dusky-footed woodrat, and Monterey shrew, at this facility, is addressed in Impact 4.6-2.

Implementation of the following mitigation measures would ensure that impacts on special-status species at this site are reduced to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1e (Avoidance and Minimization Measures for Special-status Plants)**, **4.6-1g (Avoidance and Minimization Measures for Black Legless Lizard, Silvery Legless Lizard, and Coast Horned Lizard)**, **4.6-1h (Avoidance**

and Minimization Measures for Western Burrowing Owl), **4.6-1i (Avoidance and Minimization Measures for Nesting Birds)**, **4.6-1j (Avoidance and Minimization Measures for American Badger)**, **4.6-1k (Avoidance and Minimization Measures for Monterey Dusky-Footed Woodrat)**, **4.6-1l (Avoidance and Minimization for Special-status Bats)**, **4.6-1m (Avoidance and Minimization Measures for Native Stands of Monterey Pine)**,**4.6-1n (Habitat Mitigation and Monitoring Plan)**, **4.6-1o (Avoidance and Minimization Measures for California Red-legged Frog and California Tiger Salamander)**, and **4.6-1p (Control Measures for Spread of Invasive Plants)**. These measures would reduce impacts on special-status species by designating a lead biologist to oversee and ensure implementation of special-status species protective measures; requiring worker training regarding special-status species potentially present to ensure that workers are aware of special-status species that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as installation of an exclusion fencing to ensure special-status species do not occur within the construction area, a trash abatement program to ensure special-status species predators are not attracted to the site, and other measures to avoid and minimize impacts on special-status species; requiring specific measures to avoid and minimize impacts on special-status plants such as avoiding individual plants to the extent feasible and compensating for temporary or permanent loss of special-status plants at a level acceptable to the applicable resource agencies; requiring specific measures to avoid and minimize impacts on black legless lizard, silvery legless lizard, and coast horned lizard such as relocating individuals to areas outside of the construction area to avoid injury or mortality from construction; requiring measures to avoid and minimize impacts on western burrowing owl such as conducting pre-construction surveys to determine if owls are present and implementing minimization measures to minimize construction impacts on owls, if present, and compensating for loss of habitat; requiring specific measures to avoid and minimize impacts on nesting birds such as limiting construction to the non-nesting season when feasible to avoid impacts to active nests; requiring specific measures to avoid and minimize impacts on American badger such as conducting pre-construction surveys to identify whether any badger dens are present and avoiding and/or passively relocating badgers from dens as necessary to avoid and minimize impacts to badgers within active dens; requiring measures to avoid and minimize impacts on Monterey dusky-footed woodrat such as relocating active nests within the construction area to areas outside of the construction area to minimize impacts to individual woodrats from construction activities; requiring measures to avoid and minimize impacts on special-status bats such as limiting removal of trees or structures with potential bat roosting habitat to the time of year when bats are active to avoid disturbing bats during the maternity roosting season or months of winter torpor; requiring measures to avoid and minimize impacts on native stands of Monterey Pines such as avoiding any stands present to avoid tree loss and replacing trees that cannot be avoided to compensate for any loss; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; requiring measures to avoid and minimize impacts on California red-legged frog and California tiger salamander such as pre-construction surveys to determine if these species are present and implementing minimization measures to minimize construction impacts on these species, if present, and compensating for permanent impacts; and requiring implementation of

measures to reduce the introduction or spread of invasive species that may degrade habitat for special-status species.

Carmel Valley Pump Station

The proposed Carmel Valley Pump Station is described in Section 3.2.3.8 of Chapter 3, Description of the Proposed Project. This facility would be located outside of the MBNMS.

The pump station would be enclosed within a 500-square-foot single-story building and a 100-square-foot electrical control building would be constructed outside of the pump station building. This pump station also includes an inlet and outlet pipeline that connects the pump station to Carmel Valley Road. Construction would take approximately 6 months to complete and would occur during daytime hours only. The construction footprint for the pump station and associated pipelines is approximately 0.2 acre.

The site includes non-native annual grassland, landscaped, and developed areas bordered by coast live oak woodland.

Special-status species that could be significantly impacted during construction of the Carmel Valley Pump Station are listed in **Table 4.6-6**. They include California red-legged frog, Monterey pine, Coast Range newt, red-tailed hawk, red-shouldered hawk, white-tailed kite, American peregrine falcon, American kestrel, loggerhead shrike, pallid bat, western red bat, Monterey dusky-footed woodrat, and Monterey shrew. If Monterey pines are located at the site, they may be part of a native stand, which is considered special-status. If a native Monterey pine stand is present within or adjacent to the construction area, it could be directly or indirectly impacted by construction activities during the 6-month construction period as described above under the heading *Overview of Potential Construction Effects on Plants*, a significant impact.

California red-legged frogs are known to breed in the Carmel River and small tributaries and backpools in the vicinity of the proposed Carmel Valley Pump Station (CDFW, 2016). Non-native grassland at the site provides potential upland habitat for this species. If California red-legged frog are present at the site, construction of the Carmel Valley Pump Station could directly or indirectly impact these individuals during the 6-month construction period as described above under the heading *Overview of Potential Construction Effects on Wildlife*, a significant impact. Additionally, construction activities would temporarily impact 0.04 acre and permanently impact 0.08 acre of upland habitat, which is a significant impact.

Additionally, raptors, such as red-tailed hawk or red-shouldered hawk, and birds protected under the MTBA and California Fish and Game Code may nest in trees that border the boundary of site. Special-status bats may also roost in trees adjacent to the construction area. Monterey dusky-footed woodrat and Monterey shrew may occur in the adjacent coast live oak woodland understory. Coast Range newt could occur in grassland or adjacent oak woodland. If these species are present in the construction area, construction could directly or indirectly impact these species during the 6-month construction period as described above under the heading *Overview of Potential Construction Effects on Wildlife*, which would be a significant impact. This impact

would be inclusive of construction noise which, as stated in Section 4.12 Noise and Vibration, could generate noise levels more than 15 dBA above existing ambient noise levels.

However, implementation of the following mitigation measures would ensure that impacts on special-status species at this site are reduced to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1i (Avoidance and Minimization Measures for Nesting Birds)**, **4.6-1k (Avoidance and Minimization Measures for Monterey Dusky-Footed Woodrat), 4.6-1l (Avoidance and Minimization Measures for Special-status Bats)**, **4.6-1m (Avoidance and Minimization Measures for Native Stands of Monterey Pine)**, **4.6-1n (Habitat Mitigation and Monitoring Plan)**, and **4.6-1o (Avoidance and Minimization Measures for California Red-legged frog and California Tiger Salamander)**. These measures would reduce impacts on special-status species by designating a lead biologist to oversee and ensure implementation of special-status species protective measures; requiring worker training regarding special-status species potentially present to ensure that workers are aware of special-status species that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as installation of an exclusion fencing to ensure special-status species do not occur within the construction area, a trash abatement program to ensure special-status species predators are not attracted to the site, and other measures to avoid and minimize impacts on special-status species; requiring specific measures to avoid and minimize impacts on nesting birds such as limiting construction to the non-nesting season when feasible to avoid impacts to active nests; requiring measures to avoid and minimize impacts on Monterey dusky-footed woodrat such as relocating active nests within the construction area to areas outside of the construction area to minimize impacts to individual woodrats from construction activities; requiring measures to avoid and minimize impacts on special-status bats such as limiting removal of trees or structures with potential bat roosting habitat to the time of year when bats are active to avoid disturbing bats during the maternity roosting season or months of winter torpor; requiring measures to avoid and minimize impacts on native stands of Monterey Pines such as avoiding any stands present to avoid tree loss and replacing trees that cannot be avoided to compensate for any loss; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; and requiring measures to avoid and minimize impacts on California red-legged frog and California tiger salamander such as pre-construction surveys to determine if these species are present and implementing minimization measures to minimize construction impacts on these species, if present, and compensating for permanent impacts.

Ryan Ranch-Bishop Interconnection Improvements

The proposed Ryan Ranch–Bishop Interconnection Improvements are described in Section 3.2.3.11 of Chapter 3, Description of the Proposed Project. This facility would be located outside of the MBNMS. The 1.1-mile-long, 8-inch-diameter Ryan Ranch–Bishop Interconnection Improvements pipeline would extend between an existing interconnection at Highway 68 and Ragsdale Avenue and a new connection to the Bishop system. Construction of the Ryan Ranch–

Bishop Interconnection Improvements would occur during daytime hours and would take approximately 4 months to complete. The construction footprint is approximately 7.3 acres.

The proposed Ryan Ranch–Bishop Interconnection Improvements would be located within a business park area with existing stands of coast live oak woodland, northern coastal scrub, and non-native grassland interspersed throughout the developed areas. In general, construction disturbance would be limited to the road right-of-ways; however, there is an area of non-native grassland adjacent to the roadway where disturbance would occur.

Special-status species that could be significantly impacted during construction of the Ryan Ranch–Bishop Interconnection Improvements are indicated in **Table 4.6-6**. Although construction-related disturbance would be largely limited to the paved roadways, some special-status plant species could occur in coast live oak woodland adjacent to the construction area or non-native grassland within or adjacent to the construction area, including Hickman's onion, Toro manzanita, Michael's rein orchid, and native stands of Monterey pine. If these special-status plant species, or others listed in **Table 4.6-6**, occur within or adjacent to the construction disturbance areas, these plants could be directly or indirectly impacted by construction activities during the 4-month construction period as described above under the heading *Overview of Potential Construction Effects on Plants*. This would be a significant impact.

Although California tiger salamander breeding habitat is absent from the site, California tiger salamander breeding ponds are known within 1 mile of the Ryan Ranch–Bishop Interconnection Improvements (CDFW, 2016); thus, salamander could occur in upland habitat at the site. California red-legged frog aquatic habitat is absent from site, however, this frog is known to breed within the Carmel River (CDFW, 2016) and could occur in grassland within the construction areas or other suitable upland habitat adjacent to construction area while dispersing. Construction activities would temporarily impact approximately 0.5 acre of California tiger salamander and California red-legged frog upland habitat. If these species are present they could be directly or indirectly impacted by construction activities during the 4-month construction period as described above under the heading *Overview of Potential Construction Effects on Wildlife*, a significant impact.

Additionally, Coast Range newt, Monterey dusky-footed woodrat, Monterey shrew, and/or American badger could occur in suitable habitat within or adjacent to the Ryan Ranch–Bishop Interconnection Improvements site. Special-status nesting birds and bats could also occur within or adjacent to site. If these species, or others listed in **Table 4.6-6** are present, they could be directly or indirectly impacted by construction activities during the 4-month construction period as described above under the heading *Overview of Potential Construction Effects on Wildlife*, a significant impact.

Construction-related impacts on special-status plant and animal species during construction of the Ryan Ranch-Bishop Interconnection Improvements would be significant (see **Table 4.6-6** for a complete list of special-status species that would be significantly impacted). However, implementation of the following mitigation measures would reduce impacts on special-status species to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker**

Environmental Awareness Training and Education Program), **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1e (Avoidance and Minimization Measures for Special-status Plants)**, **4.6-1i (Avoidance and Minimization Measures for Nesting Birds), 4.6-1j (Avoidance and Minimization Measures for American Badger)**, **4.6-1k (Avoidance and Minimization Measures for Monterey Dusky-Footed Woodrat)**, **4.6-1l (Avoidance and Minimization Measures for Special-status Bats)**, **4.6-1m (Avoidance and Minimization Measures for Native Stands of Monterey Pine)**, **4.6-1n (Habitat Mitigation and Monitoring Plan)**, and **4.6-1o (Avoidance and Minimization Measures for California Red-legged frog and California Tiger Salamander)**. These measures would reduce impacts on special-status species by designating a lead biologist to oversee and ensure implementation of special-status species protective measures; requiring worker training regarding special-status species potentially present to ensure that workers are aware of special-status species that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as installation of an exclusion fencing to ensure special-status species do not occur within the construction area, a trash abatement program to ensure special-status species predators are not attracted to the site, and other measures to avoid and minimize impacts on special-status species; requiring specific measures to avoid and minimize impacts on special-status plants such as avoiding individual plants to the extent feasible and compensating for temporary or permanent loss of special-status plants at a level acceptable to the applicable resource agencies; requiring specific measures to avoid and minimize impacts on nesting birds such as limiting construction to the non-nesting season when feasible to avoid impacts to active nests; requiring specific measures to avoid and minimize impacts on American badger such as conducting pre-construction surveys to identify whether any badger dens are present and avoiding and/or passively relocating badgers from dens as necessary to avoid and minimize impacts to badgers within active dens; requiring measures to avoid and minimize impacts on Monterey dusky-footed woodrat such as relocating active nests within the construction area to areas outside of the construction area to minimize impacts to individual woodrats from construction activities; requiring measures to avoid and minimize impacts on special-status bats such as limiting removal of trees or structures with potential bat roosting habitat to the time of year when bats are active to avoid disturbing bats during the maternity roosting season or months of winter torpor; requiring measures to avoid and minimize impacts on native stands of Monterey Pines such as avoiding any stands present to avoid tree loss and replacing trees that cannot be avoided to compensate for any loss; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; and requiring measures to avoid and minimize impacts on California red-legged frog and California tiger salamander such as pre-construction surveys to determine if these species are present and implementing minimization measures to minimize construction impacts on these species, if present, and compensating for permanent impacts.

Main System-Hidden Hills Interconnection Improvements

The proposed Main System-Hidden Hills Interconnection Improvements are described in Section 3.2.3.11 of Chapter 3, Description of the Proposed Project. This facility would be located outside of the MBNMS. The existing interconnection between the main CalAm distribution system and the Hidden Hills system would be improved by installing approximately 1,200 feet of 6-inch-

diameter pipeline along the northern extent of Tierra Grande Drive. Additionally, the existing pump capacity at the Upper Tierra Grande Booster Station and the Middle Tierra Grande Booster Station would be upgraded. Construction of the Main System-Hidden Hills Interconnection Improvements would occur during daytime hours and would take approximately 3 months to complete. The construction footprint for the Main System-Hidden Hills Interconnection Improvements is 1.1 acre.

The Main System–Hidden Hills Interconnection Improvements site is located in a low-density residential area. Construction disturbance would be limited to the road right-of-way and within the existing developed booster stations, but coast live oak woodland, Monterey pine woodland, and northern coastal scrub occur adjacent to the developed areas.

Special-status species that could be significantly impacted during construction of the Main System-Hidden Hills Interconnection Improvements are indicated in **Table 4.6-6**. Although construction-related disturbance would be limited to the paved roadways and existing facilities, some special-status plant species could occur in coast live oak woodland, non-native grassland, or northern coastal scrub adjacent to the developed areas, including Yadon's rein orchid, Hickman's onion, Toro manzanita, Michael's rein orchid, and native stands of Monterey pine. If these special-status plant species, or others listed in **Table 4.6-6**, occur within or adjacent to the construction disturbance areas, they could be directly or indirectly impacted by construction activities during the 3-month construction period as described above under the heading *Overview of Potential Construction Effects on Plants*. This would be a significant impact.

Similarly, if California red-legged frog, California tiger salamander, or Coast Range newt are dispersing through suitable habitat adjacent to the work area during construction; if Monterey dusky-footed woodrat, Monterey shrew, or American badger are located in suitable habitat adjacent to the construction area; if raptors or special-status nesting passerines, roosting special-status bats, or other special-status wildlife species listed in **Table 4.6-6**, are present within or adjacent to the construction work area, they could be directly or indirectly impacted by construction activities during the 3-month construction period as described above under the heading *Overview of Potential Construction Effects on Wildlife*, which would be a significant impact.

Implementation of the following mitigation measures would reduce impacts on special-status species to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1e (Avoidance and Minimization Measures for Special-status Plants)**, **4.6-1i (Avoidance and Minimization Measures for Nesting Birds), 4.6-1j (Avoidance and Minimization Measures for American Badger)**, **4.6-1k (Avoidance and Minimization Measures for Monterey Dusky-Footed Woodrat)**, **4.6-1l (Avoidance and Minimization Measures for Special-status Bats)**, **4.6-1m (Avoidance and Minimization Measures for Native Stands of Monterey Pine)**, **4.6-1n (Habitat Mitigation and Monitoring Plan)** and **4.6-1o (Avoidance and Minimization Measures for California Red-legged frog and California Tiger Salamander)**. These measures would reduce impacts on special-status species by designating a lead biologist to oversee and ensure implementation of special-status species protective measures; requiring worker training regarding special-status species potentially present

to ensure that workers are aware of special-status species that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as installation of an exclusion fencing to ensure special-status species do not occur within the construction area, a trash abatement program to ensure special-status species predators are not attracted to the site, and other measures to avoid and minimize impacts on special-status species; requiring specific measures to avoid and minimize impacts on special-status plants such as avoiding individual plants to the extent feasible and compensating for temporary or permanent loss of special-status plants at a level acceptable to the applicable resource agencies; requiring specific measures to avoid and minimize impacts on nesting birds such as limiting construction to the non-nesting season when feasible to avoid impacts to active nests; requiring specific measures to avoid and minimize impacts on American badger such as conducting pre-construction surveys to identify whether any badger dens are present and avoiding and/or passively relocating badgers from dens as necessary to avoid and minimize impacts to badgers within active dens; requiring measures to avoid and minimize impacts on Monterey dusky-footed woodrat such as relocating active nests within the construction area to areas outside of the construction area to minimize impacts to individual woodrats from construction activities; requiring measures to avoid and minimize impacts on special-status bats such as limiting removal of trees or structures with potential bat roosting habitat to the time of year when bats are active to avoid disturbing bats during the maternity roosting season or months of winter torpor; requiring measures to avoid and minimize impacts on native stands of Monterey Pines such as avoiding any stands present to avoid tree loss and replacing trees that cannot be avoided to compensate for any loss; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; requiring measures to avoid and minimize impacts on California red-legged frog and California tiger salamander such as pre-construction surveys to determine if these species are present and implementing minimization measures to minimize construction impacts on these species, if present, and compensating for permanent impacts.

Staging Areas

There are eight staging areas located throughout the project area. **Table 4.6-7** below lists the location of each staging area, a description of the site, habitat types present, and the special-status species with potential to occur within or adjacent to the staging areas. These facilities would be located outside of the MBNMS. The majority of the staging areas are located within developed or highly disturbed areas. However, there is potential for special-status species to occur in the vicinity of each of the staging area as listed in **Table 4.6-7**.

These special-status species include California tiger salamander, California red-legged frog, black legless lizard, silvery legless lizard, Coast Range newt, special-status plants, Smith's blue butterfly, nesting birds, roosting bats, and others listed in **Table 4.6-2**.

Special-status species that could be significantly impacted during use of the staging areas are indicated in **Table 4.6-6**. Although construction-related disturbance would be limited to the developed or highly disturbed areas, some special-status plant species could occur in areas adjacent to the developed and disturbed areas, including, but not limited to, Monterey

TABLE 4.6-7
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR AT CONSTRUCTION STAGING AREAS

Location	Site Description	Staging Area Footprint (acre)	Habitat Types Present	Special-Status Species with Potential to Occur within or Adjacent to the Staging Areas
Monte Road/Neponset Road in unincorporated Monterey County	Paved parking lot (semi-trucks) at Dole Vegetable Processing Plant	0.7	Developed/Landscaped, Ice Plant Mats, Ruderal	Habitat for California tiger salamander, California red-legged frog, Coast Range newt, black legless lizard, and silvery legless lizard occurs in the staging area vicinity. Nesting birds and roosting bats may occur in adjacent buildings and trees. Branching beach aster and Monterey spineflower documented in nearby central dune scrub.
Beach Road in Marina	Paved parking lot at Walmart	0.4	Developed/Landscaped, Ruderal, Ice Plant Mats, Non-native Annual Grassland	Habitat for black legless lizard, silvery legless lizard, coast horned lizard, and Coast Range newt occurs in the staging area vicinity. Nesting birds and roosting bats may occur in adjacent trees. Branching beach aster documented in nearby central dune scrub.
Highway 1/1st Street in Marina	Gated paved parking lot	1.2	Developed/Landscaped, Ice Plant Mats	Habitat for black legless lizard, silvery legless lizard, and coast horned lizard occurs in the staging area vicinity. Nesting birds and roosting bats may occur in adjacent trees. Monterey spineflower, coast buckwheat and branching beach aster documented in nearby central dune scrub. Smith's blue butterfly may occur in vicinity.
2nd Avenue, between Lightfighter Drive and Divarty Street, in Seaside	Paved parking lot at the Cal State University at Monterey Bay Athletic Fields	3.2	Developed/Landscaped, Ruderal, Ice Plant Mats	Habitat for black legless lizard, silvery legless lizard, and coast horned lizard occurs in the staging area vicinity. Nesting birds and roosting bats may occur in adjacent trees. Landscaped manzanita observed at the site during ESA's reconnaissance survey.
2nd Avenue/Lightfighter Drive in Seaside	Paved parking lot.	0.5	Developed/Landscaped, Ruderal, Central Dune Scrub	Habitat for black legless lizard, silvery legless lizard, coast horned lizard, and other special-status species with potential to occur in central dune scrub occurs in the staging area vicinity. Nesting birds and roosting bats may occur in adjacent trees
West side of General Jim Moore Boulevard, near Gigling Road, in Seaside	Paved parking lot	0.3	Developed/Landscaped, Coast Live Oak Woodland	Habitat for black legless lizard, silvery legless lizard, coast horned lizard, and Coast Range newt occurs in the staging area vicinity. Nesting birds and roosting bats may occur in adjacent trees.
East side of General Jim Moore Boulevard, near Gigling Road, in Seaside	Paved parking lot	0.2	Developed/Landscaped, Ice Plant Mats, Ruderal, Coast Live Oak Woodland	Habitat for black legless lizard, silvery legless lizard, coast horned lizard, and Coast Range newt occurs in the staging area vicinity. Nesting birds and roosting bats may occur in adjacent trees and buildings. Monterey spineflower documented in nearby central dune scrub (AECOM, 2016).
West side of General Jim Moore Boulevard, near Seaside Middle School, in Seaside	Sandy area	0.1	Northern Coastal Scrub, Ice Plant Mats, Coyote Brush Scrub, Developed/ Landscaped	Habitat for black legless lizard, silvery legless lizard, coast horned lizard, and Monterey shrew occurs in the staging area vicinity. Nesting birds and roosting bats may occur in adjacent trees and buildings. Monterey spineflower and branching beach aster documented in nearby central dune scrub. Monterey ceanothus documented within survey area (AECOM, 2016) and confirmed to be located on vegetated shoulder of paved area by ESA during reconnaissance surveys.

spineflower, branching beach aster, Kellogg's horkelia, and Monterey ceanothus. If these special-status plant species, or others listed in **Table 4.6-6**, occur within or adjacent to the construction disturbance areas, they could be directly or indirectly impacted by construction activities during the construction period as described above under the heading *Overview of Potential Construction Effects on Plants*. This would be a significant impact.

Similarly, if California red-legged frog, California tiger salamander, black legless lizard, Coast Range newt, or Smith's blue butterfly are located in suitable habitat adjacent to the construction area; if raptors or special-status nesting passerines, roosting special-status bats, or other special-status wildlife species listed in **Table 4.6-6**, are present within or adjacent to the construction work area, they could be directly or indirectly impacted by construction activities during the construction period as described above under the heading *Overview of Potential Construction Effects on Wildlife*, which would be a significant impact.

Implementation of the following mitigation measures would reduce impacts on special-status species to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1e (Avoidance and Minimization Measures for Special-status Plants)**, **4.6-1f (Avoidance and Minimization Measures for Smith's Blue Butterfly), 4.6-1g (Avoidance and Minimization Measures for Black Legless Lizard, Silvery Legless Lizard, and Coast Horned Lizard), 4.6-1h (Avoidance and Minimization Measures for Western Burrowing Owl), 4.6-1i (Avoidance and Minimization Measures for Nesting Birds), 4.6-1j (Avoidance and Minimization Measures for American Badger), 4.6-1k (Avoidance and Minimization Measures for Monterey Dusky-Footed Woodrat), 4.6-1l (Avoidance and Minimization Measures for Special-status Bats)**, **4.6-1n (Habitat Mitigation and Monitoring Plan), 4.6-1o (Avoidance and Minimization Measures for California Red-legged Frog and California Tiger Salamander),** and **4.6-1p (Control Measures for Spread of Invasive Plants)**. These measures would reduce impacts on special-status species by designating a lead biologist to oversee and ensure implementation of special-status species protective measures; requiring worker training regarding special-status species potentially present to ensure that workers are aware of special-status species that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as installation of an exclusion fencing to ensure special-status species do not occur within the construction area, a trash abatement program to ensure special-status species predators are not attracted to the site, and other measures to avoid and minimize impacts on special-status species; requiring specific measures to avoid and minimize impacts on special-status plants such as avoiding individual plants to the extent feasible and compensating for temporary or permanent loss of special-status plants at a level acceptable to the applicable resource agencies; requiring specific measures to avoid and minimize impacts on Smith's blue butterfly such as avoiding host plants to the extent feasible to avoid impacts to individuals and providing compensatory mitigation for permanent impacts; requiring specific measures to avoid and minimize impacts on black legless lizard, silvery legless lizard, and coast horned lizard such as relocating individuals to areas outside of the construction area to avoid injury or mortality from construction; requiring measures to avoid and minimize impacts on western burrowing owl such as conducting pre-construction surveys to

determine if owls are present and implementing minimization measures to minimize construction impacts on owls, if present, and compensating for loss of habitat; requiring specific measures to avoid and minimize impacts on nesting birds such as limiting construction to the non-nesting season when feasible to avoid impacts to active nests; requiring specific measures to avoid and minimize impacts on American badger such as conducting pre-construction surveys to identify whether any badger dens are present and avoiding and/or passively relocating badgers from dens as necessary to avoid and minimize impacts to badgers within active dens; requiring measures to avoid and minimize impacts on Monterey dusky-footed woodrat such as relocating active nests within the construction area to areas outside of the construction area to minimize impacts to individual woodrats from construction activities; requiring measures to avoid and minimize impacts on special-status bats such as limiting removal of trees or structures with potential bat roosting habitat to the time of year when bats are active to avoid disturbing bats during the maternity roosting season or months of winter torpor; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; requiring measures to avoid and minimize impacts on California red-legged frog and California tiger salamander such as pre-construction surveys to determine if these species are present and implementing minimization measures to minimize construction impacts on these species, if present, and compensating for permanent impacts; and requiring implementation of measures to reduce the introduction or spread of invasive species that may degrade habitat for special-status species;

Consistency with Regulatory Requirements

In addition to the physical impacts described above, as noted in Section 4.6.2, Regulatory Framework, MPWSP construction could be inconsistent with applicable regulatory requirements related to special-status species that were adopted for the purpose of avoiding or mitigating an environmental effect. Specifically, the project could be inconsistent with the FESA, Federal Migratory Bird Treaty Act, CESA, California Fish and Game Code, City of Marina General Plan Policies 4.112, 4.114, 4.115, 4.118, 4.119, and 2.10; City of Marina Local Coastal Land Use Plan Policies 25 and 26 and Planning Guideline entitled Rare and Endangered Species: Habitat Protection; City of Seaside Local Coastal Program Land Use Plan Policy NCR-CZ 1.1.C; Seaside Municipal Code Chapter 8.54; Monterey County Greater Monterey Peninsula Area Plan Policy GMP-3.9; Monterey County General Plan Policies OS-4.1, OS-5.1, OS-5.2, OS-5.4, OS-5.16, and OS-5.25; Monterey County North County Land Use Plan Policies 2.3.2.1, 2.3.2.10, 2.3.3.B6, 2.3.3.C2, NC-3.3, and NC-3.5 and Key Policy 4.3.4; Fort Ord Reuse Plan (Seaside) Biological Resource Policies A-4, B-1, C-3, D-1; Fort Ord Reuse Plan (Monterey County) Biological Resource Policies A-9, B-1, D-1, which were established to avoid or mitigate special-status species impacts, respectively. As discussed in the preceding paragraphs, **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures), 4.6-1d (Protective Measures for Western Snowy Plover), 4.6-1e (Avoidance and Minimization Measures for Special-status Plants), 4.6-1f (Avoidance and Minimization Measures for Smith's Blue Butterfly), 4.6-1g (Avoidance and Minimization Measures for Black Legless Lizard, Silvery Legless Lizard, and Coast Horned Lizard), 4.6-1h (Avoidance and Minimization Measures for Western**

Burrowing Owl), 4.6-1i (Avoidance and Minimization Measures for Nesting Birds), 4.6-1j (Avoidance and Minimization Measures for American Badger), 4.6-1k (Avoidance and Minimization Measures for Monterey Dusky-Footed Woodrat), 4.6-1l (Avoidance and Minimization Measures for Special-status Bats), 4.6-1m (Avoidance and Minimization Measures for Native Stands of Monterey Pine), 4.6-1n (Habitat Mitigation and Monitoring Plan), 4.6-1o (Avoidance and Minimization Measures for California Red-legged Frog and California Tiger Salamander), 4.6-1p (Control Measures for Spread of Invasive Plants), 4.6-1q (Frac-out Contingency Plan), 4.12-1b (General Noise Controls for Construction Equipment), and **4.14-2 (Site-Specific Nighttime Lighting Measures)** would reduce impacts on special-status species by: designating a lead biologist to oversee and ensure implementation of special-status species protective measures; requiring worker training regarding special-status species potentially present to ensure that workers are aware of special-status species that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as installation of an exclusion fencing to ensure special-status species do not occur within the construction area, a trash abatement program to ensure special-status species predators are not attracted to the site, and other measures to avoid and minimize impacts on special-status species; requiring specific measures to avoid, minimize, and compensate for impacts on the western snowy plover such as avoiding the breeding season, installing a visual construction barrier for work conducted adjacent to breeding habitat during the breeding season to reduce human disturbance to plovers, conducting pre-construction surveys to determine if plovers are present and implementing minimization measures to minimize construction impacts on plovers, if present, and compensating for habitat loss to mitigate for temporary and permanent loss of habitat; requiring specific measures to avoid and minimize impacts on special-status plants such as avoiding individual plants to the extent feasible and compensating for temporary or permanent loss of special-status plants at a level acceptable to the applicable resource agencies; requiring specific measures to avoid and minimize impacts on Smith's blue butterfly such as avoiding host plants to the extent feasible to avoid impacts to individuals and providing compensatory mitigation for permanent impacts; requiring specific measures to avoid and minimize impacts on black legless lizard, silvery legless lizard, and coast horned lizard such as relocating individuals to areas outside of the construction area to avoid injury or mortality from construction; requiring measures to avoid and minimize impacts on western burrowing owl such as conducting pre-construction surveys to determine if owls are present and implementing minimization measures to minimize construction impacts on owls, if present, and compensating for loss of habitat; requiring specific measures to avoid and minimize impacts on nesting birds such as limiting construction to the non-nesting season when feasible to avoid impacts to active nests; requiring specific measures to avoid and minimize impacts on American badger such as conducting pre-construction surveys to identify whether any badger dens are present and avoiding and/or passively relocating badgers from dens as necessary to avoid and minimize impacts to badgers within active dens; requiring measures to avoid and minimize impacts on Monterey dusky-footed woodrat such as relocating active nests within the construction area to areas outside of the construction area to minimize impacts to individual woodrats from construction activities; requiring measures to avoid and minimize impacts on special-status bats such as limiting removal of trees or structures with potential bat roosting habitat to the time of year when bats are active to avoid disturbing bats during the maternity

roosting season or months of winter torpor; requiring measures to avoid and minimize impacts on native stands of Monterey Pines such as avoiding any stands present to avoid tree loss and replacing trees that cannot be avoided to compensate for any loss; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; requiring measures to avoid and minimize impacts on California red-legged frog and California tiger salamander such as pre-construction surveys to determine if these species are present and implementing minimization measures to minimize construction impacts on these species, if present, and compensating for permanent impacts; requiring implementation of measures to reduce the introduction or spread of invasive species that may degrade habitat for special-status species; requiring preparation of a Frac-out Contingency Plan and implementation of measures in the Plan to contain and clean-up any frac-outs in waterways to minimize impacts of frac-outs on special-status species and their habitat; requiring implementation of noise controls for construction equipment to reduce noise impacts on special-status wildlife species; and requiring measures to minimize light spillover outside of the construction area to minimize construction lighting impacts on special-status wildlife species. Therefore, with these measures implemented, the MPWSP would be brought into conformance with the above-noted regulatory requirements.

Impact Conclusion

Construction activities associated with all proposed project facilities have the potential to result in significant impacts on special-status species. For all facilities, implementation of the proposed mitigation measures would reduce impacts on special-status species to a less-than-significant level.

Mitigation Measures

Mitigation Measure 4.6-1a applies to all project facilities: the subsurface slant wells, MPWSP Desalination Plant, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Brine Discharge Pipeline and Pipeline to CSIP Pond, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), New Transmission Main and New Transmission Main Optional Alignment, Terminal Reservoir, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, Main System–Hidden Hills Interconnection Improvements, and staging areas.

Mitigation Measure 4.6-1a: Retain a Lead Biologist to Oversee Implementation of Protective Measures.

Prior to initiation of construction, CalAm and/or representatives of CalAm shall retain a qualified Lead Biologist[19] to oversee compliance with avoidance and minimization measures for all special-status species and sensitive habitats. The Lead Biologist shall be onsite, or shall appoint qualified biologists and/or qualified biological monitors to be

[19] The term "qualified biologist" or "qualified Lead Biologist" for surveys is defined as an individual who shall possess, at a minimum, a bachelor's degree in biology, ecology, wildlife biology or closely related field and has demonstrated prior field experience using accepted resource agency techniques for the survey prescribed, and who possesses all appropriate USFWS, NMFS, and CDFW permits. The term "biological monitor" or "qualified biological monitor" is defined as holding similar educational credentials to those of a qualified biologist and who has functioned as an environmental inspector or monitor on at least two construction projects within the preceding two years.

onsite, during all fencing and ground disturbance activities. The Lead Biologist, qualified biologists, and qualified biological monitors shall be subject to approval by resource agencies with jurisdiction over the special-status species with potential to occur at the project site (and local agencies, if required). Only the Lead Biologist and/or qualified biologists may lead protocol surveys and relocate special-status species, as authorized by the resource agencies with jurisdiction over these species.

In the event that construction-related activities have the potential to violate the prescribed special-status species and habitat protection measures, the project Lead Biologist, or other appointed qualified biological monitors shall report to construction or operational site supervisors with authority to stop work to prevent any violations. Work shall proceed only after the construction-related hazards to special-status species and habitats are removed and the species is no longer at risk. Violations shall be thoroughly documented as part of compliance monitoring activities.

The Lead Biologist shall ensure that all compliance monitoring activities are documented on a daily basis, and shall prepare a summary monitoring report on a monthly basis to be submitted to regulatory agencies upon their request. The monthly summary monitoring report shall provide information regarding the worker awareness training (see Mitigation Measure 4.6-1b below), surveys, and any observed special-status species, including any accidental injuries or fatalities. The monthly report shall also document the effectiveness and practicality of the prescribed avoidance and minimization measures and recommend modifications to the measures if needed. The Lead Biologist shall supply agency staff with copies of compliance records, including any reports of non-compliance, upon request.

The Lead Biologist shall have in her/his possession a copy of all compliance measures while work is being conducted onsite, and shall ensure that CalAm's onsite representatives and contractors also maintain copies of the compliance measures on the site. To facilitate the Lead Biologist's role, CalAm shall ensure that the Lead Biologist is fully apprised of all decisions that change or materially affect the schedule, methods, and location of work that is subject to the protective measures for biological resources.

This measure also applies to periodic maintenance of the subsurface slant wells.

Mitigation Measure 4.6-1b applies to all project facilities.

Mitigation Measure 4.6-1b: Construction Worker Environmental Awareness Training and Education Program.

Prior to starting work, all construction workers at the project areas shall attend a Construction Worker Environmental Awareness Training and Education Program developed and presented by the Lead Biologist, appointed qualified biologist, and/or qualified biological monitor. The program shall include information on each federal and state-listed species, as well as other special-status wildlife and plant species and sensitive natural communities that may be encountered during construction activities. The training shall include: information on special-status species' life history and legal protections; the definition of "take" under the Federal Endangered Species Act (FESA) and California Endangered Species Act (CESA); the measures CalAm and/or its contractors have committed to implementing to protect special-status species and sensitive natural communities; reporting requirements and communication protocols; specific measures that

each worker shall employ to avoid "take" of special-status species; and penalties for violation of FESA and/or CESA. Training shall be documented as follows:

1. An acknowledgement form shall be signed by each worker indicating that environmental training has been completed.
2. A sticker shall be placed on hard hats indicating that the workers have completed the environmental training. Construction workers shall not be permitted to operate equipment within the construction area unless they have attended the training and are wearing hard hats with the required sticker.
3. A copy of the training transcript/training video and/or DVD, as well as a list of the names of all personnel who attended the training and copies of the signed acknowledgement forms, shall be submitted to the CPUC.

This measure also applies to periodic maintenance of the subsurface slant wells.

Mitigation Measure 4.6-1c applies to all project components.

Mitigation Measure 4.6-1c: General Avoidance and Minimization Measures.

CalAm's construction contractor(s) shall implement the following general avoidance and minimization measures to protect special-status species and sensitive natural communities at the facility sites during construction:

1. The construction footprint, staging areas, equipment access routes, and disposal or temporary placement of spoils, shall be delineated with stakes and flagging prior to construction to avoid natural resources where possible. Any construction-related disturbance outside of these boundaries, including driving, parking, temporary access, sampling or testing, or storage of materials, shall be prohibited without explicit approval of the Lead Biologist.
2. New access driveways shall not extend beyond the delineated construction work area boundary. Construction vehicles shall pass and turn around only within the delineated construction work area boundary or local road network. Where new access is required outside of existing roads or the construction work area, the route shall be clearly marked (i.e., flagged and/or staked) prior to being used, subject to review and approval of the Lead Biologist.
3. Vehicle speeds within the project area shall not exceed 15 miles per hour on roads within the sites.
4. Excavated soils shall be stockpiled in disturbed areas lacking native vegetation. Stockpile areas shall be marked by the Lead Biologist to define the limits where stockpiling can occur.
5. Standard best management practices (such as setbacks and use of silt fences and fiber rolls) shall be employed to prevent loss of habitat due to erosion caused by project related impacts (i.e., grading or clearing for new roads). All detected erosion shall be remedied immediately upon discovery.
6. Fueling of construction equipment shall take place within existing paved areas, and at least 50 feet from drainages (including streams, creeks, ditches, culverts, or storm

drain inlets) and native habitats. Contractor equipment shall be checked for leaks prior to operation and repaired when leaks are detected. Fuel containers shall be stored within appropriately-sized secondary containment barriers.

7. The introduction of exotic plant species shall be avoided through physical or chemical removal and prevention. Measures to prevent the introduction of exotic plants into the construction site via vehicular sources shall include implementing Track clean or other method of vehicle cleaning for vehicles coming to the site and leaving the site. Earthmoving equipment shall be cleaned prior to transport to the project area. Weed-free rice straw or other certified weed-free straw shall be used for erosion control. Weed populations introduced into the site during construction shall be eliminated by chemical and/or mechanical means approved by California Department of Fish and Wildlife (CDFW) and the United States Fish and Wildlife Service (USFWS).

8. Use of herbicides as vegetation control measures shall be used only when mechanical means have been deemed ineffective. All uses of such herbicidal compounds shall observe label and other restrictions mandated by the U.S. Environmental Protection Agency, California Department of Food and Agriculture, and state and federal legislation as well as additional project-related restrictions deemed necessary by the CDFW and/or USFWS. No rodenticides shall be used.

9. Prior to the start of construction at any proposed facility site where special-status amphibians, reptiles and mammals have a moderate or high potential to occur, the construction work area boundary shall be fenced with a temporary exclusion fence to prevent special-status wildlife from entering the site during construction (see **Table 4.6-6** for the list of special-status species that could be significantly impacted at each project facility site). The exclusion fencing shall be constructed of metal flashing, plastic sheeting, or other materials that will prohibit California horned lizards, Monterey shrews, and other special-status reptiles, amphibians, and rodents from climbing the fence. If meshing is used it shall be of a size that would not catch wildlife. The fencing shall be buried a minimum of 6 inches below grade to secure the fence and extend a minimum of 30 inches above grade. The fencing shall be inspected by the Lead Biologist or qualified biological monitor on a daily basis during construction activities to ensure fence integrity. Any needed repairs to the fence shall be performed on the day of their discovery. Fencing shall be installed and maintained during all phases of construction. Final fence design and location shall be determined in consultation with USFWS and CDFW. Exclusion fencing shall be removed once construction activities are complete.

10. If special-status wildlife species are found on the site during project construction, construction activities shall cease in the vicinity of the animal until the animal moves on its own outside of the project area (if possible). The wildlife resource agency(ies) with jurisdiction over the species shall be consulted regarding any additional avoidance, minimization, or mitigation measures that may be necessary if the animal does not move on its own. A report shall be prepared by the Lead Biologist to document the activities of the animal within the site; all fence construction, modification, and repair efforts; and movements of the animal once again outside the exclusion fence. This report shall be submitted to the CPUC and pertinent wildlife agencies with jurisdiction over the wildlife species.

11. Work shall be conducted during daylight hours to the extent practicable. Immediately prior to conducting vegetation removal or grading activities inside fenced exclusion areas, the Lead Biologist or a qualified biologist shall survey within the exclusion area to ensure that no special-status species are present. The Lead Biologist or a qualified biologist shall also monitor vegetation removal or grading activities inside fenced exclusion areas for the presence of special-status species.

12. To prevent the inadvertent entrapment of special-status wildlife during construction, all excavated, steep-walled holes or trenches more than 2 feet deep shall be covered with plywood or similar materials at the close of each working day, or escape ramps constructed of earth fill or wooden planks shall be positioned within the excavations to allow special-status wildlife to escape on their own. Before such holes or trenches are filled, they shall be thoroughly inspected for trapped animals. If trapped animals are observed, escape ramps or structures shall be installed immediately to allow escape. If listed species are trapped, the USFWS and/or CDFW, as appropriate, shall be contacted to determine the appropriate method for relocation.

13. All construction pipes, culverts, or similar structures that are stored at a construction site for one or more overnight periods and with a diameter of 4 inches or more shall be inspected for special-status wildlife before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a special-status animal is discovered inside a pipe, that section of pipe shall not be moved until the appropriate resource agency, with jurisdiction over that species, has been consulted to determine the appropriate method for relocation. If necessary, under the direct supervision of the biologist, the pipe may be moved once to remove it from the path of construction activity until the animal has escaped.

14. All vertical tubes used in project construction, such as chain link fencing poles or signage mounts, shall be temporarily or permanently capped at the time they are installed to avoid the entrapment and death of special-status birds.

15. Water used for dust abatement shall be minimized to the extent feasible in an effort to avoid the formation of puddles that could attract common ravens and other predators to the construction work areas.

16. No vehicle or equipment parked in the project area shall be moved prior to inspecting the ground beneath the vehicle or equipment for the presence of wildlife. If present, the animal shall be left to move on its own.

17. All vehicles and equipment shall be in proper working condition to ensure that there is no potential for fugitive emissions of motor oil, antifreeze, hydraulic fluid, grease, or other hazardous materials. The Lead Biologist shall be informed of any hazardous spills within 24 hours of the incident. Hazardous spills shall be immediately cleaned up and the contaminated soil shall be properly disposed of at a licensed facility.

18. A trash abatement program shall be implemented during construction. Trash and food items shall be contained in closed containers and removed from the construction site daily to reduce the attractiveness to opportunistic predators such as common ravens, coyotes, and feral dogs.

19. Workers shall be prohibited from feeding wildlife and bringing pets and firearms to the construction work areas.

20. Intentional killing or collection of wildlife species, including special-status species in the project area and surrounding areas shall be prohibited.

21. All temporarily disturbed areas shall be returned to pre-project conditions or better.

This measure also applies to periodic maintenance of the subsurface slant wells.

Mitigation Measure 4.6-1d applies to the subsurface slant wells and the Source Water Pipeline and Source Water Pipeline Optional Alignment.

Mitigation Measure 4.6-1d: Protective Measures for Western Snowy Plover.

Construction contractors shall be required to implement the following measures to protect western snowy plover:

1. CalAm shall require that its construction contractor(s) implement all avoidance and minimization measures required by USFWS as part of the FESA Section 7 consultation between the ONMS and USFWS.

2. Construction work at the slant well heads and along the segment of the Source Water Pipeline located west of the CEMEX processing plant shall occur during the western snowy plover non-breeding season (defined as October 1 through February 28) unless otherwise approved by the USFWS.

3. For work that cannot be completed during the non-nesting season, the following steps to obtaining USFWS approval shall be implemented:

    a. CalAm shall engage the services of Point Blue or other qualified western snowy plover biologist (subject to approval by USFWS) to perform one year of surveys during the nesting season preceding construction to determine whether nesting is occurring within sight or audible range of the slant well head locations or Source Water Pipeline.

    b. If findings from the nesting season survey are negative, then the qualified western snowy plover biologist shall conduct additional pre-construction nesting surveys within 24 hours of initiation of construction activities within 300 feet of all construction work areas to determine if any snowy plover nests are present. If there is a break of 3 days or more in construction activities, a survey shall be conducted before construction begins again.

    c. If nests are observed within 300 feet of construction activities, the qualified biologist shall notify and consult with USFWS to determine whether construction may proceed, based on detailed information on location of nest(s), proximity to construction, site lines and topography, and noise environment. Any additional avoidance or minimization measures shall be implemented prior to initiating construction activities.

    d. The biologist shall conduct periodic monitoring during construction to determine if there are any nest starts. Nest starts shall be reported to USFWS to determine whether construction on all or portions of the slant wells or Source Water Pipeline need to be suspended for the duration of nesting and fledging. The biologist will inform the decision with detailed information on location of

nest(s), proximity to construction, site lines and topography, and noise environment.

4. For construction during the breeding season that is approved by USFWS, visual barriers shall be installed around any work area located within line of sight of potential nesting habitat. Visual barriers shall be constructed at an adequate height and width to visually block construction equipment and construction crews from snowy plover nesting habitat. Final designs of the visual barriers shall be coordinated with USFWS. Existing sand dunes may serve as visual barriers.

5. For work conducted during the non-nesting season, a qualified biologist will evaluate the nature and extent of wintering plover activity in the project area several days prior to construction and inform CalAm so they can make construction decisions that avoid or minimize disturbance to plovers. The biologist shall conduct periodic monitoring during construction to ensure that minimization measures are implemented to avoid or minimize disturbance to plovers.

6. CalAm shall restore all temporarily impacted potential snowy plover habitat following construction. Restoration and mitigation activities shall be described in a Habitat Mitigation and Monitoring Plan consistent with **Mitigation Measure 4.6-1n (Habitat Mitigation and Monitoring Plan)**.

7. Anti-perching devices, such as bird spikes or wire strips, shall be installed and maintained on the top of the proposed electrical control panel to discourage potential plover predators.

8. Permanent loss of western snowy plover habitat will be compensated, at a minimum ratio of 2:1, or as otherwise negotiated with USFWS, through actions to enhance existing degraded habitat according to one of the following approaches, or a combination thereof:

    a. Prior to project implementation, CalAm shall prepare a Habitat Mitigation and Monitoring Plan, as described in Mitigation Measure 4.6-1n (Habitat Mitigation and Monitoring Plan), which will describe either onsite or offsite restoration. The plan will include actions to benefit western snowy plover, in conjunction with providing mitigation for special-status plants, as described in Mitigation Measure 4.6-1e, below. The plan will be subject to USFWS input and approval. It will describe restoration methods that may include, but not be limited to removal of ice plant, stabilization of dune sand, planting, seeding or other means of re-establishing native plant species. CalAm will identify and secure access rights and other approvals to implement the plan, and will execute the plan. CalAm will conduct, or will support a qualified third party monitor to conduct annual monitoring of restoration performance measures, such as cover, density and diversity of native plant species, thresholds of non-native plant abundance, and stability of dune sands.

    b. Alternatively, and also subject to USFWS input and approval, in lieu of undertaking restoration actions described above, CalAm may contribute funds to either a mitigation bank authorized to sell credits for western snowy plover habitat or dunes scrub vegetation, or to an existing restoration program, such as those undertaken by the Monterey Peninsula Regional Park District.

This measure also applies to periodic maintenance of the subsurface slant wells.

Mitigation Measure 4.6-1e applies to: the: the subsurface slant wells, MPWSP Desalination Plant, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), New Transmission Main and New Transmission Main Optional Alignment, Terminal Reservoir, Ryan Ranch-Bishop Interconnection Improvements, Main System–Hidden Hills Interconnection Improvements, and staging areas.

Mitigation Measure 4.6-1e: Avoidance and Minimization Measures for Special-status Plants.

Prior to construction, CalAm or its contractor shall conduct focused botanical survey(s) for special-status plants in all potentially suitable habitat during the appropriate blooming period for each species and in accordance with the guidelines established by California Department of Fish and Game in *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFG, 2009). Maps depicting the results of these surveys shall be prepared for use in final design. If more than two years elapse between the focused botanical surveys and commencement of ground disturbance activities, a final set of appropriately-timed focused botanical surveys shall be conducted and populations mapped. The results of these final surveys shall be combined with previous survey results to produce habitat maps showing habitat where the special-status plants have been observed during either of the focused botanical surveys conducted for each facility site.

Special-status plant species are widespread throughout the project area, and could occur at the following facility locations: subsurface slant well site, MPWSP Desalination Plant site, ASR-5 and ASR-6 Wells sites, Terminal Reservoir site, and along the Source Water Pipeline, new Desalinated Water Pipeline and new Desalinated Water Pipeline Optional Alignment, the Castroville Pipeline and Castroville Pipeline Optional Alignments, new Transmission Main and new Transmission Main Optional Alignment, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline, Ryan Ranch-Bishop Interconnection Improvements, and Main System-Hidden Hills Interconnection Improvements, and at proposed staging areas.

1. To the extent feasible, project facilities shall be sited to avoid permanent and temporary impacts on special-status plants and their required constituent habitat elements.

2. Special-status plants located within temporary construction areas shall be fenced or flagged for avoidance (if feasible) prior to construction. The Lead Biologist or the appointed biological monitor shall ensure compliance with off-limits areas. If avoidance is not feasible, seasonal avoidance measures (i.e., limited operating periods based on timing of annual plant dormancy), or temporarily placing heavy fabric or wooden mats over the affected habitat shall be applied as appropriate. Topsoil salvage and site restoration may also be implemented, to be determined by the Lead Biologist and USFWS and CDFW, as appropriate.

3. For potential impacts on listed plant species, such as Menzies' wallflower, sand gilia, Monterey spineflower, and Yadon's rein orchid, CalAm shall comply with the FESA CESA by implementing any requirements from USFWS and CDFW consultation. For state listed rare plants, an Incidental Take Permit (ITP) may be required which

would provide conditions for allowable take and measures to compensate impacts on rare plants.

4. For HMP plant species on former Fort Ord lands, plants shall be salvaged, under the direction of a qualified biologist, as necessary, per the requirements of the HMP, and in accordance with any requirements from USFWS and CDFW.

5. Compensation for temporary or permanent loss of special-status plant occurrences, in the form of land purchase or restoration, shall be provided to the level acceptable to the resource agencies with jurisdiction over those species. Compensatory measures shall be determined on a case-by-case basis in consultation with the resource agencies with jurisdiction over those species. Compensation for loss of special-status plant populations typically involves the purchase and permanent stewardship of known occupied habitat or the restoration and reintroduction of populations in degraded, unoccupied habitat. Restoration or reintroduction may be located on- or offsite.

6. CalAm shall prepare a **Habitat Mitigation and Monitoring Plan, as described in Mitigation Measure 4.6-1n** (Habitat Mitigation and Monitoring Plan), which will describe either onsite or offsite restoration.

This measure also applies to periodic maintenance of the subsurface slant wells.

Mitigation Measure 4.6-1f applies to the subsurface slant wells, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, New Transmission Main and New Transmission Main Optional Alignment, and staging areas.

Mitigation Measure 4.6-1f: Avoidance and Minimization Measures for Smith's Blue Butterfly.

CalAm or its construction contractor(s) shall implement the following measures to reduce impacts on Smith's blue butterfly during construction:

1. CalAm shall require that its construction contractor(s) implement all avoidance and minimization measures required by USFWS as part of the FESA Section 7 consultation between ONMS and USFWS.

2. Floristic botanical surveys of all suitable habitat for coast buckwheat and seacliff buckwheat, both of which are host plants to Smith's blue butterfly, shall be conducted by a qualified biologist during project design and prior to project implementation. Maps depicting the results of these surveys shall be prepared to document the location of the host plants within or adjacent to the project area.

3. Construction of project elements shall be planned to avoid mapped host plants for Smith's blue butterfly whenever feasible.

4. If it is not feasible to avoid disturbance to host plants during project construction, the following shall be implemented:

    a. Prior to the start of construction activities and before conducting preconstruction surveys for Smith's blue butterfly, the Lead Biologist or an appointed qualified biologist shall prepare a protect-in-place and relocation plan for Smith's blue

butterfly and its host plants. If either is found in areas subject to permanent habitat or plant loss, then plants would be salvaged and relocated in accordance with the plan. The relocation plan shall be submitted to USFWS for approval. The relocation plan shall define the study area, describe appropriate handling and relocation methods (such as digging up and removing individual plants, duff, and/or soil and moving them to a new location), and identify appropriate relocation sites.

b. If preconstruction surveys identify butterflies or host plants in areas subject only to temporary disturbance that do not require plant removal, then the plants, and leaf litter and soil which may hold dormant butterfly pupae, would be protected in place with heavy fabric, plywood or other mats (depending on the stability of the underlying soil) to allow construction vehicles to pass over. Following construction, the fabric or mats would be carefully removed and the area allowed to recover. Short-term damage to buckwheat populations is expected to be low.

c. A qualified biologist shall survey the work area no more than 30 days before the onset of ground disturbance. If any life stage of the Smith's blue butterfly or its host plants is found within the project area boundary, the Lead Biologist or qualified biologist shall relocate plants, duff, and/or soil, from the site before construction begins per the relocation plan described above.

5. Upon completion of construction activities, CalAm shall restore Smith's blue butterfly habitat temporarily impacted during construction. Compensatory mitigation for permanent impacts shall be provided either onsite or offsite at a minimum ratio of 2:1, or as otherwise negotiated with USFWS. Restoration and mitigation activities shall be described in the Habitat Mitigation and Monitoring Plan prescribed by **Mitigation Measure 4.6-1n (Habitat Mitigation and Monitoring Plan)**.

This measure also applies to periodic maintenance of the subsurface slant wells.

Mitigation Measure 4.6-1g applies to the subsurface slant wells, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), New Transmission Main and New Transmission Main Optional Alignment, Terminal Reservoir, and staging areas.

Mitigation Measure 4.6-1g: Avoidance and Minimization Measures for Black Legless Lizard, Silvery Legless Lizard, and Coast Horned Lizard.

The Lead Biologist shall appoint a qualified biologist possessing a Scientific Collecting Permit issued by CDFW for black legless lizard, silvery legless lizard, and coast horned lizard to conduct preconstruction surveys for legless lizards and coast horned lizards within 24 hours prior to the initiation of ground disturbing activities or vegetation clearing in suitable habitats such as central dune scrub, coast sage scrub, and central maritime chaparral.

1. Prior to conducting the surveys, the qualified biologist shall prepare a relocation plan that describes the appropriate survey and handling methods for the lizards, and identifies nearby relocation sites where the lizards would be relocated if found during the preconstruction surveys. Surveys should be conducted at relocation sites to

determine the existing lizard population size and ensure that the relocation sites will not become overpopulated. Only relocation sites that are not overpopulated and have suitable habitat conditions (e.g., soils, moisture content, vegetation, aspect) shall be used. The relocation plan shall be submitted to CDFW for approval prior to the start of construction activities.

2. Legless lizard surveys shall be conducted by hand raking soil and leaf litter beneath brush. If Legless lizards are encountered, they shall be salvaged and relocated per the relocation plan.

3. Coast horned lizard surveys shall be conducted by walking transects spaced appropriately to allow for 100 percent visual coverage in search of lizards under shrubs, along gravelly-sandy areas, or any other suitable habitat. Any lizard encountered shall be relocated per the relocation plan.

This measure also applies to periodic maintenance of the subsurface slant wells.

Mitigation Measure 4.6-1h applies to the Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, New Transmission Main and New Transmission Main Optional Alignment, Terminal Reservoir, and staging areas.

Mitigation Measure 4.6-1h: Avoidance and Minimization Measures for Western Burrowing Owl.

The following measures shall be implemented to avoid and minimize impact on western burrowing owl:

1. Prior to the start of construction activities in or around suitable burrowing owl habitat, the Lead Biologist shall appoint a qualified biologist to conduct protocol surveys for burrowing owl. The survey methodology shall be consistent with the methods outlined in the *Staff Report on Burrowing Owl Mitigation* (CDFG, 2012). The surveys shall consist of walking parallel transects spaced 7 to 20 meters (23 to 65 feet) apart, adjusting for vegetation height and density as needed, and noting any potential burrows with fresh burrowing owl sign or presence of burrowing owls. A copy of the protocol survey results shall be submitted to the CPUC and CDFW upon request. Protocol surveys shall be conducted within both the breeding and non-breeding seasons to determine the presence/absence of burrowing owls.

2. A qualified biologist shall conduct preconstruction surveys of the permanent and temporary impact areas in or around suitable burrowing owl habitat to locate active breeding or wintering burrowing owl burrows not more than less than 14 days prior to construction and/or prior to exclusion fencing installation. The methodology for the preconstruction surveys shall be consistent with the methods outlined in the *Staff Report on Burrowing Owl Mitigation*.

3. If no burrowing owls are detected, no additional action is necessary.

4. In areas positive for burrowing owl presence, the Lead Biologist or qualified biological monitor shall be onsite during all construction activities in areas where burrowing owls are determined to be present.

5. If burrowing owls are detected during the nesting and fledging seasons (April 1 to August 15 and August 16 to October 15, respectively), no ground-disturbing activities shall be permitted within the distances specified in **Table 4.6-8** from an active burrow, unless otherwise authorized by CDFW. The specified buffer distance ranges from 656 feet to 1,640 feet, according to the time of year and the level of disturbance. Buffers shall be established in accordance with **Table 4.6-8** and occupied burrows shall not be disturbed during the nesting season unless a qualified biologist approved by CDFW verifies through noninvasive methods that either: (1) the birds have not begun egg-laying and incubation; or (2) juveniles from the occupied burrows are foraging independently and are capable of independent survival. Burrowing owls shall not be moved or excluded from burrows during the breeding season (April 1 to October 15).

6. During the non-breeding (winter) season (October 16 to March 31), consistent with **Table 4.6-8**, ground-disturbing work shall maintain a distance ranging from 164 to 1,640 feet from any active burrows, depending on the level of disturbance, to be determined through coordination with CDFW. If active winter burrows are found that would be directly affected by ground-disturbing activities, owls can be displaced from winter burrows according to recommendations made in the *Staff Report on Burrowing Owl Mitigation*.

TABLE 4.6-8
BURROWING OWL BURROW BUFFERS

Location	Time of Year	Level of Disturbance		
		Low	Medium	High
Nesting sites	April 1–August 15	656 feet	1,640 feet	1,640 feet
Nesting sites	August 16–October 15	656 feet	656 feet	1,640 feet
Any occupied burrow	October 16–March 31	164 feet	328 feet	1,640 feet

SOURCE: CDFG Staff Report, 2012.

7. Burrowing owls should not be excluded from burrows unless or until a Burrowing Owl Exclusion Plan is developed by the Lead Biologist, approved by CDFW, and submitted to the CPUC. At a minimum, the plan shall include the following:

   a. Confirmation by site surveillance that the burrow(s) is empty of burrowing owls and other species preceding the use of a scope to visually inspect the burrow;

   b. Specifications regarding the type of scope to be used and the appropriate timing of using a scope to visually inspect burrows to avoid disturbance of individual owls;

   c. Occupancy factors to look for and what shall guide determination of vacancy and excavation timing;

   d. Methods for burrow excavation. Excavation using hand tools with refilling to prevent reoccupation is preferable whenever possible;

   e. Removal of other potential owl burrow surrogates or refugia onsite;

f. Photographing the excavation and closure of the burrow to demonstrate success and sufficiency;

g. Monitoring of the site to evaluate success and, if needed, to implement remedial measures to prevent subsequent owl use and to avoid take;

h. Methods to ensure the impacted site shall continually be made inhospitable to burrowing owls and fossorial[20] mammals (e.g., by allowing vegetation to grow tall, heavy disking, or immediate and continuous grading) until development is complete.

8. Site monitoring shall be conducted prior to, during, and after exclusion of burrowing owls from their burrows sufficient to ensure take is avoided. Prior to exclusion activities, daily monitoring shall be conducted for one week to confirm young owls have fledged if the exclusion occurs immediately after the end of the breeding season.

9. If burrowing owls are found on-site, compensatory mitigation for loss of breeding and/or wintering habitat shall be implemented onsite or offsite in accordance with burrowing owl *Staff Report on Burrowing Owl Mitigation* guidance and in consultation with CDFW. If compensatory mitigation is necessary, CalAm shall detail the compensatory mitigation in a Burrowing Owl Habitat Mitigation Plan (which shall be incorporated into the Habitat Mitigation and Monitoring Plan described in **Mitigation Measure 4.6-1n**). At a minimum, the following measures shall be implemented:

   a. Temporarily disturbed habitat shall be restored, if feasible, to pre-construction conditions, including soil decompaction and revegetation.

   b. Permanent impacts on nesting, occupied and satellite burrows, and any other burrowing owl habitat shall be mitigated such that the habitat acreage, number of burrows, and number of burrowing owls impacted are replaced. Compensatory mitigation may include the permanent conservation of lands with similar vegetation communities (grassland, scrublands, desert, urban, and agriculture) as those lands where the permanent loss of habitat would occur. Conservation lands should provide habitat for burrowing owl nesting, foraging, wintering, and/or dispersal (i.e., during breeding and nonbreeding seasons) comparable to or better than that of the impact area, and with sufficiently large acreage, and presence of fossorial mammals.

Mitigation Measure 4.6-1i applies to all project components.

Mitigation Measure 4.6-1i: Avoidance and Minimization Measures for Nesting Birds.

This measure applies to all nesting birds protected by the federal Migratory Bird Treaty Act and Section 3503 of the California Fish and Game Code, except for western snowy plover and western burrowing, which are addressed in Mitigation Measure 4.6-1d and 4.6-1h, respectively.

Nesting birds may be present at all of the proposed facility sites. A qualified biologist shall conduct preconstruction avian nesting surveys prior to initiation of construction activities at all facility sites, unless otherwise indicated below.

[20] Adapted to digging or burrowing.

1. No preconstruction surveys or avoidance measures are required for construction activities that would be completed entirely during the non-nesting season (September 16 to January 31).

2. For all construction activities scheduled to occur during the nesting season (February 1 to September 15), the qualified biologist shall conduct a preconstruction avian nesting survey within 14 days of site clearing and/or ground disturbance. Copies of the survey results shall be submitted to the CPUC.

3. If construction activities at any given facility site begins in the non-breeding season and proceeds continuously into the breeding season, no surveys are required. However, if there is a break of 14 days or more in construction activities during the breeding season, a new nesting bird survey shall be conducted before reinitiating construction.

4. The surveying biologist shall be capable of determining the species and nesting stage without causing intrusive disturbance. The surveys shall cover all potential nesting sites within 500 feet of the project area for raptors and within 300 feet for other birds.

If active nests are found, a no-disturbance buffer (at least 300 to 500 feet for raptors and 50 to 100 feet for other birds [or as otherwise determined in consultation with CDFW] shall be created around the active nests). If the nest(s) are found in an area where ground disturbance is scheduled to occur, the project operator shall require that ground disturbance be delayed until after the birds have fledged.

This measure also applies to periodic maintenance of the subsurface slant wells.

Mitigation Measure 4.6-1j applies to the MPWSP Desalination Plant, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), New Transmission Main and New Transmission Main Optional Alignment, Terminal Reservoir, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and staging areas.

Mitigation Measure 4.6-1j: Avoidance and Minimization Measures for American Badger.

The following measures shall be implemented to avoid and minimize impacts on American badger:

1. A qualified biologist shall conduct preconstruction surveys for American badger dens prior to the start of construction at potentially affected sites. The survey results shall be submitted to the CPUC.

2. Areas of suitable habitat for American badger in the project area include fallow agricultural and grazing land and non-native grasslands. Surveys shall be conducted wherever these vegetation communities exist within 100 feet of the project area boundary. Along pipeline alignments surveys shall be phased to occur within 14 days prior to disturbance along that portion of the alignment.

3. If no potential American badger dens are found during the preconstruction surveys, no further action is required.

4. If the biologist determines that any potential dens identified during the preconstruction surveys are inactive, the biologist shall excavate the dens by hand with a shovel to prevent use by badgers during construction.

5. If active badger dens are found during the course of preconstruction surveys, the following measures shall be taken to avoid and minimize adverse effects on American badger:

    a. Relocation shall be prohibited during the badger pupping season (typically February 15 to June 1).

    b. Construction activities shall not occur within 50 feet of active badger dens. The Lead Biologist shall contact CDFW immediately if natal badger dens are detected to determine suitable buffers.

If the biologist determines that potential dens within the project area, and outside the breeding season, may be active, the biologist shall notify the CDFW. Badgers shall be passively relocated from active dens during the nonbreeding season. Passive relocation may include incrementally blocking the den entrance with soil, sticks, and debris for three to five days to discourage use of these dens prior to project disturbance. After the qualified biologist determines that badgers have abandoned any active dens found within the project area, the dens shall be hand-excavated with a shovel to prevent re-use during construction.

Mitigation Measure 4.6-1k applies to the Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), New Transmission Main and New Transmission Main Optional Alignment, Terminal Reservoir, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and staging areas.

Mitigation Measure 4.6-1k: Avoidance and Minimization Measures for Monterey Dusky-Footed Woodrat.

The following measures shall be implemented to avoid and minimize impacts on Monterey dusky-footed woodrat:

1. A qualified wildlife biologist shall conduct preconstruction surveys for Monterey dusky-footed woodrat. The surveys shall be conducted within 14 days prior to the start of construction in suitable habitat and shall identify any woodrat nests located within 50 feet of anticipated construction disturbance areas.

2. If woodrat nests are found during the preconstruction surveys, the wildlife biologist shall conduct additional surveys throughout the duration of construction activities at the potentially affected facility site to identify any newly constructed woodrat nests.

3. If nests are observed outside of the construction area, the qualified biologist shall demarcate a suitable buffer area with orange construction fencing and require that all construction activities and disturbance remain outside of the fencing.

4. Active woodrat nests located within the anticipated construction disturbance areas shall be relocated. To the extent feasible, nests should be relocated outside of the peak breeding season, (peak breeding season is typically February through November). Relocation of woodrats and/or their nests shall be conducted by the Lead Biologist or qualified wildlife biologist as follows:

a. Clear understory vegetation from around the nest using hand tools.

b. After all vegetative cover has been cleared around the nest, the biologist shall gently disturb the nest to encourage the woodrat(s) to abandon the nest and seek cover in adjacent habitat.

c. Once the woodrats have left the nest, the biologist shall carefully relocate the nest sticks to suitable habitat outside of the construction disturbance area, piling the sticks at the base of trees or large shrubs if available. If multiple nests are relocated, the stick piles shall be placed at least 25 feet from one another.

d. The Lead Biologist shall ensure potential health hazards to the biologists moving nests are addressed to minimize the risk of contracting diseases associated with woodrats and woodrat nests. These include hantavirus, Lyme disease, and plague. The biologists that relocate nests shall take the following precautionary safety measures:

   i. Wear a Cal/OSHA-certified facial respirator to reduce inhalation of potential disease causing organisms.

   ii. Wear a white Tyvec protective suit to provide a barrier for ticks and fleas and facilitate their detection and removal.

   If nest relocation cannot be avoided within the peak breeding season, the Lead Biologist shall contact CDFW for further guidance on relocating woodrat nests and shall implement all further CDFW recommendations.

Mitigation Measure 4.6-1l applies to the MPWSP Desalination Plant, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Brine Discharge Pipeline and Pipeline to CSIP Pond, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), New Transmission Main and New Transmission Main Optional Alignment, Terminal Reservoir, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, Main System–Hidden Hills Interconnection Improvements, and staging areas.

Mitigation Measure 4.6-1l: Avoidance and Minimization Measures for Special-status Bats.

A pre-construction survey for special-status bats shall be conducted by a qualified biologist prior to construction activities to characterize potential bat habitat and identify active roost sites. Surveys should be conducted within 100 feet of construction activities. If an active bat roost being used for maternity or hibernation is found within 100 feet of the construction activities a no-disturbance buffer of 100 feet shall be established around these roost sites until they are determined to be no longer active by the qualified biologist. Should potential roosting habitat or active bat roosts be found in trees and/or structures to be removed under the project, the following measures shall be implemented:

1. Removal of trees or structures with potential bat roosting habitat or active roosts shall occur when bats are active, approximately between the periods of March 1 to April 15 and August 15 to October 15; outside of bat maternity roosting season

(approximately April 15 – August 31) and outside of months of winter torpor (approximately October 15 – February 28) to the extent feasible.

2. If removal of trees and structures with potential bat roosting habitat during the periods when bats are active is not feasible a qualified biologist will develop a Bat Protection Plan. This plan will include a supplemental evaluation of activity at potential roosting habitat conducted within 14 days prior to removal and additional roost specific protective measures to be implemented prior to and during removal.

3. The qualified biologist shall be present during tree and structure removal if potential roosting habitat or active bat roosts are present. Trees and structures with potential roosting habitat or active roosts shall be removed only when no rain is occurring or is forecast to occur for 3 days, when nighttime temperatures are at least 50°F, and when wind speeds are less than 15 mph.

4. Removal of trees with active or potentially active roost sites shall follow a two-step removal process:

    a. On the first day of tree removal and under supervision of the qualified biologist, branches and limbs not containing cavities or fissures in which bats could roost, shall be cut only using hand tools.

    b. On the following day and under the supervision of the qualified biologist, the remainder of the tree may be removed, either using hand tools or other equipment (e.g. excavator or backhoe).

5. Removal of structures containing or suspected to contain active bat roosts shall be partially dismantled under the supervision of the qualified biologist in the evening prior to the emergence of bats. Structures shall be partially dismantled to significantly change the roost conditions, causing bats to abandon and not return to the roost. Removal will be completed the subsequent day.

6. Bat roosts that begin during construction are presumed to be unaffected, and no buffer would be necessary. Direct impacts on bat roosts or take of individual bats will be avoided.

Mitigation Measure 4.6-1m applies to the Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), Terminal Reservoir, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, and Main System-Hidden Hills Interconnection Improvements.

Mitigation Measure 4.6-1m: Avoidance and Minimization Measures for Native Stands of Monterey Pine.

A qualified botanist or arborist shall conduct surveys for native stands of Monterey pine prior to completion of final project design documents. Individual Monterey pine trees existing within the construction work area shall be evaluated to determine if they are native occurrences, relics, or otherwise naturally-occurring remnants of the past historic range. Maps depicting the results of these surveys shall be prepared for consideration during final facility design. Native stands of Monterey pine could occur at the identified facility sites and pipeline alignments based on the historical extent of native Monterey pines and biological reconnaissance surveys.

To the extent feasible, project facilities shall be sited and construction activities planned to avoid impacts on native stands of Monterey pine. Any native stands of Monterey pines located within the anticipated construction disturbance area shall be fenced or flagged for avoidance prior to construction, and a biological monitor shall be present to ensure compliance with off-limits areas.

If removal of native stands of Monterey pine cannot be avoided, trees shall be replaced at a 2:1 ratio for trees removed or directly impacted by construction activities. Only local Monterey pine genetic stock shall be used for replanting at the project site. Replacement plantings shall be planted contiguous with other individuals of the same species in areas that are determined to have suitable site conditions. Protective fencing shall be installed around the seedlings to protect against disturbance. Replacement trees shall be maintained and monitored for a period of five years to ensure success. The Habitat Mitigation and Monitoring Plan to be prepared in accordance with **Mitigation Measure 4.6-1n (Habitat Mitigation and Monitoring Plan)** shall detail the monitoring requirements and success criteria.

This mitigation measures applies to native stands of Monterey pines. Independent of whether Monterey pines in the project area are considered native stands, individual trees may be subject to local tree ordinances; see **Mitigation Measure 4.6-5 (Compliance with Local Tree Policies and Ordinances)**.

Mitigation Measure 4.6-1n applies to the subsurface slant wells, MPWSP Desalination Plant, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), New Transmission Main and New Transmission Main Optional Alignment, Terminal Reservoir, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and staging areas.

Mitigation Measure 4.6-1n: Habitat Mitigation and Monitoring Plan.

CalAm shall develop and submit a Habitat Mitigation and Monitoring Plan (HMMP) to the appropriate resource agencies (CCC, CDFW, CCRWQCB, USACE, USFWS, and local agencies that require a habitat mitigation and monitoring plan) for approval prior to project construction. The HMMP shall be implemented at all areas where special-status species habitat or sensitive natural communities will be restored, created, or enhanced to mitigate for project impacts either prior to, concurrently with, or following project construction, as specified in the HMMP. The HMMP shall outline measures to be implemented to, depending on the mitigation requirements, restore, improve, or re-establish special-status species habitat, sensitive natural communities, and critical habitat on the site, and shall include the following elements:

1. Name and contact information for the property owner of the land on which the mitigation will take place
2. Identification of the water source for supplemental irrigation
3. Identification of depth to groundwater
4. Site preparation guidelines to prepare for planting, including coarse and fine grading

5. Plant material procurement, including assessment of risk of introduction of plant pathogens through use of nursery-grown container stock vs. collection and propagation of site-specific plant materials, or use of seeds
6. Planting plan outlining species selection, planting locations and spacing, for each vegetation type to be restored
7. Planting methods, including containers, hydroseed or hydromulch, weed barriers and cages, as needed
8. Soil amendment recommendations
9. Irrigation plan, with proposed rates (in gallons per minute), schedule (i.e. recurrence interval), and seasonal guidelines for watering
10. Site protection plan to prevent unauthorized access, accidental damage and vandalism
11. Weeding and other vegetation maintenance tasks and schedule, with specific thresholds for acceptance of invasive species
12. Performance standards by which successful completion of mitigation can be assessed in comparison to a relevant baseline or reference site, and by which remedial actions will be triggered; all success criteria to be summarized in tabular form
13. Monitoring methods and schedule
14. Reporting requirements and schedule
15. Adaptive management and corrective actions to achieve the established success criteria
16. Educational outreach program to inform operations and maintenance departments of local land management and utility agencies of the mitigation purpose of restored areas to prevent accidental damages
17. Description of any other compensatory mitigation in the form of land purchase, establishment of conservation easements or deed restrictions, contribution of funds in lieu of active restoration, or purchase of mitigation bank credits, or other means by which the mitigation site will be preserved in perpetuity.

Mitigation Measure 4.6-1o applies to the MPWSP Desalination Plant, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Brine Discharge Pipeline and Pipeline to CSIP Pond, Castroville Pipeline and Castroville Pipeline Optional Alignments, Terminal Reservoir, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and staging areas.

Mitigation Measure 4.6-1o: Avoidance and Minimization Measures for California Red-legged Frog and California Tiger Salamander.

A preconstruction survey for California red-legged frog and California tiger salamander shall be conducted by a qualified biologist in suitable habitat where there is a moderate to high potential for these species to occur prior to vegetation removal or grading, as specified below:

1. Prior to conducting the surveys, the qualified biologist shall prepare a relocation plan that describes the appropriate survey and handling methods for California red-legged frog and California tiger salamander, and identifies nearby relocation sites where individuals would be relocated if found during the preconstruction surveys. The relocation plan shall be submitted to USFWS and CDFW for approval prior to the start of construction activities.

2. Preconstruction surveys shall be conducted within 5 days prior to, and immediately prior to, vegetation removal, grading, or installation of exclusion fence to identify any California red-legged frog, California tiger salamander, and any small mammal burrows.

3. Small mammal burrows identified during preconstruction surveys shall be surveyed (through hand-excavation, scoping, or other suitable methods to be determined in consultation with USFWS and CDFW) to identify any California red-legged frog or California tiger salamander. Once the burrow is confirmed to be vacant, the burrow shall be collapsed.

4. If California red-legged frog or California tiger salamander are observed within the construction area, a qualified biologist shall relocate the individual according to the relocation plan above and only with authorization from USFWS and CDFW.

5. Exclusion fencing shall be installed around construction areas where there is a moderate to high potential for these species to occur as specified in **Mitigation Measure 4.6-1c (General Avoidance and Minimization Measures)**.

6. The qualified biologist shall monitor vegetation removal and grading inside the exclusion fence as specified in **Mitigation Measure 4.6-1c (General Avoidance and Minimization Measures)**.

Upon completion of construction activities, CalAm shall restore California tiger salamander and California red-legged frog habitat temporarily impacted during construction. Compensatory mitigation for permanent impacts shall be provided either onsite or offsite at a minimum ratio of 2:1, or as otherwise negotiated with USFWS and CDFW. Restoration and mitigation activities shall be described in the Habitat Mitigation and Monitoring Plan prescribed by **Mitigation Measure 4.6-1n (Habitat Mitigation and Monitoring Plan)**.

Mitigation Measure 4.6-1p applies to the subsurface slant wells, MPWSP Desalination Plant, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), New Transmission Main and New Transmission Main Optional Alignment, Terminal Reservoir, and staging areas.

Mitigation Measure 4.6-1p: Control Measures for Spread of Invasive Plants.

Construction best management practices shall be implemented in construction areas within or adjacent to lands with native plant communities that may be susceptible to non-native plant species invasion to prevent the spread of invasive plants, seed, propagules, and pathogens through the following actions:

1) Avoid driving in or operating equipment in weed-infested areas outside of fenced work areas and restrict travel to established roads.

2) Avoid leaving exposed soil or construction materials in areas with the potential for invasive plants (e.g., in staging areas). Non-active stockpiles shall be covered with plastic or a comparable material.

3) Clean tools, equipment, and vehicles before transporting materials and before entering and leaving worksites (e.g., wheel washing stations at Project site access points). Inspect vehicles and equipment for weed seeds and/or propagules stuck in tire treads or mud on the vehicle to minimize the risk of carrying them to unaffected areas. Designate areas within active construction sites for cleaning and inspections.

4) An environmental inspector, under direction of the Lead Biologist or appointed qualified biologist (see **Mitigation Measure 4.6-1a**) shall inspect vehicles and equipment prior to project initiation at applicable work areas (listed above) for weed seeds and plant fragments that could colonize within the site or be transported to other sites. At project initiation, all construction vehicles must be cleaned to remove soil and plant fragments at designated locations, and vehicles or equipment that are not clean shall be rejected until clear of weed seed and plant fragments. Wheel washing stations or other methods to remove and contain seeds or other plant fragments from vehicles, equipment, boots, and tools shall be established in designated areas.

5) All equipment and tools involved in soil disturbance at applicable work areas shall be disinfected using a 10% bleach or 70% isopropyl alcohol solution prior to initial use or prior to returning to applicable work areas if used on another project site.

6) Only certified, weed-free, plastic-free imported erosion control materials (or rice straw in upland areas) shall be used for the project.

This measure also applies to periodic maintenance of the subsurface slant wells.

Mitigation Measure 4.6-1q applies to HDD installation of the Castroville Pipeline beneath the Salinas River and Tembladero Slough.

Mitigation Measure 4.6-1q: Frac-out Contingency Plan.

CalAm shall retain a licensed geotechnical engineer to develop a Frac-out Contingency Plan (Plan). CalAm will submit the plan to the appropriate resource agencies (CDFW, CCRWQCB, USACE, USFWS, NMFS, and local agencies with land use jurisdiction) for approval prior to the start of construction of any pipeline that will use HDD installation. The Plan shall be implemented at all areas where HDD installation under a waterway would occur to avoid, minimize, or mitigate for project impacts either prior to, concurrently with, or following HDD installation, as specified in the Plan. The plan shall include, at a minimum:

1) Measures describing training of construction personnel about monitoring procedures, equipment, materials and procedures in place for the prevention, containment, clean-up (such as creating a containment area and using a pump, using a vacuum truck, etc.), and disposal of released bentonite slurry, and agency notification protocols;

2) Methods for preventing frac-out including maintaining pressure in the borehole to avoid exceeding the strength of the overlying soil.

3) Methods for detecting an accidental release of bentonite slurry that include: (a) monitoring by a minimum of one biological monitor throughout drilling operations to ensure swift response if a frac-out occurs; (b) continuous monitoring of drilling pressures to ensure they do not exceed those needed to penetrate the formation; (c) continuous monitoring of slurry returns at the exit and entry pits to determine if slurry circulation has been lost; and (d) continuous monitoring by spotters to follow the progress of the drill bit during the pilot hole operation, and reaming and pull back operations.

4) Protocols CalAm and/or its contractors will follow if there is a loss of circulation or other indicator of a release of slurry.

5) Cleanup and disposal procedures and equipment CalAm and/or its contractors will use if a frac-out occurs.

6) If a frac-out occurs, CalAm and/or its contractors shall immediately halt work and notify and consult with the staffs of the agencies listed above regarding appropriate incident-specific actions to be undertaken, including implementation of the cleanup and disposal procedures in Item 5, before HDD activities can begin again.

Mitigation Measure 4.12-1b applies to the subsurface slant wells and Source Water Pipeline west of Highway 1.

Mitigation Measure 4.12-1b (General Noise Controls for Construction Equipment)

(See Impact 4.12-1 in Section 4.12, Noise and Vibration, for description.)

Mitigation Measure 4.14-2 applies to subsurface slant wells, MPWSP Desalination Plant, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Brine Discharge Pipeline and Pipeline to CSIP Pond, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline), and New Transmission Main and New Transmission Main Optional Alignment.

Mitigation Measure 4.14-2: Site-Specific Nighttime Lighting Measures.

(See Impact 4.14-2 in Section 4.14, Aesthetic Resources, for description.)

Impact 4.6-2: Result in substantial adverse effects on riparian habitat, critical habitat, or other sensitive natural communities during construction. (*Less than Significant with Mitigation*)

This impact addresses impacts on the sensitive natural communities (including riparian habitat) described in Section 4.6.1.5, and on designated critical habitat, described in Section 4.6.1.9. Section 4.6.1.10, Sensitive Terrestrial Biological Resources in the Project Area, above, describes how sensitive natural communities are distributed throughout the project area.

Table 4.6-4 in Section 4.6.2.3, Regulatory Framework, above, presents an evaluation of project consistency with the applicable LCP policies that relate to ESHAs. Wetlands and other waters may also be considered ESHAs and sensitive natural communities; however, potential impacts on wetlands or other waters are addressed below under Impact 4.6-3.

Consultation will include addressing any destruction or adverse modification of critical habitat that is described in Section 4.6.2.1, Federal Regulations. Impacts within critical habitat are generally only considered significant if they adversely affect the primary constituent habitat elements required by the corresponding species.

Sensitive communities and critical habitat within or adjacent to project construction areas could be temporarily or permanently impacted during project construction. A discussion of the potential construction-related impacts on sensitive communities and critical habitat associated with each project facility is provided below.

Impact acreages are provided below for each facility when appropriate and are provided as an approximation based on the current proposed project footprint. Since many of the facilities overlap, the impact acreages provided below may overlap with the impact acreages for other facilities and optional alignments. The final impact acreages for the entire project would be based on whether the proposed project uses the proposed alignments or optional alignments.

Subsurface Slant Wells

Sensitive Natural Communities. Central dune scrub occurs in and around the subsurface slant well site. As described in Section 4.6.1.4, Vegetation Communities and Habitat Types, central dune scrub in this area varies between relatively undisturbed central dune scrub, formerly disturbed sand dunes that are revegetating with native and non-native dune scrub vegetation, and unvegetated disturbed sandy soil in actively mined areas. Construction of the subsurface slant wells would occur in the Coastal Zone and would be subject to the City of Marina LCLUP. As described in Section 4.6.1.10, Sensitive Terrestrial Biological Resources in the Project Area, the majority of the subsurface slant well area would likely be considered either “primary habitat” or “secondary habitat” areas protected under the City of Marina’s LCLUP. For the purpose of this analysis, it is assumed that primary habitat would include any central dune scrub habitat mapped within the CEMEX property and secondary habitat would be any developed areas located within 100 feet of the central dune scrub.

As described in Section 3.3.2 of Chapter 3, Description of the Proposed Project, slant well construction would temporarily disturb approximately 9 acres in the CEMEX mining area. A portion of this construction footprint overlaps with a portion of the construction footprints for the Source Water Pipeline and Source Water Pipeline using the optional alignment. The majority of this disturbance area is central dune scrub, although there are some existing disturbed areas. Slant well construction (including drilling, staging, and truck access) would temporarily disturb sensitive central dune scrub through direct removal of vegetation and changes to topography. Construction of the nine permanent subsurface slant wells in the CEMEX mining area is expected to take a total of

15 months to complete, but could occur anytime during the 24-month construction duration. Temporary disturbance to central dune scrub during construction would be a significant impact.

The components of the proposed subsurface slant wells that would be below the mean high water line would be within the MBNMS. Impacts to marine biological resources from the slant well components that would be located within the MBNMS are described in Section 4.5 Marine Biological Resources. The facility components that are evaluated in this section would be located above the mean high water line and outside of the MBNMS.

Within the 9-acre disturbance area, new permanent facilities would be constructed within central dune scrub. These permanent facilities include five new concrete pads with associated aboveground infrastructure at Well Sites 2 through 6; each well site would include one to three wellhead vaults, above-ground mechanical piping, an electrical control cabinet, and a pump-to-waste vault. A graded access road also would be constructed. These features would result in the permanent loss of approximately 1.0 acre of central dune scrub.

Critical Habitat. Subsurface slant well construction would occur outside of western snowy plover critical habitat and would not result in direct impacts on critical habitat. However, conversion of the test slant well to a permanent well and construction of aboveground facilities at Site 1 would occur approximately 240 feet east of critical habitat for western snowy plover. Slant well construction could indirectly impact the primary constituent elements of this critical habitat if worker foot traffic extends beyond the designated construction work area, if trash and debris is left behind following construction, or if invasive plant species are introduced or spread at the site. These indirect impacts on critical habitat would be significant.

Implementation of the following mitigation measures would reduce impacts on sensitive natural communities and critical habitat resulting from slant well construction to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures), 4.6-1d (Protective Measures for Western Snowy Plover), 4.6-1n (Habitat Mitigation and Monitoring Plan), 4.6-1p (Control Measures for Spread of Invasive Plants)**, **4.6-2a (Consultation with Local Agencies and the California Coastal Commission regarding Environmentally Sensitive Habitat Areas)**, and **4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities)**. These measures would reduce impacts on sensitive natural communities and critical habitat by designating a lead biologist to oversee and ensure implementation of sensitive natural community protective measures; requiring worker training regarding sensitive natural communities potentially present to ensure that workers are aware of sensitive natural communities that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as staking or flagging the construction area to ensure work is restricted to the construction footprint and avoids adjacent sensitive natural communities and other measures to avoid and minimize impacts on sensitive natural communities; requiring specific measures to avoid, minimize, and compensate for impacts on the western snowy plover such as avoiding the breeding season, installing a visual construction barrier for work conducted adjacent to breeding habitat during the

breeding season to reduce human disturbance to plovers, conducting pre-construction surveys to determine if plovers are present and implementing minimization measures to minimize construction impacts on plovers, if present, and compensating for habitat loss to mitigate for temporary and permanent loss of habitat; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; requiring implementation of measures to reduce the introduction or spread of invasive species that may degrade sensitive habitat; ensuring the project conforms to ESHA policies (including local coastal plan policies); and requiring measures to avoid and minimize impacts on sensitive natural communities such as requiring that staging areas are located away from sensitive communities to minimize project impacts to these resources and compensating for loss of habitat.

MPWSP Desalination Plant

The proposed MPWSP Desalination Plant is described in Chapter 3, Description of the Proposed Project, Section 3.2.2 and would be constructed on the upper terrace (approximately 25 acres) of a 46-acre vacant parcel on Charles Benson Road. This facility would be located outside of the MBNMS. It would take approximately 24 months to construct.

Sensitive Natural Communities. The majority of the MPWSP Desalination Plant site is non-native grassland; however, there is a small patch of yellow bush lupine scrub, a type of northern coastal scrub, located in the northeastern corner of the site. The site is outside of the Coastal Zone and would not be subject to the Coastal Act. Construction of the MPWSP Desalination Plant would permanently impact approximately 0.06 acre of northern coastal scrub, which would be a significant impact. This community could also be indirectly impacted through the dispersal or spread of invasive plant species, which would be a significant impact.

Critical Habitat. There is no critical habitat at the 25-acre MWSP Desalination Plant site. However, critical habitat for south/central California coast steelhead and tidewater goby occurs along the Salinas River, approximately 670 feet north of the proposed MPWSP Desalination Plant development area. Construction of the MPWSP Desalination Plant would not directly impact south/central California coast steelhead or tidewater goby critical habitat. However, soil-disturbing activities at the site could result in soil erosion and the migration of eroded soil and sediment downgradient towards the Salinas River. As discussed under Impact 4.3-1 in Section 4.3, Surface Water Hydrology and Water Quality, project construction activities that disturb more than 1 acre are subject to the NPDES Construction General Permit requirements. Per the requirements, a SWPPP would be prepared by a Qualified SWPPP Developer and a Qualified SWPPP Practitioner would oversee its implementation. The SWPPP, which would include site-specific erosion and stormwater control measures to be implemented during construction of the MPWSP Desalination Plant, would reduce or eliminate the off-site migration of pollutants and sediment. Mandatory compliance with the NPDES Construction General Permit would avoid substantial adverse effects on water quality in critical habitat along the Salinas River. Thus, the impact on critical habitat along the Salinas River would be less than significant, and no mitigation is necessary.

Implementation of the following mitigation measures would reduce impacts on sensitive natural communities resulting from construction of the MPWSP Desalination Plant to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures), 4.6-1n (Habitat Mitigation and Monitoring Plan), 4.6-1p (Control Measures for Spread of Invasive Plants)**, and **4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities)**. These measures would reduce impacts on sensitive natural communities by designating a lead biologist to oversee and ensure implementation of sensitive natural community protective measures; requiring worker training regarding sensitive natural communities potentially present to ensure that workers are aware of sensitive natural communities that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as staking or flagging the construction area to ensure work is restricted to the construction footprint and avoids adjacent sensitive natural communities and other measures to avoid and minimize impacts on sensitive natural communities; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; requiring implementation of measures to reduce the introduction or spread of invasive species that may degrade sensitive habitat; and requiring measures to avoid and minimize impacts on sensitive natural communities such as requiring that staging areas are located away from sensitive communities to minimize project impacts to these resources and compensating for loss of habitat.

Pipelines and Other Conveyance Facilities North of Reservation Road

Source Water Pipeline

The Source Water Pipeline and Source Water Pipeline Optional alignments are described in Chapter 3, Description of the Proposed Project, Section 3.2.1.2. This facility would be located outside of the MBNMS. Construction of this pipeline would take approximately 6 months.

Sensitive Natural Communities. Central dune scrub occurs along the portions of the Source Water Pipeline alignment that are located within the Coastal Zone. As described in Section 4.6.1.4, Vegetation Communities and Habitat Types, the occurrence of central dune scrub in this area ranges from relatively undisturbed areas dominated by native species, to disturbed areas dominated by a combination of native and non-native invasive species. Central dune scrub and adjacent areas within the Coastal Zone may be considered Primary or Secondary Habitat under the City of Marina LCLUP, and may be designated as ESHA under the North County Land Use Plan Local Coastal Program and by the CCC.

Earthmoving activities associated with installation of the Source Water Pipeline could result in the temporary loss of approximately 6.7 acres of central dune scrub (upon completion of construction, the site would be graded and revegetated). A portion of the 6.7-acre central dune scrub impact area also falls within the new Desalinated Water Pipeline and Castroville Pipeline alignments described below and may overlap with some of the impact area for the subsurface slant wells described above. The movement of construction vehicles and equipment over

vegetated areas, as well as inadvertent discharges of pollutants to these areas via stormwater runoff, could result in direct and indirect impacts on central dune scrub located within and adjacent to the construction work areas. Temporary and indirect impacts on central dune scrub would be significant.

Critical Habitat. Critical habitat for western snowy plover is located outside of and approximately 240 feet west of the western end of the Source Water Pipeline project area. Installation of the Source Water Pipeline would not result in direct impacts on critical habitat. However, pipeline installation could indirectly impact the nearby primary constituent elements of critical habitat for western snowy plover if construction worker foot traffic extends beyond the designated construction area, if trash and debris is left behind following construction, and/or if invasive plant species are introduced or spread at the site. These indirect impacts on critical habitat would be significant.

Implementation of the following mitigation measures would reduce impacts on sensitive natural communities and critical habitat associated with construction of the Source Water Pipeline to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1d (Protective Measures for Western Snowy Plover)**, **4.6-1n (Habitat Mitigation and Monitoring Plan), 4.6-1p (Control Measures for Spread of Invasive Plants)**, **4.6-2a (Consultation with Local Agencies and the California Coastal Commission regarding Environmentally Sensitive Habitat Areas)**, and **4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities)**. As summarized above in the impact discussion for the subsurface slant wells, these measures would reduce impacts on sensitive natural communities and critical habitat by requiring implementation of general and specific protective measures.

Since the Source Water Pipeline and Source Water Pipeline using the optional alignment would impact the same type and the same amount of sensitive natural community habitat, the same impacts and mitigation measures would apply to the Source Water Pipeline using the optional alignment as apply to the Source Water Pipeline.

New Desalinated Water Pipeline

The Desalinated Water Pipeline is described in Chapter 3, Description of the Proposed Project, Section 3.2.3.3. This facility would be located outside of the MBNMS. The construction footprint is approximately 35.4 acres. A portion of the construction footprint for the new Desalinated Water Pipeline overlaps with a portion of the construction footprints for the Source Water Pipeline, Source Water Pipeline using the optional alignment, Castroville Pipeline, Castroville Pipeline using the optional alignment 1, and Castroville Pipeline using the optional alignment 2. Construction of this pipeline, combined with the new Transmission Main described below, would take approximately 15 months.

Sensitive Natural Communities. Central dune scrub, coast live oak woodland, and riparian woodland and scrub occur along portions of the Desalinated Water Pipeline alignment that are within the Coastal Zone. Central dune scrub and coast live oak woodland in this alignment are

relatively disturbed and are dominated by a combination of native and non-native invasive species. Riparian woodland and scrub forms a riparian corridor along the Locke-Paddon Park pond. Riparian woodland and scrub, central dune scrub, and coast live oak woodland may be considered Primary and Secondary Habitat under the City of Marina LCLUP, and may be designated as ESHA under the North County Land Use Plan Local Coastal Program and by the CCC.

Earthmoving activities associated with installation of the Desalinated Water Pipeline could result in the temporary loss of approximately 9.4 acres of central dune scrub, 0.2 acre of coast live oak woodland, and 0.4 acre of riparian woodland and scrub (upon completion of construction, the site would be graded and revegetated to its pre-construction condition). A portion of the 9.4-acre central dune scrub impact area also falls within the Source Water Pipeline alignment described above and Castroville Pipeline alignment described below. The movement of construction vehicles and equipment over vegetated areas, as well as inadvertent releases of pollutants to these areas via stormwater runoff, could result in direct and indirect impacts on central dune scrub, coast live oak woodland, and riparian woodland and scrub located within and adjacent to the construction corridor. These communities could also be indirectly impacted through the dispersal or spread of invasive plant species, which would be a significant impact. Temporary and indirect impacts on central dune scrub, coast live oak woodland, and riparian woodland and scrub would be significant.

Critical Habitat. There is no critical habitat within, or adjacent to, the Desalinated Water Pipeline alignment. Therefore, installation of the Desalinated Water Pipeline would have no impact on critical habitat.

Implementation of the following mitigation measures would reduce impacts on sensitive natural communities associated with installation of the Desalinated Water Pipeline to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1n (Habitat Mitigation and Monitoring Plan), 4.6-1p (Control Measures for Spread of Invasive Plants)**, **4.6-2a (Consultation with Local Agencies and the California Coastal Commission regarding Environmentally Sensitive Habitat Areas)**, and **4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities)**.

These measures would reduce impacts on sensitive natural communities and critical habitat by designating a lead biologist to oversee and ensure implementation of sensitive natural community protective measures; requiring worker training regarding sensitive natural communities potentially present to ensure that workers are aware of sensitive natural communities that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as staking or flagging the construction area to ensure work is restricted to the construction footprint and avoids adjacent sensitive natural communities and other measures to avoid and minimize impacts on sensitive natural communities; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as

required; requiring implementation of measures to reduce the introduction or spread of invasive species that may degrade sensitive habitat; ensuring the project conforms to ESHA policies (including local coastal plan policies); and requiring measures to avoid and minimize impacts on sensitive natural communities such as requiring that staging areas are located away from sensitive communities to minimize project impacts to these resources and compensating for loss of habitat.

Since the new Desalinated Water Pipeline and new Desalinated Water Pipeline using the optional alignment would impact the same type and the same amount of sensitive natural community habitat, the same impacts and mitigation measures would apply to the new Desalinated Water Pipeline using the optional alignment as apply to the new Desalinated Water Pipeline.

Castroville Pipeline

The Castroville Pipeline and Castroville Optional alignments (1 and 2) are described in Chapter 3, Description of the Proposed Project, Section 3.2.3.9. This facility would be located outside of the MBNMS. The construction footprint is approximately 15.0 acres. A portion of the Castroville Pipeline construction footprint overlaps with a portion of the construction footprints for the Source Water Pipeline, Source Water Pipeline using the optional alignment, new Desalinated Water Pipeline, and new Desalinated Water Pipeline using the optional alignment. Construction of this pipeline would take approximately 4 months.

Sensitive Natural Communities. Central dune scrub, northern coastal scrub, riparian woodland and scrub, and freshwater marsh occur along the Castroville Pipeline alignment. The central dune scrub and northern coastal scrub areas are relatively isolated and somewhat disturbed. The riparian woodland and scrub and freshwater marsh occur in association with the Salinas River, in an isolated patch along the pipeline, and in an area north of Tembladero Slough. A small segment of the proposed Castroville Pipeline alignment is located within the coastal zone. Central dune scrub within this area may be designated as ESHA under the North County Land Use Plan Local Coastal Program and by the CCC.

The pipeline would be installed underneath the Salinas River and Tembladero Slough using HDD techniques to avoid direct impacts on those features, but would be installed using open trench techniques for the remainder of the pipeline. Earthmoving activities associated with installation of the Castroville Pipeline could result in the temporary loss of approximately 0.004 acre of central dune scrub, 0.15 acre of northern coastal scrub, and 0.06 acre of riparian woodland and scrub (upon completion of construction, the site would be graded and revegetated to its pre-construction condition). A portion of the 0.004-acre central dune scrub impact area also falls within the Source Water Pipeline and new Desalinated Water Pipeline alignments described above. The movement of construction vehicles and equipment over vegetated areas, as well as inadvertent releases of pollutants to these areas via stormwater runoff, could result in direct and indirect impacts on central dune scrub, northern coastal scrub, riparian woodland and scrub, and freshwater marsh located within and adjacent to the construction corridor. These communities could also be indirectly impacted through the dispersal or spread of invasive plant species, which would be a significant impact. Temporary and indirect impacts on central dune scrub, northern coastal scrub, riparian woodland and scrub, and freshwater marsh would be significant.

Critical Habitat. The Castroville Pipeline would be installed using HDD beneath the Salinas River and Tembladero Slough, which are part of the south/central California coast steelhead Salinas Hydrologic critical habitat unit. The Salinas River is within the tidewater goby Unit MN-2 (Salinas River) critical habitat unit. As discussed under Impact 4.3-1 in Section 4.3, Surface Water Hydrology and Water Quality, a SWPPP would be prepared, which would include site-specific erosion and stormwater control measures (such as installing sediment barriers like silt fencing and fiber rolls and maintaining equipment and vehicles used for construction) to be implemented during construction of the Castroville Pipeline, which would reduce or eliminate the off-site migration of pollutants and sediment. Mandatory compliance with the SWPPP would avoid substantial adverse effects from upland erosion on water quality in critical habitat along the Salinas River and Tembladero Slough. If a frac-out occurs during HDD, bentonite slurry could be released into the Salinas River and/or Tembladero Slough, which could degrade water quality and adversely impact steelhead critical habitat (Salinas River and Tembladero Slough) and tidewater goby critical habitat (Salinas River), a significant impact.

Implementation of the following mitigation measures would reduce impacts on sensitive natural communities associated with installation of the Castroville Pipeline to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1n (Habitat Mitigation and Monitoring Plan), 4.6-1p (Control Measures for Spread of Invasive Plants)**, **4.6-1q (Frac-out Contingency Plan)**, **4.6-2a (Consultation with Local Agencies and the California Coastal Commission regarding Environmentally Sensitive Habitat Areas)**, and **4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities)**. These measures would reduce impacts on sensitive natural communities and critical habitat by designating a lead biologist to oversee and ensure implementation of sensitive natural community protective measures; requiring worker training regarding sensitive natural communities potentially present to ensure that workers are aware of sensitive natural communities that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as staking or flagging the construction area to ensure work is restricted to the construction footprint and avoids adjacent sensitive natural communities and other measures to avoid and minimize impacts on sensitive natural communities; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; requiring implementation of measures to reduce the introduction or spread of invasive species that may degrade sensitive habitat; requiring preparation of a Frac-out Contingency Plan and implementation of measures in the Plan to contain and clean-up any frac-outs in waterways to minimize impacts of frac-outs on sensitive habitat; ensuring the project conforms to ESHA policies (including local coastal plan policies); and requiring measures to avoid and minimize impacts on sensitive natural communities such as requiring that staging areas are located away from sensitive communities to minimize project impacts to these resources and compensating for loss of habitat.

The Castroville Pipeline using the optional alignment 1 would impact approximately 0.06 acre of riparian woodland and scrub, 0.01 acre of freshwater marsh, and 0.15 acre of northern coastal

scrub. The Castroville Pipeline using the optional alignment 2 would impact approximately 0.06 acre of riparian woodland and scrub and 0.15 acre of northern coastal scrub. The Castroville Pipeline using the optional alignments would generally result in the same type of impact as described for the Castroville Pipeline. The same impact conclusion and mitigation measures would apply to the Castroville Pipeline using the optional alignments as apply to the Castroville Pipeline.

Brine Discharge Pipeline and Pipeline to CSIP Pond

The Brine Discharge Pipeline and Pipeline to CSIP Pond are described in Sections 3.2.2.5 and 3.2.3.10, respectively, of Chapter 3, Description of the Proposed Project. These facilities would be located outside of the MBNMS. The Brine Discharge Pipeline would take approximately 3 months to install and the Pipeline to CSIP Pond would take approximately 2 months to install. The construction footprint for both of these pipelines combined is approximately 6.6 acres.

Sensitive Natural Communities. The proposed Brine Discharge Pipeline and Pipeline to CSIP Pond contain developed/landscaped and ruderal areas and a few patches of non-native grassland. No sensitive natural communities were identified along these alignments during reconnaissance level surveys conducted in preparation of this EIR/EIS. These alignments are outside of the Coastal Zone and would not be subject to the Coastal Act. No impact on sensitive natural communities would result from construction of the Brine Discharge Pipeline and Pipeline to CSIP Pond, and no mitigation is necessary.

Critical Habitat. There is no critical habitat within the proposed Brine Discharge Pipeline and Pipeline to CSIP Pond alignments. The Salinas River, which is designated as critical habitat for south/central California coast steelhead and tidewater goby, is located approximately 1,200 feet north of the northern terminus of both pipelines. Construction of the Brine Discharge Pipeline and Pipeline to CSIP Pond would not result in significant indirect impacts on south/central California coast steelhead and tidewater goby critical habitat. Similar to the discussion above for the MPWSP Desalination Plant, pipeline installation activities would also be subject to the NPDES Construction General Permit requirements and the SWPPP would include erosion and stormwater control measures to be implemented during construction. These measures would help to prevent pollutants and sediment generated during pipeline installation activities from migrating downstream and entering the Salinas River. Mandatory compliance with the NPDES Construction General Permit would avoid substantial adverse effects on water quality in critical habitat along the Salinas River. Thus, the impact on critical habitat along the Salinas River would be less than significant, and no mitigation is necessary.

Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline)

The proposed ASR Facilities are described in Chapter 3, Description of the Proposed Project, Section 3.2.4. These facilities would be located outside of the MBNMS. Construction of the ASR-5 and ASR-6 Wells would take approximately 12 months. Construction of the ASR Pipelines (ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline) would take approximately 5 months. The construction footprint for both of the ASR

Wells is expected to be approximately 0.9 acre. The construction footprint of the area where water would be conveyed is approximately 7.0 acres. The construction footprint for all three ASR pipelines is approximately 8.8 acres. A portion of the construction footprint for the ASR pipelines overlaps with a portion of the construction footprints for the new Transmission Main and the new Transmission Main using the optional alignment.

Sensitive Natural Communities. Coast live oak woodland and central maritime chaparral occur at the various proposed ASR facility sites. In the vicinity of these proposed facility sites, these communities occur on sandy soils and are dominated by native species. These proposed facilities would be located outside of the Coastal Zone and would not be subject to the Coastal Act.

Coast live oak woodland occurs at the proposed ASR-5 and ASR-6 Well sites. Construction of the ASR-5 and ASR-6 Wells would likely result in the temporary loss of up to 0.9 acre of coast live oak woodland and permanent loss of up to 0.04 acre of coast live oak woodland. The temporary and permanent loss of oak woodland would be a significant impact. In addition, water produced during development of the ASR-5 and ASR-6 Wells would be conveyed to a natural depression located east of the intersection of San Pablo Avenue and General Jim Moore Boulevard that includes central maritime chaparral. Conveyance of water to this area has potential to temporarily impact approximately 4.6 acres of central maritime chaparral. However, implementation of the mitigation measures prescribed below would reduce the impact to a less-than-significant level.

The ASR Pipelines would be constructed within the developed General Jim Moore Boulevard and would not have a direct temporary or permanent impact any sensitive natural communities. However, coast live oak woodland, northern coastal scrub, and central maritime chaparral border portions of the pipeline alignments and could be indirectly impacted during construction from accidental foot traffic or equipment use outside of the construction boundary or the introduction or spread of invasive plant species. Temporary impacts on oak woodland, northern coastal scrub, and central maritime chaparral are considered significant.

Critical Habitat. No critical habitat occurs within the proposed ASR Facilities. Monterey spineflower critical habitat occurs approximately 50 feet east of the area where the water produced during development of the ASR-5 and ASR-6 Wells would be conveyed to and percolated into the ground. Construction of these ASR facilities would remain outside of critical habitat and would not impact critical habitat. No impact would result, and no mitigation is necessary.

Implementation of the following mitigation measures would reduce impacts on sensitive natural communities at the proposed ASR Facilities to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures), 4.6-1n (Habitat Mitigation and Monitoring Plan), 4.6-1p (Control Measures for Spread of Invasive Plants)**, and **4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities)**. As summarized above in the impact discussion for the MPWSP Desalination Plant, these measures would reduce impacts on sensitive natural communities by requiring implementation of general and specific protective measures.

Pipelines and Other Conveyance Facilities South of Reservation Road

New Transmission Main

The new Transmission Main and new Transmission Main Optional alignments are described in Chapter 3, Description of the Proposed Project Proposed, Section 3.2.3.4, of this EIR/EIS. This facility would be located outside of the MBNMS. Construction of this pipeline and the new Desalinated Water Pipeline would take approximately 15 months to complete. The construction footprint is approximately 27.1 acres. A portion of the new Transmission Main construction footprint overlaps with a portion of the ASR pipelines construction footprint.

Sensitive Natural Communities. Central dune scrub, coast live oak woodland, and northern coastal scrub occur along the new Transmission Main alignment. The occurrence of central dune scrub in this area ranges from areas dominated by non-native species to areas with higher cover of native dune scrub species. Coast live oak woodland and northern coastal scrub along the alignment is interspersed with single family residences. The central dune scrub found along the Transmission Main alignment is located within the Coastal Zone and may be considered Primary and Secondary Habitat under the City of Marina LCLUP, and may be designated as ESHA by the City of Seaside Local Coastal Program Land Use Plan and by the CCC.

Installation of the Transmission Main would temporarily impact approximately 1.9 acres of central dune scrub and 0.07 acre of coast live oak woodland through direct removal of vegetation during open-trench excavation activities or from trampling of the vegetation from construction vehicle access. Additionally, central dune scrub, coast live oak woodland, and northern coastal scrub occur adjacent to the construction area and could be indirectly impacted if worker foot traffic were to extend beyond the designated construction work area, if trash and debris is left behind following construction, and/or if invasive plant species are introduced or spread at the site. No permanent impacts on central dune scrub would result from installation of the Transmission Main. Temporary impacts on central dune scrub, coast live oak woodland, and northern coastal scrub during construction would be significant.

Critical Habitat. The majority of the Transmission Main alignment is located a minimum of 150 feet east of Monterey spineflower critical habitat. Construction of the new Transmission Main would remain outside of critical habitat and would not impact critical habitat. No impact would result and no mitigation is necessary.

Implementation of the following mitigation measures would reduce temporary impacts on sensitive natural communities resulting from installation of the new Transmission Main to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1n (Habitat Mitigation and Monitoring Plan), 4.6-1p (Control Measures for Spread of Invasive Plants)**, **4.6-2a (Consultation with Local Agencies and the California Coastal Commission regarding Environmentally Sensitive Habitat Areas)**, and **4.6-2b (Avoid, Minimize and Compensate for Construction Impacts to Sensitive Communities)**. As summarized above in the impact discussion for the Desalinated Water Pipeline, these measures

would reduce temporary impacts on sensitive natural communities by requiring implementation of general and specific protective measures.

Since the new Transmission Main and new Transmission Main using the optional alignment would impact the same type and approximately the same amount of sensitive natural community habitat (The new Transmission Main would impact approximately 1.9 acres of central dune scrub, while the Transmission Main using the optional alignment would impact approximately 1.4 acre of central dune scrub. Both alignments would impact the same amount of coast live oak woodland), the same impacts and mitigation measures would apply to the new Transmission Main using the optional alignment as apply to the new Transmission Main.

Terminal Reservoir

The proposed Terminal Reservoir is described in Chapter 3, Description of the Proposed Project, Section 3.2.3.5. This facility would be located outside of the MBNMS. The construction footprint for the Terminal Reservoir is approximately 6 acres.

Sensitive Natural Communities. Central maritime chaparral and coast live oak woodland, both sensitive communities, occur at the Terminal Reservoir site. At the Terminal Reservoir site central dune scrub exists as a mosaic of disturbed and undisturbed variations, with most of the disturbed areas located near General Jim Moore Boulevard and adjacent to existing access roads within the former Ford Ord military base. Coast live oak woodland occurs in patches in the southeastern corner of the site. The site is outside of the Coastal Zone and would not be subject to the Coastal Act.

Installation of the Terminal Reservoir aboveground tank option would result in the permanent loss of approximately 1 acre of central maritime chaparral from installation of the concrete pad for the Terminal Reservoir and a permanent access road. Additionally, construction of the facility would temporarily impact up to 5 additional acres of central maritime chaparral during construction. If the Terminal Reservoir is constructed in buried tanks, then there would be approximately 5.75 acres of temporary impacts on central maritime chaparral and there would be approximately 0.25 acre of impact from the permanent access road. Additionally, central maritime chaparral and coast live oak woodland located outside of the Terminal Reservoir construction disturbance area could be inadvertently impacted by construction worker foot traffic, trash or debris left behind following construction, or through the introduction or spread of invasive plant species at the site. The permanent and temporary impacts on central maritime chaparral would be significant. However, with implementation of the mitigation measures prescribed in the discussion of critical habitat, below, impacts on sensitive natural communities during construction of Terminal Reservoir would be reduced to a less-than-significant level.

Critical Habitat. Monterey spineflower critical habitat is not located within the Terminal Reservoir site; however, it is located adjacent to the site. Although construction at the Terminal Reservoir would not directly impact critical habitat, the primary constituent elements of the Monterey spineflower critical habitat abutting the Terminal Reservoir site to the east could be inadvertently impacted by worker traffic or construction related-trash, which would be a significant impact.

Impacts to sensitive natural communities and critical habitat associated with construction of the Terminal Reservoir would be reduced to a less-than-significant level with implementation of the following mitigation measures: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1e (Avoidance and Minimization Measures for Special-status Plants), 4.6-1n (Habitat Mitigation and Monitoring Plan), 4.6-1p (Control Measures for Spread of Invasive Plants)**, and **4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities)**. These measures would reduce impacts on sensitive natural communities and critical habitat by designating a lead biologist to oversee and ensure implementation of sensitive natural community protective measures; requiring worker training regarding sensitive natural communities potentially present to ensure that workers are aware of sensitive natural communities that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as staking or flagging the construction area to ensure work is restricted to the construction footprint and avoids adjacent sensitive natural communities and other measures to avoid and minimize impacts on sensitive natural communities; requiring specific measures to avoid and minimize impacts on special-status plants such as avoiding individual plants to the extent feasible and compensating for temporary or permanent loss of special-status plants at a level acceptable to the applicable resource agencies; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; requiring implementation of measures to reduce the introduction or spread of invasive species that may degrade sensitive habitat; and requiring measures to avoid and minimize impacts on sensitive natural communities such as requiring that staging areas are located away from sensitive communities to minimize project impacts to these resources and compensating for loss of habitat.

Carmel Valley Pump Station

The proposed Carmel Valley Pump Station is described in Section 3.2.3.8 of Chapter 3, Description of the Proposed Project. This facility would be located outside of the MBNMS. Construction would take approximately 6 months to complete. The construction footprint for the pump station and associated pipelines is approximately 0.2 acre.

Sensitive Natural Communities. The Carmel Valley Pump Station site includes non-native annual grassland, landscaped, and developed areas and does not contain any sensitive natural communities. These sites are outside of the Coastal Zone and would not be subject to the Coastal Act. No impact on sensitive natural communities would result. No mitigation is necessary.

Critical Habitat. The Carmel Valley Pump Station site is located within California red-legged frog critical habitat unit MNT-2 (Carmel River). Non-native grassland within the Carmel Valley Pump Station site provides California red-legged frog upland habitat as described in Section 4.6.1.9. Construction of the Carmel Valley Pump Station would permanently impact 0.01 acre and temporarily impact 0.12 acre of non-native grassland upland habitat. This would be a significant impact on California red-legged frog critical habitat.

Steelhead critical habitat is located approximately 280 feet south of the Carmel Valley Pump Station site. As discussed under Impact 4.3-1 in Section 4.3, Surface Water Hydrology and Water Quality, a SWPPP would be prepared, which would include site-specific erosion and stormwater control measures to be implemented during construction of the Carmel Valley Pump Station, which would reduce or eliminate the off-site migration of pollutants and sediment. Mandatory compliance with the SWPPP would avoid substantial adverse effects on water quality in critical habitat along the Carmel River. Thus, the impact on steelhead critical habitat along the Carmel River would be less than significant and no mitigation is necessary.

Impacts to critical habitat associated with construction of the Carmel Valley Pump Station would be reduced to a less-than-significant level with implementation of the following mitigation measures: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures), 4.6-1n (Habitat Mitigation and Monitoring Plan), 4.6-1o (Avoidance and Minimization Measures for California Red-legged Frog and California Tiger Salamander),** and **4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities)**.

These measures would reduce impacts on sensitive natural communities and critical habitat by designating a lead biologist to oversee and ensure implementation of sensitive natural community protective measures; requiring worker training regarding sensitive natural communities potentially present to ensure that workers are aware of sensitive natural communities that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as staking or flagging the construction area to ensure work is restricted to the construction footprint and avoids adjacent sensitive natural communities and other measures to avoid and minimize impacts on sensitive natural communities; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; requiring measures to avoid and minimize impacts on California red-legged frog and California tiger salamander such as pre-construction surveys to determine if these species are present and implementing minimization measures to minimize construction impacts on these species, if present, and compensating for permanent impacts; and requiring measures to avoid and minimize impacts on sensitive natural communities such as requiring that staging areas are located away from sensitive communities to minimize project impacts to these resources and compensating for loss of habitat.

Ryan Ranch-Bishop Interconnection Improvements

The proposed Ryan Ranch–Bishop Interconnection Improvements are described in Section 3.2.3.11 of Chapter 3, Description of the Proposed Project. This facility would be located outside of the MBNMS. The construction footprint is approximately 7.3 acres.

Sensitive Natural Communities. The majority of the Ryan Ranch-Bishop Interconnection Improvements site is located within road right-of-ways, although a small extent of non-native grassland also occurs within the project area. Coast live oak woodland and northern coastal scrub occur adjacent to the Ryan Ranch-Bishop Interconnection Improvements project area.

Construction of the Ryan Ranch-Bishop Interconnection Improvements could indirectly impact adjacent sensitive natural communities if worker foot traffic extends beyond the designated construction work area. Indirect impacts on sensitive natural communities would be significant.

The Ryan Ranch-Bishop Interconnection Improvements site is outside of the Coastal Zone and would not be subject to the Coastal Act.

Critical Habitat. No critical habitat occurs within the Ryan Ranch-Bishop Interconnection Improvements site. The closest critical habitat to this site is Monterey spineflower critical habitat located approximately 0.7 mile to the north and California red-legged frog critical habitat located approximately 1.0 mile to the south. Due to the distance between the anticipated construction disturbance area for the Ryan Ranch-Bishop Interconnection Improvements and the critical habitat, no impact would result from the construction of these improvements, and no mitigation is necessary.

Impacts to sensitive natural communities associated with construction of the Ryan Ranch-Bishop Interconnection Improvements would be reduced to a less-than-significant level with implementation of the following mitigation measures: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures), 4.6-1b (Construction Worker Environmental Awareness Training and Education Program), 4.6-1c (General Avoidance and Minimization Measures), 4.6-1n (Habitat Mitigation and Monitoring Plan),** and **4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities)**.These measures would reduce impacts on sensitive natural communities and critical habitat by designating a lead biologist to oversee and ensure implementation of sensitive natural community protective measures; requiring worker training regarding sensitive natural communities potentially present to ensure that workers are aware of sensitive natural communities that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as staking or flagging the construction area to ensure work is restricted to the construction footprint and avoids adjacent sensitive natural communities and other measures to avoid and minimize impacts on sensitive natural communities; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; and requiring measures to avoid and minimize impacts on sensitive natural communities such as requiring that staging areas are located away from sensitive communities to minimize project impacts to these resources and compensating for loss of habitat.

Main System-Hidden Hills Interconnection Improvements

The proposed Main System-Hidden Hills Interconnection Improvements are described in Section 3.2.3.11 of Chapter 3, Description of the Proposed Project. This facility would be located outside of the MBNMS. The construction footprint for the Main System-Hidden Hills Interconnection Improvements is 1.1 acre.

Sensitive Natural Communities. The Main System-Hidden Hills Interconnection Improvements is located entirely within road right-of-ways and existing facilities and would not have direct impacts on sensitive natural communities. Coast live oak woodland occurs adjacent to the Main

System-Hidden Hills Interconnection Improvements project area and could be indirectly affected if worker foot traffic extends beyond the designated construction work area. Indirect impacts on sensitive natural communities would be significant.

Critical Habitat. The Main System-Hidden Hills Interconnection Improvements site is located within California red-legged frog critical habitat. All construction activities would occur within paved or developed surfaces that do not contain the primary constituent elements for California red-legged frog described in Section 4.1.6.9. However the adjacent coast live oak woodland provides upland dispersal habitat for California red-legged frog. Construction of the Main System-Hidden Hills Interconnection Improvements could indirectly impact adjacent critical habitat if worker foot traffic extends beyond the designated construction work area. Indirect impacts on critical habitat would be significant.

Impacts to sensitive natural communities and critical habitat associated with construction of the Main System-Hidden Hills Interconnection Improvements would be reduced to a less-than-significant level with implementation of the following mitigation measures: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures), 4.6-1n (Habitat Mitigation and Monitoring Plan), 4.6-1o (Avoidance and Minimization Measures for California Red-legged Frog and California Tiger Salamander),** and **4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities)**.These measures would reduce impacts on sensitive natural communities and critical habitat by designating a lead biologist to oversee and ensure implementation of sensitive natural community protective measures; requiring worker training regarding sensitive natural communities potentially present to ensure that workers are aware of sensitive natural communities that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as staking or flagging the construction area to ensure work is restricted to the construction footprint and avoids adjacent sensitive natural communities and other measures to avoid and minimize impacts on sensitive natural communities; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; requiring measures to avoid and minimize impacts on California red-legged frog and California tiger salamander such as pre-construction surveys to determine if these species are present and implementing minimization measures to minimize construction impacts on these species, if present, and compensating for permanent impacts; and requiring measures to avoid and minimize impacts on sensitive natural communities such as requiring that staging areas are located away from sensitive communities to minimize project impacts to these resources and compensating for loss of habitat.

Staging Areas

The proposed Staging Areas are described in Section 3.3.1.2 of Chapter 3, Description of the Proposed Project. These facilities would be located outside of the MBNMS.

Sensitive Natural Communities. There are eight staging areas located throughout the project area. The majority of the staging areas are located within developed or highly disturbed areas.

However some staging areas contain northern coastal scrub and coast live oak woodland, which are considered sensitive natural communities. **Table 4.6-9** below describes which staging area contains, or is adjacent to, a sensitive natural community and the type of temporary impact. If sensitive natural communities occur in the staging area, use of the staging area could result in direct temporary loss of that community. Use of the staging areas could indirectly impact adjacent sensitive natural communities if worker foot traffic extends beyond the designated construction work area. Temporary direct or indirect impacts on central dune scrub, coast live oak woodland, and northern coastal scrub would be significant.

TABLE 4.6-9
CONSTRUCTION STAGING AREAS SENSITIVE NATURAL COMMUNITY IMPACTS

Location	Staging Area Footprint (acre)	Sensitive Natural Community Present	Estimated Temporary Impact on Sensitive Natural Communities
2nd Avenue/Lightfighter Drive in Seaside	0.5	Central Dune Scrub	Potential indirect impacts
West side of General Jim Moore Boulevard, near Gigling Road, in Seaside	0.3	Coast Live Oak Woodland	0.03 acre temporary impact
East side of General Jim Moore Boulevard, near Gigling Road, in Seaside	0.2	Coast Live Oak Woodland	0.002 acre temporary impact
West side of General Jim Moore Boulevard, near Seaside Middle School, in Seaside	0.1	Northern Coastal Scrub	0.1 acre temporary impact

Although no sensitive natural communities were mapped within the staging area located at Beach Road, this staging is located within the coastal zone and may qualify as Primary or Secondary Habitat under the City of Marina LCLUP. Impacts to Primary or Secondary Habitat would be a significant impact.

Impacts to sensitive natural communities, including potential Primary or Secondary Habitat, associated with the use of the staging areas listed in **Table 4.6-9** would be reduced to a less-than-significant level with implementation of the following mitigation measures: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures), 4.6-1b (Construction Worker Environmental Awareness Training and Education Program), 4.6-1c (General Avoidance and Minimization Measures), 4.6-1n (Habitat Mitigation and Monitoring Plan), 4.6-2a (Consultation with Local Agencies and the California Coastal Commission regarding Environmentally Sensitive Habitat Areas),** and **4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities)**. These measures would reduce impacts on sensitive natural communities and critical habitat by designating a lead biologist to oversee and ensure implementation of sensitive natural community protective measures; requiring worker training regarding sensitive natural communities potentially present to ensure that workers are aware of sensitive natural communities that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as staking or flagging the construction area to ensure work is restricted to the construction footprint and avoids adjacent sensitive natural communities and other measures to avoid and minimize impacts on sensitive natural communities; developing and implementing a mitigation and monitoring plan for

temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; ensuring the project conforms to ESHA policies (including local coastal plan policies); and requiring measures to avoid and minimize impacts on sensitive natural communities such as requiring that staging areas are located away from sensitive communities to minimize project impacts to these resources and compensating for loss of habitat.

No other staging areas have potential to impact sensitive natural communities.

Critical Habitat. There is no critical habitat within, or adjacent to, any of the staging areas. Therefore, use of the staging areas would have no impact on critical habitat.

Consistency with Regulatory Requirements

In addition to the physical impacts described above, as noted in Section 4.6.2, Regulatory Framework, MPWSP construction could be inconsistent with applicable regulatory requirements related to sensitive natural communities, critical habitat, and ESHAs that were adopted for the purpose of avoiding or mitigating an environmental effect. Specifically, the project could be inconsistent with the FESA, the Coastal Act, City of Marina General Plan Policies 4.112, 4.114, 4.115, 4.116, 4.118, 4.119, 4.120, and 2.10; City of Marina LCLUP Policies 8, 19, 25, 26 and Planning Guideline entitled Rare and Endangered Species: Habitat Protection; Fort Ord Dunes State Park General Plan and Environmental Impact Report BIO-8; City of Seaside Local Coastal Program Land Use Plan Policies NCR-CZ 1.1.C, NCR-CZ 1.2.1A, NCR-CZ 1.2.B, LUD-CZ 3.1A, and LUD-CZ 3.1B; Seaside General Plan Policies COS-4.1 and COS-4.3; Monterey County Carmel Valley Master Plan Policy CV-3.7; Monterey County Greater Monterey Peninsula Area Plan Policy GMP-3.9; Monterey County General Plan Policies OS-5.1, OS-5.2, OS-5.4, OS-5.5, OS-5.6, OS-5.11, OS-5.13, OS-5.16, OS-5.17, OS-5.23; Monterey County North County Land Use Plan Policies 2.3.2.1, 2.3.2.2, 2.3.2.3, 2.3.2.4, 2.3.2.5, 2.3.2.6, 2.3.2.8, 2.3.2.9, 2.3.3.C2, NC-3.3, and NC-3.5, and Key Policy 4.3.4; Fort Ord Reuse Plan (Seaside) Biological Resources Policies A-4 and C-1; Fort Ord Reuse Plan (Monterey County) Biological Resources Policies A-9 and C-1; and California Coastal Act Section 30240, which were established to avoid or mitigate sensitive natural community, critical habitat, and ESHA impacts. As discussed in the preceding paragraphs, **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures), 4.6-1d (Protective Measures for Western Snowy Plover), 4.6-1e (Avoidance and Minimization Measures for Special-status Plants), 4.6-1n (Habitat Mitigation and Monitoring Plan), 4.6-1o (Avoidance and Minimization Measures for California Red-legged Frog and California Tiger Salamander), 4.6-1p (Control Measures for Spread of Invasive Plants), 4.6-1q (Frac-out Contingency Plan), 4.6-2a (Consultation with Local Agencies and the California Coastal Commission regarding Environmentally Sensitive Habitat Areas)**, and **4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities)** would reduce impacts on sensitive natural communities, critical habitat and ESHA by designating a lead biologist to oversee and ensure implementation of sensitive natural community protective measures; requiring worker training regarding sensitive natural communities potentially present to ensure that workers are aware of sensitive natural communities that occur in the project area

and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as staking or flagging the construction area to ensure work is restricted to the construction footprint and avoids adjacent sensitive natural communities and other measures to avoid and minimize impacts on sensitive natural communities; requiring specific measures to avoid, minimize, and compensate for impacts on the western snowy plover such as avoiding the breeding season, installing a visual construction barrier for work conducted adjacent to breeding habitat during the breeding season to reduce human disturbance to plovers, conducting pre-construction surveys to determine if plovers are present and implementing minimization measures to minimize construction impacts on plovers, if present, and compensating for habitat loss to mitigate for temporary and permanent loss of habitat; requiring specific measures to avoid and minimize impacts on special-status plants such as avoiding individual plants to the extent feasible and compensating for temporary or permanent loss of special-status plants at a level acceptable to the applicable resource agencies; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; requiring measures to avoid and minimize impacts on California red-legged frog and California tiger salamander such as pre-construction surveys to determine if these species are present and implementing minimization measures to minimize construction impacts on these species, if present, and compensating for permanent impacts; requiring implementation of measures to reduce the introduction or spread of invasive species that may degrade sensitive habitat; requiring preparation of a Frac-out Contingency Plan and implementation of measures in the Plan to contain and clean-up any frac-outs in waterways to minimize impacts of frac-outs on sensitive habitat; ensuring the project conforms to ESHA policies (including local coastal plan policies); and requiring measures to avoid and minimize impacts on sensitive natural communities such as requiring that staging areas are located away from sensitive communities to minimize project impacts to these resources and compensating for loss of habitat. Therefore, with these measures implemented, the MPWSP would be brought into conformance with the above-noted regulatory requirements.

Impact Conclusion

Construction of the subsurface slant wells, MPWSP Desalination Plant, Source Water Pipeline and Source Water Pipeline Optional Alignment, new Desalinated Water Pipeline and new Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), new Transmission Main and new Transmission Main Optional Alignment, Terminal Reservoir, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Staging Areas would result in less than significant impacts on riparian habitat, sensitive natural communities, and critical habitat when mitigation measures are implemented.

The Brine Discharge Pipeline and Pipeline to CSIP Pond would not impact riparian habitat, sensitive natural communities, or critical habitat.

Overall, the impact on riparian habitat, sensitive natural communities, and critical habitat, would be reduced to a less than significant level with implementation of the prescribed mitigation.

Mitigation Measures

Mitigation Measure 4.6-1a applies to the subsurface slant wells, MPWSP Desalination Plant, Source Water Pipeline, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline), New Transmission Main and New Transmission Main Optional Alignment, Terminal Reservoir, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Staging Areas.

Mitigation Measure 4.6-1a: Retain a Lead Biologist to Oversee Implementation of Protective Measures.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1b applies to the subsurface slant wells, MPWSP Desalination Plant, Source Water Pipeline, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline), New Transmission Main and New Transmission Main Optional Alignment, Terminal Reservoir, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Staging Areas.

Mitigation Measure 4.6-1b: Construction Worker Environmental Awareness Training and Education Program.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1c applies to the subsurface slant wells, MPWSP Desalination Plant, Source Water Pipeline, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline), New Transmission Main and New Transmission Main Optional Alignment, Terminal Reservoir, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Staging Areas.

Mitigation Measure 4.6-1c: General Avoidance and Minimization Measures.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1d applies to the subsurface slant wells and Source Water Pipeline and Source Water Pipeline Optional Alignment.

Mitigation Measure 4.6-1d: Protective Measures for Western Snowy Plover.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1e applies to the Terminal Reservoir.

Mitigation Measure 4.6-1e: Avoidance and Minimization Measures for Special-status Plants.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1n applies to the subsurface slant wells, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline), New Transmission Main and New Transmission Main Optional Alignment, Terminal Reservoir, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Staging Areas.

Mitigation Measure 4.6-1n: Habitat Mitigation and Monitoring Plan.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1o applies to the Main System-Hidden Hills Interconnection Improvements and the Carmel Valley Pump Station.

Mitigation Measure 4.6-1o: Avoidance and Minimization Measures for California Red-legged Frog and California Tiger Salamander.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1p applies to the subsurface slant wells, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, and ASR Recirculation Pipeline), New Transmission Main and New Transmission Main Optional Alignment, and Terminal Reservoir.

Mitigation Measure 4.6-1p: Control Measures for Invasive Plants.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1q applies to HDD installation of the Castroville Pipeline beneath the Salinas River and Tembladero Slough.

Mitigation Measure 4.6-1q: Frac-out Contingency Plan

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-2a applies to the Subsurface Slant Wells, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, New Transmission Main and New Transmission Main Optional Alignment, and Staging Areas.

Mitigation Measure 4.6-2a: Consultation with Local Agencies and the California Coastal Commission regarding Environmentally Sensitive Habitat Areas.

Some parts of the project area occur within the Coastal Zone and development within the Coastal Zone would require a Coastal Development Permit. Prior to the issuance of project permits, CalAm and/or its contractor shall provide evidence to the CPUC that they have submitted a Coastal Development Permit application to the California Coastal Commission and/or local jurisdictions, through an applicable Local Coastal Plan, for a project that conforms to the principal Coastal Act policy pertaining to ESHA (PRC Section 30240), which provides that " a) Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on such resources shall be allowed within such areas" and "b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas."

Through the permit application process, CalAm shall coordinate with the CCC or local jurisdiction to determine the extent of ESHA within or adjacent (within 100 feet) to portions of the proposed project within the Coastal Zone and ensure that the project conforms to the ESHA policy as defined above. CalAm will consult with the CCC or local jurisdiction and obtain the necessary permit(s) in order to proceed with the MPWSP. The CCC or local agency would authorize the project if it conforms to ESHA policies, along with other policies of the Coastal Act.

Mitigation Measure 4.6-2b applies to the subsurface slant wells, MPWSP Desalination Plant, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), New Transmission Main and New Transmission Main Optional Alignment, Terminal Reservoir, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Staging Areas.

Mitigation Measure 4.6-2b: Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities.

The following measures shall be implemented to reduce direct impacts on sensitive natural communities and the special-status species that utilize these sensitive communities. To the extent feasible, the construction contractor(s) shall implement the following avoidance and minimization measures:

a) Project facilities shall be sited and designed to avoid disturbance of central maritime chaparral, central dune scrub, coast live oak woodland, and riparian woodland and scrub, any areas defined as ESHA, any sensitive communities defined by local jurisdictions, and any other sensitive natural communities, including critical habitat, identified within the project area.

b) Any areas used for staging, laydown, material storage, equipment storage, job trailers, employee parking, or other project-related support activities that do not need to be located to the active construction area shall be located away from jurisdictional areas, sensitive communities, and shall be protected from stormwater runoff using temporary perimeter sediment barriers such as berms, silt fences, fiber rolls, covers, sand/gravel bags, and straw bale barriers.

c) All potential contaminants shall be stored on impervious surfaces, plastic ground covers, or in secondary containment to prevent any spills or leakage from contaminating the ground, and shall be located at least 100 feet from adjacent habitat where practicable.

d) Any spillage of pollutants or construction material shall be contained immediately in accordance with the project SWPPP. The contaminated area shall be cleaned and any contaminated materials properly disposed of. The Lead Biologist shall be notified of all spills.

e) Where direct impacts on sensitive natural communities, ESHA, or critical habitat cannot feasibly be avoided, CalAm shall implement the following measures:

   i. Any temporarily impacted sensitive natural communities, including critical habitat, shall be restored to previous conditions or better at the end of construction. To the extent feasible, topsoil shall be salvaged during grading and earthmoving activities, stockpiled separately from subsoil, and protected from erosion (e.g., covered or watered). Composting additives shall be used to amend the soil, if needed, and compacted topsoil shall be properly prepared prior to reuse for post-construction restoration of temporarily disturbed areas. A minimum of 12 inches of topsoil shall be salvaged (or if there is less than 12 inches of topsoil initially, as much as practicable). Restoration shall be conducted in conformance with the terms of the Habitat Mitigation and Monitoring Plan (HMMP) prepared under Mitigation Measure 4.6-1n. Compensatory mitigation for permanent impacts on sensitive natural communities shall occur, and at a ratio of 1:1 or greater, specified in regulatory permits issued by the CCC, CDFW, or USFWS. All compensatory mitigation shall be conducted in accordance with the terms of the HMMP, as described in Mitigation Measure 4.6-1n. Where applicable, compensatory mitigation shall be developed onsite. Alternatively, subject to approval by the appropriate agencies, offsite mitigation may be developed, or credits purchased through an approved mitigation bank, or approved Habitat Conservation Plan.

   ii. For HMP sensitive natural communities on former Fort Ord lands, plants shall be salvaged, under the direction of a qualified biologist, as necessary per the requirements of the HMP, and in accordance with any requirements from USFWS and CDFW.

Impact 4.6-3: Result in substantial adverse effects on federal wetlands, federal other waters, and/or waters of the state during construction. (*Less than Significant with Mitigation*)

This impact addresses impacts on federal wetlands, federal other waters, and/or waters of the state described in Sections 4.6.1.6 and 4.6.2.

A formal wetland delineation has not been conducted for the project. For the purposes of this analysis, the project area was evaluated for the presence of waters of the U.S./waters of the state (including wetlands under CCC jurisdiction) through examination of NWI maps (USFWS, 2016) and field surveys conducted for the MPWSP by AECOM between 2013 and 2015 (AECOM, 2016), and by ESA in 2013, 2014, and 2016 (ESA, 2013, 2014, 2016). Many potentially jurisdictional wetlands and waters occur within the study area such as riparian woodland and scrub, freshwater marsh, open water, and other small culverts and drainages. The proposed project may have direct effects on these potential waters of the U.S. and/or waters of the state. Direct impacts on those wetlands could include removal of vegetation, soil, or structures and/or the placement of fill in the wetland/other water, or hydrological modifications (i.e., altering the flow of water in or out of the wetland or water).

Waters of the U.S. and waters of the state occur off-site in close proximity to many project components and could be subject to indirect impacts as a result of project construction. Indirect impacts could occur if construction activities inadvertently extend beyond the designated construction work area, if construction worker foot traffic extends beyond the designated construction work area and into these features, and/or if trash and debris is left in the features following construction. Other indirect impacts include sedimentation as a result of increased soil erosion from grading or trenching activities and degradation of water quality from pollutants (e.g., oil, hydraulic fluid) that are conveyed by surface water runoff from the construction site to offsite waters of the U.S./waters of the state.

The following discussion of project-related impacts on waters of the U.S. and/or waters of the state is organized by facility.

Impact acreages are provided below for each facility when appropriate and are provided as an approximation based on the current proposed project footprint. Since many of the facilities overlap, the impact acreages provided below may overlap with the impact acreages for other facilities and optional alignments. The final impact acreages for the entire project would be based on whether the proposed project uses the proposed alignments or optional alignments.

Subsurface Slant Wells

The construction footprint for the subsurface slant wells is 9 acres. A portion of this construction footprint overlaps with a portion of the construction footprints for the Source Water Pipeline and Source Water Pipeline using the optional alignment. The components of the proposed subsurface slant wells that would be below the mean high water line would be within the MBNMS. Impacts to marine biological resources from the slant well components that would be located within the MBNMS are described in Section 4.5 Marine Biological Resources. The facility components that

are evaluated in this section would be located above the mean high water line and outside of the MBNMS.

Construction of the subsurface slant wells is not expected to directly impact any waters of the U.S. or waters of the state as none occur within the subsurface slant well site in the CEMEX active mining area. Some potential waters of the U.S. and/or waters of the state are located in the vicinity of the slant well Site 1. The CEMEX dredging pond and Pacific Ocean are located over 350 feet from the slant well Site 1. Due to the distances between the construction work area and these potential waters of the U.S./waters of the state, construction activities would not be expected to inadvertently extend beyond the construction work area and impact these features. Moreover, implementation of BMPs in the project-specific SWPPP would require measures to manage soil erosion and protect water quality that would avoid impacts on water quality in these potential wetlands/waters. Therefore, impacts on the CEMEX dredging pond and Pacific Ocean during conversion of the test slant well to a permanent slant well and construction of the aboveground facilities at Site 1 would be less than significant and no mitigation is necessary.

The CEMEX settling ponds are located approximately 50 feet from the slant well Site 1. Indirect impacts on water quality are not expected as the settling ponds are surrounded by berms and are not downgradient of the slant well construction work area. Additionally, mandatory compliance with the NPDES Construction General Permit, including implementation of the project SWPPP, would protect water quality. However, due to proximity of the ponds to the slant well site, potentially significant impacts could result from construction-related activity extending beyond the designated construction work area and into these features.

Implementation of the following mitigation measures would reduce the potential impact on the CEMEX settling ponds to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures), 4.6-1b (Construction Worker Environmental Awareness Training and Education Program),** and **4.6-1c (General Avoidance and Minimization Measures)**. These measures would reduce impacts on potentially jurisdictional waters by designating a lead biologist to oversee and ensure implementation of jurisdictional waters protective measures; requiring worker training regarding jurisdictional waters potentially present to ensure that workers are aware of jurisdictional waters that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; and requiring general measures such as staking or flagging the construction area to ensure work is restricted to the construction footprint and avoids adjacent jurisdictional waters and other measures to avoid and minimize impacts on jurisdictional waters.

MPWSP Desalination Plant

No waters of the U.S. or waters of the state exist within the 25-acre[21] MPWSP Desalination Plant site. Therefore, construction of the desalination plant and supporting facilities would not result in direct impacts on waters of the U.S. and/or waters of the state. The Salinas River is located about 670 feet to the north of the site and freshwater forested/shrub wetland mapped by the NWI is

[21] As stated in Section 3.2.2 of Chapter 3, Description of the Proposed Project, all proposed project facilities would be constructed on the upper terrace (25 acres) of the 46-acre parcel.

located about 110 feet north of the site. Due to the distances between the construction work area and these features, it is unlikely that construction activities would inadvertently extend beyond the construction work area and directly impact these features. Soil disturbing activities at the site could increase soil erosion and the eroded soil could migrate downgradient to the potential wetland and the Salinas River. However, mandatory compliance with the NPDES Construction General Permit, including implementation of BMPs in the project's SWPPP, would manage soil erosion and protect water quality, thereby avoiding significant impacts on water quality in the potential wetland and the Salinas River. Therefore, the impact on the Salinas River and the potential wetland would be less than significant and no mitigation is necessary.

The MPWS Desalination Plant would be located outside of the MBNMS.

Pipelines and Other Conveyance Facilities North of Reservation Road

Source Water Pipeline

The construction footprint for the Source Water Pipeline is approximately 16.4 acres. A portion of this footprint overlaps with a portion of the construction footprints for the subsurface slant well, Castroville Pipeline, Castroville Pipeline using the optional alignment 1, Castroville Pipeline using the optional alignment 2, the new Desalinated Water Pipeline, and the new Desalinated Water Pipeline using the optional alignment. The Source Water Pipeline would be located outside of the MBNMS.

Several waters of the U.S./waters of the state occur in the vicinity of the proposed Source Water Pipeline alignment. The Pacific Ocean and the CEMEX dredging pond are located over 350 feet to the north and west of the western terminus of the proposed Source Water Pipeline alignment. A third feature mapped as a freshwater emergent wetland by the NWI is located west of Lapis Road, east of Highway 1, and northeast of the CEMEX access road, approximately 160 feet west of the proposed Source Water Pipeline alignment. A fourth feature mapped as a freshwater emergent wetland by the NWI is located south of the CEMEX access road, approximately 580 feet south of the proposed pipeline alignment. Due to the distances between the construction work area and these features, it unlikely that construction activities would inadvertently extend beyond the construction work area and impact these features. Construction-related soil erosion or the inadvertent discharge of toxic construction chemicals could result in significant adverse effects on these off-site features. However, implementation of BMPs in the project's SWPPP would manage soil erosion from the construction work area and protect water quality in these potential wetlands/waters. Therefore, the impact would be less than significant and no mitigation is necessary.

The CEMEX settling ponds are located 50 feet north of the western terminus of the proposed Source Water Pipeline alignment. Indirect impacts on water quality related to soil erosion and potential releases of toxic construction chemicals are not expected as the settling ponds are surrounded by berms and are not located downgradient of the construction work area. Additionally, mandatory compliance with the NPDES Construction General Permit, including implementation of the project SWPPP, would protect water quality in the ponds and prevent significant impacts on water quality. However, due to proximity of the ponds to the slant well

site, potentially significant impacts could result from construction-related activity extending beyond the designated construction work area and into these features.

Implementation of the following mitigation measures would reduce the significant impact on the CEMEX settling ponds to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures), 4.6-1b (Construction Worker Environmental Awareness Training and Education Program),** and **4.6-1c (General Avoidance and Minimization Measures)**. As summarized above in the impact discussion for the subsurface slant wells, these measures would reduce impacts on potentially jurisdictional waters by requiring implementation of protective measures.

Since the Source Water Pipeline and Source Water Pipeline using the optional alignment would have the same potential impacts, the same impacts and mitigation measures would apply to the Source Water Pipeline using the optional alignment as apply to the Source Water Pipeline.

New Desalinated Water Pipeline

The construction footprint for the new Desalinated Water Pipeline is approximately 35.4 acres. A portion of the construction footprint for the new Desalinated Water Pipeline overlaps with a portion of the construction footprints for the Source Water Pipeline, Source Water Pipeline using the optional alignment, Castroville Pipeline, Castroville Pipeline using the optional alignment 1, and Castroville Pipeline using the optional alignment 2. The new Desalinated Water Pipeline would be located outside of the MBNMS.

Riparian woodland and scrub at Locke-Paddon Park and near the intersection of Marina Green Drive and Del Monte Boulevard are potential waters of the U.S./waters of the state. Pipeline installation activities could temporarily impact 0.42 acre of riparian woodland and scrub. Temporary impacts on these potential waters of the U.S./waters of the state would be significant.

Direct impacts on these features would be reduced to a less-than-significant level with implementation of the following mitigation measures: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures), 4.6-1b (Construction Worker Environmental Awareness Training and Education Program), 4.6-1c (General Avoidance and Minimization Measures),** and **4.6-3 (Avoid, Minimize, and or Mitigate Impacts to Wetlands)**. These measures would reduce impacts on potentially jurisdictional waters by designating a lead biologist to oversee and ensure implementation of jurisdictional waters protective measures; requiring worker training regarding jurisdictional waters potentially present to ensure that workers are aware of jurisdictional waters that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as staking or flagging the construction area to ensure work is restricted to the construction footprint and avoids adjacent jurisdictional waters and other measures to avoid and minimize impacts on jurisdictional waters; and requiring the project to be designed to avoid and/or minimize direct impacts on jurisdictional waters to the extent feasible, using HDD or other trenchless methods to install pipeline underneath wetlands or waters (with some exceptions), and compensating for loss of jurisdictional waters.

Indirect impacts could occur from construction-related soil erosion and related effects on water quality. However, mandatory compliance with the NPDES Construction General Permit, including implementation of the project SWPPP, would avoid significant indirect impacts on water quality and no mitigation measures are required.

Since the new Desalinated Water Pipeline and the new Desalinated Water Pipeline using the optional alignment would have the same potential impacts, the same impacts and mitigation measures would apply to the new Desalinated Water Pipeline using the optional alignment as apply to the new Desalinated Water Pipeline.

Castroville Pipeline

The construction footprint for the Castroville Pipeline is approximately 15.0 acres. A portion of the Castroville Pipeline construction footprint overlaps with a portion of the construction footprints for the Source Water Pipeline, Source Water Pipeline using the optional alignment, new Desalinated Water Pipeline, and new Desalinated Water Pipeline using the optional alignment. The Castroville Pipeline would be located outside of the MBNMS.

There are a few potentially jurisdictional waters of the U.S./water of the state within the Castroville Pipeline alignment which include the Salinas River, Tembladero Slough, riparian woodland and scrub communities, freshwater marsh communities, and a few culverts and ditches.

Pipeline installation activities could temporarily impact approximately 0.06 acre of riparian woodland and scrub, and additional culverts and ditches. Temporary impacts on these potential waters of the U.S./waters of the state would be significant.

The pipeline would be installed beneath the Salinas River and Tembladero Slough using HDD. The Salinas River, Tembladero Slough, and other potentially jurisdictional features are located adjacent to the alignment and the construction area. Mandatory compliance with the NPDES Construction General Permit, including implementation of the project SWPPP, would protect impacts on water quality in these features from upland erosion. Due to proximity of these features to the construction site, potentially significant impacts could result from construction-related activity extending beyond the designated construction work area and into these features. Additionally, if a frac-out occurs during HDD, bentonite slurry could be released into the Salinas River and/or Tembladero Slough, which could degrade water quality, a significant impact.

Direct impacts on these features would be reduced to a less-than-significant level with implementation of the following mitigation measures: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures), 4.6-1b (Construction Worker Environmental Awareness Training and Education Program), 4.6-1c (General Avoidance and Minimization Measures), 4.6-1q (Frac-out Contingency Plan),** and **4.6-3 (Avoid, Minimize, and or Mitigate Impacts to Wetlands)**. These measures would reduce impacts on potentially jurisdictional waters by designating a lead biologist to oversee and ensure implementation of jurisdictional waters protective measures; requiring worker training regarding jurisdictional waters potentially present to ensure that workers are aware of jurisdictional waters that occur in the project area and the measures to be implemented to avoid, minimize, and/or

mitigate impacts; requiring general measures such as staking or flagging the construction area to ensure work is restricted to the construction footprint and avoids adjacent jurisdictional waters and other measures to avoid and minimize impacts on jurisdictional waters; requiring preparation of a Frac-out Contingency Plan and implementation of measures in the Plan to contain and clean-up any frac-outs in waterways to minimize impacts of frac-outs on special-status species and their habitat; and requiring the project to be designed to avoid and/or minimize direct impacts on jurisdictional waters to the extent feasible, using HDD or other trenchless methods to install pipeline underneath wetlands or waters (with some exceptions), and compensating for loss of jurisdictional waters.

The Castroville Pipeline using the optional alignment 1 would impact approximately 0.06 acre of riparian woodland and scrub, 0.01 acre of freshwater marsh, and additional culverts and ditches. The Castroville Pipeline using the optional alignment 2 would impact approximately 0.06 acre of riparian woodland and scrub and additional culverts and ditches. The Castroville Pipeline using the optional alignments would generally result in the same type of impact as described for the Castroville Pipeline. The same impact conclusion and mitigation measures would apply to the Castroville Pipeline using the optional alignments as apply to the Castroville Pipeline.

Brine Discharge Pipeline and Pipeline to CSIP Pond

The construction footprint for both the Brine Discharge Pipeline and Pipeline to CSIP Pond combined is approximately 6.6 acres. These facilities would be located outside of the MBNMS.

The Brine Discharge Pipeline and Pipeline to CSIP Pond would have no direct impacts on waters of the U.S./waters of the state because as described below none are assumed to be located within these pipeline alignments. The CSIP pond is located within the Pipeline to CSIP Pond alignment and is mapped as a freshwater pond by the NWI. The Monterey Regional Water Pollution Control Agency (MRWPCA) operates this concrete-lined, man-made, industrial pond as part of their wastewater treatment and recycled water facilities. For this reason, this EIR/EIS assumes the ponds are not waters of the U.S. or waters of the state. No direct impact on waters of the U.S. or waters of the state would occur from installation of the Brine Discharge Pipeline and Pipeline to CSIP Pond.

A potentially jurisdictional pond is located approximately 60 feet south of both alignments. Water quality within this feature could be indirectly impacted from soil erosion and potential releases of toxic construction chemicals. Mandatory compliance with the NPDES Construction General Permit, including implementation of the project SWPPP, would protect water quality in the pond and prevent significant impacts on water quality. However, due to proximity of the pond to the pipeline alignment, potentially significant impacts could result from construction-related activity extending beyond the designated construction work area and into these features.

Implementation of the following mitigation measures would reduce the significant impact on the pond to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures), 4.6-1b (Construction Worker Environmental Awareness Training and Education Program),** and **4.6-1c (General Avoidance and Minimization Measures)**. As summarized above in the impact discussion for the subsurface

slant wells, these measures would reduce impacts on potentially jurisdictional waters by requiring implementation of protective measures.

Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline)

The ASR Facilities include the ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline. These facilities would be located outside of the MBNMS. The construction footprint for both of the ASR Wells is expected to be approximately 0.9 acre. The construction footprint of the area where water would be conveyed is approximately 7.0 acres. The construction footprint for all three ASR pipelines is approximately 8.8 acres. A portion of the construction footprint for the ASR pipelines overlaps with a portion of the construction footprints for the new Transmission Main and the new Transmission Main using the optional alignment.

There are no potential waters of the U.S./waters of the state within the Proposed ASR Facilities project area. Two potential waters of the U.S./waters of the state mapped by the NWI occur over 400 feet from the ASR Pipelines alignment. The project's distance from these features ensures that construction activities would not impact them. Furthermore, mandatory compliance with the NPDES Construction General Permit, including implementation of the project SWPPP, would avoid adverse impacts on offsite waters of the U.S./waters of the state. Therefore, there are no direct impacts and potential indirect impacts on these potential waters of the U.S./waters of the state would be less than significant and no mitigation is necessary.

Pipelines and Other Conveyance Facilities South of Reservation Road

New Transmission Main

The construction footprint for the new Transmission Main is approximately 27.1 acres. A portion of the new Transmission Main construction footprint overlaps with a portion of the ASR pipelines construction footprint. The new Transmission Main would be located outside of the MBNMS.

There are no potential waters of the U.S./waters of the state within the new Transmission Main alignment. There is one potentially jurisdictional feature located adjacent to the new Transmission Main project area, an ephemeral drainage located south of the 8th Street overpass. Water quality within this feature could be indirectly impacted from soil erosion and potential releases of toxic construction chemicals. Mandatory compliance with the NPDES Construction General Permit, including implementation of the project SWPPP, would protect water quality in the pond and prevent significant impacts on water quality. However, due to proximity of the drainage to the pipeline alignment, potentially significant impacts could result from construction-related activity extending beyond the designated construction work area and into these features.

Indirect impacts on potential waters of the U.S./waters of the state associated with installation of the new Transmission Main would be significant. However, implementation of **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures), 4.6-1b (Construction Worker Environmental Awareness Training and**

Education Program), and **4.6-1c (General Avoidance and Minimization Measures)** would reduce these indirect impacts to a less-than-significant level. As summarized above in the impact discussion for the subsurface slant wells, these measures would reduce impacts on potentially jurisdictional waters by requiring implementation of protective measures.

Other potential waters of the U.S./waters of the state mapped by the NWI are located at least 400 feet from the new Transmission Main alignment. The project's distance from these features ensures that construction activities would not impact them. Additionally, mandatory compliance with the NPDES Construction General Permit would avoid significant impacts on the water quality. Therefore, construction of the new Transmission Main would not be expected to impact these offsite potential waters of the U.S./waters of the state.

Since the new Transmission Main and the new Transmission Main using the optional alignment would have the same potential impacts, the same impacts and mitigation measures would apply to the new Transmission Main using the optional alignment as apply to the new Transmission Main.

Terminal Reservoir

The construction footprint for the Terminal Reservoir is approximately 6 acres. This facility would be located outside of the MBNMS.

The proposed Terminal Reservoir site contains a wetland mapped by the NWI as a freshwater emergent wetland that may be considered a water of the U.S./water of the state. It is anticipated that construction of the Terminal Reservoir would avoid direct removal of the feature because it is not in the proposed construction footprint. Mandatory compliance with the NPDES Construction General Permit, including implementation of the project SWPPP, would protect water quality in the wetland feature and prevent significant impacts on water quality. However, due to proximity of the pond to the reservoir site, potentially significant impacts could result from construction-related activity extending beyond the designated construction work area and into these features.

Indirect impacts on potential waters of the U.S./waters of the state associated with construction of the Terminal Reservoir would be significant. However, implementation of **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures), 4.6-1b (Construction Worker Environmental Awareness Training and Education Program),** and **4.6-1c (General Avoidance and Minimization Measures)** would reduce these indirect impacts to a less-than-significant level. As summarized above in the impact discussion for the subsurface slant wells, these measures would reduce impacts on potentially jurisdictional waters by requiring implementation of protective measures.

Another potential water of the U.S./water of the state occurs over 800 feet east of the Terminal Reservoir site. The project's distance from this feature ensures that construction activities would not impact it. Moreover, mandatory compliance with the NPDES Construction General Permit, including implementation of BMPs in the project's SWPPP would avoid impacts on water quality in the potential wetland/water and distance makes it unlikely that construction activities would inadvertently extend into the wetland/water feature. Therefore, impacts on the off-site potential water of the U.S./water of the state would be less than significant and no mitigation is necessary.

Carmel Valley Pump Station

The construction footprint for the Carmel Valley Pump Station, including associated pipelines, is approximately 0.2 acre. This facility would be located outside of the MBNMS.

There is a potentially jurisdictional wetland feature mapped by the NWI within the Carmel Valley Pump Station study area. Carmel Valley Pump Station construction activities could temporarily impact 0.005 acre of this feature.

Direct impacts on this potentially jurisdictional feature would be reduced to a less-than-significant level with implementation of the following mitigation measures: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures), 4.6-1b (Construction Worker Environmental Awareness Training and Education Program), 4.6-1c (General Avoidance and Minimization Measures),** and **4.6-3 (Avoid, Minimize, and or Mitigate Impacts to Wetlands)**. As summarized above in the impact discussion for the new Desalinated Water Pipeline, these measures would reduce impacts on potentially jurisdictional waters by requiring implementation of protective measures.

The Carmel River is located approximately 280 feet south of the Carmel Valley Pump Station site. The project's distance from this feature ensures that construction activities would not impact it. Moreover, mandatory compliance with the NPDES Construction General Permit, including implementation of BMPs in the project's SWPPP would avoid impacts on water quality in the River and distance makes it unlikely that construction activities would inadvertently extend into the River. Therefore, indirect impacts on the off-site potential water of the U.S./water of the state would be less than significant and no mitigation is necessary.

Ryan Ranch-Bishop Interconnection Improvements

The construction footprint for the Ryan Ranch-Bishop Interconnection Improvements is approximately 7.3 acres. This facility would be located outside of the MBNMS.

The NWI has mapped a wetland drainage that appears to pass through a culvert underneath Lower Ragsdale Drive near the intersection of Lower Ragsdale Drive and Ryan Court within the Ryan Ranch-Bishop Interconnection Improvements site. This drainage may be considered a water of the U.S./waters of the state. Installation of the Ryan Ranch-Bishop Interconnection Improvements could temporarily impact 0.24 acre of the wetland drainage. Temporary impacts on this potential water of the U.S./water of the state would be significant. Other drainages mapped by the NWI are also located adjacent to the construction area. Mandatory compliance with the NPDES Construction General Permit, including implementation of the project SWPPP, would protect water quality in these features and prevent significant impacts on water quality.

However, due to proximity of the potentially jurisdictional drainage to the pipeline alignment, potentially significant impacts to the potentially jurisdictional feature could result from construction-related activity extending beyond the designated construction work area and into these features.

Direct impacts on these features would be reduced to a less-than-significant level with implementation of the following mitigation measures: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures), 4.6-1b (Construction Worker Environmental Awareness Training and Education Program), 4.6-1c (General Avoidance and Minimization Measures),** and **4.6-3 (Avoid, Minimize, and or Mitigate Impacts to Wetlands)**. As summarized above in the impact discussion for the new Desalinated Water Pipeline, these measures would reduce impacts on potentially jurisdictional waters by requiring implementation of protective measures.

Main System-Hidden Hills Interconnection Improvements

The construction footprint for the Main System-Hidden Hills Interconnection Improvements is 1.1 acre. This facility would be located outside of the MBNMS.

A wetland drainage, mapped by the NWI, is located approximately 600 feet downslope of the majority of the Main System-Hills Interconnection Improvements site, but appears to run either beneath or adjacent to the Middle Tierra Grande Booster Station. Depending on construction methods, construction activities at the Middle Tierra Grande Booster Station could temporarily directly impact the wetland drainage or indirectly impact the wetland drainage if construction worker foot traffic extends into this feature. Direct or indirect impacts would be a significant impact. Mandatory compliance with the NPDES Construction General Permit, including implementation of the project SWPPP, would protect water quality in these features and prevent significant impacts on water quality.

Direct impacts on this feature would be further reduced to a less-than-significant level with implementation of the following mitigation measures: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures), 4.6-1b (Construction Worker Environmental Awareness Training and Education Program), 4.6-1c (General Avoidance and Minimization Measures),** and **4.6-3 (Avoid, Minimize, and or Mitigate Impacts to Wetlands)**. As summarized above in the impact discussion for the new Desalinated Water Pipeline, these measures would reduce impacts on potentially jurisdictional waters by requiring implementation of protective measures.

Staging Areas

No potential waters of the U.S./waters of the state occur within any of the eight staging areas located throughout the project area.

Mandatory compliance with the NPDES Construction General Permit, including implementation of BMPs in the project's SWPPP would avoid impacts on any unknown potential waters outside of the boundary of the 8 staging areas. Therefore, use of the 8 staging areas would not result in direct or indirect impacts on waters of the U.S. and/or waters of the state. This impact is less than significant and no mitigation is necessary.

All staging areas would be located outside of the MBNMS.

Consistency with Regulatory Requirements

In addition to the physical impacts described above, as noted in Section 4.6.2, Regulatory Framework, MPWSP construction could be inconsistent with applicable regulatory requirements related to waters of the U.S. and/or waters of the state. Specifically, the project could be inconsistent with the Sections 404 and 401 of the CWA, Section 10 of the Rivers and Harbors Act, the Porter-Cologne Act, the Coastal Act, City of Marina General Plan Policies 4.112, 4.114, 4.116, 4.118, 4.119, 4.121, and 2.10; City of Marina LCLUP Policies 24 and 26 and Planning Guidelines entitled Rare and Endangered Species: Habitat Protection and Wetlands Protection; City of Seaside Local Coastal Program Land Use Plan Policies NCR-CZ 1.1.C, NCR-CZ 1.2.A, NCR-CZ 1.2.B, NCR-CZ 1.3.A, NCR-CZ 1.3.B, LUD-CZ 3.1.A, LUD-CZ 3.1B; Seaside General Plan Policies COS-4.1 and COS-4.2; Monterey County Carmel Valley Master Plan Policy CV-3.7; Monterey County Greater Monterey Peninsula Area Plan Policy GMP-3.6; Monterey County General Plan Policies OS-5.16, OS-5.18, OS-5.22; and Fort Ord Reuse Plan (Seaside) Biological Resources Policy A-2, which were established to avoid or mitigate impacts on waters of the U.S. and/or waters of the state. As discussed in the preceding paragraphs, **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures), 4.6-1b (Construction Worker Environmental Awareness Training and Education Program), 4.6-1c (General Avoidance and Minimization Measures), 4.6-1q (Frac-out Contingency Plan),** and **4.6-3 (Avoid, Minimize, and or Mitigate Impacts to Wetlands)** would reduce impacts on waters of the U.S. and/or waters of the state by designating a lead biologist to oversee and ensure implementation of jurisdictional waters protective measures; requiring worker training regarding jurisdictional waters potentially present to ensure that workers are aware of jurisdictional waters that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as staking or flagging the construction area to ensure work is restricted to the construction footprint and avoids adjacent jurisdictional waters and other measures to avoid and minimize impacts on jurisdictional waters; requiring preparation of a Frac-out Contingency Plan and implementation of measures in the Plan to contain and clean-up any frac-outs in waterways to minimize impacts of frac-outs on special-status species and their habitat; and requiring the project to be designed to avoid and/or minimize direct impacts on jurisdictional waters to the extent feasible, using HDD or other trenchless methods to install pipeline underneath wetlands or waters (with some exceptions), and compensating for loss of jurisdictional waters. Therefore, with these measures implemented, the MPWSP would be brought into conformance with the above-noted regulatory requirements.

Impact Conclusion

For all project facilities, mandatory compliance with the NPDES Construction General Permit, including implementation of the project-specific SWPPP, would ensure the construction-related impact on water quality in waters of the U.S./waters of the state related to increased soil erosion and/or inadvertent releases of toxic construction chemicals is less than significant.

Implementation and construction of the subsurface slant wells, Source Water Pipeline and Source Water Pipeline Optional alignment, new Desalinated Water Pipeline and new Desalinated Water Pipeline Optional alignment, Castroville Pipeline and Castroville Pipeline Optional alignments,

Brine Discharge Pipeline and Pipeline to CSIP Pond, new Transmission Main and new Transmission Main Optional alignment, Terminal Reservoir, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, and Main System-Hidden Hills Interconnection Improvements, have the potential to significantly impact waters of the U.S./waters of the state as a result of placement of fill, removal of a water/wetland feature, and/or the potential for construction activities or construction worker foot traffic to extend beyond the designated construction work area. For these facilities, implementation of the proposed mitigation measures would reduce impacts on waters of the U.S./waters of the state to less than significant.

The impact is less than significant for the MPWSP Desalination Plant, proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), and staging areas.

Overall, the project has potential to impact waters of the U.S./waters of the state. The impact would be less than significant with mitigation.

Mitigation Measures

Mitigation Measure 4.6-1a applies to the subsurface slant wells, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Brine Discharge Pipeline and Pipeline to CSIP Pond, New Transmission Main and New Transmission Main Optional Alignment, Terminal Reservoir, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, and Main System-Hidden Hills Interconnection Improvements.

> **Mitigation Measure 4.6-1a: Retain a Lead Biologist to Oversee Implementation of Protective Measures.**
>
> (See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1b applies to the subsurface slant wells, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Brine Discharge Pipeline and Pipeline to CSIP Pond, New Transmission Main and New Transmission Main Optional Alignment, Terminal Reservoir, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, and Main System-Hidden Hills Interconnection Improvements.

> **Mitigation Measure 4.6-1b: Construction Worker Environmental Awareness Training and Education Program.**
>
> (See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1c applies to the subsurface slant wells, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Brine Discharge Pipeline and Pipeline to CSIP Pond, New Transmission Main and New Transmission Main Optional Alignment, Terminal Reservoir, Carmel Valley Pump

Station, Ryan Ranch-Bishop Interconnection Improvements, and Main System-Hidden Hills Interconnection Improvements.

Mitigation Measure 4.6-1c: General Avoidance and Minimization Measures.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1q applies to HDD installation of the Castroville Pipeline beneath the Salinas River and Tembladero Slough.

Mitigation Measure 4.6-1q: Frac-out Contingency Plan

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-3 applies to the New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, New Transmission Main and New Transmission Main Optional Alignment, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvement, and Main System-Hidden Hills Interconnection Improvements.

Mitigation Measure 4.6-3: Avoid, Minimize, and or Mitigate Impacts to Wetlands.

1. A jurisdictional wetland delineation shall be conducted to determine the extent of waters of the U.S. and waters of the state within the project component footprints and anticipated construction disturbance area.

2. The proposed project shall be designed to avoid and/or minimize direct impacts on wetlands and/or waters under the jurisdiction of the U.S. Army Corps of Engineers, Regional Water Quality Control Board, California Department of Fish and Wildlife, and/or the California Coastal Commission to the extent feasible. Horizontal Directional Drilling or other trenchless methods will be used at all pipeline crossings of wetlands and other waters of the U.S. and of the state which, except some small order seasonal or ephemeral drainages which do not support riparian woodland, riparian scrub, marsh or other wetland vegetation, and which would be crossed during the dry season in the absence of flow or standing water.

3. Where disturbance to jurisdictional waters cannot be avoided, compensation shall be provided at a 1:1 or greater ratio as specified in project permits issued by the U.S. Army Corps of Engineers, Regional Water Quality Control Board, California Department of Fish and Wildlife, and/or the California Coastal Commission. Where applicable, compensation shall be detailed on a project-specific basis and shall include development of a Wetland Mitigation and Monitoring Plan (WMMP), which shall be developed prior to the start of construction and in coordination with permit applications and/or conditions. Offsite mitigation credits may be purchased at an approved mitigation bank; if no banks are available, then alternative mitigation may be achieved through payment of in-lieu fees or development of project specific onsite or offsite mitigation, though these options may require different mitigation ratios. At a minimum, the WMMP shall include:

    a. Name and contact information for the property owner of the land on which the mitigation will take place;

    b. Identification of the source for supplemental irrigation;

c. Identification of depth to groundwater;

d. Baseline information, including a summary of the findings in any other recent wetland delineations applicable to the project disturbance area;

e. Anticipated habitat enhancements to be achieved through compensatory actions;

f. Monitoring methods and schedule;

g. Performance and success criteria for wetland creation and/or enhancement, with success criteria in tabular form, including (1) conducting a wetland delineation for wetlands constructed to compensate for loss of federal jurisdictional wetlands, and (2) ensuring that all wetlands constructed as federal wetlands meet the federal criteria for jurisdictional wetlands.

h. Roles and responsibilities for mitigation funding, implementation, maintenance, monitoring, and reporting.

i. Identification of the mechanism that will preserve the mitigation site in perpetuity, if necessary.

Impact 4.6-4: Be inconsistent with any local policies or ordinances protecting biological resources, such as a tree preservation policy or local tree ordinances. (*Significant and Unavoidable*)

Potential inconsistencies with the City of Marina LCLUP and local tree ordinances are described below.

Potential inconsistencies with all other local policies and ordinances protecting biological resources are addressed throughout this section rather than in a stand-alone impact discussion. Potential conflicts were identified in Table 4.6-4, above. In instances where the consistency analysis concluded the project may conflict with a policy or ordinance, the reader is referred to specific impact discussions (Impacts 4.6-1, 4.6-2, 4.6-3, etc.) addressing those specific biological resource issues.

City of Marina LCLUP

Several project facilities would occur in areas that may qualify as Primary and Secondary Habitat according to the City of Marina LCLUP. These facilities include the subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, new Transmission Main, and the staging area located at Beach Road.

The subsurface slant wells would be located in dune vegetation and wildlife habitat that qualify as Primary and Secondary Habitat according to the City of Marina LCLUP, and therefore the project would result in impacts on Primary and Secondary Habitat. Through design and facility siting, impacts on sensitive biological resources including special-status species and habitat have been minimized. Nonetheless, impacts could result from vegetation removal, grading, excavation,

vehicle movements, or construction of the slant wells, and from periodic maintenance of the well heads. These activities have the potential to disturb vegetation, including nesting habitat for western snowy plover, host plants for Smith's blue butterfly, and sandy substrate for silvery legless lizard. Maintenance activities also could result in exacerbating dune erosion, and hazardous material spills (i.e., fuel, oil, lubricants) in sensitive habitat areas.

Construction and operation of the subsurface slant wells would permanently disturb up to 6 acres of central dune scrub and ice plant mats. The majority of the dune scrub vegetation is currently in a disturbed condition, situated in an inactive sand mining and material handling area that has been retired from use and subject to ice plant control. Typical dominant plant species of intact dune scrub vegetation are largely absent or just beginning to colonize the site, but a sizable population of Monterey spineflower, which often follows disturbance, is present, as are coast buckwheat host plants for Smith's blue butterfly.

Maintenance of the slant well heads would occur approximately every 5 years, and would require re-disturbance of a portion of the initial construction impact area. This would keep these sites in a permanent state of recovery from disturbance, whereby dune scrub vegetation would not be allowed to mature. Therefore, this would be considered a permanent loss of habitat for the special-status species that have the potential to recolonize the slant well head location if it were restored or allowed to recover naturally.

Similar to the subsurface slant wells, construction of the Source Water Pipeline, new Desalinated Water Pipeline, new Transmission Main, and the staging area located at Beach Road could temporarily impact areas that may qualify as Primary and Secondary Habitat. Impacts to sensitive natural communities, including areas that may qualify as Primary and Secondary Habitat, are described in Impact 4.6-2.

Compensation for permanent impacts on sensitive biological resources would occur through development and implementation of a Habitat Mitigation and Monitoring Plan described in **Mitigation Measure 4.6-1n: Habitat Mitigation and Monitoring Plan**, which describes restoration and preservation of dune scrub habitat suitable for western snowy plover, Smith's blue butterfly, and other special-status species that would occur within the Monterey Bay coastal dune ecosystem.

The Marina LCLUP prohibits development in Primary Habitat that is not protective of and dependent upon that habitat. The LCLUP states, "Primary habitat areas shall be protected and preserved against any significant disruption of habitat values and only uses dependent on those resources shall be allowed within those areas (City of Marina, 1982)."

Implementation of **Mitigation Measure 4.6-1n: Habitat Mitigation and Monitoring Plan** would reduce impacts on special-status species habitat by requiring development and implementation of a mitigation and monitoring plan for temporarily and permanently impacted special-status species habitat to ensure that temporary and permanent losses are fully compensated as required. However, construction and maintenance of the subsurface slant wells, new Desalinated Water Pipeline, new Transmission Main and the staging area located at Beach Road are not uses or developments

dependent on the sensitive resources that comprise the Primary Habitat present. Therefore, these facilities would be inconsistent with the City of Marina LCLUP policies governing protection of Primary and Secondary Habitats, a significant and unavoidable impact.

The CCC reached a similar conclusion in its review of the test slant well Coastal Development Permit application, on appeal. The CCC staff report for the test slant well states:

> "Although the project is proposed to be located in portions of the CEMEX site that have been subject to disturbance, the entire area in which the project would be located is primary habitat and ESHA under the LCP. The proposed project is not a resource dependent use, so it cannot be approved consistent with the LCP's habitat protection policies. (CCC, 2014)"

The CCC staff report noted that development of the test slant wells in the proposed location would also conflict with Coastal Act policies related to protection of ESHA (30240).

The CCC was ultimately able to approve the project consistent with the Coastal Act by relying upon Coastal Act Section 30260, which encourages coastal-dependent industrial uses and provides for resolution of conflicting Coastal Act policies where such development is concerned.

Local Tree Ordinances

In general, the types of trees protected by local tree ordinances vary by jurisdiction. **Table 4.6-10**, below, summarizes the local plan, policy, or ordinance that regulates tree removal at each proposed facility site and describes the trees that are protected under the respective plan, policy, or ordinance. The table also includes a description of whether each proposed facility has potential to be inconsistent with a local tree ordinance by removing or impacting a protected tree.

Subsurface Slant Wells

The CEMEX mining area contains relatively undisturbed central dune scrub, formerly disturbed sand dunes that are slowly being occupied by native and non-native dune scrub vegetation, and unvegetated disturbed sandy soil in actively mined areas. There are no trees within the subsurface slant well site. Therefore, no impact would result and no mitigation is necessary.

Staging Areas

There are 8 staging areas located throughout the project area. Some staging areas have trees located along the edge of the staging area boundary; however no trees would be removed during project implementation. Therefore, no impact would result and no mitigation is necessary.

All Other Proposed Project Facilities and Pipelines

To the extent feasible, all other proposed project facilities would be sited so as to minimize tree removal and avoid impacts on trees. Depending on final siting and design of the proposed project facilities, as well as the construction methods and techniques, implementation of the proposed project could necessitate tree removal at various locations throughout the project area. Any trees removed during project construction may be inconsistent with local tree ordinances. This would be a potentially significant impact.

TABLE 4.6-10
APPLICABLE LOCAL PLANS, POLICIES, AND ORDINANCES RELATED TO TREE REMOVAL

Proposed Facility	Jurisdiction	Local Plans, Policies, and Ordinances Related to Tree Removal	Protected Trees	Potential to be Inconsistent with Tree Ordinance
Subsurface Slant Wells	City of Marina	City of Marina Zoning Ordinance and General Plan	A tree removal permit is required to be obtained from the city for any tree that shall be removed or relocated. Oak woodland shall be protected to the greatest extent possible in recognition both of its relatively high biological and aesthetic resource value and its important role in California's and Monterey County's natural heritage. In areas supporting oak woodland, a site survey of this resource should be completed for all new subdivisions and commercial projects as part of a preliminary site and development review. All stands of oak woodland and individual specimens with a diameter of 6 inches or more when measured 4.5 feet from ground level should be identified on a base map. To the greatest extent possible, development plans shall then attempt to incorporate the oak woodland or individual specimens into the plan as an integral feature of the natural and built environment. All oak trees shall be replaced and maintained with new trees of the same stock as those found onsite or in the site vicinity according to the following replacement formula: a minimum one-for-one (one replacement tree for each tree removed) where replacement trees are proposed to be the same diameter or greater than those to be removed; a minimum three-to-one (three replacement trees for each tree removed) for replacement trees of lesser diameter than those proposed for removal, unless, as determined by arborist, the site's specific environmental conditions would not sufficiently support a healthy oak habitat. All diameter measurements shall be taken at 4.5 feet from ground level. Replacement trees shall be a mixture of sizes.	Consistent. There are no trees at the subsurface slant well site.
MPWSP Desalination Plant	Monterey County	Monterey County Zoning Ordinance (Greater Monterey Peninsula Area Plan)	The following trees are protected under this ordinance (tree diameters are measured 2 feet above the ground surface): ● oak trees 6 inches or more in diameter in the areas designated as Resource Conservation; Residential; Commercial; Industrial; Industrial, Mineral Extraction; or Agricultural ● landmark oak trees (trees 24 inches or more in diameter, trees which are visually significant, historically significant, or exemplary of their species) ● any oak tree removed for commercial harvesting purposes The applicant would be required to relocate or replace each removed protected tree on a one-to-one ratio. Additionally, the removal of healthy, native oak, Monterey pine, and redwood trees shall be discouraged.	Potentially Inconsistent. Several trees along Charles Benson Road may require removal to accommodate the proposed access driveways.

TABLE 4.6-10 (Continued)
APPLICABLE LOCAL PLANS, POLICIES, AND ORDINANCES RELATED TO TREE REMOVAL

Proposed Facility	Jurisdiction	Local Plans, Policies, and Ordinances Related to Tree Removal	Protected Trees	Potential to be Inconsistent with Tree Ordinance
MPWSP Desalination Plant (cont.)	Monterey County	Monterey County Code	Oak trees within areas designated as Resource Conservation, Residential, Commercial, or Industrial cannot be removed without the approval of necessary permits. Exceptions include removal of oak trees pursuant to the purpose and standards required in areas designated as Agriculture, Industrial, and or Mineral Extraction. In addition, Title 20, Parts 2-5, addresses native tree removal and protection in the Coastal Zone and Title 21 outside the Coastal Zone. Chapter 16 of the Monterey County Municipal Code also addresses oak and other native tree protection. Native trees in Monterey County, as defined in the ordinance, include Santa Lucia fir, black cottonwood, Fremont cottonwood, box elder, willows, California laurel, sycamores, oaks and madrones. Trees must be at least six inches in diameter two feet above the ground level in order to be subject to these regulations. A landmark oak tree is defined as an oak tree that is 24 inches or more in diameter when measured two feet above ground level or one that is visually significant, historically significant, or exemplary of its species. Removal of any landmark tree is prohibited unless approved by the County Director of Planning and Building Inspection. The applicant would be required to relocate or replace each removed protected tree on a one-to-one ratio.	
Source Water Pipeline and Source Water Pipeline Optional Alignment	City of Marina	City of Marina Zoning Ordinance and General Plan	See above.	Potentially Inconsistent. Although not anticipated, depending on final design, implementation of this pipeline could require tree removal or construction within the driplines of trees at the CEMEX sand mining facility and/or along Charles Benson Road.
	Monterey County	Monterey County Zoning Ordinance (North County Land Use Plan Local Coastal Program)	The following trees are protected under this ordinance (tree diameters are measured 2 feet above the ground surface): ● oak trees 6 inches or more in diameter in the areas designated as Resource Conservation; Residential; Commercial; Industrial; Industrial, Mineral Extraction; or Agricultural ● landmark oak trees (trees 24 inches or more in diameter, trees which are visually significant, historically significant, or exemplary of their species) ● any oak tree removed for commercial harvesting purposes The applicant would be required to relocate or replace each removed protected tree on a one-to-one ratio.	
	Monterey County	Monterey County Zoning Ordinance (Greater Monterey Peninsula Area Plan)	See above.	
	Monterey County	Monterey County Code	See above.	

TABLE 4.6-10 (Continued)
APPLICABLE LOCAL PLANS, POLICIES, AND ORDINANCES RELATED TO TREE REMOVAL

Proposed Facility	Jurisdiction	Local Plans, Policies, and Ordinances Related to Tree Removal	Protected Trees	Potential to be Inconsistent with Tree Ordinance
New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment	City of Marina	City of Marina Zoning Ordinance and General Plan	See above.	Potentially Inconsistent. Although not anticipated, depending on final design, implementation of this pipeline could require tree removal or construction within the driplines of trees along Charles Benson Road or Del Monte Boulevard.
	Monterey County	Monterey County Zoning Ordinance (North County Land Use Plan Local Coastal Program)	See above.	
	Monterey County	Monterey County Zoning Ordinance (Greater Monterey Peninsula Area Plan)	See above.	
	Monterey County	Monterey County Code	See above.	
Castroville Pipeline and Castroville Pipeline Optional Alignments	Monterey County	Monterey County Zoning Ordinance (Greater Monterey Peninsula Area Plan)	See above.	Potentially Inconsistent. Although not anticipated, depending on final design, implementation of this pipeline could require tree removal or construction within the driplines of trees located along Charles Benson Road, the Salinas River, north of Tembladero Slough, and in other isolated locations along the alignment.
	Monterey County	Monterey County Zoning Ordinance (North County Area Plan)	The following trees are protected under this ordinance (tree diameters are measured 2 feet above the ground surface): ● oak or madrone trees 6 inches or more in diameter ● landmark oak trees (trees 24 inches or more in diameter, trees which are visually significant, historically significant, or exemplary of their species) ● any oak tree removed for commercial harvesting purposes The applicant would be required to relocate or replace each removed protected tree on a one-to-one ratio.	
	Monterey County	Monterey County Zoning Ordinance (Greater Salinas Area Plan)	The following trees are protected under this ordinance (tree diameters are measured 2 feet above the ground surface): ● oak trees 6 inches or more in diameter in the areas designated as Resource Conservation; Residential; Commercial; Industrial; Industrial, Mineral Extraction; or Agricultural ● landmark oak trees (trees 24 inches or more in diameter, trees which are visually significant, historically significant, or exemplary of their species) ● any oak tree removed for commercial harvesting purposes The applicant would be required to relocate or replace each removed protected tree on a one-to-one ratio.	
	Monterey County	Monterey County Code	See above.	

TABLE 4.6-10 (Continued)
APPLICABLE LOCAL PLANS, POLICIES, AND ORDINANCES RELATED TO TREE REMOVAL

Proposed Facility	Jurisdiction	Local Plans, Policies, and Ordinances Related to Tree Removal	Protected Trees	Potential to be Inconsistent with Tree Ordinance
Brine Discharge Pipeline and Pipeline to CSIP Pond	Monterey County	Monterey County Zoning Ordinance (Greater Monterey Peninsula Area Plan)	See above.	Potentially Inconsistent. Although not anticipated, depending on final design, implementation of these pipelines could require tree removal or construction within the driplines of trees located along Charles Benson Road and along the MRWPCA Regional WTTP access roads.
	Monterey County	Monterey County Code	See above.	
Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline)	City of Seaside	City of Seaside Municipal Code	A tree permit is required to be obtained from the City for removal or alteration of any tree on private property. The applicant would be required to relocate or replace each removed protected tree on a one-to-one ratio.	Potentially Inconsistent. Although not anticipated, depending on final design, installation of the ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline could require tree removal or construction within the driplines of trees located at these sites.
New Transmission Main and New Transmission Main Optional Alignment	City of Marina	City of Marina Zoning Ordinance and General Plan	See above.	Potentially Inconsistent. Although not anticipated, depending on final design, implementation of this pipeline could require tree removal or construction within the driplines of trees located along Del Monte Boulevard, the TAMC right-of-way, Lightfighter Drive, and General Jim Moore Boulevard.
	City of Seaside	City of Seaside Municipal Code	See above.	
	City of Monterey	City of Monterey Municipal Code	A tree permit is required to be obtained from the City for removal or excessive pruning of any protected tree. Protected trees are defined as a) trees located on a vacant private parcel that are more than two inches (2”) in diameter when measured at a point four feet six inches (4’6”) above the tree’s natural grade; and, b) trees located on a private, developed parcel that are more than six inches (6”) when measured at a point four feet six inches (4’6”) above the tree’s natural grade.	
Terminal Reservoir	City of Seaside	City of Seaside Municipal Code	See above.	Potentially Inconsistent. Although not anticipated, depending on final design, installation of the Terminal Reservoir could require tree removal or construction within the driplines of trees located at this site.
Carmel Valley Pump Station	Monterey County	Monterey County Zoning Ordinance (Carmel Valley Master Plan)	The following trees are protected under this ordinance (tree diameters are measured 2 feet above the ground surface): ● oak, madrone, or redwood trees 6 inches or more in diameter ● landmark oak trees (trees 24 inches or more in diameter, trees which are visually significant, historically significant, or exemplary of their species)	Potentially Inconsistent. Although not anticipated, depending on final design, installation of the Carmel Valley Pump Station could require tree removal or construction within the driplines of trees located at this site.

TABLE 4.6-10 (Continued)
APPLICABLE LOCAL PLANS, POLICIES, AND ORDINANCES RELATED TO TREE REMOVAL

Proposed Facility	Jurisdiction	Local Plans, Policies, and Ordinances Related to Tree Removal	Protected Trees	Potential to be Inconsistent with Tree Ordinance
Carmel Valley Pump Station (cont.)			● any oak tree removed for commercial harvesting purposes The applicant would be required to relocate or replace each removed protected tree on a one-to-one ratio.	
	Monterey County	Monterey County Code	See above.	
Ryan Ranch–Bishop Interconnection Improvements	City of Monterey	City of Monterey Municipal Code	See above.	Potentially Inconsistent. Although not anticipated, depending on final design, installation of the Ryan Ranch-Bishop Interconnection Improvements could require tree removal or construction within the driplines of trees located at this site.
	Monterey County	Monterey County Zoning Ordinance (Greater Monterey Peninsula Area Plan)	See above.	
	Monterey County	Monterey County Code	See above.	
Main System–Hidden Hills Interconnection Improvements	Monterey County	Monterey County Zoning Ordinance (Carmel Valley Master Plan)	See above.	Potentially Inconsistent. Although not anticipated, depending on final design, installation of the Main System-Hidden Hills Interconnection Improvements could require tree removal or construction within the driplines of trees located at this site.
	Monterey County	Monterey County Code	See above.	

Implementation of **Mitigation Measure 4.6-4 (Compliance with Local Tree Ordinances),** which summarizes the local tree ordinances and permit requirements that would be implemented if trees were removed, would reduce potential impacts from being inconsistent with local tree ordinances to less than significant by ensuring compliance with local tree ordinances. This measure would reduce impacts on local tree ordinances by requiring conformance with local tree policies and ordinances.

Consistency with Regulatory Requirements

In addition to the impacts described above, as noted in Section 4.6.2, Regulatory Framework, MPWSP construction could be inconsistent with applicable regulatory requirements related to the City of Marina LCLUP policy protecting Primary and Secondary Habitat and trees.

With respect to the City of Marina LCLUP policy protecting Primary and Secondary Habitat, the project would be inconsistent with the City of Marina LCLUP Policy 25, "Rare and Endangered Species: Habitat Protection." Implementation of **Mitigation Measure 4.6-1n: Habitat Mitigation and Monitoring Plan** would reduce impacts on special-status species habitat by requiring development and implementation of a mitigation and monitoring plan for temporarily and permanently impacted special-status species habitat to ensure that temporary and permanent losses are fully compensated as required;. However, given that project facilities proposed for such habitats are not resource-dependent, and because the LCLUP policy provides no exception to the requirement that developments within such habitats be resource-dependent, potential conflicts with this policy would remain unresolved. The effect would be would be significant and unavoidable.

Regarding tree protection requirements, the project could be inconsistent with City of Marina General Plan Policy 4.120, City of Marina Municipal Code Chapter 17.51, Monterey City Code Chapter 37, Seaside Municipal Code Chapter 8.54, Carmel Valley Master Plan Policy CV-3.11, Monterey County Greater Monterey Peninsula Area Plan Policy GMP-3.5, Monterey County Code Section 21.64.260, Monterey County General Plan Policy OS-5.11, and Monterey County North County Area Plan Policy NC-3.4, which were established to avoid or mitigate impacts on trees. As discussed in the preceding paragraphs, **Mitigation Measure 4.6-4 (Compliance with Local Tree Ordinances),** which summarizes the local tree ordinances and permit requirements that would be implemented if trees were removed, would reduce potential impacts related to conflicts with local tree ordinances to less than significant. This measure would reduce impacts on local tree ordinances by requiring conformance with local tree policies and ordinances. Therefore, with these measures implemented, the MPWSP would be brought into conformance with the above-noted regulatory requirements.

Impact Conclusion

Implementation and construction of the subsurface slant wells, Source Water Pipeline and Source Water Pipeline Optional alignment, and potentially the new Desalinated Water Pipeline and new Desalinated Water Pipeline Optional alignment, new Transmission Main and new Transmission Main Optional alignment, and the staging area located at Beach Road would be inconsistent with the City of Marina LCLUP and impacts would be significant and unavoidable.

Implementation and construction of the MPWSP Desalination Plant, Castroville Pipeline and Castroville Pipeline Optional alignments, Brine Discharge Pipeline and Pipeline to CSIP Pond, proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), Terminal Reservoir, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, and Main System-Hidden Hills Interconnection Improvements have the potential to be inconsistent with local tree ordinances. For these facilities, implementation of the proposed mitigation measures would reduce potential impacts from being inconsistent with local tree ordinances to less than significant.

Use of the remaining staging areas would be consistent with local tree ordinances. There would be no impact from these facilities and no mitigation is necessary.

Overall, the project would be inconsistent with local policies or ordinances protecting biological resources. The impact would be significant and unavoidable.

Mitigation Measures

Mitigation Measure 4.6-1n applies to the subsurface slant wells, Source Water Pipeline and Source Water Pipeline Optional alignment, new Desalinated Water Pipeline and new Desalinated Water Pipeline Optional alignment, new Transmission Main and new Transmission Main Optional alignment, and Staging Areas.

Mitigation Measure 4.6-1n: Habitat Mitigation and Monitoring Plan

(See Impact 4.6-1, above, for description)

Mitigation Measure 4.6-4 applies to the MPWSP Desalination Plant, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Brine Discharge Pipeline and Pipeline to CSIP Pond, New Transmission Main and New Transmission Main Optional Alignment, Terminal Reservoir, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, and Main System-Hidden Hills Interconnection Improvements.

Mitigation Measure 4.6-4: Compliance with Local Tree Ordinances.

1. The project applicant shall perform a comprehensive survey within the project footprint to identify, measure, and map trees subject to local tree removal ordinances (as specified in Table 4.6-10).
2. Any trees that are subject to local tree removal ordinances should be avoided to the extent practicable.
3. If tree removal cannot be avoided by project construction, then the applicant would comply with the applicable local tree policies or ordinances, obtain appropriate tree removal permits from applicable local agencies, and comply with those permits.

Impact 4.6-5: Introduce or spread an invasive non-native species during construction. (*Less than Significant with Mitigation*)

Project construction activities could contribute to the spread of invasive plants and/or introduce new invasive plants to the project area or adjacent lands with native plant communities through earth moving, transport of vehicles, equipment and materials, and unanticipated sediment dispersal during rain events, which would be a significant impact. Invasive species include those species that are rated by the California Invasive Plant Council as a 'high' or 'moderate' invasive species.[22]

Construction activities at the following facilities have potential to spread or introduce invasive species to native plant communities in or adjacent to the project area: subsurface slant wells, MPWSP Desalination Plant, Source Water Pipeline and Source Water Pipeline Optional alignment, new Desalinated Water Pipeline and new Desalinated Water Pipeline Optional alignment, Castroville Pipeline and Castroville Pipeline Optional alignments, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), new Transmission Main and new Transmission Main Optional alignment, and Terminal Reservoir. These facilities are either located within or are adjacent to native plant communities. Introducing or spreading invasive species to native plant communities is a significant impact. Implementation of **Mitigation Measure 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)** and **4.6-1p (Control Measures for Spread of Invasive Plants)** would reduce impacts to less than significant by designating a lead biologist to oversee and ensure implementation of special-status species and sensitive natural community protective measures and requiring implementation of measures, such as cleaning tools and equipment, to reduce the introduction or spread of invasive species.

Construction activities at the following facilities would not be expected to spread or introduce invasive species: Brine Discharge Pipeline and Pipeline to CSIP Pond, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and staging areas. The project areas for these facilities are either developed or largely surrounded by developed areas. Therefore, there would be no impact from the introduction or spread of the invasive species at these facilities and no mitigation is necessary.

Consistency with Regulatory Requirements

In addition to the physical impacts described above, as noted in Section 4.6.2, Regulatory Framework, MPWSP construction could be inconsistent with applicable regulatory requirements related to the introduction or spread of invasive species. Specifically, the project could be

[22] The California Invasive Plant Council defines high and moderate invasive species as follows (Cal-IPC, 2016):
High – These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.
Moderate – These species have substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, through establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.

inconsistent with Executive Order 13112, which was established to avoid or mitigate impacts from the introduction or spread of invasive species. As discussed in the preceding paragraphs, **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)** and **4.6-1p (Control Measures for Spread of Invasive Plants)** would reduce impacts from the introduction or spread of invasive species by designating a lead biologist to oversee and ensure implementation of special-status species and sensitive natural community protective measures and requiring implementation of measures, such as cleaning tools and equipment, to reduce the introduction or spread of invasive species. Therefore, with these measures implemented, the MPWSP would be brought into conformance with the above-noted regulatory requirement.

Impact Conclusion

Implementation and construction of the subsurface slant wells, MPWSP Desalination Plant, Source Water Pipeline and Source Water Pipeline Optional alignment, new Desalinated Water Pipeline and new Desalinated Water Pipeline Optional alignment, Castroville Pipeline and Castroville Pipeline Optional alignments, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), new Transmission Main and new Transmission Main Optional alignment, and Terminal Reservoir has the potential to introduce or spread invasive species. For these facilities, implementation of the proposed mitigation measures would reduce potential impacts from introducing or spreading invasive species to less than significant.

Implementation and construction of the Brine Discharge Pipeline and Pipeline to CSIP Pond, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and staging areas would not introduce or spread invasive species. There would be no impact from these facilities and no mitigation is necessary.

Overall, the project has potential to introduce or spread invasive species, which would be a significant impact. The impact would be less than significant with mitigation.

Mitigation Measures

Mitigation Measure 4.6-1a applies to the subsurface slant wells, MPWSP Desalination Plant, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), New Transmission Main and New Transmission Main Optional Alignment, and Terminal Reservoir.

Mitigation Measure 4.6-1a: Retain a Lead Biologist to Oversee Implementation of Protective Measures

(See Impact 4.6-1, above, for description)

Mitigation Measure 4.6-1p applies to the subsurface slant wells, MPWSP Desalination Plant, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), New Transmission Main and New Transmission Main Optional Alignment, and Terminal Reservoir.

Mitigation Measure 4.6-1p: Control Measures for Spread of Invasive Plants

(See Impact 4.6-1, above, for description)

4.6.5.2 Operational and Facility Siting Impacts

With the exception of the MPWSP Desalination Plant, which would be staffed 24 hours a day, 365 days a year, all other proposed project facilities would be operated remotely via Supervisory Control and Data Acquisition (SCADA) and would not be regularly manned. Approximately every 5 years, periodic maintenance of the subsurface slant wells would require use of heavy construction equipment and would result in substantial ground disturbance in the CEMEX active mining area. CalAm facility operators would conduct routine inspections and maintenance of all aboveground facilities but none of the other facilities would result in ground disturbance during routine operations.

It is assumed that CalAm maintenance staff would make pipelines repairs when needed. Because the location, nature, and extent of disturbance associated with future pipeline repairs cannot be predicted, it would be too speculative to analyze the potential site-specific adverse effects associated with future pipeline repairs at this time. However, certain pipeline repairs may be subject to future CEQA/NEPA review. For these reasons, only known, reasonably foreseeable, operational impacts are evaluated below.

Impact 4.6-6: Result in a substantial adverse effect on candidate, sensitive, or special-status species during project operations. (*Less than Significant with Mitigation*)

As described in Impact 4.6-1 and shown in **Table 4.6-2**, above, many special-status plants and animals are either known to occur, or have the potential to occur at the proposed facility sites. Operation of some project facilities would generate noise and increase ambient noise levels in the vicinity of the facility site. In addition, some of the aboveground facilities would include nighttime lighting. Depending on the existing conditions at the facility sites, operational noise and/or nighttime lighting could disturb migrating birds and other special-status wildlife species in the vicinity. These effects are described below. Routine site visits by CalAm facility operators to conduct inspections and monitor facility operations are not expected to generate substantial noise or result in adverse effects on special-status plants and wildlife.

Subsurface Slant Wells

CalAm facility operators would access the slant well sites using the existing CEMEX access road and the improved access road that would run north-south from Site 6 to the CEMEX access road (see **Figure 3-3a**). There is no proposed night lighting at this facility.

The slant wells would require periodic maintenance approximately every 5 years. During periodic maintenance, mechanical brushes would be lowered into the wells to mechanically clean the screens and, if needed, environmentally inert chemical cleaning products would be used. Periodic maintenance of the slant wells would result in approximately 6 acres of ground disturbance in the CEMEX active mining area. Maintenance of the 10 slant wells would occur over a period of 9 to 18 weeks every 5 years. Maintenance would be conducted between October and February to avoid the western snowy plover nesting season.

Several special-status species, as listed in **Table 4.6-2** and discussed in Impact 4.6-1, have potential to occur within central dune scrub in the immediate vicinity of the subsurface slant wells. These include Monterey spineflower, western snowy plover, Smith's blue butterfly, black legless lizard, and silvery legless lizard.

Additionally, western snowy plovers are known to breed and winter in this area and have potential to occur within the slant well site. As mentioned above, periodic maintenance would occur between October and February and outside of the western snowy plover breeding season (breeding season is typically between March and September), so this maintenance would have no impact on breeding western snowy plover individuals. The disturbance area is located in and around the wellheads. Although western snowy plovers have not been recently documented breeding in the back dune area, nests have been historically observed in the back dunes, and this area continues to provide potential breeding habitat for this species. Continual disturbance of this 6-acre area every 5 years may preclude plovers from nesting in this location in the future. Therefore, this would be a permanent loss of up to 6 acres of western snowy plover habitat, which includes a mix of relatively undisturbed central dune scrub, formerly disturbed sand dunes that are revegetating with native and non-native dune scrub vegetation, and unvegetated disturbed sandy soil in actively mined areas, which would be a significant impact.

Maintenance activities would largely occur within the backdunes, away from the beach and foredunes where flocks of plovers are typically found in this season. However, wintering plovers could occur throughout the maintenance area and noise or disturbance from maintenance activities could directly or indirectly impact wintering plovers, a potentially significant impact. Maintenance work may also displace wintering birds that may utilize the beach or back dunes. Abundant wintering habitat is available elsewhere along the Monterey Bay shoreline to support any wintering western snowy plovers displaced during maintenance, since they are not reliant on a stationary location, such as a nest, during winter. Permanent impacts to plover habitat were addressed in the previous paragraph.

Steelhead have potential to occur in the Salinas River and Tembladero Slough. As described in Impact 4.4-3 in Section 4.4.5.2, slant well pumping would not directly pull surface water from the Salinas River, but it could draw in groundwater that would otherwise discharge to the river. The

proposed project would remove approximately 400 afy of groundwater from the river recharge system. The annual volume of water flowing through the Salinas River to the ocean in 2012 was approximately 250,000 afy. Therefore, the 400 afy reduction would be approximately 0.16 percent of the total flow volume, a minor reduction in surface water supply. This same conclusion applies to Tembladero Slough where the removal of approximately 65 afy of groundwater discharge would constitute a minor reduction in surface water supply. Since project operations would not result in a substantial reduction in surface water supply in the Salinas River or Tembladero Slough, operations would not result in a substantial impact on steelhead or their habitat. Therefore, impacts on steelhead would be less than significant.

Coast buckwheat, host plant for Smith's blue butterfly, occurs within the proposed subsurface slant wells site (ESA, 2013; 2014). Removal of or impacts on these plants and associated soil during maintenance could impact individual adult butterflies, their eggs, or larvae, if present. Impacts to any life form of the Smith's blue butterfly would result in a significant impact. Additionally, maintenance activities have potential to impact up to approximately 1.6 acre of Smith's blue butterfly habitat. Since maintenance activities would disturb these areas every 5 years, it is considered a permanent loss of habitat, which would be a significant impact.

Monterey spineflower, black legless lizard, silvery legless lizard, and other special-status species listed under subsurface slant wells in **Table 4.6-6** could be directly or indirectly impacted during maintenance of the subsurface slant wells during the 9 to 18 week construction period every 5 years in a similar manner to the impacts described under the headings *Overview of Potential Construction Effects on Plants* and *Overview of Potential Construction Effects on Wildlife* in Impact 4.6-1. These impacts would be potentially significant.

Impacts from subsurface slant well maintenance on central dune scrub, which is habitat for black legless lizard, silvery legless lizard, and coast horned lizard, are addressed below under Impact 4.6-7.

Implementation of the following mitigation measures would ensure that impacts on sensitive species at this site are reduced to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1d (Protective Measures for Western Snowy Plover), 4.6-1e (Avoidance and Minimization Measures for Special-status Plants), 4.6-1f (Avoidance and Minimization Measures for Smith's Blue Butterfly), 4.6-1g (Avoidance and Minimization Measures for Black Legless Lizard, Silvery Legless Lizard, and Coast Horned Lizard), 4.6-1i (Avoidance and Minimization Measures for Nesting Birds), 4.6-1n (Habitat Mitigation and Monitoring Plan), 4.6-1p (Control Measures for Spread of Invasive Plants)**, **4.12-1b (General Noise Controls for Construction Equipment)**, and **4.14-2 (Site-Specific Nighttime Lighting Measures).** These measures would reduce impacts on special-status species from maintenance of the subsurface slant wells as described for the subsurface slant wells in impact 4.6-1.

Operation of the well pumps in the subsurface slant wells would generate noise. As stated in Section 4.12, Noise and Vibration, noise from pump operations would attenuate as it passes

through both soil and the subsurface concrete casing. Simultaneous operation of 10 well pumps would conservatively generate a noise level of approximately 66 dBA at 50 feet. At 150 feet, this noise level would be no greater than the ambient noise generated by breaking waves (57 dBA). Since ambient noise levels at the CEMEX active mining area include noise generated from heavy machinery and mining vehicles associated with the CEMEX operations (85 dBA at 50 feet), crashing waves at the Pacific Ocean (57 dBA at 300 feet), and vehicle traffic along Highway 1, the 66 dBA attenuated noise level from pump operations would be less than the combination of these existing sources. Since the attenuated noise from the pumps would not exceed ambient noise levels, the pumps would not expected to impact migratory birds or other special-status wildlife at the site. Impacts would be less than significant.

MPWSP Desalination Plant

The 3-million-gallon brine storage basin at the MPWSP Desalination Plant would be approximately 1.5 acres in extent. Research on impacts of hypersaline waterbodies on birds indicates that waterfowl using large highly saline lakes or ponds can become sick or die, particularly if there is not a source of fresh water in the vicinity. These waterbodies varied in size between 140 to approximately 3,200 acres in size (Gordus et al., 2002; Windingstand et al., 1987; USGS, 2004).

In 1985, approximately 150 waterfowl died and 250 were sickened from salt poisoning in White Lake, an approximately 3,200-acre waterbody (Windingstand et al., 1987). Sodium concentrations at that time were over 17,000 mg/l. In 1998 and 1999, approximately 200 dead and sick ruddy ducks were collected from an approximately 140-acre agricultural evaporation basin located in the San Joaquin Valley. Sodium concentrations were approximately 39,000 mg/l in the basin that year (Gordus et al., 2002).

The salinity of the brine in the MPWSP brine storage basis is expected to range between 57 and 58 parts per thousand (ppt; Flow Science, Inc., 2014). Waterfowl using the brine storage basin over long periods of time could become sick or die from salt toxicosis. The brine storage basin would be much smaller in size compared to the large hypersaline ponds described above and it is unlikely that the brine storage basin would impact the same number of birds as the ponds described above. Additionally, the freshwater pond located within Locke-Paddon Park, approximately 2 miles south of the proposed brine storage basin, is similar in size to the proposed basin and would provide a freshwater alternative to the basin. Although it is unlikely that many birds would become sick or die at the brine storage basin annually, over the life of the project, some migratory waterfowl could become sick or die from use of the brine storage basin, a significant impact.

Implementation of **Mitigation Measure 4.6-6 (Installation and Monitoring of Bird Deterrents at the Brine Storage Basin)** would reduce potential impacts on migratory waterfowl by discouraging them from using the basin. Bird deterrent measures (such as use of a falconer, bird whistles, and fine ropes placed over the pond) are used at the adjacent MRWPCA Regional Wastewater Treatment Plant to successfully deter most birds from their ponds (Holden, 2015).

The MPWSP Desalination Plant would use lighting for safety and security. Lighting would be similar to the existing light sources in the vicinity and would not change existing night lighting conditions or impact special-status wildlife in the vicinity. Pumps for the RO system would be

located within the treatment building and would not generate substantial noise. Some noise would be generated from the emergency diesel-powered generator for approximately 20 to 30 minutes each week. As stated in Section 4.12, Noise and Vibration, generators of the size proposed typically generate a noise level of 81 dBA L_{max} at 50 feet, similar to that of a diesel truck. Given the existing volume of diesel truck pass-by events on Charles Benson Road currently occurring from operations of the adjacent Monterey County Landfill, relatively infrequent noise from the generator, coupled with the sites proximity to an existing landfill and water treatment facility, would not significantly impact special-status wildlife in the vicinity. Lighting and noise impacts on special-status wildlife would be less than significant.

Terminal Reservoir

Lighting would be installed at the proposed Terminal Reservoir site for safety and security purposes. As the Terminal Reservoir would be located in a relatively undeveloped area that provides potential habitat for migratory birds or bats, the new lighting would introduce a new source of substantial light to the area that could impact migratory birds or bats by causing them to abandon their nests or roosts, which is a significant impact. However, with implementation of **Mitigation Measure 4.14-2 (Site-Specific Nighttime Lighting Measures)**, the impact would be reduced to a less-than-significant level. The measure would reduce nighttime light and glare impacts on special-status wildlife species by requiring use of low-intensity lighting and that light be shielded or directed downward to prevent light spillage into adjoining areas where special-status wildlife species may occur.

ASR-5 and ASR-6 Wells

Nighttime lighting may need to be installed at the ASR-5 and ASR-6 Wells for site safety and security. Lighting would be similar to existing light sources adjacent to the site (from the adjacent street lights, the golf course on the opposite side of General Jim Moore Boulevard, and adjacent residences) and would not significantly add to existing light sources or impact special-status wildlife in the vicinity of this site. Lighting impacts would be less than significant.

Each of the ASR-5 and ASR-6 Wells would be equipped with a pump that would be enclosed in a standard concrete pump house to attenuate pump noise. As stated in Section 4.12, Noise and Vibration, placing the motors in a standard concrete pump house would result in a resultant noise level of 57.5 dBA L_{max} at 50 feet. Ambient noise levels at the ASR-5 and ASR-6 Well sites (52 dBA) are the result of recreational activities at the golf course and vehicle traffic along General Jim Moore Boulevard. Substantial increases in the ambient noise level could adversely affect special-status wildlife within 50 feet of the ASR-5 and ASR-6 Well sites, a potentially significant impact. As described in Impact 4.12-5 in Section 4.12.6.2, implementation of **Mitigation Measure 4.12-5 (Stationary Source Noise Controls)** would ensure that noise levels are maintained no greater than 5dBA above existing monitored ambient values. This would ensure that the pumps would not substantially increase noise levels and would not significantly impact special-status wildlife in the vicinity of the site. Noise impacts on special-status wildlife would be less than significant with mitigation.

Carmel Valley Pump Station

Minimal nighttime lighting would be used at the Carmel Valley Pump Station for security. As the Carmel Valley Pump Station is located in the vicinity of the Carmel River riparian corridor, which provides habitat for migratory birds and bats, the new lighting would introduce a new source of substantial light to the area that could impact migratory birds or bats by causing them to abandon their nests or roosts, which is a significant impact. However, with implementation of **Mitigation Measure 4.14-2 (Site-Specific Nighttime Lighting Measures)**, the impact would be reduced to a less-than-significant level. The measure would reduce nighttime light and glare impacts on special-status wildlife species by requiring use of low-intensity lighting and that light be shielded or directed downward to prevent light spillage into adjoining areas where special-status wildlife species may occur.

Although CalAm would operate the Carmel Valley Pump Station via SCADA, CalAm facility operators would make routine visits to inspect the facilities and monitor operations. Routine visits would not generate substantial noise levels.

Operational pump noise could increase ambient noise levels in the immediate vicinity of the concrete pump houses. The Carmel Valley Pump Station is bordered by Carmel Valley Road to the north, the Carmel River and associated riparian corridor to the south, and residences to the east and west, and the existing ambient noise level at the site is 61.5 dBA. As stated in Section 4.12, Noise and Vibration, placing the pumps in an enclosed building would result in a resultant noise level of 62.6 dBA L_{eq} at 50 feet. Operation of the pump would not generate noise substantially above ambient levels. Therefore, noise impacts on special-status wildlife species would be less than significant.

Main System-Hidden Hills Interconnection Improvements

There would be no changes to the nighttime lighting at the Upper Tierra Grande Booster Station and Middle Tierra Grande Booster Station.

Upgraded pumps would replace existing pumps at the Upper Tierra Grande Booster Station and the Middle Tierra Grande Booster Station. Although the new replacement pumps would generate more noise than the existing pumps, they would still be located within existing buildings that would attenuate noise. Both pumps would be located alongside existing roadways and within existing residential developments. As stated in Section 4.12, Noise and Vibration, placing the pumps in the building enclosure would result in resultant noise levels of 61.1 dBA L_{eq} at 50 feet and 55.4 dBA L_{eq} at 50 feet at the Upper Tierra Grande Booster Station and Middle Tierra Grande Booster Station, respectively. Ambient noise levels at the site (44.7 dBA) are the result of existing residential activities at the site. Noise from these upgraded pumps would substantially increase noise levels. Substantial increases in the ambient noise level could adversely affect special-status wildlife within 50 feet of the booster stations. As described in Impact 4.12-5 in Section 4.12.6.2, implementation of **Mitigation Measure 4.12-5 (Stationary Source Noise Controls)** would ensure that noise levels are maintained no greater than 5 dBA above existing monitored ambient values. This would ensure that the pumps would not substantially increase noise levels and would

not significantly impact special-status wildlife in the vicinity of the site. Noise impacts on special-status wildlife would be less than significant with mitigation.

All Pipelines

Operation of the Source Water Pipeline, new Desalinated Water Pipeline, Castroville Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, new Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, ASR Pump-to-Waste Pipeline, and Ryan Ranch-Bishop Interconnection Improvements would not generate noise because these pipelines and pipeline connections would be located underground and would not include pumps or any other noise-generating facilities. Pipeline operations would have no impact on special-status species. No mitigation is required.

Consistency with Regulatory Requirements

In addition to the physical impacts described above, as noted in Section 4.6.2, Regulatory Framework, MPWSP operations could be inconsistent with applicable regulatory requirements related to special-status species that were adopted for the purpose of avoiding or mitigating an environmental effect. Specifically, the project could be inconsistent with the FESA, Federal Migratory Bird Treaty Act, CESA, California Fish and Game Code, City of Marina General Plan Policies 4.112, 4.114, 4.118, 4.119, and 2.10; City of Marina Local Coastal Land Use Plan Policies 25 and 26 and Planning Guideline entitled Rare and Endangered Species: Habitat Protection, which were established to avoid or mitigate special-status species impacts, respectively. As discussed in the preceding paragraphs, **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures), 4.6-1d (Protective Measures for Western Snowy Plover), 4.6-1e (Avoidance and Minimization Measures for Special-status Plants), 4.6-1f (Avoidance and Minimization Measures for Smith's Blue Butterfly), 4.6-1g (Avoidance and Minimization Measures for Black Legless Lizard, Silvery Legless Lizard, and Coast Horned Lizard), 4.6-1i (Avoidance and Minimization Measures for Nesting Birds), 4.6-1n (Habitat Mitigation and Monitoring Plan), 4.6-1p (Control Measures for Spread of Invasive Plants)**, **Mitigation Measure 4.6-6 (Installation and Monitoring of Bird Deterrents at the Brine Storage Basin), 4.12-1b (General Noise Controls for Construction Equipment)**, **Mitigation Measure 4.12-5 (Stationary Source Noise Controls)**, and **Mitigation Measure 4.14-2 (Site-Specific Nighttime Lighting Measures)** would reduce impacts on special-status species from MPWSP operations by designating a lead biologist to oversee and ensure implementation of special-status species protective measures; requiring worker training regarding special-status species potentially present to ensure that workers are aware of special-status species that occur in the project area and the measures to be implemented to avoid, minimize, and/or mitigate impacts; requiring general measures such as installation of an exclusion fencing to ensure special-status species do not occur within the construction area, a trash abatement program to ensure special-status species predators are not attracted to the site, and other measures to avoid and minimize impacts on special-status species; requiring specific measures to avoid, minimize, and compensate for impacts on the western snowy plover such as avoiding the breeding season,

installing a visual construction barrier for work conducted adjacent to breeding habitat during the breeding season to reduce human disturbance to plovers, conducting pre-construction surveys to determine if plovers are present and implementing minimization measures to minimize construction impacts on plovers, if present, and compensating for habitat loss to mitigate for temporary and permanent loss of habitat; requiring specific measures to avoid and minimize impacts on special-status plants such as avoiding individual plants to the extent feasible and compensating for temporary or permanent loss of special-status plants at a level acceptable to the applicable resource agencies; requiring specific measures to avoid and minimize impacts on Smith's blue butterfly such as avoiding host plants to the extent feasible to avoid impacts to individuals and providing compensatory mitigation for permanent impacts; requiring specific measures to avoid and minimize impacts on black legless lizard, silvery legless lizard, and coast horned lizard such as relocating individuals to areas outside of the construction area to avoid injury or mortality from construction; requiring specific measures to avoid and minimize impacts on nesting birds such as limiting construction to the non-nesting season when feasible to avoid impacts to active nests; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; requiring implementation of measures to reduce the introduction or spread of invasive species that may degrade habitat for special-status species; discouraging migratory waterfowl from using the Brine Storage Basin; requiring implementation of noise controls for construction equipment to reduce noise impacts on special-status wildlife species; ensuring that noise levels are maintained no greater than 5 dBA above existing monitored ambient values to reduce noise impacts on special-status wildlife species; and requiring use of low-intensity lighting and that light be shielded or directed downward to prevent light spillage into adjoining areas where special-status wildlife species may occur.

Therefore, with these measures implemented, the MPWSP would be brought into conformance with the above-noted regulatory requirements.

Impact Conclusion

Periodic maintenance of the subsurface slant wells and regular operation of the MPWSP Desalination Plant, Terminal Reservoir, and Carmel Valley Pump Station have the potential to impact special-status species. Implementation of the proposed mitigation measures would reduce impacts on special-status species to less than significant.

Operations and maintenance of the ASR-5 and ASR-6 Wells and Main System-Hidden Hills Interconnection Improvements would have less-than-significant impacts on special-status species. No mitigation is required.

Operations and maintenance of the Source Water Pipeline, new Desalinated Water Pipeline, Castroville Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, new Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, ASR Pump-to-Waste Pipeline, and Ryan Ranch-Bishop Interconnection Improvements, would not impact special-status species. Therefore, no impact would result and no mitigation is required.

Mitigation Measures

Mitigation Measure 4.6-1a applies to periodic maintenance of the subsurface slant wells.

Mitigation Measure 4.6-1a: Retain a Lead Biologist to Oversee Implementation of Protective Measures.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1b applies to periodic maintenance of the subsurface slant wells.

Mitigation Measure 4.6-1b: Construction Worker Environmental Awareness Training and Education Program.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1c applies to periodic maintenance of the subsurface slant wells.

Mitigation Measure 4.6-1c: General Avoidance and Minimization Measures.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1d applies to periodic maintenance of the subsurface slant wells.

Mitigation Measure 4.6-1d: Protective Measures for Western Snowy Plover.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1e applies to periodic maintenance of the subsurface slant wells.

Mitigation Measure 4.6-1e: Avoidance and Minimization Measures for Special-status Plants.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1f applies to periodic maintenance of the subsurface slant wells.

Mitigation Measure 4.6-1f: Avoidance and Minimization Measures for Smith's Blue Butterfly.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1g applies to periodic maintenance of the subsurface slant wells.

Mitigation Measure 4.6-1g: Avoidance and Minimization Measures for Black Legless Lizard, Silvery Legless Lizard, and Coast Horned Lizard.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1i applies to periodic maintenance of the subsurface slant wells.

Mitigation Measure 4.6-1i: Avoidance and Minimization Measures for Nesting Birds.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1n applies to periodic maintenance of the subsurface slant wells.

Mitigation Measure 4.6-1n: Habitat Mitigation and Monitoring Plan.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1p applies to periodic maintenance of the subsurface slant wells.

Mitigation Measure 4.6-1p: Control Measures for Spread of Invasive Plants

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-6 applies only to the MPWSP Desalination Plant.

Mitigation Measure 4.6-6: Installation and Monitoring of Bird Deterrents at the Brine Storage Basin.

Bird deterrents (such as reflective flagging, whistles, or a falconer) should be utilized at the Brine Storage Basin. The type of bird deterrent should be determined by the lead biologist and should be modified if, through monitoring (as described below), the bird deterrents are either not sufficient at deterring birds from the Brine Storage Basin or pose a risk to wildlife.

Monitoring of the Brine Storage Basin shall include the following:

- ***Monthly Monitoring*:** A qualified biologist and/or qualified biological monitor shall regularly survey the Brine Storage Basin at least once per month starting with the first month of operation of the Brine Storage Basin. The purpose of the surveys shall be to determine if the bird deterrents are effective in excluding birds and to assess whether the deterrents serve as a hazard to birds or wildlife. The monthly surveys shall be conducted in one day for a minimum of two hours following sunrise (i.e., dawn), a minimum of one hour mid-day (i.e., 1100 to 1300), and a minimum of two hours preceding sunset (i.e., dusk) in order to provide an accurate assessment of bird and wildlife use of the ponds during all seasons. Operations staff at the MPWSP Desalination Plant shall also report finding any dead birds or other wildlife at the Brine Storage Basin to the Lead Biologist within one day of the detection of the carcass. The Lead Biologists shall report any bird or other wildlife deaths or entanglements within two days of the discovery to CalAm, CDFW, and USFWS.

- ***Quarterly Monitoring*:** If after 12 consecutive monthly site visits (described above) no bird or wildlife deaths are detected at the Brine Storage Basin by or reported to the Lead Biologist, monitoring can be reduced to quarterly visits.

- ***Biannual Monitoring*:** If after 12 consecutive quarterly site visits (described above) no bird or wildlife deaths are detected by or reported to the Lead Biologist, future surveys may be reduced to two surveys per year, during the spring nesting season and during fall migration.

- ***Modification of Monitoring Program*:** As appropriate, the Lead Biologist shall modify the monitoring program based on information acquired during monitoring, and may also suggest adaptive management measures to remedy any problems that are detected during monitoring or modifications if bird impacts are not observed.

Mitigation Measure 4.12-1b applies to the subsurface slant wells.

Mitigation Measure 4.12-1b: General Noise Controls for Construction Equipment.

(See Impact 4.12-1 in Section 4.12, Noise and Vibration, for description.)

Mitigation Measure 4.15-5 applies to ASR-5 and ASR-6 Wells and Main System-Hidden Hills Interconnection Improvements

Mitigation Measure 4.12-5: Stationary-Source Noise Controls.

(See Impact 4.12-5 in Section 4.12, Noise and Vibration, for description.)

Mitigation Measure 4.14-2 applies to the subsurface slant wells, Terminal Reservoir, and Carmel Valley Pump Station.

Mitigation Measure 4.14-2: Site-Specific Nighttime Lighting Measures.

(See Impact 4.14-2 in Section 4.14, Aesthetic Resources, for description.)

Impact 4.6-7: Result in substantial adverse effects on riparian habitat, critical habitat, or other sensitive natural communities during project operations. (*Less than Significant with Mitigation*)

As described above under Impact 4.6-2, the following sensitive natural communities occur within or in the vicinity of the project area: central dune scrub, central maritime chaparral, northern coastal scrub, riparian woodland and scrub, freshwater marsh, and coast live oak woodland. Critical habitat is also considered a sensitive natural community for the purposes of this analysis. (Potential operational impacts on wetlands or other waters, which are also considered sensitive natural communities, are addressed below under Impact 4.6-8.)

Project operations would largely be confined to water transport within the new facilities and would not result in any new ground disturbance. Maintenance activities at the subsurface slant wells would include periodic ground disturbance, which may result in impacts on sensitive natural communities. Foreseeable maintenance activities at the remaining proposed facilities would not result in any new ground disturbance and would not result in impacts on sensitive natural communities.

Subsurface Slant Wells

Maintenance of the slant wells would be required approximately every 5 years and would disturb a total of up to 6 acres of central dune scrub and areas that are currently actively disturbed for sand mining activities. This disturbance area includes relatively undisturbed central dune scrub, formerly disturbed sand dunes that are revegetating with native and non-native dune scrub vegetation, and unvegetated disturbed sandy soil areas. The total duration for maintenance activities would be 9 to 18 weeks every 5 years. Disturbance every 5 years would keep these sites in a permanent state of recovery from disturbance and dune scrub vegetation would not be allowed to mature. Therefore this maintenance is considered a permanent impact. As stated above

under Impact 4.6-2, the site is in the Coastal Zone and central dune scrub in this area may be considered primary and secondary habitat under the City of Marina LCLUP. Impacts to central dune scrub would be potentially significant. Additionally, as described under Impact 4.6-2, western snowy plover critical habitat is located approximately 240 feet west of well Site 1. Slant well maintenance at well Site 1 could indirectly impact this critical habitat if worker foot traffic extends beyond the designated construction work area, if trash and debris is left behind following construction, and/or if invasive plant species are introduced or spread at the site. Indirect impacts on critical habitat would be significant.

Implementation of the following mitigation measures would ensure that maintenance impacts on sensitive natural communities, including critical habitat for western snowy plover, at this site are reduced to a less-than-significant level: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures)**, **4.6-1d (Protective Measures for Western Snowy Plover), 4.6-1n (Habitat Mitigation and Monitoring Plan), 4.6-1p (Control Measures for Spread of Invasive Plants)**, **4.6-2a (Consultation with Local Agencies and the California Coastal Commission regarding Environmentally Sensitive Habitat Areas)**, and **4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities)**. These measures would reduce impacts on sensitive natural communities and critical habitat during maintenance activities at the subsurface slant well as described for subsurface slant wells in Impact 4.6-2.

All Other Facilities

Operations and maintenance of the MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Castroville Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), new Transmission Main, Terminal Reservoir, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, and Main System–Hidden Hills Interconnection Improvements would include periodic maintenance and inspections of existing facilities. Known maintenance efforts and inspections would be limited to already developed areas, which do not support sensitive natural communities or primary constituent elements of critical habitat. No impact on sensitive natural communities or critical habitat from operations and maintenance of these facilities are expected. No mitigation is required.

Consistency with Regulatory Requirements

In addition to the physical impacts described above, as noted in Section 4.6.2, Regulatory Framework, MPWSP operations could be inconsistent with applicable regulatory requirements related to sensitive natural communities, critical habitat, and ESHA that were adopted for the purpose of avoiding or mitigating an environmental effect. Specifically, the project could be inconsistent with the FESA, the Coastal Act, City of Marina General Plan Policies 4.112, 4.114, 4.116, 4.118, and 2.10; City of Marina LCLUP Policies 8, 19, 25, 26 and Planning Guideline entitled Rare and Endangered Species: Habitat Protection, which were established to avoid or mitigate sensitive natural community, critical habitat, and ESHA impacts. As discussed in the preceding paragraphs, **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee**

Implementation of Protective Measures), **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, **4.6-1c (General Avoidance and Minimization Measures), 4.6-1d (Protective Measures for Western Snowy Plover), 4.6-1n (Habitat Mitigation and Monitoring Plan), 4.6-1p (Control Measures for Spread of Invasive Plants)**, **4.6-2a (Consultation with Local Agencies and the California Coastal Commission regarding Environmentally Sensitive Habitat Areas)**, and **4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities)** would reduce impacts on critical habitat and ESHA as described for subsurface slant wells in Impact 4.6-2. Therefore, with these measures implemented, the MPWSP would be brought into conformance with the above-noted regulatory requirements.

Impact Conclusion

Operations of underground components and project facilities within previously disturbed project footprints, which do not support sensitive natural communities or primary constituent elements of critical habitat, are not expected to impact on sensitive natural communities. No mitigation is required.

Maintenance of the subsurface slant wells has potential to impact sensitive natural communities and critical habitat. Implementation of the proposed mitigation measures would reduce impacts on sensitive natural communities and critical habitat to less than significant.

Foreseeable maintenance at the other facilities would not disturb any new areas. Therefore, no impact would result. No mitigation is required.

Overall, the project has potential to impact sensitive communities, which would be a significant impact. The impact would be less than significant with mitigation.

Mitigation Measures

Mitigation Measure 4.6-1a applies to the subsurface slant wells.

> **Mitigation Measure 4.6-1a: Retain a Lead Biologist to Oversee Implementation of Protective Measures.**
>
> (See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1b applies to the subsurface slant wells.

> **Mitigation Measure 4.6-1b: Construction Worker Environmental Awareness Training and Education Program.**
>
> (See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1c applies to the subsurface slant wells.

> **Mitigation Measure 4.6-1c: General Avoidance and Minimization Measures.**
>
> (See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1d applies to the subsurface slant wells.

Mitigation Measure 4.6-1d: Protective Measures for Western Snowy Plover.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1n applies to the subsurface slant wells.

Mitigation Measure 4.6-1n: Habitat Mitigation and Monitoring Plan.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-2a applies to subsurface slant wells.

Mitigation Measure 4.6-1p: Control Measures for Spread of Invasive Plants.

(See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-2a applies to subsurface slant wells.

Mitigation Measure 4.6-2a: Consultation with Local Agencies and the California Coastal Commission regarding Environmentally Sensitive Habitat Areas.

(See Impact 4.6-2, above, for description.)

Mitigation Measure 4.6-2b applies to subsurface slant wells.

Mitigation Measure 4.6-2b: Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities.

(See Impact 4.6-2, above, for description.

Impact 4.6-8: Result in substantial adverse effects on federal wetlands, federal other waters, and/or waters of the state during project operations. (*Less than Significant with Mitigation*)

As described in Impact 4.6-3, waters of the U.S./waters of the state under the jurisdiction of the CCC, RWQCB, and/or USACE occur within and adjacent to the project area. Project operations would largely be confined to water transport within the new facilities and would not result in any new ground disturbance. Maintenance activities at the subsurface slant wells would include ground disturbance, which may result in impacts on waters of the U.S./waters of the state within or adjacent to the project area. Foreseeable maintenance activities at the remaining proposed facilities would not result in any new ground disturbance and would not result in impacts on waters of the U.S./waters of the state.

Subsurface Slant Wells

Maintenance of the subsurface slant wells would require cleaning of well heads approximately for a total duration of 9 to 18 weeks every 5 years. Maintenance activities would not occur in potential waters of the U.S./waters of the state.

The CEMEX settling ponds, potentially waters of the U.S./waters of the state, are located approximately 50 feet from the slant well Site 1. Indirect impacts on water quality are not expected as these ponds are surrounded by berms and slope should attenuate any potential project related discharges to these features. Furthermore, maintenance activities would disturb approximately 6 acres of land, and similar to construction activities, would require coverage under the NPDES Construction General Permit and preparation and implementation of a SWPPP. Mandatory compliance with the NPDES Construction General Permit, including implementation of the project-specific SWPPP, would further reduce the potential for water quality impacts. However, due to proximity, construction crews could inadvertently impact wetlands by walking or driving through them during maintenance, which would be a significant impact.

Implementation of the following mitigation measures would ensure that potential impacts on adjacent waters of the U.S./waters of the state would be reduced to less-than-significant levels: **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1b (Construction Worker Environmental Awareness Training and Education Program)**, and **4.6-1c (General Avoidance and Minimization Measures).** These measures would reduce impacts on waters of the U.S./waters of the state from maintenance of the subsurface slant wells as described for subsurface slant wells in Impact 4.6-3.

All Other Facilities

Operations and maintenance of the MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Castroville Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), new Transmission Main, Terminal Reservoir, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, and Main System–Hidden Hills Interconnection Improvements would include periodic inspections and repairs when needed. Any foreseeable disturbance associated with facility inspections, maintenance, and operations would be limited to developed areas that do not support waters of the U.S/waters of the state. No impact on waters of the U.S./waters of the state would result from maintenance and operations activities. No mitigation is required.

Consistency with Regulatory Requirements

In addition to the physical impacts described above, as noted in Section 4.6.2, Regulatory Framework, MPWSP operations could be inconsistent with applicable regulatory requirements related to waters of the U.S. and/or waters of the state. Specifically, the project could be inconsistent with the Sections 404 and 401 of the CWA, Section 10 of the Rivers and Harbors Act, the Porter-Cologne Act, the Coastal Act, City of Marina General Plan Policies 4.112, 4.114, 4.116, 4.118, and 2.10; City of Marina LCLUP Policy 26 and Planning Guidelines entitled Rare and Endangered Species: Habitat Protection, which were established to avoid or mitigate impacts on waters of the U.S. and/or waters of the state. As discussed in the preceding paragraphs, **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures), 4.6-1b (Construction Worker Environmental Awareness Training and Education Program),** and **4.6-1c (General Avoidance and Minimization Measures)** would reduce impacts on waters of the U.S. and/or waters of the state as described for subsurface

slant wells in Impact 4.6-3. Therefore, with these measures implemented, the MPWSP would be brought into conformance with the above-noted regulatory requirements.

Impact Conclusion

Operations of underground components and project facilities within previously disturbed project footprints, which do not contain waters of the U.S./waters of the state, would result in no impact on waters of the U.S./waters of the state. No mitigation is required.

Maintenance of the subsurface slant wells has potential to impact potential waters of the U.S./waters of the state. Implementation of the proposed mitigation measures would reduce impacts on waters of the U.S/waters of the state to less than significant.

Foreseeable maintenance at the other facilities are not expected to disturb any new areas. Therefore, no impact is expected. No mitigation is required.

Overall, the project has potential to impact waters of the U.S./waters of the state, which would be a significant impact. The impact would be less than significant with mitigation.

Mitigation Measures

Mitigation Measure 4.6-1a applies to the subsurface slant wells.

> **Mitigation Measure 4.6-1a: Retain a Lead Biologist to Oversee Implementation of Protective Measures.**
>
> (See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1b applies to the subsurface slant wells.

> **Mitigation Measure 4.6-1b: Construction Worker Environmental Awareness Training and Education Program.**
>
> (See Impact 4.6-1, above, for description.)

Mitigation Measure 4.6-1c applies to the subsurface slant wells.

> **Mitigation Measure 4.6-1c: General Avoidance and Minimization Measures.**
>
> (See Impact 4.6-1, above, for description.)

Impact 4.6-9: Introduce or spread an invasive non-native species during project operations. (*Less than Significant with Mitigation*)

Periodic maintenance activities at the subsurface slant wells would include ground disturbance, which could contribute to the spread of invasive plants and/or introduce new invasive plants to the project area or adjacent lands with native plant communities through earth moving, transport

of vehicles, equipment and materials, and unanticipated sediment dispersal during rain events, which would be a significant impact.

Implementation of Mitigation Measure 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures) and 4.6-1p (Control Measures for Spread of Invasive Plants) would reduce impacts to less than significant by designating a lead biologist to oversee and ensure implementation of special-status species and sensitive natural community protective measures and requiring implementation of measures, such as cleaning tools and equipment, to reduce the introduction or spread of invasive species.

Foreseeable maintenance activities at the remaining proposed facilities would not result in any new ground disturbance and would not spread or introduce invasive species.

Consistency with Regulatory Requirements

In addition to the physical impacts described above, as noted in Section 4.6.2, Regulatory Framework, MPWSP operations could be inconsistent with applicable regulatory requirements related to the introduction or spread of invasive species. Specifically, the project could be inconsistent with Executive Order 13112, which was established to avoid or mitigate impacts from the introduction or spread of invasive species. As discussed in the preceding paragraphs, **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)** and **4.6-1p (Control Measures for Spread of Invasive Plants)** would reduce impacts from the introduction or spread of invasive species by designating a lead biologist to oversee and ensure implementation of special-status species and sensitive natural community protective measures and requiring implementation of measures, such as cleaning tools and equipment, to reduce the introduction or spread of invasive species. Therefore, with these measures implemented, the MPWSP would be brought into conformance with Executive Order 13112.

Impact Conclusion

Operations of underground components and project facilities within previously disturbed project footprints would not have the potential to introduce or spread invasive species into native plant communities. Therefore no impact would result from operations of these facilities and no mitigation is required.

Maintenance of the subsurface slant wells has potential to introduce or spread invasive species into native plant communities. Implementation of the proposed mitigation measures would reduce impacts from the introduction or spread of invasive species to less than significant.

Foreseeable maintenance at the other facilities would not disturb any new areas. Therefore no impact is expected. No mitigation is required.

Overall, the project has potential to introduce or spread invasive species, which would be a significant impact. The impact would be less than significant with mitigation.

Mitigation Measures

Mitigation Measure 4.6-1a applies to the subsurface slant wells.

> **Mitigation Measure 4.6-1a: Retain a Lead Biologist to Oversee Implementation of Protective Measures.**
>
> (See Impact 4.6-1, above, for description)

Mitigation Measure 4.6-1p applies to the subsurface slant wells.

> **Mitigation Measure 4.6-1p: Control Measures for Spread of Invasive Plants.**
>
> (See Impact 4.6-1, above, for description)

Impact 4.6-10: Be inconsistent with the provisions of an adopted Habitat Conservation Plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan during construction or operations. (*Less than Significant with Mitigation*)

The proposed project's consistency with the provisions of an adopted Habitat Conservation Plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan during construction or operations is addressed below. Impacts to HMP special-status species and sensitive natural communities with potential to occur and be impacted by the proposed project are addressed in Impacts 4.6-1, 4.6-2, 4.6-6, and 4.6-7 above.

Terminal Reservoir

The entire Terminal Reservoir site is located within the *1997 Installation-Wide Multispecies Habitat Management Plan* (HMP; USACE, 1997) for the former Fort Ord area. This proposed facility is located within a Borderland Development Area along a Natural Resource Management Area (NRMA) Interface, which means it is located in designated development areas that border a NRMA. Borderland Development Areas along a NRMA have no management restrictions except along the development/reserve interface. Per the HMP, as these areas are developed, certain management requirements would be implemented, which include invasive species control and the use of firebreaks. The proposed Terminal Reservoir does not include controls for invasive species or firebreaks. Therefore, these facilities would be inconsistent with the HMP, a significant impact.

Implementation of **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures)**, **4.6-1p (Control Measures for Spread of Invasive Plants),** and **4.6-8 (Management Requirements within Borderland Development Areas along Natural Resource Management Area Interface)** would ensure that the proposed project is not inconsistent with the provisions of an adopted Habitat Conservation Plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan and would reduce potential impacts to a less-than-significant level. These measures would reduce impacts by designating a lead biologist to oversee and ensure implementation of special-status species and sensitive natural community protective measures; requiring implementation of measures, such as

cleaning tools and equipment, to reduce the introduction or spread of invasive species; and ensuring that measures that are required to be implemented as part of the HMP are implemented for the proposed project.

Preparation of a HCP is currently underway for the former Fort Ord military base (Draft HCP; Fort Ord Reuse Authority, 2012). The Draft HCP is currently undergoing internal review and has not been released to the public. It is expected to be complete in late 2016. Once approved, the Draft HCP will supersede the HMP. Similar to the HMP, the Terminal Reservoir site is located within Borderlands that are Designated Development Areas in the Draft HCP. If the Draft HCP is approved and permitted before the proposed project is implemented, these facilities may be subject to additional mitigation measures required under the approved HCP, which cannot be known at this time.

New Transmission Main

The portion of the new Transmission Main along the Monterey Peninsula Recreational Trail is located within the HMP area. It is located within an area designated as Development with Reserve Areas or Development with Restrictions. This designation includes lands that are slated for development in the HMP that contain inholdings of habitat reserve land or require development restrictions to protect habitat within or adjacent to the parcel. The new Transmission Main would pass through the HMP's Caltrans State Route 1 Area within the Development with Reserve Areas or Development with Restrictions category. The management requirements for these parcels specify that in conjunction with any transportation work conducted by Caltrans, Caltrans will restore and enhance native coastal strand, dune scrub, and sand hill maritime chaparral habitats in the road shoulders and medians in areas that will not conflict with anticipated highway expansion, improvements, operations, or maintenance. Even though the HMP only describes the potential for Caltrans transportation in this corridor, for the purpose of this analysis, we assume that the intent of the measure was to ensure that any projects that temporarily disturbed native habitat would restore and enhance these areas following construction. Construction of the new Transmission Main would temporarily impact central dune scrub habitat, which would be inconsistent with the HMP, which is a significant impact.

Implementation of **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures), 4.6-1n (Habitat Mitigation and Monitoring Plan),** and **4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities)** would ensure that the proposed project is not inconsistent with the provisions of an adopted Habitat Conservation Plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan and would reduce potential impacts to a less-than-significant level. These measures would reduce impacts by designating a lead biologist to oversee and ensure implementation of special-status species and sensitive natural community protective measures; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; and requiring measures to minimize and/or mitigate impacts on sensitive natural communities such as restoration of temporarily impacted sensitive communities, to ensure no net loss of habitat; and ensuring that measures that may be required to be implemented as part of the HMP are implemented for the proposed project.

Similar to the HMP, the new Transmission Main alignment is located within an area designated as a Development with Reserve Areas or Development with Restrictions. If the Draft HCP is approved and permitted before the proposed project is implemented, this facility may be subject to additional mitigation measures required under the approved HCP, which cannot be known at this time.

Since the new Transmission Main and the new Transmission Main using the optional alignment would have the same potential impacts, the same impacts and mitigation measures would apply to the new Transmission Main using the optional alignment as apply to the new Transmission Main.

Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline) and Staging Areas

The proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline) and some staging areas are located within the HMP area. However, these proposed facilities are located within designated development areas that do not border a NRMA. Per the HMP, no resource conservation or resource management requirements are associated with projects in these parcels. Therefore, construction of these facilities would be consistent with adopted habitat conservation plans or natural community conservation plans or other approved local, regional, or state habitat conservation plans. No impact is expected. Impacts to HMP special-status species and sensitive natural communities with potential to occur and be impacted by the proposed ASR Facilities are addressed in Impacts 4.6-1, 4.6-2, 4.6-6, and 4.6-7 above.

Similar to the HMP, the proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline) and some staging areas are located within Designated Development Areas in the Draft HCP. If the Draft HCP is approved and permitted before the proposed project is implemented, these facilities may be subject to additional mitigation measures required under the approved HCP, which cannot be known at this time.

All Other Proposed Project Facilities

Implementation of the subsurface slant wells, MPWSP Desalination Plant, Source Water Pipeline, new Desalinated Water Pipeline, Castroville Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, and Main System–Hidden Hills Interconnection Improvements are not located within the HMP or HCP areas and therefore would not be subject to conformance with adopted habitat conservation plans, natural community conservation plans, or other approved local, regional, or state habitat conservation plans during construction as none occur at these facility sites. No impact is expected.

Consistency with Regulatory Requirements

In addition to the physical impacts described above, as noted in Section 4.6.2, Regulatory Framework, MPWSP construction and operations could be inconsistent with applicable regulatory requirements related to an approved HMP or HCP. Specifically, the project could be inconsistent with the City of Marina General Plan Policy 4.115, which was established to reduce impacts on species and habitat areas within an approved HMP or HCP. As discussed in the

preceding paragraphs, **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures), 4.6-1n (Habitat Mitigation and Monitoring Plan),** and **4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities)** would reduce potential inconsistencies with an approved HMP or HCP as described above for the new Transmission Main. Therefore, with these measures implemented, the MPWSP would be consistent with the above-noted regulatory requirements.

Impact Conclusion

The Terminal Reservoir site and the portion of the new Transmission Main along the Monterey Peninsula Recreational Trail are located within the approved HMP area and construction and operations of these facilities could be inconsistent with the HMP; which would be a significant impact. Implementation of **4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures), Mitigation Measures 4.6-1p (Control Measures for Spread of Invasive Plants), 4.6-1n (Habitat Mitigation and Monitoring Plan), 4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities),** and **4.6-8 (Management Requirements within Borderland Development Areas along Natural Resource Management Area Interface)** would reduce potential impacts to a less-than-significant level by designating a lead biologist to oversee and ensure implementation of special-status species protective measures; requiring implementation of measures, such as cleaning tools and equipment, to reduce the introduction or spread of invasive species; developing and implementing a mitigation and monitoring plan for temporarily and permanently impacted sensitive habitats to ensure that temporary and permanent losses are fully compensated as required; and requiring measures to minimize and/or mitigate impacts on sensitive natural communities such as restoration of temporarily impacted sensitive communities, to ensure no net loss of habitat; and ensuring that measures that may be required to be implemented as part of the HMP are implemented for the proposed project.

The proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline) and some staging areas are located within the HMP area. However, these proposed facilities are located within designated development areas and construction and operations of these facilities would be consistent with the HMP. The remaining facilities are not located within the HMP area and would not be subject to conformance with the HMP. No impact and no mitigation required.

Overall, the project would be inconsistent with the HMP, which would be a significant impact. The impact would be less than significant with mitigation.

Mitigation Measures

Mitigation Measure 4.6-1a applies to the New Transmission Main, New Transmission Main Optional alignment, and Terminal Reservoir

> **Mitigation Measure 4.6-1a: Retain a Lead Biologist to Oversee Implementation of Protective Measures.**
>
> (See Impact 4.6-1, above, for description)

Mitigation Measure 4.6-1p applies to the Terminal Reservoir.

Mitigation Measure 4.6-1p: Control Measures for Spread of Invasive Plants.

(See Impact 4.6-1, above, for description)

Mitigation Measure 4.6-1n applies to the New Transmission Main and New Transmission Main Optional alignment.

Mitigation Measure 4.6-1n: Habitat Mitigation and Monitoring Plan.

(See Impact 4.6-1, above, for description)

Mitigation Measure 4.6-2b applies to the New Transmission Main and New Transmission Main Optional alignment.

Mitigation Measure 4.6-2b: Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities

(See Impact 4.6-2, above, for description)

Mitigation Measure 4.6-8 applies to the Terminal Reservoir.

Mitigation Measure 4.6-8: Management Requirements within Borderland Development Areas along Natural Resource Management Area Interface.

Within Borderland Development Areas along Natural Resource Management Areas (NRMA) Interface as defined in the 1997 *Installation-Wide Multispecies Habitat Management Plan* for the former Fort Ord area, CalAm shall implement the following measures (unless otherwise negotiated between CalAm and FORA), prior to, concurrently with, or following project construction, as applicable:

1. Weed control measures for ice plant, scotch broom, and pampas grass to avoid their spread into the NRMA.
2. Parking lots, greenbelts, or other nonflammable or fire-resistant land uses shall be located as a buffer between the NRMA and development to minimize the possibility of fire damage to the NRMA as well as structures on the development parcels.
3. Structures shall be sited entirely behind a land use that is developed as a firebreak.
4. Reduce erosion so as not to affect the NRMA parcel from stormwater runoff. The method to reduce erosion shall be determined by the Lead Biologist.

4.6.6 Cumulative Effects of the Proposed Project

Impact 4.6-C: Cumulative impacts related to terrestrial biological resources (*Significant and Unavoidable*)

The geographic scope of analysis for cumulative impacts on terrestrial biological resources includes sites proposed for MPWSP components, as well as biologically linked terrestrial areas within approximately 5 miles of these sites. This cumulative impact analysis considers the incremental effects of the proposed project, when combined with the effects of past, present, and reasonably foreseeable projects (as listed in **Table 4.1-2** and shown on **Figure 4-1**) on special-status species, riparian habitat, critical habitat, or other sensitive natural communities, wetlands or other waters of the U.S. or state, and trees protected by local tree ordinances.

Special-Status Species and Sensitive Natural Communities

Many of the projects within the geographic scope of analysis occur on former Fort Ord lands, including the East Garrison Specific Plan (No. 2), Cypress Knolls Senior Residential Project (No. 8), Marina Heights (No. 9), Marina Airport Economic Development Area (No. 11), Rockrose Gardens (No. 39), CSUMB North Campus Housing Master Plan (No. 13), ITCD Academic Building (CSUMB) (No. 40), The Seaside Resort (No. 16), Monterey Downs and Horse Park and Central Coast Veteran's Cemetery Specific Plan (No. 17), Main Gate Specific Plan (No. 18), Seaside Groundwater Basin Aquifer Storage and Recovery (Phase 1) (No. 29), Seaside Groundwater Basin Aquifer Storage and Recovery (Phase 2) (No. 30), and Fort Ord Dunes State Park Campground (No. 46). The Fort Ord HMP, which cover the former Fort Ord lands, has established designated development areas and habitat reserves on former Fort Ord lands to mitigate impacts from projects within development areas on biological resources, such as Monterey spineflower, sandmat manzanita, Smith's blue butterfly, black legless lizard, California red-legged frog, California tiger salamander, and western snowy plover, on a regional scale. The preservation of certain habitat types such as maritime chaparral and central dune scrub within these habitat reserves also protects habitat for other species not directly impacted by the HMP, such as coast horned lizard and badger. The preservation of habitat reserves not only benefits these species within the former Fort Ord, but also benefits these same species on a regional scale within the southern Monterey Bay Area.

As noted, the HMP proposes actions that mitigate the effects of projects within the Fort Ord Reuse Plan area on habitat communities and associated species explicitly identified for conservation in the HMP. It is possible that the MPWSP and additional projects proposed within the HMP area could affect other habitat types that are not explicitly identified for conservation in the HMP (e.g., non-native grassland, coastal sage scrub, and oak woodland). If not properly mitigated, cumulative impacts from these projects on such habitats and dependent special-status species could be significant, and the proposed project could have a cumulatively considerable contribution. As discussed in Impacts 4.6-1, 4.6-2, 4.6-6, and 4.6-7, most of the impacts from the MPWSP on such habitat communities would be temporary, although some permanent impact would result. As summarized in the following subsections, with mitigation, the residual effect of the MPWSP on these habitat types would be negligible. As a result, after implementation of

mitigation, the MPWSP would not have a considerable contribution to a cumulatively significant impact on habitats within the HMP area. Therefore, the above-listed projects are not considered further in this cumulative impacts analysis.

Western Snowy Plover

As described in Impacts 4.6-1, 4.6-2, 4.6-6, and 4.6-7, and as summarized in **Table 4.6-6**, construction and operation of the MPWSP components could impact special-status species and the sensitive natural communities that support these species. The MPWSP would result in temporary impacts on western snowy plover that, given the sensitivity of this species, could result in a cumulatively considerable contribution to a significant cumulative impact. Cumulative projects identified in **Table 4.1-2** and within the geographic scope of cumulative impact analysis could also impact western snowy plover. Specifically, the Monterey Shores Resort (No. 19), 90-Inch Bay Avenue Outfall Phase 1 (No. 43), Slant Test Well Project (No. 47), Moss Landing Community Plan (No. 37), and The Collection at Monterey Bay Resort (No. 56) would affect beach or dune areas that may support western snowy plover. Implementation of the Monterey Bay Shores Resort and Moss Landing Community Plan projects could occur at the same time as the proposed MPWSP construction and therefore could adversely affect western snowy plover and its habitat through heavy equipment use, dust generation, elevated noise levels, and increased human activity. These effects would be cumulatively significant. However, implementation of **Mitigation Measures 4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures); 4.6-1b (Construction Worker Environmental Awareness Training and Education Program); 4.6-1c (General Avoidance and Minimization Measures); 4.6-1d (Protective Measures for Western Snowy Plover); 4.6-1n (Habitat Mitigation and Monitoring Plan); 4.6-1p (Control Measures for Spread of Invasive Plants); 4.6-2a (Consultation with Local Agencies and the California Coastal Commission regarding Environmentally Sensitive Habitat Areas); 4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities); 4.6-6 (Installation and Monitoring of Bird Deterrents at the Brine Storage Basin); 4.12-1b (General Noise Controls for Construction Equipment);** and **4.14-2 (Site-Specific Nighttime Lighting Measures)** would reduce the significance of project-specific impacts to a less-than-significant level as described above under Impact 4.6-1, 4.6-2, 4.6-6, and 4.6-7. The residual effects of the MPWSP after mitigation would not be cumulatively considerable. The subsurface slant wells would be located within and adjacent to potential western snowy plover nesting habitat, and operation of the wells, including maintenance around the well heads could prevent use of the backdune habitat for nesting, which has been documented previously. Following implementation of **Mitigation Measure 4.6-1d**, residual temporary impacts on snowy plovers (i.e., during construction and subsurface slant well maintenance) would be minimal, and permanent loss of western snowy plover habitat would be compensated at a ratio acceptable to USFWS (minimum 2:1) through actions to enhance existing degraded habitat. Thus, after mitigation, the permanent loss of snowy plover habitat attributable to the proposed project would not be cumulatively considerable. The MPWSP Desalination Plant, Terminal Reservoir, and Carmel Valley Pump Station also would have operational impacts beyond the construction phase, but are not located in western snowy plover habitat. For these reasons, the incremental effects of the MPWSP would not have a cumulatively considerable contribution to a significant cumulative effect on western snowy plover (*less than significant with mitigation*).

Migrating Waterfowl

As described in Impact 4.6-6, operation of the brine storage basin at the MPWSP Desalination Plant could impact migrating waterfowl. The Dredge Laguna Grande and Roberts Lake Project (No. 42) could potentially impact migratory waterfowl by disturbing them during dredging activities, but this would be a short-term effect. Nonetheless, these lake dregding efforts could contribute to a significant cumulative impact on migrating waterfowl, when viewed in combination with the proposed project's significant impact. Implementation of **Mitigation Measure 4.6-6 (Installation and Monitoring of Bird Deterrents at the Brine Storage Basin)** would reduce project-specific impacts to a less-than-significant level as described above under Impact 4.6-6. Additionally, the potential residual impacts from the brine pond, which may include illness or mortality of a few birds that aren't deterred from the brine storage basin, would only occur when it is in use periodically. Thus, after mitigation the effects of these projects would not combine to result in a significant cumulative impact on migrating waterfowl due to the intermittent and/or short-term nature of the impacts. Therefore, the residual effects of the MPWSP would not have a cumulatively considerable contribution to a significant cumulative effect (*less than significant with mitigation*).

Sensitive Vegetation Types and Wildlife Habitat

Construction of MPWSP components would affect non-native grassland, central dune scrub, northern coastal scrub, central maritime chaparral, and oak woodland. Operation of MPWSP components (at the subsurface slant wells) could affect central dune scrub. Disruption to these habitat communities could also affect special-status species that rely upon these habitats, including: Monterey spineflower, robust spineflower, seaside bird's beak, Menzies' wallflower, sand gilia, Yadon's rein orchid, Smith's blue butterfly, California tiger salamander, California red-legged frog, Hickman's onion, Hooker's manzanita, Toro manzanita, Pajaro manzanita, sandmat manzanita, Monterey Coast paintbrush, Monterey ceanothus, Congdon's tarplant, branching beach aster, Eastwood's goldenbush, sand-loving wallflower, Kellogg's horkelia, Carmel Valley bush-mallow, marsh microseris, northern curly-leaved monardella, south coast branching phacelia, Michael's rein orchid, Monterey pine, Santa Cruz microseris, Santa Cruz clover, Pacific Grove clover, black legless lizard, silvery legless lizard, coast horned lizard, Coast Range newt, western burrowing owl, Monterey dusky-footed woodrat, Monterey shrew, American badger, and special-status bats and birds (Impact 4.6-1). Cumulative projects identified in **Table 4.1-2** and within the geographic scope of cumulative impact analysis could also adversely affect the above-listed habitat communities and associated species. Specifically, the Salinas Valley Water Project Phase II (No. 1), Laguna Seca Villas (No. 3), Omni Enterprises, LLC (No. 4), Ferrini Ranch Subdivision (No. 5), Marina Downtown Vitalization Specific Plan (No. 10), Marina Station (No. 12), Monterey Bay Shores Resort (No. 19), Rancho Canada Village (No. 27), Rancho Canada Golf Club (No. 28), RUWAP Desalination Element (No. 31), RUWAP Recycled Water Element (No. 35), Moss Landing Community Plan (No. 37), TAMC Monterey Peninsula Light Rail Project (No. 38), and 90-Inch Bay Avenue Outfall Phase 1 (No. 43) could have impacts on non-native grassland, central dune scrub, northern coastal scrub, central maritime chaparral, and/or oak woodland. Concurrent construction and/or operation of these projects could result in a significant cumulative impact on sensitive habitat communities and associated special-status species through vegetation trimming or removal, elevated noise and dust

levels, and increased human presence. Most MPWSP effects would be limited to the 30-month construction phase, with restoration of temporarily disturbed areas to previous conditions or better at the end of construction; however, during construction, or following construction for long-term project impacts, the proposed project could have a cumulatively considerable incremental impact. Implementation of **Mitigation Measures 4.6-1a; 4.6-1b; 4.6-1c; 4.6-1e (Avoidance and Minimization Measures for Special-status Plants); 4.6-1f (Avoidance and Minimization Measures for Smith's Blue Butterfly); 4.6-1g (Avoidance and Minimization Measures for Black Legless Lizard, Silvery Legless Lizard, and Coast Horned Lizard); 4.6-1h (Avoidance and Minimization Measures for Western Burrowing Owl); 4.6-1i (Avoidance and Minimization Measures for Nesting Birds); 4.6-1j (Avoidance and Minimization Measures for American Badger); 4.6-1k (Avoidance and Minimization Measures for Monterey Dusky-Footed Woodrat); 4.6-1l (Avoidance and Minimization Measures for Special-Status Bats); 4.6-1m (Avoidance and Minimization Measures for Native Stands of Monterey Pine); 4.6-1n; 4.6-1o (Avoidance and Minimization Measures for California red-legged frog and California tiger salamander); 4.6-1p (Control Measures for Spread of Invasive Plants), 4.6-2a; 4.6-2b; 4.6-6; 4.12-5 (Stationary Source Noise Controls)** and **4.14-2** would mitigate for any potential permanent effects and reduce project-specific impacts to less-than-significant levels as described in Impacts 4.6-1, 4.6-2, 4.6-6, and 4.6-7 above. Given the limited extent and duration of effects at any given MPWSP component site, the prevalence of such habitats within the geographic scope of analysis relative to the areas of MPWSP effect, and the nearby availability of such habitats for use by species displaced during the construction period, the MPWSP's residual incremental effects on sensitive natural communities would not be cumulatively considerable (*less than significant with mitigation*).

Construction of MPWSP components would affect freshwater marsh and riparian woodland and scrub. Disruption to these habitat communities could also affect special-status species reliant upon these habitats, such as western pond turtle and tricolored blackbird. Two foreseeable projects within the geographic scope of cumulative analysis could also affect freshwater marsh and riparian woodland and scrub habitats: the Ferrini Ranch Subdivision (No. 5), and TAMC Monterey Peninsula Light Rail Project (No. 38). Construction of these projects could cause direct or indirect impacts on the sensitive freshwater marsh and riparian vegetation and wildlife habitat, and associated special-status species, resulting in a significant cumulative effect to which the proposed project could have a cumulatively considerable contribution. However, the MPWSP would avoid two perennial water features (the Salinas River and Tembladero Slough) through horizontal directional drilling (an option not available to the two cumulative projects), which would substantially minimize its contribution to cumulative impacts. Additionally, implementation of **Mitigation Measures 4.6-1a, 4.6-1b, 4.6-1c, 4.6-1i, 4.6-1n, 4.6-1p, 4.6-2a,** and **4.6-2b** would reduce the significance of project-specific impacts to less-than-significant levels as described in Impacts 4.6-1 and 4.6-2 above. Implementation of these mitigation measures would also reduce any direct and indirect impacts on freshwater marsh and riparian woodland and scrub from the proposed project to less-than-significant levels by requiring restoration of temporarily impacted areas and compensation for permanent impacts. Further, the Ferrini Ranch Subdivision is located over 5 miles from the MPWSP and, because of this distance, construction of these two projects would not impact the same specific sensitive habitat feature,

although it could affect the same habitat type. Additionally, due to the limited duration of potential effects, the restoration of disturbed areas following construction, and the availability of other similar habitats for use by displaced species during construction, the cumulative effects from the MPWSP would not be significant (*less than significant with mitigation).*

Wetlands or Other Waters

As described in Impacts 4.6-3 and 4.6-8, MPWSP construction and operation could affect federal wetlands, federal other waters, and/or waters of the state. These impacts would be temporary and, upon completion of construction, any affected wetlands would be restored to their approximate pre-construction condition. Many of the projects listed in **Table 4.1-2** could cause temporary or permanent impacts on federal wetlands, federal other waters, and/or waters of the state. Specifically, the TAMC Monterey Peninsula Light Rail Project (No. 38), Ferrini Ranch Subdivision (No. 5), Marina Station (No. 12), Moss Landing Community Plan (No. 37), Dredge Laguna and Roberts Lake (No. 42), Monterey Pacific Grove ASBS Stormwater Management Project (No. 45), and Route 156 West Corridor Project (No. 53) would result in temporary or permanent impacts on wetlands and other waters. Other projects listed in **Table 4.1-2** may have similar effects. Concurrent construction and/or operation of these projects could result in significant cumulative impacts on these resources through wetlands fill or draining and increased human presence, to which the proposed project could have a cumulatively considerable contribution. However, implementation of **Mitigation Measures 4.6-1a, 4.6-1b, 4.6-1c,** and **4.6-3 (Avoid, Minimize, and or Mitigate Impacts to Wetlands)** would reduce the project-specific impacts to less-than-significant levels as described in Impacts 4.6-3 and 4.6-8, above. The MPWSP's residual effects on federal wetlands, federal other waters, and/or waters of the state would be temporary and limited to a small percentage of wetlands habitat in the geographic scope of analysis – the MPWSP would potentially temporarily impact a maximum of approximately 1.5 acre of wetlands or other waters compared to approximately 5,500 acres of potential freshwater wetlands within the geographic scope of analysis as mapped by the National Wetland Inventory (USFWS, 2016). Additionally, a considerable amount of nearby wetlands habitat available for displaced species and ecological function would remain within the geographic scope of analysis, and the MPWSP effects would be temporary and fully restored upon completion of construction. Also, the Corps, RWQCB, CDFW, and/or the CCC may take jurisdiction over many of the water features that could be impacted by these other cumulative projects. If these other cumulative projects impact jurisdictional wetland or water features those actions would be regulated by the Corps, RWQCB, CDFW, and/or the CCC and these agencies would impose measures to minimize and/or compensate for impacts on jurisdictional resources. Therefore, the MPWSP's incremental contribution to adverse a cumulative impact on wetlands habitat would not be cumulatively considerable (*less than significant with mitigation*).

City of Marina Local Coastal Program Land Use Plan

As described in Impact 4.6-4, construction of MPWSP components would be inconsistent with the City of Marina LCLUP since the project is not a resource-dependent use. Implementation of **Mitigation Measure 4.6-1n: Habitat Mitigation and Monitoring Plan** would reduce impacts on special-status species habitat, as described in Impact 4.6-4 above, but the project would still be inconsistent with the LCLUP.

The test slant well at the CEMEX site is a cumulative project that is within the geographic scope of this analysis. The test slant well was also found to be inconsistent with the City of Marina LCLUP. Implementation of the proposed project would have a cumulatively considerable contribution to this test slant well impact related to inconsistencies with the city of Marina LCLUP. No mitigation measures are available that would reduce this impact on less than significant (*significant and unavoidable*).

Local Tree Ordinances

A significant cumulative impact would result if the incremental effects of the MPWSP combined with those of cumulative projects to be inconsistent with local tree ordinances. As described in Impact 4.6-4, construction of MPWSP components could require trimming or removal of protected trees, inconsistent with local tree ordinances. Other projects identified in **Table 4.1-2** that are within the geographic scope of cumulative impacts analysis may also need to trim or remove trees that are subject to local tree protection ordinances. For example, the Monterey Downs and Horse Park and Central Coast Veteran's Cemetery Specific Plan (No. 17) and Route 156 West Corridor Project (No. 53) would involve removal of a substantial number of trees. Local governments with jurisdiction over the geographic scope of cumulative impacts analysis (e.g., Seaside and Monterey County) have tree ordinances established for the purpose of protecting important trees and compensating for their removal. If the MPWSP and cumulative projects within the geographic scope of cumulative impact analysis involved tree removal and failed to comply with applicable tree ordinances, a significant cumulative effect would result, to which the proposed project could have a cumulatively considerable contribution. However, implementation of **Mitigation Measure 4.6-4 (Compliance with Local Tree Ordinances)** would reduce the project-level impacts to less-than-significant levels as described in Impact 4.6-4, above. Avoiding the removal of trees, or compliance with tree removal permit requirements by replacing protected trees at a minimum one-to-one ratio as described in Table 4.6-10, would minimize or mitigate impacts on locally protected trees such that residual impacts on trees would be minimal and would no longer be inconsistent with local tree ordinances. Therefore, the residual effects of the MPWSP regarding being inconsistent with local tree ordinances would be minimal and would not have a cumulatively considerable contribution to a significant cumulative impact (*less than significant with mitigation).*

Inconsistent with an adopted Habitat Conservation Plan

As described in Impact 4.6-10, the Terminal Reservoir and portions of the Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline) located east of General Jim Moore Boulevard, and portions of the new Transmission Main and new Transmission Main using the optional alignment are located within the *1997 Installation-Wide Multispecies* HMP. As described above, many cumulative projects occur on former Fort Ord lands within the boundaries of the HMP. Construction and operation of these projects may include activities subject to HMP resource conservation and management requirements. Failure of the MPWSP and one or more cumulative project to implement an applicable HMP conservation and/or management requirement would constitute a significant cumulative impact to which the proposed project could have a cumulatively considerable contribution. However, installation of the Terminal Reservoir and new Transmission

Main facilities would be required to comply with HMP-prescribed measures, such as firebreaks and control of invasive species, which would be implemented through project-level mitigation, including **4.6-1a (Retain a Lead Biologist to Oversee Implementation of Protective Measures), Mitigation Measures 4.6-1p (Control Measures for Spread of Invasive Plants), 4.6-2b (Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities),** and **4.6-8 (Management Requirements within Borderland Development Areas along Natural Resource Management Area Interface)**. These measures would reduce the significance of project-level impacts to less-than-significant levels as described in Impact 4.6-10 above. Therefore, the effects of the MPWSP regarding being inconsistent with an adopted Habitat Conservation Plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan would not be cumulatively considerable (*less than significant with mitigation).*

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4.7 Hazards and Hazardous Materials

Sections	Figures	Tables
4.7.1 Setting / Affected Environment	4.7-1 Environmental Cases Near Project Components – Northern Portion	4.7-1 Environmental Cases Identified Within 0.25 Mile of the Project Area
4.7.2 Regulatory Framework	4.7-2 Environmental Cases Near Project Components – Southern Portion	4.7-2 Schools in the Vicinity of Project Components
4.7.3 Evaluation Criteria		4.7-3 Applicable Regional and Local Plans and Polices Relevant to Hazards and Hazardous Materials
4.7.4 Approach to Analysis		4.7-4 Summary of Impacts - Hazards and Hazardous Materials Impacts
4.7.5 Direct and Indirect Effects of the Proposed Project		4.7-5 MPWSP Desalination Plant (9.6 mgd) - Water Treatment Chemicals
4.7.6 Cumulative Effects of the Proposed Project		

This section evaluates the potential for construction and operation of the Monterey Peninsula Water Supply Project (MPWSP or proposed project) to result in adverse impacts associated with hazards or hazardous materials, including releases of hazardous materials through routine use or accidents, being located near schools, airports, or within a high fire hazard area, or impairing emergency routes. The analysis is based on review of available hazards and hazardous materials websites, reports, and maps of the project area and vicinity, including reports and information posted on websites by the State Water Resources Control Board and the Department of Toxic Substances Control, and project-specific investigations conducted for various project components.

Comments received on the 2015 Draft EIR requested information on a hazardous materials site located along 1st Avenue in the City of Marina, noted the mis-location of one hazardous materials site on a figure and requested locating nearby schools on a map; the Fort Ord - University Villages site has been included and discussed in Section 4.7.1.1, the list and locations of hazardous materials sites has been updated and Figures 4.7-1 and 4.7-2 have been revised. Commenters requested a discussion on the possibility of frac-out during drilling, spill prevention measures, and a soil sampling and analyses for hazardous materials; these are now addressed in Impact 4.7-1 and Impact 4.7.2. Commenters requested the specific locations where trenchless drilling would be used for pipeline installation, and this is now discussed in Section 3.3.5.2.

4.7.1 Setting/Affected Environment

The study area for evaluation of hazards and hazardous materials impacts includes the project components and the vicinity adjacent to the components. In addition, the vicinity up to 0.25 mile from project components is considered relative to schools and up to 2 miles relative to airports. There is no known soil or groundwater contamination or wildfire hazard within MBNMS, nor any existing hazardous material usage within MBNMS that could be affected by the proposed project. Therefore, MBNMS resources are not described in the environmental setting/affected environment.

4.7.1.1 Soil and Groundwater Conditions

This section assesses the potential for hazardous materials to be present in soil and groundwater in the project area as a result of past and present land uses, and documented releases of hazardous materials in the project vicinity. This discussion is based on review of regulatory agency databases and hazardous materials investigation reports available on regulatory agencies' websites, information available on the Fort Ord Reuse Authority (FORA) website, available environmental assessments prepared for the Transportation Agency for Monterey County (TAMC) corridor and the 46-acre MPWSP Desalination Plant site, and site reconnaissance.

Past and Present Land Uses in the Project Vicinity

Various past and current land uses associated with the use, generation, or disposal of hazardous materials exist in the project vicinity: the Monterey Regional Waste Management District (MRWMD) landfill, the Monterey Regional Water Pollution Control Agency (MRWPCA) Regional Wastewater Treatment Plant, the former Fort Ord military base, commercial buildings, gasoline stations, railroad tracks, agricultural fields, residences, and recreational and open spaces. In some cases, these land uses have contributed to subsurface contamination that could be exposed during project construction and result in adverse environmental and health effects.

There is a potential for the following land uses in the project vicinity to have caused soil and/or groundwater contamination in the project area:

- ***Commercial/Industrial Uses.*** Commercial and industrial land uses include former and current gasoline service stations, dry cleaners, and other facilities that typically involve the use and storage of fuel, lubricants and oil, solvents, and other hazardous materials. Facilities with known releases of hazardous materials that have affected soil or groundwater are discussed below under the heading, Regulatory Agency Database Searches.
- ***Agricultural Uses.*** Portions of the proposed Source Water Pipeline, new Desalinated Water Pipeline, Castroville Pipeline, and Brine Discharge Pipeline are located within agricultural areas, and the proposed MPWSP Desalination Plant site is adjacent to agricultural fields. Historical agricultural land uses may leave behind residual levels of pesticides and herbicides in soils. In addition, farm equipment typically uses petroleum products and cleaning solvents (for equipment maintenance), which, in some cases, may have been released during use or storage. According to the Phase I Environmental Assessment for the 46-acre MPWSP Desalination Plant parcel,[1] the site was formerly owned by the Dole Food Company; however, the site appears to have historically been utilized as vacant land and no evidence of hazardous substances or petroleum products were noted (RBF Consulting, 2012).
- ***Railroad Operations.*** A preliminary environmental assessment of the Transportation Agency of Monterey County (TAMC) railroad corridor identified environmental concerns regarding the railroad alignment that would also overlap or be near portions of the proposed Castroville Pipeline, Source Water Pipeline, new Desalinated Water Pipeline, and the new Transmission Main Pipeline alignments (Kleinfelder, 2010). Soil along the railroad

[1] As described in Section 3.2.2 of Chapter 3, Description of the Proposed Project, the MPWSP Desalination Plant would be constructed on the upper terrace (approximately 25 acres) of the 46-acre parcel.

alignment may have been affected by fuel, oil, lubricants, and metals (e.g., cadmium, chromium, copper, nickel, and lead) leaking from railroad engines and cars over time. The railroad ties are typically wood that has been treated with creosote and less commonly copper, chrome, arsenic, and/or pentachlorophenol. Vegetation control is typically conducted using rail-mounted equipment that sprays herbicides along rail alignments.

- ***Sand Mining.*** The proposed Seawater Intake System and a portion of the Source Water Pipeline would be located within the CEMEX sand mining facility. Mining operations typically require the use of fuels and lubricants for equipment. The CEMEX facility was not listed as having a permitted UST or recorded releases in the regulatory agency database search discussed below under the heading, Regulatory Agency Database Searches.
- ***Former Fort Ord Military Base.*** Fort Ord was listed on the National Priorities List in 1990. Contaminated areas include munitions response sites; the Fritzsche Airfield Fire Drill Pit (Operable Unit [OU] 1); the Fort Ord landfill (OU2); firing ranges; hazardous waste storage areas; and unregulated disposal areas. Both soil and groundwater were impacted by contaminants in these areas, which have been investigated separately. The proposed Terminal Reservoir, ASR-5 and ASR-6 Wells, ASR Pipelines, and portions of the new Transmission Main would be within the Fort Ord Seaside Munitions Response site (LFR et al, 2011), which has potential unexploded ordnance hazards.[2] The former Fort Ord military base site is discussed in more detail below.

Regulatory Database Searches of Hazardous Materials Sites

Regulatory agency databases of hazardous materials sites that are compiled pursuant to Government Code Section 65962.5 were reviewed to identify documented releases of hazardous materials in soil and groundwater[3] within 0.25 mile (1,320 feet) of the project components, including the California State Water Resources Control Board (SWRCB) GeoTracker database and the California Department of Toxic Substances Control (DTSC) EnviroStor database. The relevant individual site documents are cited below. A 0.25-mile search radius from the project area was utilized to encompass the potential for migration of shallow groundwater contaminant plumes from typical leaking underground storage tank cases to adversely affect groundwater in the project area. Open environmental cases and their distance from project components are summarized in **Table 4.7-1** and shown on **Figures 4.7-1** and **4.7-2**. Leaking underground storage tank (LUST) sites that have been closed by the regulatory agency are not discussed because site closure indicates that the regulatory agency considers these sites to pose a low threat to human health and groundwater quality. The Fort Ord OU1 site was recently closed but is shown on Figure 4.7-1 for informational purposes. Some other closed sites located close to project components are also listed because they were closed some years ago and the older closure standards may result in residual contamination above current standards.

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2 *Unexploded ordnance* refers to explosive weapons (bombs, bullets, shells, grenades, land mines, etc.) that did not explode when they were employed and still pose a risk of detonation, potentially many decades after they were used or discarded.

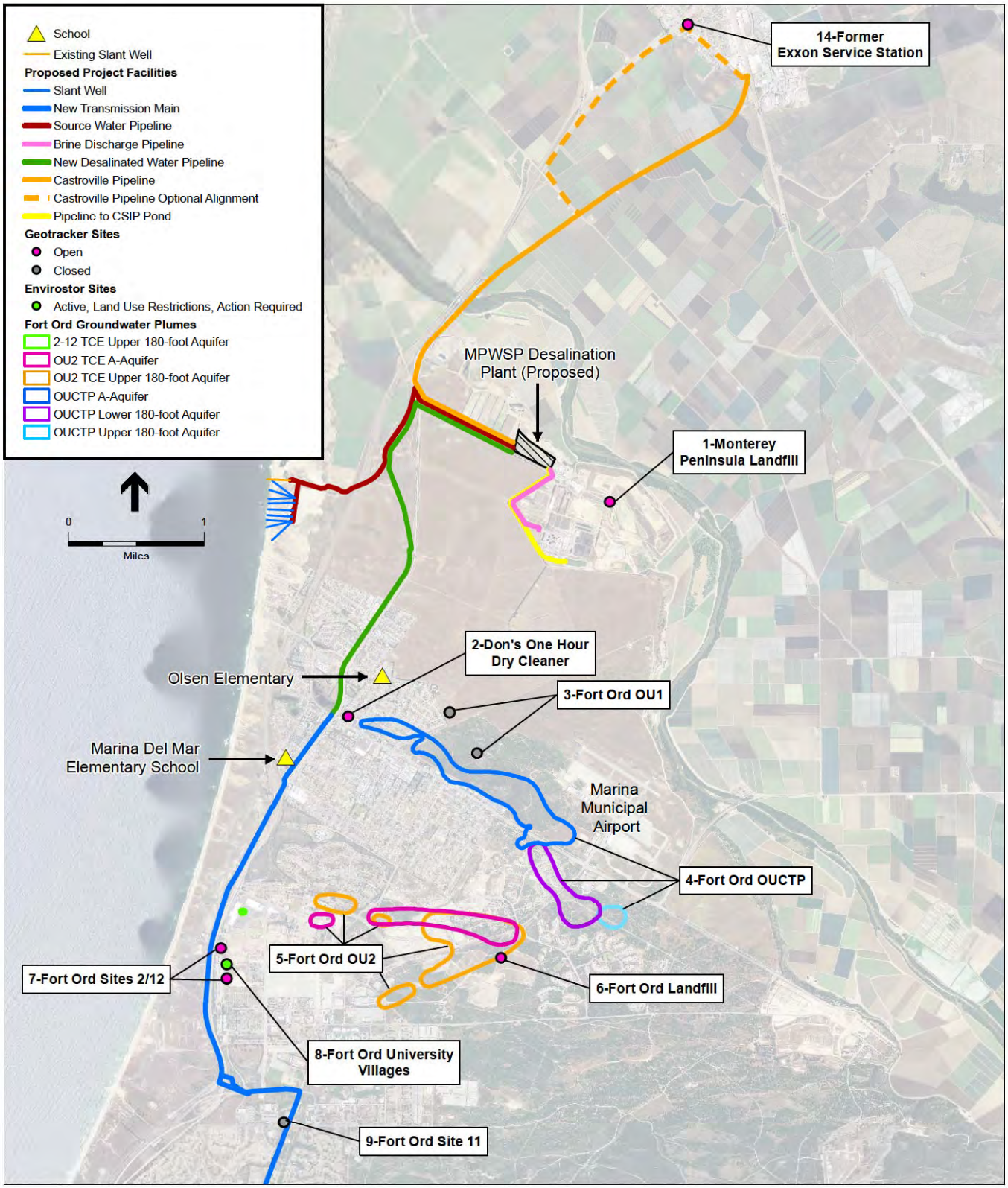
3 Unless listed in association with a documented release, it is assumed that facilities permitted to use, store, generate, or dispose of hazardous materials handle such materials in accordance with applicable laws and would not affect soil or groundwater in the project area.

TABLE 4.7-1
ENVIRONMENTAL CASES IDENTIFIED WITHIN 0.25 MILE OF THE PROJECT AREA

Map ID	Site Name/Address	Approximate Distance and Direction from Project Area	Status and Comments
1	Monterey Peninsula Class III Landfill	0.5 mile east of pipeline to CSIP Pond & Brine Discharge Pipeline	Active – No environmental issues outside of landfill; does not underlie project components
2	Don's One Hour Dry Cleaners	530 feet east of new Desalinated Water Pipeline & new Transmission Main Pipeline	Active – Groundwater remediation in progress; does not underlie project components
3	Fort Ord OU1	0.9 mile east of new Desalinated Water Pipeline	Closed – Groundwater cleanup completed
4	Fort Ord OUCTP	1,100 feet east of new Desalinated Water Pipeline	Active – Groundwater remediation in progress; does not underlie project components
5	Fort Ord OU2	0.6 mile east of new Transmission Main Pipeline	Active – Groundwater remediation in progress; does not underlie project components
6	Fort Ord Sanitary Landfill	Two miles east of new Transmission Main Pipeline	Active – Groundwater remediation in progress; does not underlie project components
7	U.S. Army Fort Ord Sites 2 and 12	425 feet east of new Transmission Main Pipeline	Active – Groundwater remediation in progress; does not underlie project components
8	U.S. Army Fort Ord University Villages	800 feet east of new Transmission Main Pipeline	Active – Areas adjacent to Highway 1 have been remediated; does not underlie project components
9	Fort Ord Site 11	At staging area at northwest corner of General Jim Moore Blvd. & Gigling Road	Closed – Removed USTs and cleanup completed
10	Fort Ord Site 39 – Inland Ranges	0.5 mile east of ASR facilities and Terminal Reservoir	Closed – Cleanup complete along General Jim Moore Boulevard
11	Fort Ord Military Base Seaside Munitions Response Area	Within project area (Terminal Reservoir, ASR-5/ASR-6 wastewater infiltration area, southern part of new Transmission Main)	Closed – Cleanup complete along General Jim Moore Boulevard
12	Fort Ord Del Rey Oaks	4,200 feet southeast of Terminal Reservoir	Closed in project area; still open inland – Cleanup complete along General Jim Moore Boulevard
13	Fort Ord York School Agreement	1,200 feet northeast of Ryan Ranch-Bishop Interconnection Improvements	Closed – Cleanup complete
14	Former Exxon Service Station	Adjacent to Castroville Pipeline Optional Alignment on northeast side of Merritt Street (Highway 183)	Active – Soil and groundwater remediation in progress

NOTE: Map ID numbers keyed to Figures 4.7-1 and 4.7-2.

SOURCES: Ahtna, 2016a, 2016b, 2016c; FORA, 2015; FORA, 2016a, 2016b; FOSET, 2007; LFR et al, 2008, 2011; Regenesis, 2016; RMC Geoscience, 2016; RRM, 2016; RWQCB, 2016; U.S. Army, 1997, 2012; USEPA, 2016; West, 2007

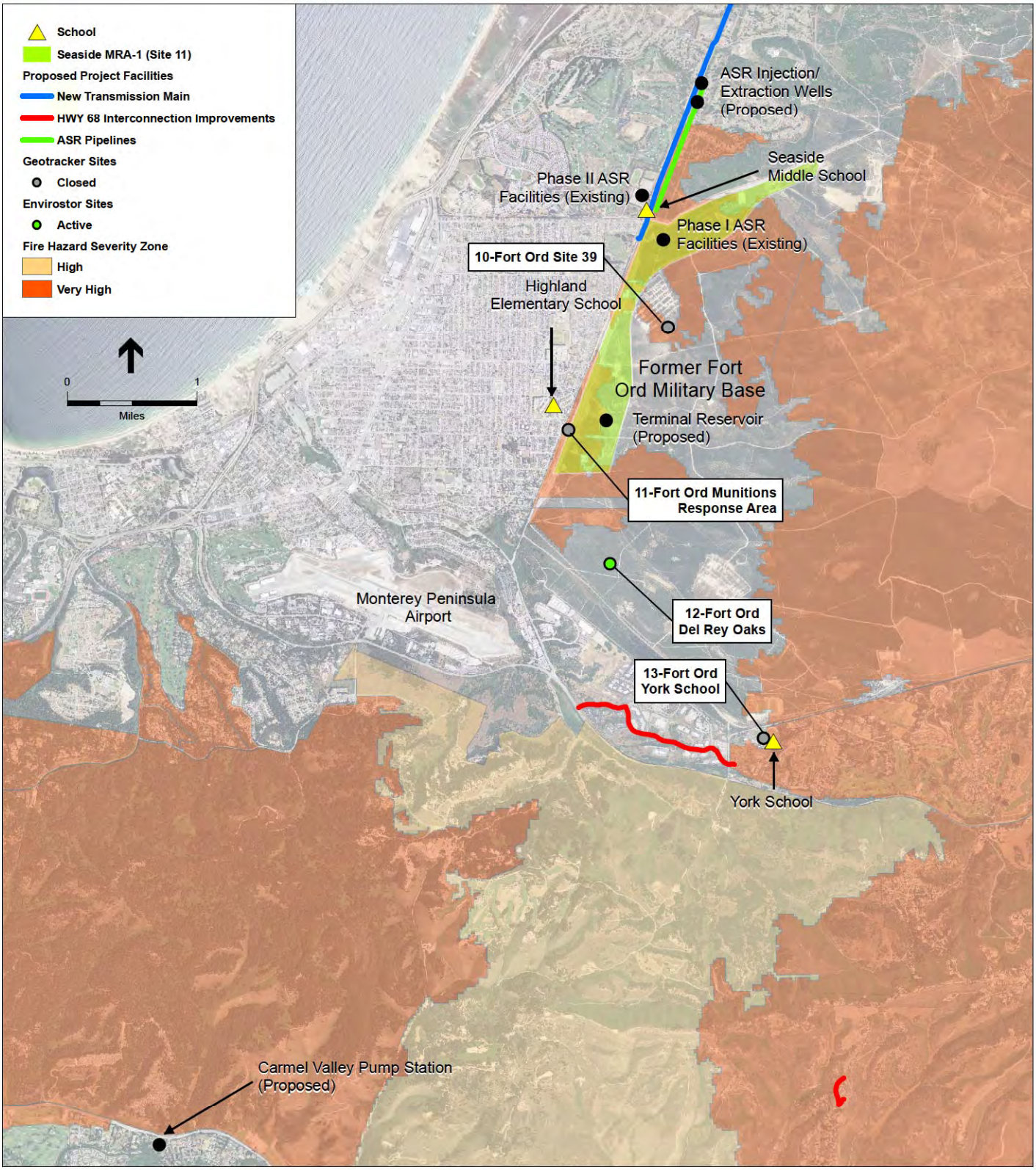


SOURCE: ESRI, 2007; RMC Geoscience, 2016; RWQCB, 2016; Regenesis, 2016; Ahtna, 2016a, 2016b, 2016c; West, 2007; FORA, 2016b

205335.01 Monterey Peninsula Water Supply Project

Figure 4.7-1

Environmental Cases Near Project Components - Northern Portion



SOURCE: CAL FIRE, 2007; CAL FIRE 2008; DTSC, 2016; ESRI, 2013; USEPA, 2016; FORA, 2015; U.S. Army, 1997; Arcadis, 2016; Leidos, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.7-2

Environmental Cases Near Project Components - Southern Portion

Sites associated with past hazardous materials use and environmental cases identified during the regulatory agency database review that are considered to have a high potential to impact soil and/or groundwater in the project area based on remedial investigation findings, proximity to individual project component sites, and/or groundwater gradient (i.e., the site is upgradient from the project area with respect to the direction of groundwater flow) are discussed below with Map ID numbers keyed to Table 4.7-1, and Figures 4.7-1 and 4.7-2.

Monterey Peninsula Class III Landfill

Non-hazardous waste has been deposited since 1966 in both unlined and lined areas of the Monterey Peninsula Class III Landfill (**Map ID 1**) (RMC Geoscience, 2016). On-going monitoring includes groundwater, surface water, leachate, and landfill gas. Groundwater flow in the -2-Foot Aquifer is generally from the Salinas River toward the landfill (southwesterly), although flow direction reversals have occurred. The flow direction in the perched 35-Foot Aquifer generally flows to the northeast and produces a series of intermittent springs and seeps along the bluff face along the northeast side of the landfill. This water is managed using a series of subdrains and surface drains that discharge or drain to a storm water percolation pond. Trace detections of volatile organic compounds (VOCs) are occasionally detected in groundwater within the interior of the landfill but not at the perimeter detection monitoring wells.

Former Don's One Hour Dry Cleaners

Don's One Hour Dry Cleaners is a former dry cleaning operation that is undergoing remediation for dry cleaning solvents released to groundwater beneath the site (**Map ID 2**) (Regenesis, 2016). Groundwater was treated with a proprietary compound injected into groundwater to remediate perchlorothene (aka tetrachloroethene; PCE) and its degradation daughter products (trichloroethene, 1,2-dichloroethene, vinyl chloride). Injections of proprietary compounds to treat dry cleaning solvents is a common method accepted by regulatory agencies. Post-treatment monitoring indicates that only vinyl chloride is still present at a low concentration in one onsite well. Regenesis has proposed to conduct a follow-up injection to complete the site remediation.

Fort Ord Military Base Seaside Munitions Response Area Including Site 39 Inland Ranges and Former Fort Ord York School

From 1917 until its deactivation in 1994, the Fort Ord military base served as a training and staging facility for United States Army (U.S. Army) infantry troops. Industrial chemicals, and munitions and explosives of concern (MECs) have been detected in soil and groundwater at numerous locations across the former base. In 1990, the United States Environmental Protection Agency (USEPA) placed the military base on the National Priorities List, indicating that the Superfund cleanup process would be applied to the site. This action was taken primarily due to the presence of unexploded ordnance (UXO) on the surface and subsurface of the property (USEPA, 2016).

Investigations regarding the locations of MEC were initiated by the U.S. Army in 1993. These investigations resulted in the delineation of Munitions Response Areas (MRAs) that include approximately 12,000 acres of the former Fort Ord military base (U.S. Army, 2012). Smaller units, known as Munitions Response Sites (MRS), are defined within the MRA. Cleanup at the

former Fort Ord military base is the responsibility of the U.S. Army, which is conducting ordnance cleanup for 8,000 acres. The U.S. Army has also entered into an Environmental Services Cooperative Agreement (ESCA) with the Fort Ord Reuse Authority (FORA) for MEC remediation and transfer of the remaining 3,340 acres (USEPA, 2016; FORA, 2015). These 3,340 acres, referred to as the Seaside MRA, will be available for redevelopment under a redevelopment plan adopted by FORA once remediation is complete. The Terminal Reservoir, and its inlet and outlet pipelines are proposed within the Seaside MRA (**Map ID 11** on **Figure 4.7-2**), specifically within the Munitions Response Site 1 (MRS-15 SEA 01), which is adjacent to and extends east of General Jim Moore Boulevard. The southernmost end of the new Transmission Main at Eucalyptus Boulevard and the Terminal Reservoir is within MRS-15 SEA 03; most of the alignments, the proposed ASR Pipelines, and the ASR-5 and ASR-6 Wells are not within delineated MRSs. The Inland Ranges (Site 39; **Map ID 10**) and the Del Rey Oaks site (**Map ID 12**) are located further inland and further away from all project components.

Beginning in 1997, the U.S. Army performed sampling and removal investigations on the four Seaside MRSs (MRS-15 SEA 01 through 04). During these investigations, 4,900 MEC items, 50,000 pounds of munitions debris, and 115,000 pounds of Army cultural debris were identified and removed from the MRSs (FORA, 2015). As of 2015, the MEC remediation field activities have been completed and the regulatory agencies have agreed that remediation is complete. Phase II investigations in the Seaside MRA took place initially for the roadway alignment and utility corridor along General Jim Moore Boulevard (LFR et al, 2008) and then subsequently for the areas outside the roadway alignment and utility corridor (LFR et al, 2011). Together, these actions resulted in removal of detected MEC to a depth of 4 feet, except in a few areas where anomalies were left in place because they were likely the result of existing infrastructure (e.g., transmission towers, culverts, fence posts, monitoring wells), and completed the Phase II removal action for the Seaside MRA (LFR et al, 2011). Specifically, MEC was removed from three locations to a depth of 4 feet within the areas of the proposed Terminal Reservoir.

The Findings of Suitability for Early Transfer (FOSET) agreement (FOSET, 2007) was established to restrict the use of the Seaside MRS parcels for any purposes other than investigation and remediation of MEC and installation of utilities (including water supply infrastructure) until site remediation activities were deemed complete by the responsible agencies. FORA will retain ownership of the Seaside MRS parcels until remediation is complete and the parcels are transferred to the City of Seaside. As of 2016, the remediation has been deemed complete and the parcels are ready for transfer. Documentation of the remediation activities and transfer of the property is anticipated to be complete by 2019 (FORA, 2016a). Until then, all ground-disturbing activity in this area requires a Right of Entry agreement with FORA and compliance with the Ordnance Remediation District Regulations of the City of Seaside.

The former Fort Ord York School also is within an inland range area that was investigated for the presence of MECs (U.S. Army, 1997). The Wilson Road portion of the Ryan Ranch Bishop Interconnection Improvements extends into this former range area (**Map ID 13**). Investigations of this local area did not identify any MECs and the property was cleared for transfer to the County of Monterey.

Former Fort Ord Groundwater Contamination Sites

In addition to hazards related to UXO and military munitions, groundwater in the aquifers located beneath the former Fort Ord military base is contaminated with volatile organic compounds (VOCs), mostly trichloroethene (TCE) and carbon tetrachloride (CT). Investigation and remediation of these contaminant plumes have been organized into operable units (OUs), as discussed below. These plumes have undergone investigation, source removal, and remedial action, including continued operation of groundwater treatment systems. The groundwater contamination plumes currently above action levels, and undergoing investigation and remediation are shown on **Figure 4.7-1**. The status of each plume is summarized below.

- **Fort Ord OU1 (Fritzsche Army Airfield Fire Drill Area; Onsite and Offsite Plumes) (Map ID 3):** The Fire Drill Area was established in 1962 as a training area for the Fort Ord Fire Department. This area consisted of an unlined burn pit, a drum loading area, a storage tank, and underground piping that connected the storage tank to a discharge nozzle. During training exercises, fuel was pumped into the burn pit, ignited, and then extinguished. Training activities ceased in 1985. These training activities are believed to have resulted in the release of contaminants to soil and groundwater. This site previously had VOCs in groundwater consisting mostly of TCE, perfluorooctanoic acid, and perfluorooctane sulfonate (RWQCB, 2016). The site has been remediated and chemical concentrations are below action levels. The site is awaiting documentation of formal closure.

- **Fort Ord OUCTP (Map ID 4):** The status of the OUCTP plume is documented in the *Fourth Quarter 2014 through Third Quarter 2015 Groundwater Monitoring Report* (Ahtna, 2016a). Carbon tetrachloride was apparently disposed of at a location near what is now Lexington Court (within the former Fort Ord) possibly sometime in the 1950s as part of various training and maintenance activities where carbon tetrachloride and other solvents were used. Carbon tetrachloride and other VOCs to a lesser extent entered the underlying A-Aquifer and migrated north along the western edge of a groundwater divide, then west-northwest parallel to Reservation Road. The A-Aquifer is being treated using enhanced in situ bioremediation, followed by monitored natural attenuation. This method involves enhancing naturally-occurring microbes to metabolize (break down) the contaminants to non-toxic compounds and does not require the extraction of groundwater.

  The carbon tetrachloride plume migrated downward into the Upper 180-Foot Aquifer through two known vertical conduits in the Fort Ord-Salinas Valley Aquitard (FO-SVA), creating two distinct parallel plumes. These vertical conduits (monitoring wells installed with inadequate sanitary seals) were decommissioned in 1999 and 2005. The two parallel plumes commingled and continued to migrate southeastward toward a natural vertical conduit (a discontinuity in the Intermediate 180-Foot Aquitard) south of monitoring well MW-OU2-64-180. Since the decommissioning of the two monitoring wells, carbon tetrachloride concentrations in the southern Upper 180-Foot Aquifer plume have attenuated, and only the northern plume remains. The Upper 180-Foot Aquifer groundwater remedy has been in operation since September 2011 and includes one groundwater extraction well (EW-OU2-09-180) connected to the OU2 groundwater treatment system (GWTS) where extracted groundwater is treated with granular activated carbon (GAC).

  Carbon tetrachloride migrated further downward into the Lower 180-Foot Aquifer likely through the same vertical conduit through which it entered the Upper 180-Foot Aquifer, and also through the natural hole in the 180-Foot Aquitard, creating two distinct plumes: one north and one south of Reservation Road. VOC concentrations associated with OUCTP in the Lower 180-Foot Aquifer south of Reservation Road are commingled with VOC

concentrations associated with the OU2 plume. Monitored natural attenuation was implemented as the groundwater remedy for the Lower 180-Foot Aquifer in March 2011. Additionally, there is a contingency plan for treatment of groundwater (via granular activated carbon or air stripping) extracted from the Lower 180-Foot Aquifer by potable water supply wells at the well-head if chemicals associated with OUCTP are detected in these wells.

- **Fort Ord OU2 and Former Sanitary Landfill (Map IDs 5 and 6):** The status of the OU2 plume is documented in the *Fourth Quarter 2014 through Third Quarter 2015 Groundwater Monitoring and Treatment System Report* (Ahtna, 2016b). The former Fort Ord Landfills were active from 1955 to 1987 and were used for residential and on-base waste disposal typical of municipal landfills during that time. Waste was placed in parallel trenches 10 to 30 feet deep and then covered over with the native dune sand excavated during trenching operations. Detailed disposal records are not available; however, information gathered during field activities and from other sources indicates that household and on-base commercial refuse, dried sewage sludge, construction debris, and small amounts of chemical waste (such as paint, oil, pesticides, electrical equipment, ink, and epoxy adhesive) were placed in the Fort Ord Landfills. These activities led to release of contaminants to the underlying unconfined A-Aquifer. The OU2 plume, primarily consisting of TCE, migrated west to the edge of the FO-SVA where it migrated downward into the Upper 180-Foot Aquifer, then east, and then down into the Lower 180-Foot Aquifer through a natural discontinuity in the intermediate 180-Foot Aquitard. Low concentrations of chemicals associated with OU2 plume co-mingle in the Lower 180-Foot Aquifer with the OUCTP plume, discussed above. The groundwater treatment system consists of a groundwater pump and treatment system with twenty-five extraction wells, two injection wells and two infiltration galleries. Groundwater is treated using granular activated carbon and reinjected or recharged back into the aquifer.

- **Fort Ord Sites 2/12 (Map ID 7)**: The status of the Fort Ord Sites 2/12 plume is documented in *Sites 2 and 12 Fourth Quarter 2014 through Third Quarter 2015 Groundwater Monitoring and Soil Gas Monitoring and Treatment System Report* (Ahtna, 2016c). The groundwater aquifer of interest within Sites 2/12 is the unconfined Upper 180-Foot Aquifer. Depth to groundwater in the Upper 180-Foot Aquifer is between 45 and 260 feet below ground surface (bgs). Groundwater in the Upper 180-Foot Aquifer generally flows southwest. The original source of the chemical plume is assumed to be historical use and improper disposal of solvents in the Site 12 area. The Upper 180-Foot Aquifer chemical plume appears to have originated within Site 12 and was subsequently transported over 3,000 feet to the southwest by groundwater flow, passing beneath Highway 1 and into the Site 2 area. The Sites 2/12 groundwater plume is characterized by the presence of eight VOCs in groundwater at concentrations above their respective action levels: chloroform, 1,2-dichloroethane, 1,1-dichloroethene, cis-1,2-dichloroethene, total 1,3-dichloropropene, PCE, TCE, and vinyl chloride. TCE and PCE concentrations are used to define the extent of the groundwater plume in the Sites 2/12 area. VOCs are also present in soil gas in the vadose zone[4] above the groundwater. Soil gas is being remediated using soil gas extraction and treatment where the soil gas is pumped out of the ground and through granular activated carbon that captures the VOCs. Groundwater is being remediated using groundwater extraction and treatment where groundwater is pumped out of the ground and through granular activated carbon followed by secondary treatment by air stripper, both of which capture the VOCs. The treated water is then recharged back into the aquifer using two injection wells and three infiltration galleries.

[4] The vadose zone is the unsaturated soil zone above the water table. Soil gas is located in the spaces between soil particles.

Fort Ord University Villages

The US Army investigated pre-1978 structures to assess the potential presence of lead in soil from historical use of lead-based paint (West, 2007). The soil investigations revealed the presence of lead from lead-based paint in soil at various locations, including the Fort Ord University Villages, located just east of Highway 1 (**Map ID 8**). Soil with lead-based paint around former buildings was excavated and removed from the portions along Highway 1 where the new Transmission Main pipeline would be located.

Fort Ord Site 11

The USTs at the former Fort Ord fueling station were previously located in the southern portion of the current service station located on the west side of General Jim Moore Boulevard, just north of the northwest corner of General Jim Moore Boulevard and Gigling Road (**Map ID 9**) (FORA, 2016b). The previous USTs were removed and the site remediated prior to 1998. The site was subsequently rebuilt to the current service station configuration.

Former Exxon Service Station

A fuel service station formerly occupied the eastern corner of the intersection of Merritt Street (Highway 183), Haro Street, and the on and off ramps for Highway 156 (**Map ID 14**) (RRM, 2016). The underground storage tanks, contaminated soil, and buildings site have been removed, and the site is being remediated using air sparging and soil vapor extraction. The depth to groundwater ranged from about 24 to 33 feet below ground surface from 2009 to 2016. The Castroville Pipeline Optional Alignment would pass just west of and adjacent to this site.

4.7.1.2 Structural and Building Components

Hazardous materials, such as asbestos, lead, and polychlorinated biphenyls, may occur in older building materials and be released during demolition or renovation of existing facilities. Because the proposed project does not include demolition or renovation of existing facilities, buildings, or structures, hazardous materials in building debris would not be encountered and, therefore, are not discussed in detail in this section.

4.7.1.3 Existing Hazardous Materials Usage

Hazardous materials are currently used at the existing ASR injection/extraction wells (ASR-1, ASR-2, ASR-3, and ASR-4) and existing California American Water Company (CalAm) pump station sites. Operation of the ASR wells involves the storage and use of carbon dioxide, lime, sodium hypochlorite solution (bleach), and other substances required for water treatment. Existing CalAm pump stations are powered by electricity, but may store fuel for backup emergency generators, and minor amounts of solvents and lubricants for maintenance.

4.7.1.4 Nearby Airports

The new Desalinated Water Pipeline would be located 1.7 miles west of the Marina Municipal Airport, which is north of the intersection of Reservation Road and Imjin Road in Marina (see

Figure 4.7-1). The new Transmission Main Pipeline would be located 0.3 miles north of the Monterey Peninsula Airport, which is east of Highway 1 and north of Highway 68 in Del Rey Oaks (see **Figure 4.7-2**).

4.7.1.5 Nearby Schools

Schools are considered sensitive receptors for hazardous materials because children are more susceptible than adults to the effects of hazardous materials. Schools that are located within 0.25 mile of the project are listed in **Table 4.7-2** and shown on **Figures 4.7-1** and **4.7-2**.

TABLE 4.7-2
SCHOOLS IN THE VICINITY OF PROJECT COMPONENTS

Project Component	Schools within 0.25 Mile of Project Components
New Desalinated Water Pipeline	• Olsen Elementary 261 Beach Road, Marina
New Transmission Main	• Marina Del Mar Elementary School 3066 Lake Drive, Marina • Seaside Middle School, 999 Coe Avenue, Seaside
ASR Pipelines	Seaside Middle School, 999 Coe Avenue, Seaside
Ryan Ranch-Bishop Interconnection Improvements	• York School, 9501 York Rd, Monterey
Castroville Pipeline, Source Water Pipeline, and Brine Discharge Pipeline; Main System-Hidden Hills Interconnection Improvements; Carmel Valley Pump Station	None

SOURCE: MPUSD, 2016; NMCUSD, 2016.

4.7.1.6 Wildfire Hazards

California Department of Forestry and Fire Protection (CAL FIRE) maps identify fire hazard severity zones in state and local responsibility areas for fire protection. Portions of the southern project area are situated either within or near a Very High or High Fire Hazard Severity Zone (CAL FIRE, 2007, 2008). Project components located within and near these areas include the new Transmission Main, ASR Pipelines, Terminal Reservoir, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station (see Figure 4.7-2).

4.7.2 Regulatory Framework

This section provides an overview of notable federal, state, and local environmental laws, policies, plans, regulations, and/or guidelines (hereafter referred to generally as "regulatory requirements") relevant to hazards and hazardous materials. A brief summary of each is provided, along with a finding regarding the project's conformity with those regulatory requirements. The conformity findings concern 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 a specific impact topic within EIR/EIS Section 4.7.5, Direct and Indirect Effects of the Proposed Project, where the potential inconsistency is addressed in more detail. Where applicable, the discussion in Section 4.7.5 includes identification of feasible mitigation that would resolve or minimize the potential inconsistency.

4.7.2.1 Federal Regulations

Comprehensive Environmental Response, Compensation, and Liability Act, Superfund Amendments and Reauthorization Act of 1986 (42 USC Section 9601 et seq.)

The Comprehensive Environmental Response, Compensation, and Liability Act, also known as CERCLA, created the federal Superfund program that provides for the response and cleanup of hazardous substances that may endanger public health or the environment. The Superfund Amendments and Reauthorization Act (SARA) amended CERCLA in 1986 to increase state involvement and required Superfund actions to consider state environmental laws and regulations. SARA also established a regulatory program for the Emergency Planning and Community Right-to-Know Act. The applicable part of SARA for the MPWSP is Title III, otherwise known as the Emergency Planning and Community Right-To-Know Act of 1986. Title III requires states to establish a process for developing local chemical emergency preparedness programs and to receive and disseminate information on hazardous substances present at facilities in local communities. The law provides primarily for planning, reporting, and notification concerning hazardous substances. Key provisions require notification when extremely hazardous substances are present above their threshold planning quantities, immediate notification to the local emergency planning committee and the state emergency response commission when a hazardous material is released in excess of its reportable quantity, and that material safety data sheets for all hazardous materials or a list of all hazardous materials be submitted to the state and local emergency planning agencies and local fire department. Contractors during construction activities and Cal-Am during operations would be required to prepare Hazardous Materials Business Plans, as required under the state Hazardous Materials Release Response Plans and Inventory Act, described below, which would make the proposed project consistent with CERCLA as amended by SARA.

Toxic Substances Control Act (15 USC 2605)/Resource Conservation and Recovery Act (42 USC 6901 et seq.)/Hazardous and Solid Waste Act

The federal Toxic Substances Control Act of 1976 and the Resource Conservation and Recovery Act of 1976 authorized the USEPA to regulate the generation, transportation, treatment, storage, and disposal of hazardous waste. The Resource Conservation and Recovery Act was amended in 1984 by the Hazardous and Solid Waste Act, which affirmed and extended the “cradle to grave” system of regulating hazardous wastes. Contractors would be required to comply with state regulations including the Hazardous Materials Release Response Plans and Inventory Act, Unified Hazardous Waste and Hazardous Materials Management Regulatory Program, License to Transport Hazardous Materials, and Hazardous Materials Storage and Handling, which would make the proposed project consistent with the Toxic Substances Control Act.

U.S. Department of Transportation Hazardous Materials Transport Act (49 USC 5101)

The U.S. Department of Transportation, in conjunction with the USEPA, is responsible for enforcement and implementation of federal laws and regulations pertaining to transportation of hazardous materials. The Hazardous Materials Transportation Act of 1974 directs the U.S. Department of Transportation to establish criteria and regulations regarding the safe storage and transportation of hazardous materials. 49 CFR 171–180, regulates the transportation of hazardous materials, types of material defined as hazardous, and the marking of vehicles transporting hazardous materials. Contractors would be required to comply with state regulations including the Hazardous Materials Release Response Plans and Inventory Act, Unified Hazardous Waste and Hazardous Materials Management Regulatory Program, License to Transport Hazardous Materials, and Hazardous Materials Storage and Handling, which would make the proposed project consistent with the U.S. Department of Transportation Hazardous Materials Transport Act.

Occupational Safety and Health Act (29 USC 15)

The Occupational Safety and Health Act of 1970 was passed to address employee safety in the workplace. The Act created the Occupational Safety and Health Administration (OSHA), whose mission is to ensure the safety and health of America's workers by setting and enforcing standards; providing training, outreach, and education; establishing partnerships; and encouraging continual improvement in workplace safety and health. The OSHA staff establishes and enforces protective standards and reaches out to employers and employees through technical assistance and consultation programs. Contractors would be required to comply with California OSHA regulations, described below, which would make the proposed project consistent with the federal OSHA.

4.7.2.2 State Regulations

California Coastal Act

The California Coastal Act (Public Resources Code Section 30000 et seq.) provides for the long-term management of lands within California's coastal zone boundary. Of primary relevance to hazards and hazardous materials is a Coastal Act policy concerning oil and hazardous substance spills. A preliminary assessment of project consistency with this priority is provided here. Final determinations regarding project consistency are reserved for the Coastal Commission. The MPWSP would be required to prepare a Hazardous Materials Business Plan and a Storm Water Pollution Prevention Plan and comply with the California Fire Code, both of which would provide procedures to store hazardous materials and respond to accidents. With implementation of this required plan, the project would be consistent with Coastal Act policy concerning oil and hazardous substance spills.

Safe Drinking Water and Toxics Enforcement Act, Proposition 65 - Health and Safety Code, Section 25249.5 et seq.

This law identifies chemicals that cause cancer and reproductive toxicity, provides information for the public, and prevents discharge of the chemicals into sources of drinking water. Lists of the

chemicals of concern are published and updated periodically. Businesses are required to notify Californians about the chemicals in products they purchase, in the workplace, or that are released to the environment. By providing this information, individuals are able to make informed decisions about protecting themselves from exposure to these chemicals. Contractors would be required to comply with state regulations including the Hazardous Materials Release Response Plans and Inventory Act, Unified Hazardous Waste and Hazardous Materials Management Regulatory Program, and Hazardous Materials Storage and Handling, which would make the proposed project consistent with the state Safe Drinking Water and Toxics Enforcement Act.

Aboveground Petroleum Storage Act - Health and Safety Code, Section 25270

Health and Safety Code Sections 25270 to 25270.13 ensure compliance with the federal Clean Water Act. The law applies to facilities that operate a petroleum aboveground storage tank with a capacity greater than 660 gallons or combined aboveground storage tanks capacity greater than 1,320 gallons or oil-filled equipment where there is a reasonable possibility that the tank(s) or equipment may discharge oil in "harmful quantities" into navigable waters or adjoining shore lands. If a facility falls under these criteria, it must prepare a Spill Prevention Control and Countermeasure Plan which would make the proposed project consistent with the Aboveground Petroleum Storage Act.

Hazardous Materials Release Response Plans and Inventory Act - Health and Safety Code, Section 25500 et seq.

The Hazardous Materials Release Response Plans and Inventory Act of 1985, also known as the Business Plan Act, requires businesses using hazardous materials to prepare a Hazardous Materials Business Plan that describes their facilities, inventories, emergency response plans, and training programs. Business plans contain basic information on the location, type, quantity, and health risks of hazardous materials stored, used, or disposed. This Act and the related regulations in Title 19 of the California Code of Regulations (CCR) Section 2620, et seq., require local governments to regulate local business storage of hazardous materials in excess of certain quantities. The law also requires that entities storing hazardous materials be prepared to respond to releases. Those using and storing hazardous materials are required to submit a Hazardous Materials Business Plan (HMBP) to their local Certified Unified Program Agency (CUPA) and to report releases to their CUPA and the State Office of Emergency Services. The California Office of Emergency Services is responsible for implementing the accident prevention and emergency response programs established under the Act and its implementing regulations. Contractors would be required to prepare and submit Hazardous Materials Business Plans, which would make the proposed project consistent with the Hazardous Materials Release Response Plans and Inventory Act.

Hazardous Waste Control Act – Health and Safety Code, Section 25100 et seq.

The Hazardous Waste Control Act of 1972 created the State hazardous waste management program, which is similar to but more stringent than the federal Resource Conservation and

Recovery Act program. The Act is implemented by regulations contained in Title 26 of the CCR,[5] which describes the following required aspects for the proper management of hazardous waste: identification and classification; generation and transportation; design and permitting of recycling treatment, storage and disposal facilities; operation of facilities and staff training; and closure of facilities and liability requirements. These regulations list more than 800 materials that may be hazardous and establish criteria for identifying, packaging, and disposing of such waste. Under the Hazardous Waste Control Act and its implementing regulations in Title 26, the generator of hazardous waste must complete a manifest that accompanies the waste from generator to transporter to the ultimate disposal location. Copies of the manifest must be filed with the DTSC. Contractors would be required to comply with the Hazardous Waste Control Act, which would make the proposed project consistent.

Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program) – Health and Safety Code Sections 25404 et seq.

This program requires the administrative consolidation of six hazardous materials and waste programs (Program Elements) under one agency, a CUPA. The following Program Elements are consolidated under the Unified Program:

- Hazardous Waste Generator and On-site Hazardous Waste Treatment Programs (a.k.a. Tiered Permitting)
- Aboveground Petroleum Storage Tanks
- Hazardous Materials Release Response Plans and Inventory Program (a.k.a. Hazardous Materials Disclosure or "Community-Right-To-Know")
- California Accidental Release Prevention Program
- UST Program
- Uniform Fire Code Plans and Inventory Requirements

The Unified Program is intended to provide relief to businesses complying with the overlapping and sometimes conflicting requirements of formerly independently managed programs. The Unified Program is implemented at the local government level by CUPAs. Most CUPAs have been established as a function of a local environmental health or fire department. The local CUPA for this project is the Monterey County Environmental Health Division. Some CUPAs have contractual agreements with another local agency, a participating agency, which implements one or more Program Elements in coordination with the CUPA. Contractors would be required to comply with the Unified Hazardous Waste and Hazardous Materials Management Regulatory Program, which would make the proposed project consistent.

[5] Title 26 is a compilation of all environmental and hazardous waste regulations issued by state regulatory agencies published in a single title of the California Administrative Code. These toxics regulations are also found in the original titles assigned to each agency, and are repeated in Title 22 and in Title 23.

California Occupational Safety and Health Act – California Labor Code, Section 6300 et seq.

The California Occupational Safety and Health Act of 1973 addresses California employee working conditions, enables the enforcement of workplace standards, and provides for advancements in the field of occupational health and safety. The Act also created the California Occupational Safety and Health Administration (Cal OSHA), the primary agency responsible for worker safety in the handling and use of chemicals in the workplace. Cal OSHA's standards are generally more stringent than federal regulations. Under the former, the employer is required to monitor worker exposure to listed hazardous substances and notify workers of exposure (8 CCR Sections 337-340). The regulations specify requirements for employee training, availability of safety equipment, accident-prevention programs, and hazardous substance exposure warnings. All contractors are required to comply with Cal OSHA, which would make the proposed project consistent.

License to Transport Hazardous Materials – California Vehicle Code, Section 32000.5 et seq.

A valid Hazardous Materials Transportation License, issued by the California Highway Patrol, is required by the State of California Vehicle Code Section 32000.5 for transportation of hazardous materials shipments for which the display of placards is required by State regulations; or hazardous materials shipments of more than 500 pounds.

Additional requirements on the transportation of explosives, inhalation hazards, and radioactive materials are enforced by the California Highway Patrol under the authority of the State Vehicle Code Sections 32100 – 33002. Transportation of explosives generally requires consistency with additional rules and regulations for routing, safe stopping distances, and inspection stops (Title 14, CCR, Chapter 6, Article 1, Sections 1150-1152.10). Inhalation hazards face similar, more restrictive rules and regulations (Title 13, CCR, Chapter 6, Article 2.5, Sections 1157-1157.8). Contractors that transport hazardous materials are required to acquire the license for and comply with the requirements of the License to Transport Hazardous Materials regulations, which would make the proposed project consistent.

Water Main Separation – California Code of Regulations, Title 22, Section 64572

California Code of Regulations, Title 22, Section 64572 states that new water mains and supply lines shall not be within the same trench as, and must be located least 10 feet horizontally from, any parallel pipeline conveying sewage, secondary-treated recycled water, and hazardous fluids such as fuels, industrial wastes, and wastewater sludge. In addition, new water mains may not be installed within 100 horizontal feet of any sanitary landfill, wastewater disposal pond, or hazardous waste disposal site, or within 25 horizontal fee of the nearest edge of any cesspool, septic tank, sewage leach field, underground hazardous material storage tank, or groundwater recharge site. None of the proposed project's pipelines will be co-located with sewer lines; contractors are required to comply with the water main separation regulations, which would make the proposed project consistent.

Utility Notification Requirements – California Code of Regulations, Title 8, Section 1541

Title 8 CCR Section1541 requires excavators to determine the approximate locations of subsurface installations, such as sewer, telephone, fuel, electric, and water lines (or any other subsurface installations that may reasonably be encountered during excavation work) prior to opening an excavation. The California Government Code (Section 4216 et seq.) requires owners and operators of underground utilities to become members of and participate in a regional notification center. According to Section 4216.1, operators of subsurface installations who are members of, participate in, and share in the costs of a regional notification center, such as Underground Services Alert, are in compliance with this section of the code. Underground Services Alert (known as USA North 811) receives planned excavation reports from public and private excavators and transmits those reports to all participating members of USA North that may have underground facilities at the location of excavation. Members will mark or stake their facilities, provide information, or give clearance to dig (USA North, 2016). Contractors are required to comply with the Utility Notification Requirements, which would make the proposed project consistent.

Prohibited Activities in Forests, Forestry and Range and Forage Lands – California Public Resources Code, Section 4411 et seq.

The California Public Resources Code (PRC) restricts the use of internal combustion engines in forest-, brush-, and grass-covered lands ; specifies requirements for the safe use of gasoline-powered tools in fire hazard areas; and specifies fire suppression equipment that must be provided onsite for various types of work in fire-prone areas. More specifically, the PRC requires the following:

- Earthmoving and portable equipment with internal combustion engines must be equipped with a spark arrestor[6] to reduce the potential for igniting a wildland fire (PRC Section 4442).
- Appropriate fire suppression equipment must be maintained during the highest fire danger period—from April 1 to December 1 (PRC Section 4428).
- On days when a burning permit is required, flammable materials must be removed to a distance of 10 feet from any equipment that could produce a spark, fire, or flame, and the construction contractor must maintain the appropriate fire suppression equipment (PRC Section 4427).
- On days when a burning permit is required, use of portable tools powered by gasoline-fueled internal combustion engines are prohibited within 25 feet of any flammable materials (PRC Section 4431).

Contractors would be required to comply with state restrictions regarding the use of internal combustion engines in forest-, brush-, and grass-covered lands, which would make the proposed project consistent.

[6] A spark arrestor is a device that prohibits exhaust gases from an internal combustion engine from passing through the impeller blades where they could cause a spark. A carbon trap is commonly used to retain carbon particles from the exhaust.

Hazardous Materials Storage and Handling, California Fire Code, California Code of Regulations, Title 24, Part 9, Section 2700 et seq.

The California Fire Code (Chapter 27) includes specific requirements for the safe storage and handling of hazardous materials. These requirements reduce the potential for a release of hazardous materials and for mixing of incompatible chemicals, and specify the following specific design features to reduce the potential for a release of hazardous materials that could affect public health or the environment:

- Separation of incompatible materials with a noncombustible partition, or appropriate distance separation.
- Spill control in all storage, handling, and dispensing areas.
- Separate secondary containment for each chemical storage system. The secondary containment must hold the entire contents of the tank, plus the volume of water needed to supply the fire suppression system for a period of 20 minutes in the event of a catastrophic spill.

The California Fire Code (Chapter 14) also addresses fire safety during construction and demolition and includes requirements for smoking, waste disposal, cutting and welding, fire protection equipment, fire reporting, access for firefighting. Contractors would be required to comply with the Hazardous Materials Storage and Handling regulations, which would make the proposed project consistent.

Screening Levels for Hazardous Materials in Soil or Groundwater

The RWQCB Environmental Screening Levels (ESLs) are guidelines used to evaluate the potential risk associated with chemicals found in soil or groundwater where a release of hazardous materials has occurred. The RWQCB has established ESLs for both residential and commercial/industrial land uses, and for construction workers. Residential screening levels are the most restrictive; soil with chemical concentrations below these levels generally would not require remediation and would be suitable for unrestricted uses if disposed of offsite. Commercial/industrial screening levels are generally less restrictive than residential screening levels because they are based on potential worker exposure to hazardous materials in the soil (and these are generally less than residential exposures). Screening levels for construction workers are also less restrictive than for commercial/industrial workers because construction workers are only exposed to the chemical of concern during the duration of construction, while industrial workers are assumed to be exposed over a working lifetime.

The California Environmental Project Agency (Cal/EPA) has also developed screening levels for human exposure to potentially hazardous chemicals. The California Human Health Screening Levels (CHHSLs) are concentrations of 54 hazardous chemicals in soil or soil gas that Cal/EPA considers to be below thresholds of concern for risks to human health. The CHHSLs can be used to screen sites for potential human health concerns where releases of hazardous chemicals have occurred. The presence of a chemical at concentrations in excess of a CHHSL does not indicate that adverse impacts are occurring or will occur, but suggests that further evaluation is warranted.

The CHHSLs are guidance, and not regulatory cleanup standards. The proposed project could be inconsistent with soil or groundwater screening levels for hazardous materials if the screening levels were not applied during soil excavation activities. This is addressed below in Impact 4.7-2.

4.7.2.3 Local Regulations

Table 4.7-3 describes the regional and local land use plans, policies, and regulations pertaining to hazards and hazardous materials that are relevant to the MPWSP and that were adopted for the purpose of avoiding or mitigating an environmental effect. Also included in Table 4.7-3 is an analysis of project consistency with such plans, policies, and regulations. Where the analysis concludes the proposed project would not conflict with the applicable plan, policy, or regulation, the finding is noted and no further discussion is provided. Where the analysis concludes the proposed project may conflict with the applicable plan, policy, or regulation, the reader is referred to Section 4.7.5, Direct and Indirect Effects of the Proposed Project, for additional discussion. In that subsection, the significance of the potential conflict is evaluated. Where the effect of the potential conflict would be significant, feasible mitigation is identified to resolve or minimize that conflict.

TABLE 4.7-3
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO HAZARDS AND HAZARDOUS MATERIALS

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)	City of Marina Local Coastal Program Land Use Plan	Policies	Subsurface Slant Wells, Source Water Pipeline, New Desalinated Water Pipeline, and New Transmission Main	***Policy 20:*** The policy of the City of Marina shall be: To seek assistance and direction in protecting Marina's beach resources from destruction by oil spills and other hazardous substances.	The intent of this policy is to protect beach resources from the damaging effects of hazardous material releases.	Consistent: The project would be required to prepare a Hazardous Materials Business Plan and comply with the California Fire Code, both of which would provide procedures to store hazardous materials and respond to accidents.
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Community Design and Development	Subsurface Slant Wells, Source Water Pipeline, New Desalinated Water Pipeline, and New Transmission Main	***Policy 4.103:*** To protect the public from heath threats posed by hazardous materials, the following policies shall be adhered to: 1. The City shall support all local, regional and state efforts directed at preventing injuries and avoiding environmental contamination due to the uncontrolled release of hazardous substances. The City shall follow all applicable regulations and procedures related to the use, storage and transportation of toxic, explosive and other hazardous materials to prevent uncontrolled discharges. 2. The City shall require discretionary review and approval of all commercial and industrial uses which will generate more than 27 gallons of hazardous wastes monthly (the limitation imposed by Monterey Regional Waste Management District for non-household hazardous wastes). City approval of these uses shall be contingent upon preparation and approval by the County Health Department of a hazardous-waste-disposal plan for these uses prepared in accordance with the requirements of the Monterey County Health Department. 3. All uses involving the handling of significant amounts of hazardous materials shall be subject to discretionary approval. Hazardous materials management and disposal plans shall be prepared in accordance with the requirements of the Monterey County Health Department for all such projects prior to the granting of any entitlements by the City. The City shall ensure that proposed industrial or commercial projects that will use or generate hazardous materials shall be compatible with surrounding uses as designated by the General Plan. Residential uses and other sensitive uses such as schools shall be adequately buffered from adjoining uses which involve the use or generation of hazardous materials.	This policy is intended to protect the public and the environment from health risks associated with the use, storage, transport, and uncontrolled release of hazardous materials.	Consistent: The project would be required to prepare a Hazardous Materials Business Plan and comply with the California Fire Code, both of which would provide procedures to store hazardous materials and respond to accidents.
City of Marina (coastal zone and inland areas)	Marina Municipal Code	Chapter 15.56 - Digging and Excavation the Former Fort Ord	Subsurface Slant Wells Source Water Pipeline, New Desalinated Water Pipeline, and New Transmission Main	***Chapter 15.56 - Digging and Excavation the Former Fort Ord*** establishes special standards and procedures for digging and excavation on those properties in the former Fort Ord which are suspected of containing ordnance and explosives. This ordinance requires that a permit be obtained from the City for any excavation, digging, development or ground disturbance of any type involving the displacement of ten cubic yards or more of soil. The permit requirements include providing each site worker a copy of the notice; complying with all requirements placed on the property by the Army and DTSC; obtaining ordnance and explosives construction support; ceasing soil disturbance activities upon discovery of suspected ordnance, and reporting of project findings.	This section of municipal code is intended to protect the public, workers, and the environment from uncontrolled detonation of ordnance.	Potentially Inconsistent: Some of the project components would result in excavation in areas within the Former Fort Ord. Although cleanup activities have removed known contamination, previously-unknown contamination may be discovered. This issue is addressed in **Impact 4.7-2**.
City of Marina (coastal zone and inland areas)	Marina Municipal Code	Chapter 8.12 – Hazardous Materials Storage and Registration	Subsurface Slant Wells, Source Water Pipeline, New Desalinated Water Pipeline, and New Transmission Main	***Section 8.12.050: Hazardous materials registration form.*** Any person who owns or operates an establishment that contains at any one time during the year, hazardous materials as defined in Section 8.12.020 shall file a completed hazardous material registration form with the health department within ninety days of the effective date of this chapter (1983).	This policy is intended to protect the public and the environment from health risks associated with uncontrolled releases of hazardous materials.	Consistent: There would be no facilities within the City of Marina that store hazardous materials.
City of Monterey (inland areas)	Monterey City Code	Chapter 13 – Fire Protection	Ryan Ranch-Bishop Interconnection Improvements	***Chapter 13:*** Defines standards for fire protection, hazardous substances clean up, and the establishment of fire hazard severity zones within the City of Monterey. The City of Monterey has adopted the 2013 California Fire Code, with amendments. The Fire Chief may require that fire hydrants be installed on private property if the Chief determines that development of the property creates an additional fire hazard that cannot be adequately served by publicly maintained fire hydrants.	The intent of this city code is to protect the public and the environment from fire hazards and uncontrolled hazardous material releases.	Consistent: As discussed in the Regulatory Framework, the project would be required to prepare a Hazardous Materials Business Plan and comply with the California Fire Code, all of which would provide procedures to store hazardous materials and respond to accidents.
City of Monterey (inland areas)	Monterey City Code	Chapter 9 – Building Regulations	Ryan Ranch-Bishop Interconnection Improvements	***Chapter 9, Article 8:*** Contains digging and excavation standards that apply to land once part of the former Fort Ord, including prohibition of digging, excavation, and development of this land until ordnance or explosive remediation is completed.	This policy is intended to protect the public, workers, and the environment from uncontrolled detonation of ordnance.	Potentially Inconsistent: Some of the project components would result in excavation in areas within the Former Fort Ord. Although cleanup activities have removed known contamination, previously-unknown contamination may be discovered. This issue is addressed in **Impact 4.7-2**.

TABLE 4.7-3 (Continued)
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO HAZARDS AND HAZARDOUS MATERIALS

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 Seaside (coastal zone and inland areas)	Seaside General Plan	Safety	New Transmission Main, ASR Wells, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline, ASR Settling Basin, and Terminal Reservoir	***Policy S-2.2:*** Minimize the risk to community associated with hazardous materials.	The intent of this policy is to protect the public and the environment from health risks associated with hazardous materials.	Consistent: As discussed in the Regulatory Framework, the project would be required to prepare a Hazardous Materials Business Plan and a Storm Water Pollution Prevention Plan, and comply with the California Fire Code, all of which would provide procedures to store hazardous materials and respond to accidents.
City of Seaside (coastal zone and inland areas)	Seaside General Plan	Safety	New Transmission Main, ASR Wells, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline, ASR Settling Basin, and Terminal Reservoir	***Implementation Plan S-2.2.1:*** Hazardous Materials. Minimize public health risk and environmental risks from the use, transport, storage, and disposal of hazardous materials by: ● Cooperating with federal, State, and County agencies to effectively regulate the management of hazardous materials and hazardous waste, especially on the former Fort Ord; ● Cooperating with the County of Monterey to reduce the per capita production of household hazardous waste in accordance with the County Hazardous Waste Management Plan; ● Identifying roadway transportation routes for conveyance of hazardous materials (the City does not exercise jurisdiction over transportation of freight along railroad right-of-way or state highways); ● Implementing a Multihazard Emergency Plan for accidents involving hazardous materials; and ● Cooperating with the Certified Unified Program Agency (CUPA) for Seaside (the County of Monterey, Environmental Health Division) and the Seaside Fire Department to administer Risk Management Plans for businesses within the City.	This plan is intended to protect the public and the environment from health risks associated with the use, storage, transport, and uncontrolled release of hazardous materials.	Consistent: As discussed in the Regulatory Framework, the project would be required to prepare a Hazardous Materials Business Plan and a Storm Water Pollution Prevention Plan, and comply with the California Fire Code, all of which would provide procedures to store hazardous materials and respond to accidents.
City of Seaside (coastal zone and inland areas)	Seaside Municipal Code	Chapter 15.34 - Digging and Excavation the Former Fort Ord	New Transmission Main, ASR Wells, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline, ASR Settling Basin, and Terminal Reservoir	***Chapter 15.34: Digging and Excavation the Former Fort Ord*** contains the "Ordnance Remediation District Regulations of the City" (Ord. 924 (part)) and establishes special standards and procedures for digging and excavation on those properties in the former Fort Ord military base which are suspected of containing ordnance and explosives. This ordinance requires that a permit be obtained from the City for any excavation, digging, development, or ground disturbance of any type involving the displacement of ten cubic yards or more of soil. The permit requirements include providing each site worker a copy of the Ordnance and Explosives Safety Alert; complying with all requirements placed on the property by an agreement between the City, FORA, and DTSC; obtaining ordnance and explosives construction support; ceasing soil disturbance activities upon discovery of suspected ordnance and notifying the Seaside Police department, the Presidio law enforcement, the Army and DTSC; coordinating appropriate response actions with the Army and DTSC; and reporting of project findings.	The intent of this code is to protect the public, workers, and the environment from health risks associated with uncontrolled ordnance detonation.	Potentially Inconsistent: Some of the project components would result in excavation in areas within the Former Fort Ord. Although cleanup activities have removed known contamination, previously-unknown contamination may be discovered. This issue is addressed in **Impact 4.7-2**.
City of Seaside (coastal zone and inland areas)	Seaside Municipal Code	Chapter 8.50 – Hazardous Materials Registration	New Transmission Main, ASR Wells, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline, ASR Settling Basin, and Terminal Reservoir	***Chapter 8.50: Hazardous Materials Registration*** requires that any person who owns or operates an establishment that contains hazardous materials any time during the year file a completed hazardous material registration form with the department of health. This form must be updated annually to ensure that the City has current information regarding hazardous substances and materials being used in the city.	This policy is intended to protect the public and the environment from health risks associated with the use, storage, transport, and uncontrolled release of hazardous materials.	Consistent: As discussed in the Regulatory Framework, the project would be required to prepare a Hazardous Materials Business Plan and a Storm Water Pollution Prevention Plan, and comply with the California Fire Code, all of which would provide procedures to store hazardous materials and respond to accidents.
County of Monterey (coastal zone)	North County Land Use Plan	2.3 Environmentally Sensitive Habitats	Source Water Pipeline and New Desalinated Water Pipeline	***2.3.3.B.8*** Oil and other toxic substances shall not be allowed to enter or drain into the estuarine system. Oil spill and toxic substance discharge contingency plans shall be developed by the appropriate agencies of Monterey County to coordinate emergency procedure for clean-up operations of all foreseeable conditions. New development shall be permitted adjacent to estuarine areas only where such development does not increase the hazard of oil spill or toxic discharge into the estuaries.	This policy is intended to protect estuaries from the unintended release of hazardous substances.	Consistent: As discussed in the Regulatory Framework, the project would be required to prepare a Hazardous Materials Business Plan and a Storm Water Pollution Prevention Plan, and comply with the California Fire Code, all of which would provide procedures to store hazardous materials and respond to accidents.
County of Monterey (coastal zone)	North County Land Use Plan	2.8 Hazards	Source Water Pipeline and New Desalinated Water Pipeline	***2.8.2 (1):*** All development shall be sited and designed to minimize risk from geologic, flood, tsunami or fire hazards to a level generally acceptable to the community. Areas of a parcel which are subject to high hazard(s) shall generally be considered unsuitable for development. Any proposed development in high hazard areas shall require the preparation of an environmental or geotechnical report prior to County review of the project.	This policy is intended to protect the public and property from natural hazards.	Consistent: As discussed in the Regulatory Framework, the project would be required to prepare a Hazardous Materials Business Plan and comply with the California Fire Code, which would provide procedures to store hazardous materials, reduce fire hazards, and respond to accidents. Geologic and flood hazards are addressed in Section 4.2, Geology, Soils, and Seismicity.

TABLE 4.7-3 (Continued)
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO HAZARDS AND HAZARDOUS MATERIALS

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
County of Monterey (coastal zone and inland areas)	Monterey County Code	Chapter 10.65 – Hazardous Materials Registration	Source Water Pipeline, MPWSP Desalination Plant, New Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipelines, Carmel Valley Pump Station Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Chapter 10.65: Hazardous Materials Registration*** requires that any person who owns or operates an establishment that contains hazardous materials at any one time during the year file a completed hazardous materials registration form to the Department of Health. An updated completed hazardous material form must be submitted to the Department of Health annually.	The intent of this policy is to protect the public and the environment from health risks associated with the use, storage, transport, and uncontrolled release of hazardous materials.	Consistent: As discussed in the Regulatory Framework, the project would be required to prepare a Hazardous Materials Business Plan and a Storm Water Pollution Prevention Plan, and comply with the California Fire Code, all of which would provide procedures to store hazardous materials and respond to accidents.
County of Monterey (coastal zone and inland areas)	Monterey County Code	Chapter 10.67 - Hazardous Materials Emergency Response	Source Water Pipeline, MPWSP Desalination Plant, New Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipelines, Carmel Valley Pump Station Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Chapter 10.67: Hazardous Materials Emergency Response*** establishes a surcharge that applies to businesses that use, store, or otherwise handle hazardous materials. The surcharge funds current or future Fire Hazardous Material Emergency Response Teams that would respond to threats to life, property, or natural resources arising from the use, storage, or handling of hazardous materials by these businesses.	This code is intended to protect public health and the environment from risks associated with the uncontrolled release of hazardous materials from businesses that use, store, or handle these substances.	Consistent: As discussed in the Regulatory Framework, the project would be required to prepare a Hazardous Materials Business Plan and a Storm Water Pollution Prevention Plan, and comply with the California Fire Code, all of which would provide procedures to store hazardous materials and respond to accidents.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	MPWSP Desalination Plant Carmel Valley Pump Station	***Policy S-4.11:*** The County shall require all new development to be provided with automatic fire protection systems (such as fire breaks, fire-retardant building materials, automatic fire sprinkler systems, and/or water storage tanks) approved by the fire jurisdiction.	This policy is intended to protect the public and the environment from fire hazards associated with New development.	Consistent: As discussed in the Regulatory Framework, the project would be required to prepare a Hazardous Materials Business Plan and comply with the California Fire Code, which would provide procedures to store hazardous materials, reduce fire hazards, and respond to accidents.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	MPWSP Desalination Plant	***Policy S-4.13:*** The County shall require all new development to have adequate water available for fire suppression. The water system shall comply with Monterey County Code Chapter 18.56, NFPA Standard 1142, or other nationally recognized standard. The fire authority having jurisdiction, the County Departments of Planning and Building Services, and all other regulatory agencies shall determine the adequacy and location of water supply and/or storage to be provided.	The intent of this policy is to ensure that New development would be served by water supplies adequate to protect the public and the environment from fire hazards.	Consistent: As discussed in the Regulatory Framework, the project would be required to prepare a Hazardous Materials Business Plan and comply with the California Fire Code, which would provide procedures to store hazardous materials, reduce fire hazards, and respond to accidents.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, New Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipelines, Carmel Valley Pump Station Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Policy S-4.14:*** Water systems constructed, extended, or modified to serve a new land use or a change in land use or an intensification of land use, shall be designed to meet peak daily demand and recommended fire flow.	This policy is intended to ensure that water utility systems have capacity to protect the public and the environment from fire hazards associated with changes in land use within the County.	Consistent: As described in the Description of the Proposed Project, the purpose of this project is to replace public water supply that would be constrained by the state Cease and Desist Order limitations to the use of Carmel River water.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, New Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipelines, Carmel Valley Pump Station Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Policy S-4.21:*** All permits for residential, commercial, and industrial structural development (not including accessory uses) shall incorporate requirements of the fire authority having jurisdiction.	The intent of this policy is to protect the public and the environment from fire hazards.	Consistent: As discussed in the Regulatory Framework, the project would be required to comply with the California Fire Code.

TABLE 4.7-3 (Continued)
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO HAZARDS AND HAZARDOUS MATERIALS

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
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Source Water Pipeline, MPWSP Desalination Plant, New Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipelines, Carmel Valley Pump Station Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Policy S-4.22:*** Every building, structure, and/or development shall be constructed to meet the minimum requirements specified in the current adopted state building code, state fire code, Monterey County Code Chapter 18.56, and other nationally recognized standards.	This policy is intended to protect the public and the environment from hazards associated with structures, including fire hazards and seismic hazards.	Consistent: As discussed in the Regulatory Framework, the project would be required to comply with the California Fire Code. Compliance with the California Building Code is addressed in Section 4.2, Geology, Soils, and Seismicity.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Carmel Valley Pump Station Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Policy S-4.26*:** When public facilities and above-ground utilities are located in high or very high fire hazard areas, special precautions shall be taken to mitigate the risks from wildfire and to ensure uninterrupted operation.	This policy is intended to protect the public, the environment, and utility systems from wildfire hazards.	Consistent: As discussed in the Regulatory Framework, the project would be required to comply with the California Fire Code, which would reduce fire hazards.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Carmel Valley Pump Station Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Policy S-4.31:*** A zone that can inhibit the spread of wildland fire shall be required of New development in fire hazard areas. Such zones shall consider irrigated greenbelts, streets, and/or Fuel Modification Zones in addition to other suitable methods that may be used to protect development. The County shall not preclude or discourage a landowner from modifying fuel within the Fuel Modification Zone, or accept any open space easement or other easement over land within a Fuel Modification Zone that would have that effect.	The intent of this policy is to protect people and structures from risk of loss, injury, or death associated with wildland fires.	Consistent: As discussed in the Regulatory Framework, the project would be required to comply with the California Fire Code, which would reduce fire hazards.
County of Monterey (coastal zone and inland areas)	Monterey County General Plan	Safety	Carmel Valley Pump Station Main System-Hidden Hills and Ryan Ranch-Bishop Interconnection Improvements	***Policy S-4.32:*** Property owners in high, very high, and extreme fire hazard areas shall prepare an overall Fuel Modification Zone plan in conjunction with permits for new structures, subject to approval and to be performed in conjunction with the CDFFP and/or other fire protection agencies in compliance with State Law.	The intent of this policy is to protect people and structures from risk of loss, injury, or death associated with wildland fires.	Consistent: As discussed in the Regulatory Framework, the project would be required to comply with the California Fire Code, which would reduce fire hazards.
Fort Ord Reuse Authority (Seaside)	Fort Ord Reuse Plan	Safety	New Transmission Main, ASR Conveyance Pipelines, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline, ASR Settling Basin, Terminal Reservoir	***Hazardous and Toxic Materials Safety Policy C-1:*** The City of Seaside shall require hazardous materials management and disposal plans for any future projects involving the use of hazardous materials.	This policy is intended to protect the public and the environment from health risks associated with the use, storage, transport, and uncontrolled release of hazardous materials.	Consistent: As discussed in the Regulatory Framework, the project would be required to prepare a Hazardous Materials Business Plan that would provide procedures to store, manage, and dispose of hazardous materials.
Fort Ord Reuse Authority (Monterey County)	Fort Ord Reuse Plan	Safety	Ryan Ranch–Bishop Interconnection Improvements	***Hazardous and Toxic Materials Safety Policy C-1:*** The County of Monterey shall require hazardous materials management and disposal plans for any future projects involving the use of hazardous materials.	This policy is intended to protect the public and the environment from health risks associated with the use, storage, transport, and uncontrolled release of hazardous materials.	Consistent: As discussed in the Regulatory Framework, the project would be required to prepare a Hazardous Materials Business Plan and a Storm Water Pollution Prevention Plan, and comply with the California Fire Code, all of which would provide procedures to store hazardous materials and respond to accidents.

SOURCES: City of Marina, 2006, 2013; City of Seaside, 2004; FORA, 1997; Monterey County, 1999, 2010

4.7.3 Evaluation Criteria

Implementation of the proposed project would have a significant impact related to hazards and hazardous materials if it would:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school;
- Be located on a site, which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment;
- Be located within an area covered by an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, and would result in a safety hazard for people residing or working in the project area;
- Be located within the vicinity of a private airstrip and would result in a safety hazard for people residing or working in the project area;
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; or
- Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

Based on the nature of the proposed project, there would be no impacts related to the following criteria for the reasons described below:

- ***Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school during operations.*** The project components that would be located within 0.25 mile of a school would be underground pipelines. There would be no storage or use of hazardous materials associated with the pipelines; therefore, no release of hazardous emissions would occur within 0.25 mile of a school during operations.
- ***Be located within the vicinity of a private airstrip and result in a safety hazard for people residing or working in the project area.*** The proposed project would not be located within the vicinity of a private airstrip; therefore, no safety hazard would result from project implementation.
- ***Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.*** The Monterey County Emergency Operations Plan provides an overview of agency roles and responsibilities during emergencies (Monterey County Office of Emergency Services, 2011). The proposed project would not interfere with the designated agency responsibilities and reporting in the event of an emergency because no roads would be completely closed, and some work activities would not occur on public roads.

- ***Increase risk of wildland fire during operations.*** Operation of the proposed project would not introduce potentially flammable activities in fire-prone areas. Project components that would be located within high fire hazard areas consist of underground water pipelines. Operation of the Carmel Valley Pump Station, which is located just south of an area of high fire hazard, could require temporary and intermittent use of a diesel-powered generator that would be stored onsite. This backup generator would be installed in accordance with applicable NFPA standards and other requirements for generators, and its operation would not be expected to increase wildfire risk. Accordingly, there would be no increased risk of wildland fire hazards.

4.7.4 Approach to Analysis

Hazards and hazardous materials information for the project area was derived from various sources and compiled in this chapter to develop a comprehensive understanding of the potential constraints and hazards associated with project construction and operations. Information sources include findings resulting from regulatory agency database searches, review of hazardous materials investigation reports, site reconnaissance, applicable regulations and guidelines, and proposed project construction and operations. Significant impacts would occur if the location or activities of project components resulted in conflicts with known hazardous materials sites.

As described in more detail below, the analysis of hazards and hazardous materials impacts in this section takes into account the various existing federal, state, and local regulations that apply to hazards and hazardous materials. Through compliance with the existing regulations, CalAm would be required to use, transport, store, and dispose of hazardous materials using procedures that would avoid hazards or reduce the potential for hazardous materials incidents.

4.7.5 Direct and Indirect Effects of the Proposed Project

Table 4.7-4 summarizes the proposed project's impacts and significance determinations related to hazards and hazardous materials.

TABLE 4.7-4
SUMMARY OF IMPACTS – HAZARDS AND HAZARDOUS MATERIALS

Impacts	Significance Determinations
Impact 4.7-1: Use of hazardous materials during construction.	LS
Impact 4.7-2: Encountering hazardous materials during construction.	LSM
Impact 4.7-3: Location on a known hazardous materials site.	LS
Impact 4.7-4: Hazardous materials within 0.25 mile of schools during construction.	LS
Impact 4.7-5: Wildland fires during construction.	LS
Impact 4.7-6: Use of hazardous materials during project operations.	LS
Impact 4.7-C: Cumulative impacts related to hazards and hazardous materials.	LSM

NOTES:
LS = Less than Significant impact, no mitigation proposed
LSM = Less than Significant impact with Mitigation

4.7.5.1 Construction Impacts

Impact 4.7-1: Create a significant hazard to the public or the environment through the routine transport, use, disposal, or accidental release of hazardous materials during construction. (Less than Significant)

All Project Components

Petroleum products, such as gasoline, diesel fuel, lubricants, and cleaning solvents would be utilized to fuel and maintain construction vehicles and equipment for all project components. As discussed in Section 3.3.2.1, the proposed slant wells would be drilled using mud rotary drilling techniques. Drilling fluids, such as bentonite mud, would be used to drill through the shallow dry dune sands to prevent loose dry sand from locking up the drill bit inside the conductor casing. Once the drill bit reaches groundwater, the construction contractor would pump out all of the sand-bentonite mud slurry and put it in a storage container for offsite hauling and disposal. Below the top of the groundwater table, only the water already present in the sand, and possibly additional potable water, would be used to circulate the drill cuttings. As discussed in Section 3.3.2.2, Wells ASR-5 and ASR-6 would be installed using a reverse rotary drilling technique. Bentonite drilling fluids would not be used during ASR well drilling; however, non-corrosive, environmentally inert, biodegradable additives might be used to keep the borehole open, as discussed in Section 4.4, Groundwater Resources. The well drilling methods would not use pressurized drilling techniques, and frac-out events are not anticipated. The routine use or reasonably foreseeable upset and accident conditions could result in inadvertent releases of small quantities of hazardous materials, which could adversely affect construction workers, soil, and surface water. Neither of the drilling methods would use fracking techniques or the chemicals used in fracking.[7]

Construction activities are required to comply with numerous hazardous materials and stormwater regulations designed to ensure that hazardous materials are transported, used, stored, and disposed of in a safe manner to protect worker safety, and to reduce the potential for a release of construction-related fuels or other hazardous materials to affect stormwater and downstream receiving water bodies (see Section 4.7.2, Regulatory Framework). The HMBP would require that hazardous materials used for construction are stored in appropriate containers, with secondary containment to contain a potential release. The California Fire Code would require measures for the safe storage and handling of hazardous materials. As discussed in Section 4.3, Surface Water Hydrology and Water Quality, the construction contractor would be required to prepare a Stormwater Pollution Prevention Plan (SWPPP) for construction activities according to the National Pollutant Discharge Elimination System (NPDES) General Construction Permit requirements. The SWPPP would list the hazardous materials (including petroleum products) proposed for use during construction and describe spill prevention measures, equipment inspections, equipment and fuel storage, and protocols for responding immediately to spills. In addition, the drilling operations would not be conducted using pressure methods and would only use water or non-corrosive, environmentally inert, biodegradable additives.

[7] Hydraulic fracturing (also fracking, hydrofracturing or hydrofracking) is a well-stimulation technique in which rock is fractured by a pressurized liquid.

Impact Conclusion

Through compliance with applicable hazardous materials storage, disposal, and stormwater permitting regulations, hazardous materials impacts associated with potential releases from the routine transport, use, or disposal of hazardous materials or the accidental release of hazardous materials during construction would be less than significant for all project components.

Mitigation Measures

None proposed.

Impact 4.7-2: Encountering hazardous materials from other hazardous materials release sites during construction. (Less than Significant with Mitigation)

All Pipelines and Conveyance Facilities, and Terminal Reservoir

The proposed project involves excavation, trenching, and grading for the construction of water conveyance pipelines, building footings, and utilities. As identified in **Table 4.7-1**, some sites with known soil and/or groundwater contamination are located within 0.25 mile of project facilities and may have affected subsurface conditions at various locations along the project area. In addition, although previous site cleanup activities have remediated known contamination at some sites, it is still possible that undiscovered contamination may be present, given the land use history in the project area. The contaminants anticipated to be encountered during project construction activities include petroleum hydrocarbons, VOCs, PAHs, and metals from gasoline service stations, and dry cleaners. Construction activities conducted within the former Fort Ord military base, a National Priorities List site, could result in exposure to UXO, which is discussed separately under Impact 4.7-3, below. Soil disturbance during construction could further disperse existing contamination into the environment and expose construction workers and the public to contaminants. If substantial hazardous materials are present in excavated soils, health and safety risks to workers and the public could occur. Such risks could occur from stockpiling, handling, or transportation of soils that have been contaminated by hazardous materials from previous spills or leaks. The dewatering of contaminated groundwater could also present risks to public health and safety, and the environment, if the contaminated groundwater (i.e., dewatering effluent) is not handled properly. The potential for contaminated soil and groundwater to be released into the environment during project construction would be considered a significant impact.

Impacts resulting from the potential release of or exposure to hazardous materials in soil or groundwater would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.7-2a (Health and Safety Plan)** and **4.7-2b (Soil and Groundwater Management Plan)**. **Mitigation Measure 4.7-2a** would require that construction contractors prepare a health and safety plan in accordance with Cal OSHA regulations. The plan would specify personal protective equipment for workers, outline construction measures to reduce the potential for workers' exposures to hazardous materials in soil and groundwater, and describe procedures for handling accidental hazardous materials releases and unanticipated contamination. **Mitigation Measure 4.7-2b** requires construction contractors to comply with all relevant environmental

regulations and plan appropriately for the safe and lawful handling and disposal of excavated soil and groundwater, when encountered. With implementation of **Mitigation Measures 4.7-2a** and **4.7-2b**, the potential for harmful exposure to hazardous materials present in soil or groundwater during pipeline and other conveyance facility construction would be reduced to a less-than-significant level.

All Other Project Components

Although hazardous materials sites are not currently identified in proximity to other proposed project components, newly discovered sites may arise prior to the time of construction that could affect subsurface conditions in the project area. Encountering unanticipated soil or groundwater contamination could result in potential exposures to construction workers, the public, or the environment, resulting in a significant impact. However, this impact would be reduced to a less-than-significant level with implementation of **Mitigation Measures 4.7-2a** and **4.7-2b**.

Consistency with Plans & Policies

As discussed above, the construction of the project has the potential to discover previously unknown contamination from previous land uses. This would be inconsistent with the City of Marina's Chapter 15.56; and the City of Monterey's Chapter 9, Article 8, as discussed above in Table 4.7-3. The construction of the project would be made consistent with the implementation of **Mitigation Measures 4.7-2a** and **4.7-2b**, and through compliance with applicable hazardous materials laws and regulations.

Impact Conclusion

There is a potential to encounter contaminated soil and/or groundwater during construction of all proposed project components. Thus, the potential for contaminated soil and groundwater to be released into the environment during project construction is considered a significant impact for all project components. However, with implementation of **Mitigation Measures 4.7-2a (Health and Safety Plan)** and **4.7-2b (Soil and Groundwater Management Plan)**, and through compliance with applicable hazardous materials laws and regulations, the potential for exposure to hazardous materials in soil and groundwater during construction would be reduced to a less-than-significant level and the MPWSP would be brought into conformance with the above-noted policies.

Mitigation Measures

Mitigation Measure 4.7-2a applies to all project components.

> **Mitigation Measure 4.7-2a: Health and Safety Plan.**
>
> The construction contractor(s) shall prepare and implement a site-specific Health and Safety Plan as required by and in accordance with 29 CFR 1910.120 to protect construction workers and the public during all excavation and grading activities. This plan shall be submitted to the California Public Utilities Commission for review prior to commencement of construction. The Health and Safety Plan shall include, but is not limited to, the following elements:

- Designation of a trained, experienced site safety and health supervisor who has the responsibility and authority to develop and implement the site health and safety plan;
- A summary of all potential risks to construction workers and maximum exposure limits for all known and reasonably foreseeable site chemicals;
- Specified personal protective equipment and decontamination procedures, if needed;
- Emergency procedures, including route to the nearest hospital; and
- Procedures to be followed in the event that evidence of potential soil or groundwater contamination (such as soil staining, noxious odors, debris or buried storage containers) is encountered. These procedures shall be in accordance with hazardous waste operations regulations and specifically include, but are not limited to, the following: immediately stopping work in the vicinity of the unknown hazardous materials release, notifying Monterey County Department of Environmental Health, and retaining a qualified environmental firm to perform sampling and remediation.

Mitigation Measure 4.7-2b applies to all project components except the slant wells.

Mitigation Measure 4.7-2b: Soil and Groundwater Management Plan.

In support of the Health and Safety Plan described above, CalAm or its contractor shall develop and implement a Soil and Groundwater Management Plan that includes a materials disposal plan specifying how the construction contractor will remove, handle, transport, and dispose of all excavated material in a safe, appropriate, and lawful manner. The plan must identify protocols for soil testing and disposal, identify the approved disposal site, and include written documentation that the disposal site will accept the waste. Contract specifications shall mandate full compliance with all applicable local, state, and federal regulations related to the identification, transportation, and disposal of hazardous materials, including those encountered in excavated soil or dewatering effluent.

As part of the Soil and Groundwater Management Plan, CalAm or its contractor shall develop a groundwater dewatering control and disposal plan specifying how contaminated groundwater (dewatering effluent), if encountered, will be handled and disposed of in a safe, appropriate and lawful manner. The plan must identify the locations at which groundwater dewatering is likely to be required, the method to analyze groundwater for hazardous materials, and the appropriate treatment and/or disposal methods. If the dewatering effluent contains contaminants that exceed the requirements of the *General WDRs for Discharges with a Low Threat to Water Quality* (Order No. R3-2011-0223, NPDES Permit No. CAG993001), the construction contractor shall contain the dewatering effluent in a portable holding tank for appropriate offsite disposal or discharge (see Section 4.5.3 in Section 4.3, Surface Water Hydrology and Water Quality, for more information regarding this NPDES permit). The contractor can either dispose of the contaminated effluent at a permitted waste management facility or discharge the effluent, under permit, to a publicly owned treatment works such as the MRWPCA Regional Wastewater Treatment Plant. This plan shall be submitted to the California Public Utilities Commission and Monterey Bay National Marine Sanctuary for review and approval prior to commencement of construction.

Impact 4.7-3: Project facilities would be located on a known hazardous materials site. (Less than Significant)

Portions of New Transmission Main and Terminal Reservoir

As discussed above in Section 4.7.1.1, Soil and Groundwater Conditions, the Terminal Reservoir (above and below ground options) and portions of the new Transmission Main and ASR Pipelines would be located in the former Fort Ord Seaside MRA. This is a known former hazardous materials site and is identified on the National Priorities List. Construction activities within this area have the potential to encounter undiscovered UXO, which, if not identified and properly handled, could cause injury to or death of construction workers or result in wildfire.

As discussed in the setting section, above, the investigations and remedial actions conducted for the Seaside MRSs are largely complete within the footprint of the project components. However, cleanup activities are ongoing and specific regulations still apply to any ground-disturbing activities within these areas, including the City of Seaside's Ordnance Remediation District regulations and the environmental protection provisions of the FOSET agreement. Prior to any construction, the applicant or its contractor would need to obtain a Right of Entry agreement from FORA (or the future property owner) and obtain a permit for digging and excavation from the City of Seaside. As part of the permit application, CalAm or its contractors would be required to provide proposed project plans, a technical summary of ordnance removal activities performed on the property in the past, a soils management plan, a UXO support workplan, an oversight reimbursement agreement, and confirmation of DTSC approval. Compliance with the City of Seaside digging and excavation permit and FORA Right of Entry requirements would ensure that all personnel authorized to access the former Fort Ord Seaside MRAs receive MEC recognition training, coordinate with a qualified Ordnance and Explosive Safety Specialist during all activities on the site, and comply with all requirements placed on the property by an agreement between the City of Seaside, FORA, and DTSC. All permits require ceasing soil disturbance activities and notification to the Seaside Police Department, the Presidio law enforcement, the U.S. Army, and DTSC of any suspected UXO immediately upon discovery. Compliance with the foregoing regulations for construction work at the former Fort Ord military base would ensure the potential impact of encountering UXO during project construction would be less than significant.

All Other Project Components

None of the other project components would be located on known hazardous materials sites. Therefore, no impact associated with the siting of these facilities on a known hazardous materials site would occur. The potential for contaminated soil or groundwater from nearby hazardous materials sites to migrate into the project area and then be encountered during project construction is addressed above under Impact 4.7-2.

Impact Conclusion

The proposed Terminal Reservoir and portions of New Transmission Main would be located on a known hazardous materials site. However, with compliance with the above-described regulations, the project would ensure the impact is less than significant. None of the other project components are located within a known hazardous materials site.

Mitigation Measures

None proposed.

Impact 4.7-4: Handle hazardous materials or emit hazardous emissions within 0.25 mile of a school during construction. (Less than Significant)

New Desalinated Water Pipeline, new Transmission Main, ASR Pipelines, and Ryan Ranch-Bishop Interconnection Improvements

These project components would be located within 0.25 mile of a school. As discussed above under Impact 4.7-1, project construction could require the use of small quantities of fuel, lubricants, paints, and solvents.

The hazardous materials storage and stormwater permitting requirements discussed under Impact 4.7-1, above, impose performance standards on the construction activities that would ensure the risk of release of hazardous materials during construction would be low. Therefore, the potential for a hazardous materials release during construction to result in increased exposure to hazardous materials at the nearby schools (see Figure 4.7-1 and 4.7-2) is remote; therefore, this impact is less than significant.

Hazardous air emissions are toxic air contaminants identified by the California Air Resources Board. Construction would result in the short-term emissions of diesel particulate matter (DPM), a toxic air contaminant, within 0.25 mile of schools. However, based on a screening-level analysis discussed in Section 4.10, Air Quality, DPM emissions would be less than the Monterey Bay Unified Air Pollution Control District's increased cancer risk threshold. Thus, this would be a less-than-significant impact.

All Other Project Components

None of the other proposed project components are located within 0.25-mile of a school. No impact would result.

Impact Conclusion

The new Desalinated Water Pipeline, new Transmission Main, ASR Pipelines, and Ryan Ranch-Bishop Interconnection Improvements Pipeline would result in a less-than-significant impact from the handling of hazardous materials within 0.25 mile of schools during construction.

Mitigation Measures

None proposed.

Impact 4.7-5: Increased risk of wildland fires during construction. (Less than Significant)

New Transmission Main, ASR Pipelines, Terminal Reservoir, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station

As illustrated in **Figure 4.7-2**, the new Transmission Main, ASR Pipelines, Terminal Reservoir, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and Carmel Valley Pump Station are proposed in or near areas classified by CAL FIRE as High or Very High Fire Hazard Severity Zones.

California regulations governing the use of construction equipment in fire prone areas are designed to minimize the risk of wildland fires during construction activity (e.g., PRC Sections 4411 et seq.). These regulations restrict the use of equipment that may produce a spark, flame, or fire; require the use of spark arrestors on construction equipment that has an internal combustion engine; specify requirements for the safe use of gasoline-powered tools in fire hazard areas; and specify fire suppression equipment that must be provided onsite for various types of work in fire prone areas. In addition, the California Fire Code addresses the fire safety of general construction operations. The construction contractor must comply with these regulations and any additional requirements imposed by CAL FIRE or the local fire protection departments. With compliance, the impact associated with an increased risk of wildland fires during construction of the Highway 68 interconnection improvements and the Carmel Valley Pump Station would be less than significant.

Further, as noted above under Impact 4.7-3, the Terminal Reservoir and portions of the New Transmission Main and ASR Pipelines are located in an area with the potential for undiscovered UXO. This area is also a Very High Fire Hazard Severity Zone as shown on Figure 4.7-2. Explosions of ordnance could result in wildfires that could be severe. As described under Impact 4.7-3, compliance with permit requirements from the City of Seaside would ensure that if UXO is encountered, it is safely handled, reducing the risk of wildfire caused by accidental detonation of UXO to a level that is less than significant.

All Other Proposed Facilities

None of the other project facilities are located within or near an area classified by CAL FIRE as a High or Very High Fire Hazard Severity Zone; however, construction activities could temporarily increase fire risk. With compliance with California Fire Code regulations for construction, the potential impact associated with an increased risk of fire during construction of all other project components would be less than significant.

Impact Conclusion

The proposed project would result in a less-than-significant impact from potential increased fire risk during construction.

Mitigation Measures

None proposed.

4.7.5.2 Operational and Facility Siting Impacts

Impact 4.7-6: Create a significant hazard to the public or the environment through the routine transport, use, disposal, or accidental release of hazardous materials during project operations. (Less than Significant)

Project components that would involve the storage and use of hazardous materials are discussed below.

Subsurface Slant Wells

Periodic maintenance of the subsurface slant wells would be required every 5 years. Maintenance workers would lower mechanical brushes into the slant wells to mechanically clean the screens. If chemical cleaning products are needed for maintenance, only environmentally inert products would be used.

Access to and the use of cleaning equipment for well maintenance would require the use of the same types of vehicles and equipment used during construction. Similar to construction, petroleum products, such as gasoline, diesel fuel, lubricants, and cleaning solvents could be utilized to fuel and maintain maintenance vehicles and equipment. The routine use or reasonably foreseeable upset and accident conditions could result in inadvertent releases of small quantities of these hazardous materials into soil and surface water. However, compliance with the various regulations regarding the safe transport, use, and storage of hazardous materials (see Section 4.7.2, Regulatory Framework) as well as the NPDES General Construction Permit requirements would ensure this impact is less than significant, similar to as discussed above in Impact 4.7-1. The SWPPP would identify the hazardous materials to be used during slant well maintenance and would describe spill prevention measures, equipment inspection requirements, equipment and fuel storage, and spill response protocols. No mitigation measures are proposed.

MPWSP Desalination Plant

The operation of the MPWSP Desalination Plant is discussed in Section 3.2.2., The desalination process would use chemicals during the pretreatment of the seawater, the post treatment of the desalination water and for cleaning the membranes; they are listed in Table 4.7-5 and include sodium hypochlorite, sodium bisulfite, sodium hydroxide, zinc orthophosphate, strong bases or acids, carbon dioxide, lime, sodium hydroxide, and flocculating agents.

The MPWSP Desalination Plant operations would involve the use and storage of chemicals to remove performance-reducing deposits from the pretreatment filtration system and reverse osmosis (RO) membranes, as well as chemicals to adjust product water quality. The types and amounts of chemicals that would be utilized in the MPWSP Desalination Plant treatment processes are listed in **Table 4.7-5**.

TABLE 4.7-5
MPWSP DESALINATION PLANT (9.6 MGD) – WATER TREATMENT CHEMICALS

Chemical	Application	Approximate Chemical Usage (pounds/year)
Sodium Hypochlorite	Pretreatment / Post-treatment	140,000 / 55,000
Sodium Bisulfite	Pretreated source water	85,000
Carbon Dioxide	Post-treatment	420,000
Lime	Post-treatment	960,000
Sodium Hydroxide	Post-treatment	55,000
Orthophosphate	Post-treatment	30,000
RO Cleaning Chemicals (various)	RO membrane cleaning	To be determined
Coagulant (if needed)	Pretreatment	To be determined

SOURCE: RBF Consulting, 2013; CalAm, 2014.

Pretreatment Process. As discussed in Section 3.2.2 of Chapter 3, Description of the Proposed Project, source water would be pretreated using pressure filters or multimedia gravity filters to remove suspended solids, microbes, and other contaminants such as iron and manganese. Routine backwashing of the pretreatment filters would occur each day. Backwashing the pretreatment filters would require that a chlorine solution (sodium hypochlorite, similar to bleach) be added to the backwash water supply to control bacterial growth on the filters. If data collected during the pilot program indicates that a chemical coagulant (e.g., ferric chloride, a commonly used coagulant) is needed in the pretreatment process, the backwash effluent would be treated to remove the coagulant chemical prior to discharge. Waste effluent produced during backwashing would flow by gravity from the pretreatment filters to two 0.25-acre, 6-foot-deep lined backwash settling basins. Suspended solids in the waste effluent would settle to the bottom of the basins, and the clarified water would be decanted. Approximately 0.4 million gallons per day (mgd) of decanted backwash water may be pumped to the Brine Discharge Pipeline, blended with brine produced by the RO system, and discharged to the existing MRWPCA ocean outfall. Alternatively, the decanted backwash water could be blended with source water before undergoing pretreatment and the RO process. Sludge formed by the solids in the backwash effluent would be periodically removed from the backwash settling basin and disposed of at a sanitary landfill.

RO System. The RO system would remove salts and other minerals from the seawater. The RO membranes would be cleaned to remove the accumulation of silts or scale, which reduces membrane performance. The RO system is expected to require cleaning two to three times per year. The RO membranes would be cleaned by circulating a cleaning solution (comprised of strong bases or acids) through the membranes and then flushing the membranes with clean water to remove the spent cleaning solution and waste effluent from the RO system. The spent cleaning solution and waste effluent would be discharged into a collection sump, chemically neutralized, then pumped into tank trucks and transported to an offsite disposal site.

Desalination Plant Post-Treatment Process. Desalinated water would be disinfected and treated with chemicals to adjust alkalinity and hardness. The primary disinfectant is a solution of sodium hypochlorite.

Bulk storage of these chemicals would be located in various 5,000- to 10,000-gallon tanks with secondary containment located within the process and electrical building. The capacity of the chemical storage tanks would vary by chemical. The design of the process and electrical building would incorporate all regulatory requirements for hazardous materials storage, such as spill containment features that exceed the capacity of the tanks; segregation of individual chemicals to prevent mixing in the case of accidental spillage; and appropriate alarm and fire sprinklers. Chemicals that have specific reactivity risks with one another will be stored at opposite ends of the storage area to reduce the potential risk of mixing. Lime and carbon dioxide would be used for post-treatment. In addition, a 750-kilowatt (KW) emergency diesel-gas powered generator and 2,000-gallon double-walled, aboveground diesel storage tank would be installed adjacent to the process and electrical building for emergency backup.

CalAm would be required to implement the project in accordance with all applicable laws and regulations governing hazardous materials storage, handling, and disposal. These regulations are designed to protect worker safety, provide for the safe storage and use of hazardous materials, reduce the potential for accidental releases, track and clean up accidental releases, and ensure that hazardous wastes are disposed of appropriately. A summary of these laws and regulations is provided in Section 4.7.2, Regulatory Framework. For example, California Fire Code, Article 80, requires all chemical storage and handling systems be designed and constructed to ensure the safe storage and handling of hazardous materials. Some of the requirements specifically applicable to the proposed project include spill control in all storage, handling and dispensing areas, separate secondary containment for each chemical storage system, and separation of incompatible materials with a non-combustible partition. These requirements reduce the potential for a release of hazardous materials and for mixing of incompatible materials that could pose a risk to workers, the public, and the environment.

As required by law, CalAm would submit a HMBP for the proposed project to the Monterey County Environmental Health Division prior to the start of project operations. The HMBP is required to include information on hazardous material handling and storage, including containment, site layout, and emergency response and notification procedures in the event of a spill or release. In addition, the plan requires annual employee health and safety training. The plan must be approved by the County prior to commencement of project construction and the proposed project would be subject to post-construction compliance inspections. The HMBP would also provide the local agencies with the information they need to plan appropriately for a chemical release, fire, or other incident, which would reduce the potential for an accidental release to cause harmful health effects to workers or the public or substantial degradation to soil or water quality.

Transportation and disposal of wastes, such as spent cleaning solutions, would also be subject to regulations for the safe handling, transportation, and disposal such as the California Labor Code, Section 6300 et seq., California Vehicle Code Sections 32000 et seq., and Health and Safety Code,

Sections 25100 et seq. Transporters licensed to haul hazardous wastes are required to meet requirements for training, secondary containment, and placarding to reduce the potential for a release of hazardous materials during transport to disposal facilities. Compliance with these various regulations would ensure this impact is less than significant. No mitigation measures are proposed.

ASR-5 and ASR-6 Wells, and Terminal Reservoir

Water recovered from the two proposed ASR injection/extraction wells would be chlorinated using sodium hypochorite for disinfection prior to being conveyed into the distribution system. The existing disinfection system has sufficient capacity to treat ASR product water extracted from all six ASR injection/extraction wells (e.g., the four existing ASR injection/extraction wells [ASR-1, ASR-2, ASR-3, and ASR-4] and the two new wells [ASR-5 and ASR-6] proposed under the MPWSP). The disinfection chemicals for the proposed ASR-5 and ASR-6 wells would be stored at the existing chemical/electrical control building at the Phase I ASR facilities site. The existing disinfection system includes a 5,000-gallon sodium hypochlorite tank with double containment, vent fume neutralizers, and a forced-air ventilation system. The proposed project would increase the annual quantity of sodium hypochlorite handled by the disinfection system, but the amount stored on-site would be the same. Sodium hypochlorite solution (12.5 percent NaOCl) would be delivered to the existing ASR disinfection facility by tanker trucks approximately once per month to replenish the system. With all six wells in operation, the expected chemical use would be less than 150 gallons per day of sodium hypochlorite.

Additional chemicals of concern are generated from the injection of chlorinated water into a groundwater aquifer. This process is known to result in the formation of disinfection by-products (DBPs) including trihalomethanes (THMs) and haloacetic acids (HAAs) from reactions with organic matter present in the aquifer. Studies regarding the fate and stability of DBPs injected into the groundwater aquifer at the MPWMD Santa Margarita Test Injection Well (Pueblo Water Resources, 2013) indicate that THMs appear to increase during the first 60 days of storage, then decline slowly over the following 90 to 150 days to below initial injection levels. According to the studies, HAAs declined steadily during aquifer storage, reaching non-detectable levels within 90 days. Groundwater extracted for drinking water supply would be required to meet drinking water requirements. The DBP data collected during the 2012 water year show that THMs were below regulatory limits for drinking water. Refer to Section 4.4, Groundwater Resources, for further discussion of groundwater quality.

With compliance with applicable regulations, the potential impact resulting from an accidental release of hazardous materials used during operation the ASR-5 and ASR-6 Wells, and Terminal Reservoir would be less than significant.

Carmel Valley Pump Station

A portable 50 kW portable diesel-powered generator would be stored at the Carmel Valley Pump Station to provide backup power in the event of a power outage. The generator would be operated in compliance with all hazardous materials regulations. Therefore, the potential impact related to release of hazardous materials during operation of the Carmel Valley Pump Station would be less than significant.

All Other Proposed Facilities

Operation of all pipelines, Ryan Ranch-Bishop Interconnection Improvements, and the Main System-Hidden Hills Interconnection Improvements would not involve the routine storage or use of hazardous materials. No impact related to the inadvertent release of hazardous materials during operation of these project components would result.

Impact Conclusion

Through compliance with existing state and federal laws and regulations regarding hazardous materials storage and management, the potential for environmental impacts due to the accidental release of hazardous materials associated with project operations would be less than significant.

Mitigation Measures

None proposed.

4.7.6 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. As discussed in Section 4.7.3, above, the project would have no impact with respect to the use of hazardous materials within 0.25 mile of a school (during operations), the location of project components within 2 miles of an airport, interference with an adopted emergency response plan or emergency evacuation plan, or wildland fire hazards (during operations). Accordingly, the proposed project could not contribute to cumulative impacts related to these topics.

Impact 4.7-C: Cumulative impacts related to hazards and hazardous materials. (Less than *Significant with Mitigation*)

The geographic scope of analysis for cumulative hazards and hazardous materials impacts encompasses the project area and nearby areas that: (1) could affect soil and groundwater conditions within the project area; or (2) are in or near areas classified by CAL FIRE as High or Very High Fire Hazards Severity Zones. The former types of impacts are generally site-specific and depend on past, present, and future land uses and existing soil, sediment, and groundwater conditions. The latter tend to be in suburban or rural areas, within or adjacent to large tracts of densely vegetated upland open spaces. The timeframe during which the MPWSP could contribute to cumulative hazards and hazardous materials effects includes the construction and operations phases.

Cumulative Impacts during Project Construction

Significant cumulative impacts related to hazards could occur if the incremental impacts of the MPWSP combined with the incremental impacts of one or more projects identified in **Table 4.1-2** to: (1) substantially increase risk that people or the environment would be exposed to hazardous

materials (as described in Impacts 4.7-1 through 4.7-4); or (2) substantially increase risk of wildfire (as described in Impact 4.7-5).

The following cumulative projects described in Table 4.1-2 in Section 4.1 would potentially be geographically adjacent to or overlap with components of the proposed project, and could result in ground disturbance and construction activities that would overlap in time with project construction:

- Laguna Seca Villas (No. 3)
- Marina Downtown Vitalization Specific Plan (No. 10)
- Marina Station (No. 12)
- Main Gate Specific Plan (No. 18)
- TAMC's Monterey Peninsula Light Rail Project (No. 38)

Because potential impacts related to the release of hazardous materials and risk of wildfire are highly site-specific, this analysis first addresses the potential for impacts of the proposed project and the above projects to combine at these specific locations, and then describes the potential cumulative impacts that could occur if the impacts do combine.

The Laguna Seca Villas Project would be located approximately 350 feet from the eastern end of the Ryan Ranch-Bishop Interconnection Improvements pipeline. Although the construction schedule for the Laguna Seca Villas Project is currently unknown, the likelihood that both projects would be under construction at the same time is remote because construction of the Ryan Ranch-Bishop Interconnection pipeline would proceed at about 250 feet per day, and so would only be in the immediate vicinity of the Laguna Seca project location for several days at most, while construction of the Laguna Seca project is unknown and could occur after the proposed project construction has been completed in this location. As described in Section 4.7.1.1 and shown in Figure 4.7-2, there is one site (former Fort Ord York School) within 0.25 mile of this location that was investigated for the presence of MECs, but none were identified and the property was cleared for transfer; therefore, no existing environmental contamination, including contaminated groundwater, is expected to be present at this location.

The reasonably foreseeable physical environmental changes associated with the proposed Marina Downtown Vitalization Specific Plan include construction on the east side of Del Monte Boulevard at Reservation Road, where the new Desalinated Water Pipeline would connect to the new Transmission Main. Although the construction schedule for this component of the specific plan is currently unknown, the likelihood that both projects would be under construction at the same time is remote because the specific plan has not been adopted and no projects have been approved at this intersection, and because construction of the new Desalinated Water Pipeline and new Transmission Main would proceed at about 250 feet per day, and so would only be in the immediate vicinity of the Del Monte Boulevard/Reservation Road intersection for several days. As described in Section 4.7.1.1 and shown in Figure 4.7-2, the former Don's One Hour Dry Cleaners site is undergoing remediation for dry cleaning solvents released to groundwater beneath the site, located at the Del Monte Boulevard/Reservation Road intersection. While the specific

plan project on the north side of Reservation Road at Del Monte Boulevard would be located on the remediation site, as noted in Table 4.7-1, the groundwater remediation at this location does not underlie proposed project components. Therefore, the proposed project would not contribute to a potential cumulative impact associated with disturbing or dewatering contaminated groundwater at this location.

The Marina Station project would be located along Del Monte Boulevard in the vicinity of the new Desalinated Water Pipeline. For the same reasons described for the Marina Downtown Vitalization Specific Plan above, the potential for construction of the new Desalinated Water Pipeline to occur at the same time as the proposed Marina Station project is remote. No existing environmental contamination, including contaminated groundwater, is expected to be present within 0.25 mile of the Marina Station project.

The adopted Main Gate Specific Plan is located near the junction of Highway 1 and Lightfighter Drive in the vicinity of the new Transmission Main. For the same reasons described for the Marina Downtown Vitalization Specific Plan above, the potential for construction of the new Transmission Main to occur at the same time as the proposed Main Gate Specific Plan projects is remote. No existing environmental contamination, including contaminated groundwater, is expected to be present within 0.25 mile of the location of the Main Gate Specific Plan projects.

TAMC's Monterey Peninsula Light Rail Project would be located adjacent to approximately 9 miles of proposed project pipelines, including portions of the Castroville Pipeline, new Desalinated Water Pipeline, and new Transmission Main. Because the light rail project is on hold indefinitely until TAMC can secure funding, its construction schedule is unknown. Because that project must undergo environmental review and permitting prior to construction, it is unlikely that construction of the light rail project and the proposed project pipelines would occur at the same time. The U.S. Army Fort Ord Sites 2 and 12 and University Villages are located on the other side of Highway 1 from the TAMC right-of-way, and as shown in Table 4.7-1, remediation for those sites does not underlie proposed project components and therefore also does not underlie the TAMC right-of-way.

All of the above projects would be subject to the same regulatory requirements as the proposed project, including the implementation of health and safety plans and soil and groundwater management plans (implemented as **Mitigation Measures 4.7-2a** and **4.7-2b** for the proposed project), and therefore any cumulative projects involving releases of hazardous materials also would be required to remediate their respective sites to established regulatory standards. This would be the case regardless of the number, frequency, or size of the release(s), or the residual amount of chemicals present in the soil from previous spills. Therefore, while it is possible that the proposed project and other projects in the cumulative could result in releases of hazardous materials at the same location, the responsible party associated with each spill would be required to remediate site conditions to the same established regulatory standards. The proposed project would result in a significant impact resulting from the potential release of or exposure to hazardous materials in soil or groundwater that could have a cumulatively considerable contribution to a potentially significant cumulative impact resulting from such releases from more than one project. However, the proposed project's impact would be reduced to a less-than-

significant level with implementation of **Mitigation Measures 4.7-2a** and **4.7-2b**, which would require that construction contractors prepare a health and safety plan in accordance with Cal OSHA regulations and comply with all relevant environmental regulations and plan appropriately for the safe and lawful handling and disposal of excavated soil and groundwater, when encountered. The residual less-than-significant effects of the proposed project that would remain after mitigation would not combine with the potential residual effects of cumulative projects to cause a potential significant cumulative impact because residual impacts would be highly site-specific and, as described above, are highly unlikely to occur within the same timeframe such that multiple releases could occur before containment and/or mitigation can be implemented. Accordingly, with implementation of mitigation measures, the project would not have a cumulatively considerable contribution to a significant cumulative impact with respect to the release of hazardous materials during construction (*less than significant with mitigation*).

As also described in Section 4.7.5.1, proposed project components located in or near areas classified by CAL FIRE as High or Very High Fire Hazard Severity Zones include Main System Hidden Hills Interconnection Improvements, Ryan Ranch-Bishop Interconnection Improvements, and Carmel Valley Pump Station (CAL FIRE, 2007; 2008). As described in Impact 4.7-5, compliance with CAL FIRE's regulations governing the use of construction equipment in fire-prone areas (see Section 4.7.2, Regulatory Framework) and compliance with the state fire code would reduce the project-specific incremental impact to a less-than-significant level.

Two of the cumulative projects identified in **Table 4.1-2** – Rancho Cañada Village and Golf Club (Nos. 27 and 28) – are proposed for the Very High Fire Hazard Severity Zone within which the Carmel Valley Pump Station is proposed. Although the Rancho Cañada projects' construction schedules are unknown, there is some possibility that they could overlap with the timing of the Carmel Valley Pump Station construction, and would involve the use of construction equipment or other vehicles with internal combustion engines and/or gasoline powered tools that are capable of producing a spark, flame, or fire. Concurrent activities could result in a cumulative increase in wildland fire risk in this location. This compounded increase in risk could place an additional burden on local fire departments, particularly if access for emergency vehicles were impeded. CAL FIRE's fire prevention regulations related to the use of construction equipment in fire-prone areas also would apply to all cumulative projects involving construction. The Rancho Cañada Village and Golf Club projects would be required to comply with these fire prevention regulations, including the use of spark arrestors and fire suppression equipment. Compliance with these regulations would reduce the potential for a significant cumulative impact with respect to substantial increase in wildfire risk, and would ensure that the project's incremental contribution is not cumulatively considerable (*less than significant*).

Cumulative Impacts during Project Operations

Significant cumulative impacts related to operational hazards could occur if the incremental impacts of the proposed project combined with those of one or more of the projects identified in **Table 4.1-2** to cause a substantial increase in risk that people or the environment would be exposed to hazardous materials used or encountered during the operations phase (Impact 4.7-6).

As discussed in Section 4.7.5.2, Subsurface Slant Wells, maintenance of the proposed subsurface slant wells would require use of cleaning materials and vehicles, introducing potential for inadvertent releases of hazardous materials into the soil and groundwater. MPWSP Desalination Plant operation would require the use of hazardous materials, such as fuels and water treatment chemicals, to be stored onsite. The ASR injection/extraction wells would require disinfection chemicals stored at the Phase I ASR facilities site to be used at a higher rate, but would not cause an increase in onsite storage volume. Compliance with the various regulations regarding the safe transport, use, and storage of hazardous materials (see Section 4.7.2, Regulatory Framework) would reduce the project-specific incremental impact to a less-than-significant level.

Many of the cumulative projects identified in **Table 4.1-2** also would require the transport, use, and storage of hazardous chemicals. However, none of the cumulative projects would be expected to store or handle large quantities of hazardous materials on or adjacent to sites of proposed project components that would also require storage or handling of such materials. As a result, no significant cumulative impact would occur in association with the storage or handling of hazardous materials. However, significant cumulative impacts involving hazardous materials releases could occur along transportation corridors used by the MPWSP and cumulative projects.

For all project components involving the handling, storage, and disposal of hazardous materials, CalAm and/or its contractors would be required to implement a Hazardous Materials Business Plan and comply with applicable regulations, including those governing containment, site layout, and emergency response and notification procedures in the event of a spill or release. Transportation and disposal of wastes, such as spent cleaning solutions, would also be subject to regulations for the safe handling, transportation, and disposal of chemicals and wastes (see Section 4.7.2, Regulatory Framework). As noted previously, such regulations include standards to which parties responsible for hazardous materials releases must return spill sites, regardless of location, frequency, or size of release, or existing background contaminant concentrations. Therefore, compliance with existing laws and regulations regarding hazardous materials transport would reduce the risk of environmental or human exposure to such materials. The combined effects of the proposed project and cumulative projects would not result in a significant cumulative impact (*less than significant*).

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4.8 Land Use, Land Use Planning, and Recreation

Sections	Figures	Tables
4.8.1 Setting/Affected Environment 4.8.2 Regulatory Framework 4.8.3 Approach to Analysis 4.8.4 Evaluation Criteria 4.8.5 Direct and Indirect Effects of the Proposed Project 4.8.6 Cumulative Effects of the Proposed Project	4.8-1 Coastal Zone 4.8-2 Recreational Opportunities in the Northern Project Area 4.8-3 Recreational Opportunities in the Southern Project Area	4.8-1 Overview of Designated Land Uses and Recreational Facilities within 0.25 mile of the Proposed Facilities 4.8-2 Applicable Regional and Local Land Use Plans and Policies Relevant to Land Use and Recreation 4.8-3 Summary of Impacts – Land Use and Recreation

This section analyzes the potential for the Monterey Peninsula Water Supply Project (MPWSP or proposed project) to affect established land uses and recreational facilities, and evaluates project consistency with applicable plans, policies, and ordinances governing land use in the project area. Potential impacts on agricultural land uses are evaluated separately in Section 4.16, Agriculture.

Comments received on the April 2015 Draft EIR related to Land Use, Land Use Planning, and Recreation concern offshore/nearshore and beach recreational uses and access to the Monterey Bay National Marine Sanctuary, the MPWSP's relationship to and compatibility with Fort Ord Dunes State Park, as well as MPWSP consistency with applicable regulatory requirements. This section has been modified to address these comments. Revisions pertaining to land uses and recreational opportunities are presented in Section 4.8.1, Setting /Affected Environment. Revisions concerning compatibility with applicable regulatory requirements and potential effects of the proposed project are presented in Sections 4.8.2, Regulatory Framework and, 4.8.5, Direct and Indirect Effects of the Proposed Project, respectively.

4.8.1 Setting/Affected Environment

The study area for evaluation of land use and recreation impacts includes the lands on which MPWSP facilities are proposed, the adjacent lands, and recreational facilities and resources located within 0.25 mile of the proposed facility sites.

The project area extends approximately 10 miles, from the northern reach of the Castroville Pipeline on Merritt Street in Castroville, to the southern terminus of the new Transmission Main in Seaside, with proposed components extending further south for approximately 6 miles into the Carmel Valley and east to the unincorporated community of Hidden Hills along Highway 68. The project area includes portions of the cities of Marina, Seaside, Monterey, and unincorporated Monterey County, and federal lands (e.g., Presidio of Monterey, the Ord Military Community[1]). With the exception of the federal lands, land uses in the project area are generally governed by the local coastal programs, general plans, and zoning codes of the local jurisdictions. Land uses on federal lands are governed by the respective managing federal agency (e.g., U.S. Army).

[1] These are lands retained by the US government, following the Fort Ord Base Closure and Reuse Plan.

Lands within the former Fort Ord military reservation have mostly been transferred to state and local governments and are now subject to state and local land use plans and regulations. However, local agency land use decisions affecting transferred lands within the former Fort Ord remain subject to discretionary review by the Fort Ord Reuse Authority (FORA).

Land uses in the northern portion of the project area are dominated by agricultural and industrial uses; the remaining portions of the project area are generally urbanized and include residential, commercial, institutional, quasi-public, and industrial land uses. The westernmost portions of the project area lie within the coastal zone, as defined in the California Coastal Act and regulated by the California Coastal Commission (CCC).

There are a variety of recreational resources throughout Monterey County—from federal preserves to state beaches and small neighborhood parks. These resources include the Monterey Bay National Marine Sanctuary (MBNMS), along with designated parks, trails, and open spaces that provide for a diversity of active and passive recreational opportunities. Public access to the area's unique natural resources is an important component of recreation in Monterey County. The Monterey Bay shoreline hosts one of the most significant and rare dune landforms on the west coast. Public access to beaches, dunes, and hiking trails is available from numerous locations along the coast. There are also several designated bikeways throughout the project area that serve as both recreational facilities and alternative transportation routes.[2]

A more detailed overview of existing land uses, land use jurisdictions, and recreational resources adjacent to or within the vicinity (0.25 mile) of MPWSP components is provided in **Table 4.8-1** and described below. Many of the proposed project components would be buried entirely underground, and predominantly within existing public rights-of-way and at existing public water/wastewater facility sites. These include the Source Water Pipeline and optional alignment, new Desalinated Water Pipeline and optional alignment, Castroville Pipeline and optional alignments, Brine Discharge Pipeline, Pipeline to CSIP Pond, ASR Conveyance Pipelines, new Transmission Main and optional alignment, Ryan Ranch-Bishop Interconnection Improvements, and Main System-Hidden Hills Interconnection Improvements.

Figure 4.8-1 presents the various local government jurisdictional boundaries and the extent of the coastal zone relative to the project area. **Figures 4.8-2** and **4.8-3** present parks and other recreational facilities in the project area.

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[2] "Bikeway" is a general term used to refer to facilities that provide primarily bicycle travel. The Caltrans Bikeway Planning and Design section (Chapter 1000 of the State of California Highway Design Manual) categorizes bikeways into three types:

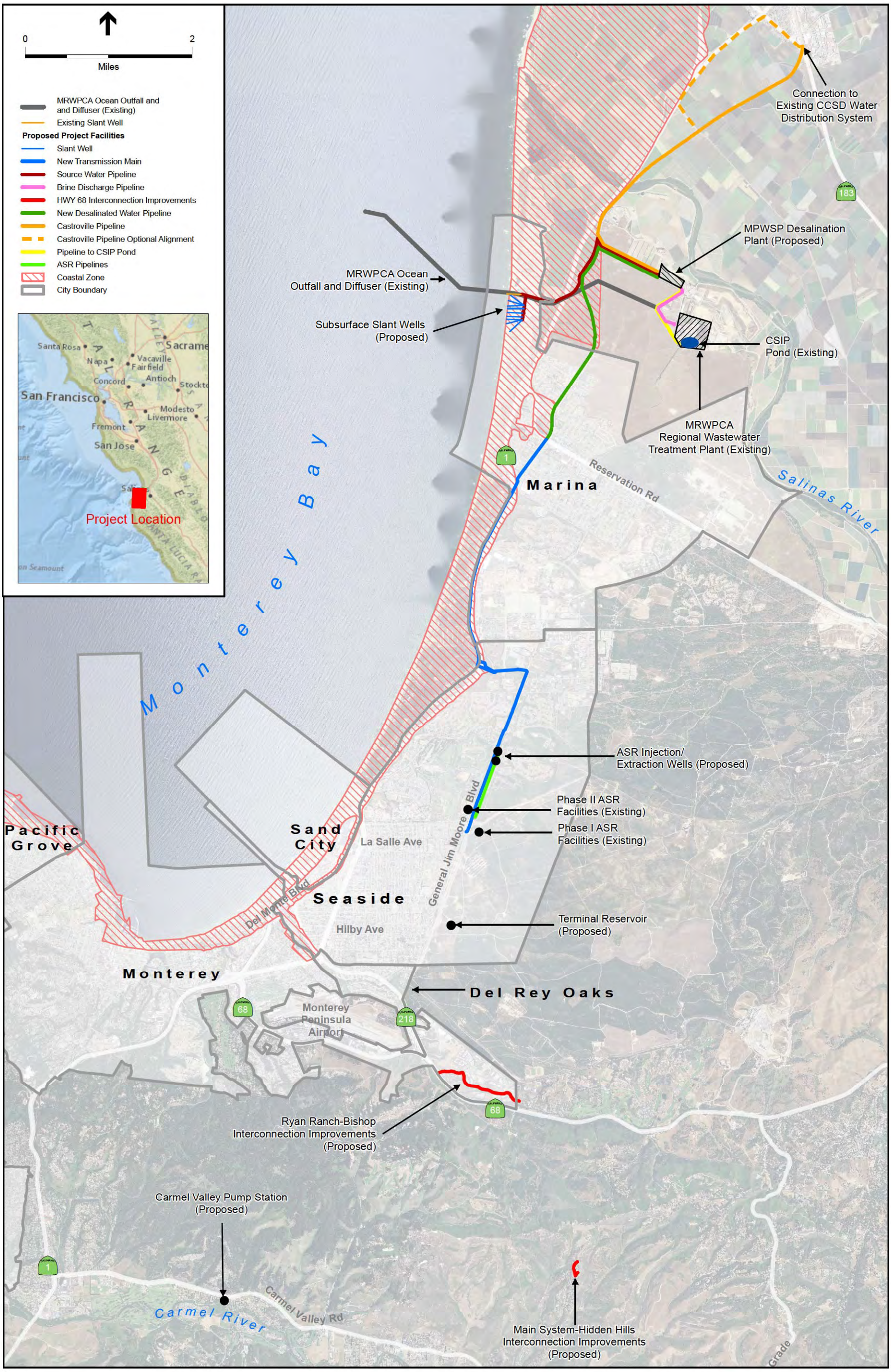
- Class I bikeways are bike paths and provide a completely separated right-of-way for the exclusive use of bicycle and pedestrian traffic with cross-flow minimized. Class I bikeways exist along General Jim Moore Boulevard between Normandy Road and Coe Avenue. The Monterey Peninsula Recreational Trail (also known as the Monterey Bay Coastal Trail), which extends approximately 18 miles between Castroville and Pacific Grove, is also a Class I bikeway.
- Class II bikeways are bike lanes and are indicated by a striped lane for one-way bike travel on a street or highway, typically with signage placed along the street segment. A Class II bikeway exists along General Jim Moore Boulevard between Coe Avenue and Canyon del Rey Boulevard.
- Class III bikeways are bike routes that involve shared use of the roadway with motor vehicle traffic. Typically these facilities are city streets with signage indicating the designated bike route without additional striping or improvements for bicyclists.

TABLE 4.8-1
OVERVIEW OF DESIGNATED LAND USES AND RECREATIONAL FACILITIES WITHIN 0.25 MILE OF THE PROPOSED FACILITIES

Proposed Facility	Location	Jurisdiction	Adjacent Land Uses	Public Recreational Areas Within 0.25 mile
Subsurface Slant Wells	On a 376-acre coastal parcel in north Marina, within a former CEMEX mining area.	City of Marina (coastal zone)	Agricultural / Industrial/Recreation (to the west)	Publicly accessible beach and MBNMS, west of CEMEX property
MPWSP Desalination Plant	On the upper 25-acre terrace of a 46-acre vacant parcel on Charles Benson Road, northwest of the Monterey Regional Water Pollution Control Agency (MRWPCA) Regional Wastewater Treatment Plant.	Monterey County	Agricultural, Light Industrial, Public / Quasi-Public	None within 0.25 mile
Source Water Pipeline & Optional Alignment	Between the proposed subsurface slant wells in a former CEMEX mining area and the CEMEX building located approximately 0.5 mile inland.	City of Marina (coastal zone)	Agricultural / Industrial	Publicly accessible beach and MBNMS
	Between the CEMEX building and the intersection of Del Monte Boulevard and Charles Benson Road.	Monterey County (coastal zone)	Agricultural, Railroad	Monterey Peninsula Recreational Trail
	From the intersection of Del Monte Boulevard and Charles Benson Road to the proposed MPWSP Desalination Plant site.	Monterey County (inland)	Agricultural, Light Industrial, Public / Quasi-Public	Monterey Peninsula Recreational Trail
New Desalinated Water Pipeline & Optional Alignment	From the proposed MPWSP Desalination Plant site, west along Charles Benson Road, and south along Lapis Road and Del Monte Boulevard to the boundary between the city of Marina and unincorporated Monterey County.	Monterey County (inland and coastal zone)	Agricultural, Light Industrial, Public / Quasi-Public, Railroad	Monterey Peninsula Recreational Trail
New Desalinated Water Pipeline & Optional Alignment	From the boundary between the city of Marina and unincorporated Monterey County, south along Del Monte Boulevard to Reservation Road.	City of Marina (inland and coastal zone)	Residential, Commercial, Parklands Light Industrial	Monterey Peninsula Recreational Trail, Locke-Paddon Park, and Vince DiMaggio Park
Castroville Pipeline	From the proposed MPWSP Desalination Plant site, north to Merritt Street via Monte Road.	Monterey County (inland)	Agricultural, Light Industrial, Public / Quasi-Public, Railroad	Monterey Peninsula Recreational Trail
Castroville Pipeline Optional Alignment	From the proposed MPWSP Desalination Plant site, north to Merritt Street via Monte Road, Nashua Road, and Highway 156.	Monterey County (inland)	Agricultural, Light Industrial, Commercial, Residential, and Public / Quasi-Public, Railroad	Monterey Peninsula Recreational Trail and Cato Phillips Park
Brine Discharge Pipeline	Between the MPWSP Desalination Plant site and the headworks to the MRWPCA ocean outfall at the MRWPCA Regional Wastewater Treatment Plant.	Monterey County (Inland)	Agricultural, Light Industrial, Public / Quasi-Public	None within 0.25 mile
Pipeline to CSIP Pond	Between the proposed MPWSP Desalination Plant site and the existing CSIP pond located at the southern end of the MRWPCA Regional Wastewater Treatment Plant.	Monterey County (inland)	Agricultural, Light Industrial, Public / Quasi-Public	None within 0.25 mile

TABLE 4.8-1 (Continued)
OVERVIEW OF DESIGNATED LAND USES AND RECREATIONAL FACILITIES WITHIN 0.25 MILE OF THE PROPOSED FACILITIES

Proposed Facility	Location	Jurisdiction	Adjacent Land Uses	Public Recreational Areas Located Within 0.25 mile
ASR-5 and ASR-6 Wells and ASR Conveyance Pipelines	Along General Jim Moore Boulevard between Ardennes Circle and Coe Avenue in the Fitch Park military housing area.	City of Seaside (the ASR-5 and ASR-6 Well sites are owned by U.S. Army; local land use regulations have limited application; inland) Presidio of Monterey – Ord Military Community (U.S. Army)	Residential, Open Space, Recreational, Public/Quasi-Public	Class I and II bikeway (General Jim Moore Boulevard); Bayonet and Blackhorse Golf Course
New Transmission Main & Optional Alignment	From Reservation Road south along the west side of Del Monte Boulevard to the Highway 1 undercrossing/onramp.	City of Marina (inland)	Residential, Commercial, Light Industrial, Public / Quasi-Public, Parklands, Railroad, Highway	Monterey Peninsula Recreational Trail, Locke-Paddon Park, Marina State Beach, Fort Ord Dunes State Park, Bayonet and Blackhorse Golf Course
New Transmission Main & Optional Alignment	From the Del Monte/Highway 1 undercrossing south to the Lightfigher Drive/Highway 1 undercrossing.	City of Marina (coastal zone)	Parklands, Railroad, Highway, Public/Quasi-Public	Monterey Peninsula Recreational Trail, Fort Ord Dunes State Park, Marina State Beach
New Transmission Main & Optional Alignment	From the Lightfigher Drive/Highway 1 undercrossing west and south to terminus at Coe Avenue/General Jim Moore Boulevard intersection.	City of Seaside (inland and coastal zone)	Parklands, Railroad, Highway, Public/Quasi-Public, Commercial, Recreational	Fort Ord Dunes State Park, Monterey Peninsula Recreational Trail, Stilwell Park, Class I and II bikeway (General Jim Moore Boulevard), Bayonet and Blackhorse Golf Course
Terminal Reservoir	East of the intersection of General Jim Moore Boulevard and Hilby Avenue, in the former Fort Ord military base.	City of Seaside (inland) Fort Ord Reuse Authority (inland)	Open Space	Fort Ord National Monument, Class II bikeway (General Jim Moore Boulevard), and a Class III bikeway (Hilby Avenue)
Terminal Reservoir	East of the intersection of General Jim Moore Boulevard and Hilby Avenue, in the former Fort Ord military base.	City of Seaside (inland)	Open Space, Residential	Fort Ord National Monument, Class II bikeway (General Jim Moore Boulevard), and a Class III bikeway (Hilby Avenue)
Carmel Valley Pump Station	In Monterey County, near the Carmel Valley Road/Rancho San Carlos Road intersection	Monterey County (inland)	Open Space, Residential	Class II bikeway (Carmel Valley Road)
Ryan Ranch–Bishop Interconnection Improvements	Along Ragsdale Drive, Lower Ragsdale Drive, and Wilson Road.	City of Monterey (inland)	Residential, Commercial, Open Space/Parkland	Ryan Ranch Park, Class II bikeways (Ragsdale Drive, Lower Ragsdale Drive, and Wilson Road)
Main System–Hidden Hills Interconnection Improvements	Tierra Grande Drive	Monterey County (inland)	Residential, Open Space	None within 0.25 mile



SOURCE: ESA, 2016, CCC, 2014

205335.01 Monterey Peninsula Water Supply Project

Figure 4.8-1
Coastal Zone

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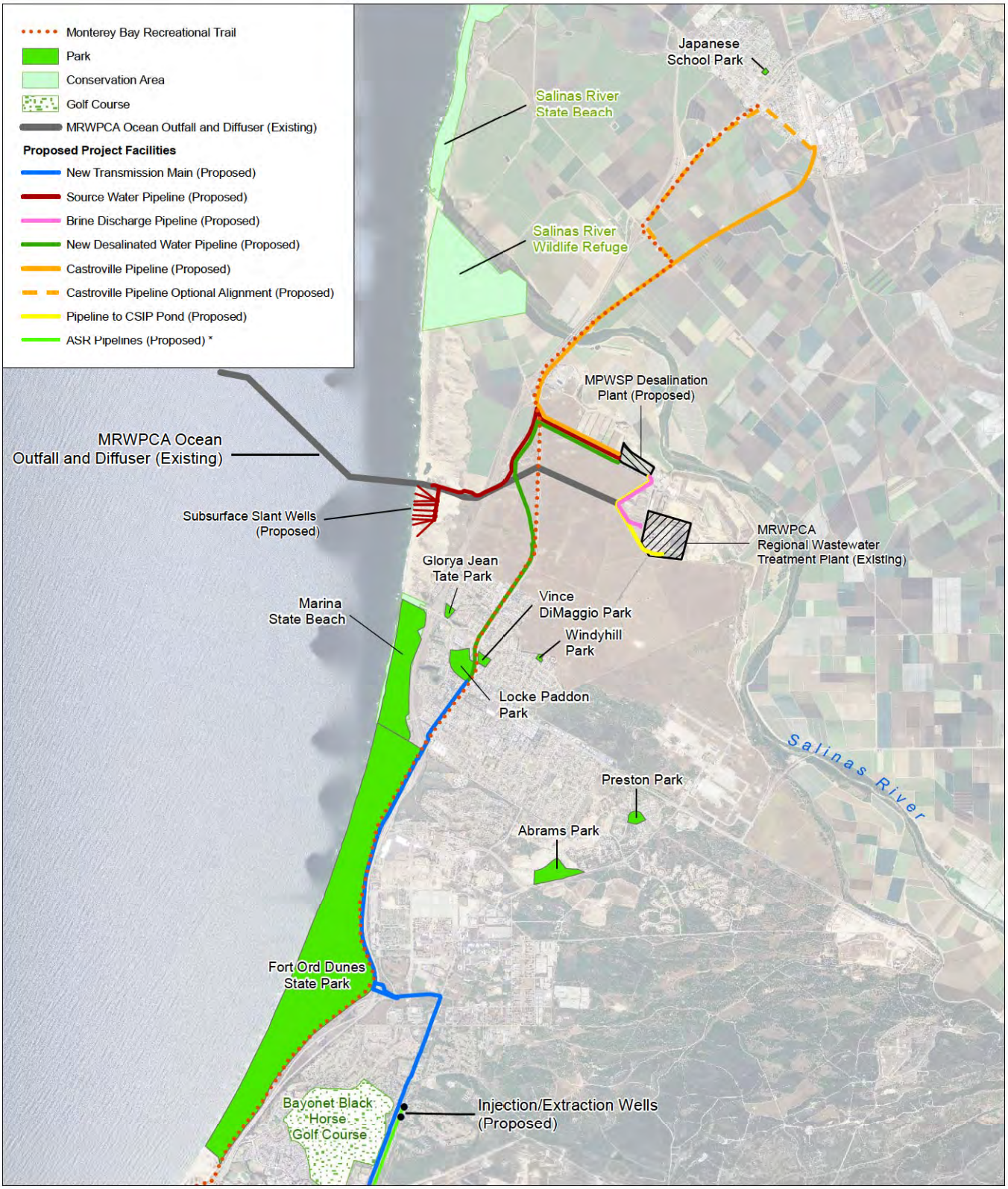


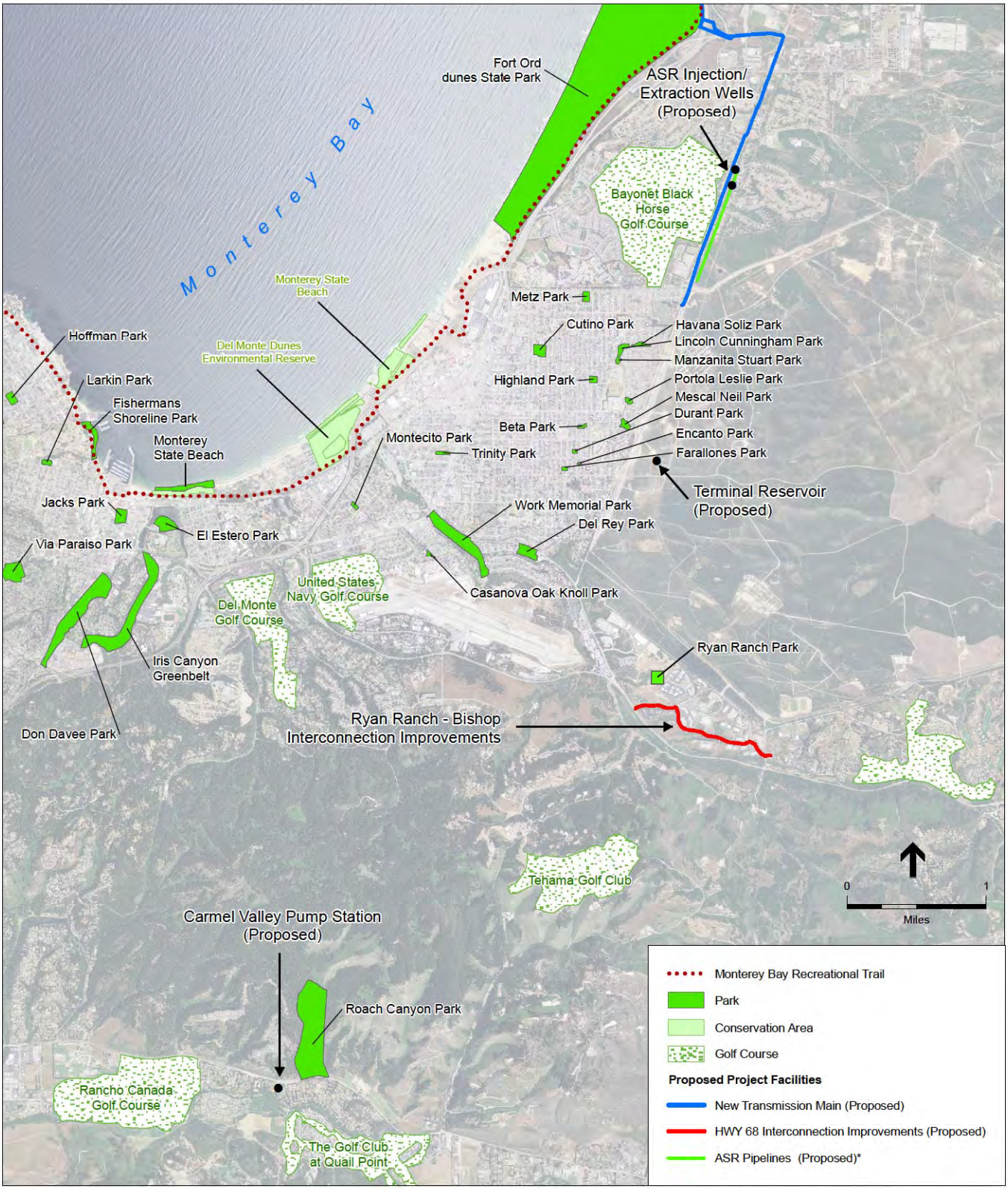
NOTE:
*The ASR Pipelines are the ASR Conveyance Pipeline, the ASR Pump-to-Waste Pipeline, and the ASR Recirculation Pipeline. See Figure 3-9a for the individual pipeline alignments.

SOURCE: GlobeXplorer, 2006; ESRI, 2007; ESA, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.8-2

Recreational Opportunities in the Northern Project Area



NOTE:
*The ASR Pipelines are the ASR Conveyance Pipeline, the ASR Pump-to-Waste Pipeline, and the ASR Recirculation Pipeline. See Figure 3-9a for the individual pipeline alignments.

SOURCE: GlobeXplorer, 2006; ESRI, 2007; ESA, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 4.8-3

Recreational Opportunities in the Southern Project Area

4.8.1.1 Subsurface Slant Wells

Land Use. A portion of the subsurface slant wells would be constructed above the maximum high-tide elevation, within the 376-acre CEMEX sand mining facility located on the coast in north Marina (Figure 3-3). CEMEX owns the coastal land above mean high tide; the California State Lands Commission owns the land below mean high tide. The sand mining operations at the CEMEX facility have been in existence since 1906. The sand mining facility is bounded to the west by beach and the Pacific Ocean, to the north and south by vegetated sand dunes, and to the east by open space, grazing and croplands, and Highway 1.

Recreation. The beach bordering the western edge of the CEMEX property is publicly accessible from paths to the beach which are located off public roads approximately 1 mile south at Marina Dunes Preserve and 1.25 miles north at the Salinas River National Wildlife Refuge. The Monterey Peninsula Recreational Trail is located approximately 1 mile east of the slant well site. The CEMEX property abuts the mean high water line representing the boundary of MBNMS, which extends out to approximately 30 miles offshore, and provides for a diversity of recreational opportunities, including swimming, kayaking, fishing, surfing, scuba diving, wildlife viewing, among many others. There are no other recreational resources on the site of the subsurface slant wells.

4.8.1.2 MPWSP Desalination Plant

Land Use. The MPWSP Desalination Plant would be constructed on an upper 25-acre portion of a 46-acre vacant parcel located on Charles Benson Road, in unincorporated Monterey County (see Figure 3-5). The site of the proposed MPWSP Desalination Plant is bounded to the west and north by open space, grazing, and agricultural lands, and to the east and south by public facility and industrial uses at the Monterey County Landfill and the Monterey Regional Water Pollution Control Agency (MRWPCA) Regional Wastewater Treatment Plant.

Recreation. There are no parks or recreational facilities in the vicinity of the MPWSP Desalination Plant site.

4.8.1.3 Source Water Pipeline

Land Use. The Source Water Pipeline would traverse portions of northern Marina and unincorporated Monterey County (see Figures 3-3, 3-4, and 3-5). Lands adjacent to the proposed and optional alignments are used primarily for open space, grazing, and row crop farming, agricultural operations, and public/quasi-public uses (e.g. Monterey County Landfill and The Last Chance Mercantile Reuse Store).

Recreation. The Source Water Pipeline and optional alignment would cross the Monterey Peninsula Recreational Trail at the intersection of Del Monte Boulevard and Charles Benson Road. There are no parks or other recreational facilities in the vicinity of the proposed Source Water Pipeline alignment.

4.8.1.4 New Desalinated Water Pipeline

Land Use. The approximately 0.8-mile segment of the new Desalinated Water Pipeline between Del Monte Boulevard and the proposed MPWSP Desalination Plant site would be co-located with the Source Water Pipeline and the Castroville Pipeline and follow one of the two routes (proposed or optional alignments). The northern portion of the proposed alignment would cross both coastal and inland portions of unincorporated Monterey County; in the vicinity of Lapis Road and Del Monte Boulevard, the pipeline would be constructed within the Transportation Agency for Monterey County (TAMC) right-of-way (see Figures 3-4, 3-5 and 3-6).

Land uses in the vicinity of the Monterey County portion of the proposed new Desalinated Water Pipeline and optional alignment include primarily open space, grazing, and row crop farming, and public/quasi-public uses. The southern portion of the proposed alignment crosses portions of inland and coastal Marina (see Figures 3-6 and 3-7). Land uses in the vicinity of the Marina segment of the proposed new Desalinated Pipeline and optional alignment include residential, light industrial, commercial, parks, and public facilities.

Recreation. The new Desalinated Water Pipeline and optional alignment would cross the Monterey Peninsula Recreational Trail at the intersection of Del Monte Boulevard and Charles Benson Road. In addition, the segment between the Lapis Road/Del Monte Boulevard (southern) intersection and Del Monte Boulevard Reservation Road intersection would be constructed parallel to and west of the Monterey Peninsula Recreational Trail. Locke-Paddon (within Marina's coastal zone) and Vince DiMaggio Parks are located adjacent to the west and east, respectively, of the new Desalinated Water Pipeline proposed and optional alignment near its junction with the transmission main at Reservation Road.

4.8.1.5 Castroville Pipeline

Land Use. The Castroville Pipeline would be constructed within unincorporated Monterey County. The segment of the proposed alignment extending from Del Monte Boulevard to the CCSD Well #3 on Merritt Street would follow the TAMC right-of-way along Monte Road. The Castroville Pipeline Optional Alignment 1 would follow other public rights-of-way (see Figures 3-11 and 3-12). Land uses in the vicinities of both alignment options are predominantly agricultural, with adjacent lands primarily used for row crop production and grazing. Public and quasi-public and light industrial (e.g., Monterey County Landfill and former Dole Fresh Vegetables packaging plant) also occur along the proposed and optional alignments. Residential and commercial land uses are more prevalent along the segment of the Castroville Pipeline Optional Alignment 1 that extends along Merritt Street in Castroville.

Recreation. The Castroville Pipeline and Castroville Pipeline Optional Alignment 1 would cross the Monterey Peninsula Recreational Trail at the intersection of Del Monte Boulevard and Charles Benson Road. In addition, the segment of the Castroville Pipeline Optional Alignment 1 along Highway 156 between the Nashua Road and Merritt Street would be constructed parallel to and west of the Monterey Peninsula Recreational Trail. Optional alignment 1 would also pass within 0.25 mile of Cato Phillips Park.

4.8.1.6 Brine Discharge Pipeline

Land Use. The Brine Discharge Pipeline would extend from the MPWSP Desalination Plant to a new connection with the MPWPCA outfall at the existing MRWPCA Regional Wastewater Treatment Plant (see Figure 3-5). The proposed pipeline alignment is within unincorporated Monterey County. Lands in the vicinity of the Brine Discharge Pipeline alignment are used for open space, grazing, and the industrial operations of the Monterey County Landfill and MRWPCA Regional Wastewater Treatment Plant.

Recreation. There are no parks or recreational facilities in the vicinity of the proposed Brine Discharge Pipeline alignment.

4.8.1.7 Pipeline to CSIP Pond

Land Use. The Pipeline to CSIP Pond would extend from the MPWSP Desalination Plant to a point of connection with the Castroville Seawater Intrusion Project, located within the MRWPCA Regional Wastewater Treatment Plant (see Figure 3-5). The proposed alignment is within unincorporated Monterey County. As with the Brine Discharge Pipeline, lands adjacent to the Pipeline to CSIP Pond alignment are used for open space, grazing, and the Monterey County Landfill and MRWPCA Regional Wastewater Treatment Plant.

Recreation. There are no parks or recreational facilities in the vicinity of the proposed Pipeline to CSIP Pond alignment.

4.8.1.8 Aquifer Storage and Recovery Facilities

Land Use. The proposed ASR injection/extraction wells (ASR-5 and ASR-6 Wells) would be located east of General Jim Moore Boulevard and south of Ardennes Circle, in the Fitch Park military housing area (Figure 3-9). These MPWSP components would be constructed in the former Fort Ord military base (Ord Military Community) on land owned by the U.S. Army. The sites of the proposed facilities are presently undeveloped. The ASR-5 and ASR-6 Wells would be constructed within 50 feet of existing residences. The ASR Recirculation Pipeline, ASR Conveyance Pipeline, and ACR Pump-to-Waste Pipeline (ASR pipelines) would be installed within the General Jim Moore Boulevard right-of-way, within city of Seaside jurisdiction. The alignment would connect the proposed ASR-5 and ASR-6 Wells with existing infrastructure near the General Jim Moore/Coe Avenue intersection. Land uses in the vicinity of these facilities are predominantly residential, recreational (e.g., Bayonet and Black Horse Golf Courses), and public/quasi-public (e.g., Seaside Middle School) in nature.

Recreation. Class I and II bikeways exists along General Jim Moore Boulevard, between Coe Avenue and Normandy Road. The ASR injection/extraction well sites and pipeline alignments occur within 0.25 miles of the Bayonet and Blackhorse Golf Courses.

4.8.1.9 New Transmission Main

Land Use. The new Transmission Main and optional alignment would extend approximately 6 miles from the new Desalinated Water Pipeline connection at the intersection of Del Monte Boulevard and Reservation Road in Marina to a connection with existing infrastructure near the General Jim Moore/Coe Avenue intersection (Figures 3-7, 3-8, and 3-9). Portions of the proposed and optional pipeline alignments would be located within the Marina and Seaside land use jurisdictions. Land use patterns along the alignment east of Highway 1 are within Marina, and are defined primarily by medium-density commercial and residential development. Public and quasi-public land uses also occur in this area (e.g., Marina Del Mar Elementary School). West of Highway 1, the pipeline would be constructed within the TAMC right-of-way. Land uses in this area include parklands and railroad to the west and highway to the east. Land use patterns along the alignment east of Highway 1 within Seaside are predominantly residential, recreational (e.g., Bayonet and Black Horse Golf Courses), public/quasi-public (e.g., CSUMB and Dual Language Academy of the Monterey Peninsula, and Ord Military Community).

Recreation. The segment of the new Transmission Main and optional alignment between the Del Monte Boulevard/Reservation Road intersection and Highway 1/Lightfigher Drive undercrossing would be constructed parallel to and west of the Monterey Peninsula Recreational Trail. The pipeline would also pass within 0.25 mile of Bayonet and Black Horse Golf Courses, Locke-Paddon Park, Marina State Beach, Fort Ord Dunes State Park, Stilwell Park, Monterey Peninsula Recreational Trail, and Class I and II bikeways (General Jim Moore Boulevard).

4.8.1.10 Terminal Reservoir

Land use. The proposed Terminal Reservoir would be located east of General Jim Moore Boulevard, approximately 0.3 mile north of Watkins Gate Road in a mostly undeveloped area (with the exception of a dirt access road and utilities) of the former Fort Ord military base, within the city of Seaside (Figure 3-9). The Bureau of Land Management (BLM) manages 14,600 acres of land to the east of the site, known as the BLM Natural Resource Management Area.

Recreation. A Class II bikeway exists along General Jim Moore Boulevard between Coe Avenue and Canyon Del Rey Boulevard. There are no existing parks adjacent to the proposed Terminal Reservoir site. However, the lands immediately north of the site are designated for Parks and Open Space (POS) and zoned for Open Space and Recreation (OSR) (City of Seaside, 2004a; 2010). To the east of the Terminal Reservoir site is the Fort Ord National Monument. Comprised of former Fort Ord military reservation lands, a substantial portion of this National Monument, including the portion nearest the Terminal Reservoir site, remains under U.S. Army management and is closed to the public due to munitions hazards. However, approximately 3 miles north and east of the Terminal Reservoir site, the public has access to roughly 86 miles of hiking trails over some 7,200 acres of the portion of Fort Ord National Monument under the BLM's authority (BLM, 2012; 2014).

4.8.1.11 Carmel Valley Pump Station

Land Use. The Carmel Valley Pump Station would be located approximately 250 feet south of Carmel Valley Road and 500 feet west of Rancho San Carlos Road, in unincorporated Monterey County (Figure 3-10c). Land uses in the vicinity of the pump station site include low density residential development and open space.

Recreational. A Class II bikeway exists along Carmel Valley Road.

4.8.1.12 Interconnection Improvements for Highway 68 Satellite Systems

Land Use. The Ryan Ranch–Bishop Interconnection Improvements would be located within the city of Monterey adjacent to lands used for office park, light industrial, and parks and open space (Figure 3-10a). The proposed Main System–Hidden Hills Interconnection Improvements would be located in unincorporated Monterey County adjacent to low-density residential development, surrounded by open space (Figure 3-10b).

Recreation. The proposed Ryan Ranch–Bishop Interconnection Improvements would be located adjacent to Ryan Ranch Park (accessible via Ryan Ranch Road), an open space area with a network of unpaved hiking trails that is managed by the City of Monterey Parks Department. Class II bikeways also exist along Ragsdale Drive, Lower Ragsdale Drive, and Wilson Road. The Laguna Seca Recreation Area is within 3 miles of the proposed Main System–Hidden Hills Interconnection Improvements.

4.8.2 Regulatory Framework

This section provides an overview of applicable federal, state, and local environmental laws, policies, plans, regulations, and/or guidelines (hereafter referred to generally as "regulatory requirements") relevant to land use and recreational resources. A brief summary of each is provided, along with a finding regarding the project's conformity with those regulatory requirements. The conformity findings concern 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 a specific impact topic within EIR/EIS Section 4.8.5, Direct and Indirect Effects of the Project, where the potential inconsistency is addressed in more detail. Where applicable, the discussion in Section 4.8.5 includes the identification of feasible mitigation that would resolve or minimize the potential inconsistency.

4.8.2.1 Federal Regulations

Marine Protection, Research, and Sanctuaries Act of 1972

The Marine Protection, Research, and Sanctuaries Act of 1972, also known as the National Marine Sanctuaries Act (Act), provides for the identification, designation, and management of

marine areas that are of special significance due to their recreational, ecological, historical, research, educational, or aesthetic qualities. Accordingly, a primary purpose of the Act's implementing regulations (15 CFR 922) is to protect, preserve, and manage recreational resources of national marine sanctuaries. The importance of recreation is further emphasized in the 2008 MBNMS *Final Management Plan*, which includes a desalination action plan and strategies to guide siting and development of desalination projects in a manner that is protective of MBNMS resources, including recreational opportunities. In addition, MBNMS worked with the National Marine Fisheries Service (NMFS) to develop desalination guidelines (NOAA, 2010). See EIR/EIS Section 6.4, Project Consistency with Monterey Bay National Marine Sanctuary Desalination Guidelines, for additional discussion.

Activities that would be subject to MBNMS jurisdiction, which extends seaward from the mean high water line out to approximately 30 miles, are generally limited to drilling the subsurface seawater intake pipelines into the submerged lands of MBNMS, and the discharge of brine from an existing ocean outfall, which is approximately two miles off shore and 90-110 feet below sea level. No MPWSP facilities are proposed for or would involve construction that would impede access to, or use of the MBNMS as a recreational resource. As proposed, implementation and operation of the MPWSP could have water quality and marine biological resources impacts that could affect recreational opportunities. Additional discussion of MPWSP effects related to water quality and marine biological resources is provided in EIR/EIS Section 4.3, Surface Water Hydrology and Water Quality, and Section 4.5, Marine Biological Resources.

Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) of 1972 provides for management of the nation's coastal resources, including the Great Lakes, and balances economic development with environmental conservation. The California Coastal Commission has jurisdiction for CZMA implementation throughout the state.[3] The California Coastal Act contains numerous enforceable policies that are directed at protecting and, where feasible, restoring coastal resources. The California Coastal Commission applies the Coastal Act's policies when reviewing applications for coastal development permits in California state waters. The Coastal Commission also applies land use policies when reviewing federally licensed and permitted activities to ensure they are consistent with the State's coastal management program in accordance with the CZMA federal consistency provision. The Coastal Commission considers an application for a coastal development permit to cover the requirement for an applicant submitting a consistency certification to the Coastal Commission. Typically, the Coastal Commission will provide its response (concurrence, conditional concurrence, or objection) in its staff report for the coastal development permit.

Real Property Master Plan – Presidio of Monterey

The U.S. Army's 1983 Real Property Master Plan – Presidio of Monterey provides for the orderly development and maintenance of land, facilities, and infrastructure within the Presidio of Monterey Installation, which includes the Presidio of Monterey and the Ord Military Community.

[3] Except within the San Francisco Bay-Delta where the Bay Conservation and Development Commission has authority for implementation of CZMA within its jurisdictional area.

The Master Plan depicts Army Land Use Categories assigned to lands within these military planning areas. Use categories identified within these military planning areas include: Community, Professional/Institutional, Troop, and Residential. The Master Plan also describes the types of uses appropriate within each category. The document does not prohibit development of utilities in any of the land use categories. In February 2013, the U.S. Army Corps of Engineers completed an environmental impact statement (EIS) analyzing the potential environmental consequences of implementing a revised Real Property Master Plan. The EIS evaluated three alternatives for the Real Property Master Plan. The alternatives focus almost entirely on facilities improvements and new construction and would not involve revisions to existing land use designations. The U.S. Army is in the process of revising the Real Property Master Plan, based upon the findings of the EIS. The completion date for the revised Real Property Master Plan remains unknown. Elements of the project subject to the Real Property Master Plan include the ASR-5 and ASR-6 Wells. In 2010 and 2012, the U.S. Army prepared NEPA environmental assessments (EAs) analyzing the potential land use effects of the ASR-5 and ASR-6 wells proposed for the Presidio of Monterey. The EAs concluded that the proposed MPWSP facilities would have no impact with respect to conflict with any applicable land use plans, policies, or regulations (RBF Consulting, 2010; 2012).

4.8.2.2 State Regulations

Fort Ord Reuse Authority and Fort Ord Reuse Plan

The 1994 Fort Ord Reuse Authority Act (California Government Code section 67650-67700); hereafter referred to as the "FORA Act") was passed with the goals of facilitating the transfer, reuse, and management of lands within the former Fort Ord military reservation. Pursuant to the Act, on May 20, 1994, the Fort Ord Reuse Authority (FORA) was established as a corporation of the State of California. The purpose of the FORA is to prepare, adopt, finance, and implement a plan for the land formerly occupied by Fort Ord. The FORA is governed by a 13-member board (FORA Board) comprised of representatives from the Monterey County Board of Supervisors, and city council members from each of the cities of Marina, Seaside, Carmel, Del Rey Oaks, Sand City, Monterey, Pacific Grove, and Salinas (member agencies). The FORA Act directs the Board to prepare and adopt a plan (Reuse Plan) for the future use and development of lands within the former Fort Ord Territory (FORA, 1997a).

The FORA Act requires that, with a few exceptions for universities, all Fort Ord land that has been transferred from the federal government must be used in a manner consistent with the Reuse Plan. This provision is affirmed and explained further in the Fort Ord Master Resolution, adopted in March of 1997 (FORA, 1997b). For member agencies with jurisdiction over lands within the former Fort Ord territory, the Master Resolution (Section 8.01.010(c)) requires all general plans, and "all policies and programs relating to the land use or the construction, installation, or maintenance of capital improvements or public works within the Fort Ord Territory, shall be consistent with the Reuse Plan…" Before any such plans or regulations may take effect, the member agency must first obtain from the FORA Board a determination that the plan or regulation is consistent with the Reuse Plan. Upon certification by the Board, development review authority is transferred to the member agency with jurisdiction over the FORA lands.

However, pursuant to the FORA Act and Master Resolution (Section 8.01.030(c)), after certification of said general plan, policies, and programs, the Board may continue to review for consistency member agencies' development entitlement decisions in the former Fort Ord territory (FORA, 1997b).

The Fort Ord Reuse Plan, adopted in 1997, includes the information normally found in a general plan. It establishes the general plan context and rationale, addressing matters of community visioning, existing setting, use concepts, and implementation; and includes the Reuse Plan Elements, setting forth goals, objectives, policies, and programs by land use and jurisdiction for land use, circulation, recreation and open space, conservation, noise, and safety (FORA, 1997a).

MPWSP components proposed within former Fort Ord territory and subject to the Reuse Plan include the Terminal Reservoir (which would be located within Seaside's jurisdiction and subject to Seaside approvals), and a segment of the Ryan Ranch-Bishop Interconnection Improvements (which would occur within Monterey County's jurisdiction and subject to Monterey County's approvals). However, as noted above, the FORA Board may, at its discretion, decide to review local decisions with respect to Fort Ord Reuse plan consistency. Preliminary determinations by the EIR preparers regarding MPWSP consistency with the Reuse Plan policies related to land use and recreation are presented in **Table 4.8-2**. Analyses of consistency with Reuse Plan policies related to other topics presented in their respective topical sections of this EIR/EIS.

Fort Ord Dunes State Park General Plan

The *Fort Ord Dunes State Park General Plan* (*General Plan*) outlines the purpose and vision for the park; and sets forth management goals and guidelines for protection of the natural environment; resource restoration; and for the siting, design, and construction of future park improvements in a manner that avoids environmental effects. Prominent among the *General Plan's* guiding principles (and indeed the mission of California Department of Parks and Recreation) is the provision and management of recreational opportunities consistent with resource management and protection. The new Transmission Main and optional alignment would traverse an approximately 0.25 band of Fort Ord Dunes State Park lands between Divarty Street/1st Street and the alignments' Highway 1 undercrossing near Lightfighter Drive. The pipeline segment proposed for State Parks lands would be sited between the Monterey Peninsula Recreational Trail and the existing railroad. This area is presently inaccessible to the public, as the alignment area is fenced. Pipeline installation would temporarily disturb this area during construction, but would then be returned to its approximate pre-construction condition. As a result, new Transmission Main pipeline construction activities within Fort Ord Dunes State Park would not conflict with *General Plan* goals or guidelines related to recreation. Additional discussion of effects on Fort Ord Dunes State Park access is provided in Impacts 4.8-1 and 4.8-2.

California Coastal Act

The California Coastal Act (Public Resources Code Section 30000 et seq.) was enacted by the State Legislature in 1976 to provide long-term protection of the State's 1,100-mile coastline for the benefit of current and future generations. The Coastal Act provides for the long-term

management of lands within California's coastal zone boundary, as established by the Legislature and defined in Coastal Act (Section 30103). The width of the coastal zone varies across the State, extending inland a couple hundred feet in some locations to 5 miles in others, and offshore out to 3 miles. A map of the coastal zone in the project vicinity is shown in **Figure 4.8-1**.

The Coastal Act created a unique partnership between the State (acting through the CCC) and local government entities (15 coastal counties and 61 coastal cities) to manage the conservation and development of coastal resources through a comprehensive planning and regulatory program. This is accomplished primarily through the preparation of sets of policies and regulations adopted by coastal local governments to carry out Coastal Act policies at the local level, known as local coastal programs. Upon CCC certification of a local coastal program, authority for issuance of Coastal Development Permits is transferred from the State (via the CCC) to the certified local government. Until such time, responsibility for issuance of Coastal Development Permits remains with the CCC. The agency also retains jurisdiction over certain coastal areas, such as tidelands and public trust lands. Local Coastal Programs applicable to the MPWSP are discussed below.

The Coastal Act includes specific policies for management of natural resources and public access within the coastal zone (see Division 20 of the Public Resources Code). Of primary relevance to land use and recreation are Coastal Act policies concerning coastal public access and recreational opportunities, locating new development near existing development, and ensuring new or expanded public works facilities are designed and limited so as not to induce growth inconsistent with the Coastal Act. A preliminary assessment of project consistency with these priorities is provided here. Final determinations regarding project consistency are reserved for the Coastal Commission.

With respect to public access and recreation, MPWSP construction may have short-term effects on shoreline access (i.e., increased traffic and temporary park entrance detours) during the construction period. However, most MPWSP components in proximity to the coastal zone (i.e., pipelines) would be buried underground and would not substantially affect long-term public access to or along the coast. Coastal erosion and shoreline retreat may result in encroachment of the subsurface slant wells (Site 1) onto the beach, which could affect access along the shoreline. This issue is addressed further in Section 4.2, Geology, Soils, and Seismicity. Specifically, please refer to Table 4.2-6 for additional discussion of the project's conformity with applicable Coastal Act policies related to beach erosion.

Regarding locating new development, the new Transmission Main would be constructed below ground and within an existing developed right-of-way. The subsurface slant wells would be sited among existing industrial mining development. These MPWSP facilities would impose no long-term demands on area public services.

Concerning growth inducement, which is discussed more fully in Chapter 2, Water Demand, Supplies, and Water Rights, the MPWSP has been sized to meet the requirements of State Water Resources Control Board (SWRCB) Orders 95-10 and 2009-0060, and the 2006 groundwater basin adjudication, along with existing and anticipated future demands of existing water entitlement holders, the anticipated economic recovery of the local hospitality industry, and development of existing legal lots of record.

For these reasons, the MPWSP would not conflict with Coastal Act policies related to land use and recreation.

4.8.2.3 Local Regulations

County and City General Plans, Ordinances, and Regulations

California state law requires each county and city to adopt "a comprehensive, long-term general plan for the physical development of the county or city, and any land outside its boundaries which bears relation to its planning" (Government Code Section 65300). State planning and zoning law (Government Code Section 65800 et seq.) also provides for local government adoption and administration of zoning laws, ordinances, rules and regulations to implement such general plans. A summary of general plans and ordinances applicable to the project area is provided below.

Local Coastal Programs

The local coastal program typically includes a land use plan and implementing regulations (also referred to as an "implementation plan"). The land use plan that is part of the local coastal program sets forth the types, locations, and intensities of land uses, along with applicable resource protection and development policies for lands within the coastal zone. The implementation plan typically consists of zoning regulations, zoning map, and permit procedures. In general, a local coastal program is not considered certified until the CCC approves both the land use plan and implementation plan. Within the project area, several jurisdictions have certified local coastal programs, including: Monterey County and the cities of Marina, and Seaside (described below in Section 4.8.2.3). The CCC retains jurisdiction for issuance of Coastal Development Permits areas of the coastal zone where no LCP has been certified. Local coastal program policies related to land use and recreation and adopted for the purpose of avoiding or mitigating an environmental effect are presented in **Table 4.8-2** and discussed further in Section 4.8.5, Direct and Indirect Effects of the Project. Local coastal program policies related to other types of coastal resources are addressed in their respective topical sections of this EIR/EIS.

Monterey County Plans and Policies

The following sections describe documents prepared by Monterey County that govern land use decisions in the project area. Monterey County policies related to land use and recreation and adopted for the purpose of avoiding or mitigating an environmental effect are presented in **Table 4.8-2**. A discussion of the project's consistency with established land use plan and zoning designations within the project area is provided below.

2010 Monterey County General Plan

The *2010 Monterey County General Plan* includes area or master plans for 14 regional planning areas, including the four coastal land use plans (see "Local Coastal Programs," below) and ten inland area or master plans. The MPWSP would involve development within several of these 14 planning areas, including the Greater Monterey Peninsula, North County, North County LUP, Salinas, and Carmel Valley planning areas. The *2010 Monterey County General Plan* consists of

policies that apply countywide and policies unique to specific regions. The Land Use Element contains countywide policies that are applicable to the entire unincorporated area. Area plans contain more focused policies that address specific regional or local issues (Monterey County, 2010).

Monterey County Local Coastal Program

The County's coastal zone is divided into four areas governed by land use plans and coastal implementation plans, which together comprise the County's Local Coastal Program. The four land use plans include those for Big Sur Coast, Carmel, Del Monte Forest (coastal portion), and North County (which also includes the Moss Landing Community Plan). The four land use plans stand alongside the *2010 Monterey County General Plan* and function as the general plan for the respective areas of the coastal zone. The MPWSP, as well as components of the Alternatives (discussed in Chapter 5, Alternatives), would involve development within the *North County Land Use Plan* area; the Big Sur Coast, Carmel Valley, and Del Monte Forest area land use plans are not applicable to lands within the project area.

Monterey County Zoning Ordinance

The Zoning Ordinance is the primary implementation tool for the land use policies identified in the *2010 Monterey County General Plan and North County Land Use Plan*. Land uses within the project area would be subject to the requirements of the Inland Zoning Ordinance (Title 21) and the Coastal Zoning Ordinance (Title 20). The Zoning Ordinance, which is applicable to unincorporated areas, implements the goals and policies of the *General Plan and North County Land Use Plan* by identifying specific types of land uses, intensity of uses and development standards to be used in guiding the development and use of land within unincorporated areas of the county.

Monterey County Municipal Health and Safety Code (Title 10) Section 10.72 (Not Applicable to MPWSP)

Although not applicable to the MPWSP (described below), this discussion is provided for informational purposes. In 1989, Monterey County adopted an ordinance governing the issuance, suspension and revocation of permits for the construction and operation of desalination facilities. Sections 10.72.010 et seq. establishes:

> *No person, firm, water utility, association, corporation, organization, or partnership, or any city, county, district, or any department or agency of the State shall commence construction of or operate any Desalination Treatment Facility (which is defined as a facility which removes or reduces salts from water to a level that meets drinking water standards and/or irrigation purposes) without first securing a permit to construct and a permit to operate said facility. Such permits shall be obtained from the Director of Environmental Health of the County of Monterey, or his designee, prior to securing any building permit.*

Applicants for desalination construction permits must give notice of an intent to construct; provide preliminary feasibility studies; show conformance with local land use zoning; and submit "specific detail engineering, construction plans and specifications;" submit a chemical analysis of the intake water, a study of groundwater extraction impacts, studies and plans for brine and other by-products disposal, and an alternative water supply contingency plan (Section 10.27.020A-F).

The ordinance further requires public ownership of desalination plants and requires that each plant have a dual system, where one side is held in reserve in the event of a breakdown on the other side. Section 10.72.030(B) requires applicants to: "Provide assurances that each facility would be owned and operated by a public entity."

On September 21, 2012, CPUC Administrative Law Judge Gary Weatherford issued a proposed "Decision Declaring Preemption of County Ordinance and the Exercise of Paramount Jurisdiction," stating in the first paragraph:

> This decision determines that the authority of the Commission in regard to this application preempts Monterey County Code of Ordinance, Title 10, Chapter 10.72, concerning construction, operation, and ownership of desalination plants. This decision further determines that the findings, conclusions, and orders herein are an exercise of jurisdiction that is paramount to that of a county Superior Court concerning the same subject (CPUC, 2012a).

On October 31, 2012, the CPUC issued a decision affirming the ALJ's ruling (CPUC, 2012b). On December 4, 2012, CalAm, the County of Monterey, and Monterey County Water Resources Agency entered into a settlement agreement to resolve pending lawsuits, among other matters. The settlement agreement acknowledges the CPUC Decision as final and binding, and also acknowledges that the Ordinance in question shall not apply to CalAm or the MPWSP (CalAm, 2012).

City Plans and Policies

The following sections describe documents prepared by the cities that govern land use decisions in the project area. A list of local government policies applicable to the project and relevant to land use and recreation is provided in **Table 4.8-2**. A discussion of the project's consistency with established land use plan and zoning designations within the project area is provided below.

City of Marina General Plan

The *City of Marina General Plan* was adopted on October 31, 2000 and last amended in November 2006. The two major purposes of the *City of Marina General Plan* are to guide long-term planning and development decisions by the City in a manner consistent with City goals, and to provide clear documentation of the City's goals and commitments. The *City of Marina General Plan* is only applicable to the portions of the project that are inside the coastal zone (slant wells and a portion of the source water pipeline); components outside the coastal zone would not require a Use Permit (Szymanis, 2014). *City of Marina General Plan* policies related to land use and recreation and applicable to the project are presented in **Table 4.8-2**.

City of Marina Local Coastal Land Use Plan

The *City of Marina Local Coastal Land Use Plan*, certified by the CCC in 1982, establishes appropriate land uses by type and density, and establishes a policy framework for plan implementation. The policy framework of the land use plan includes the policy statements, the plan guidelines, the land use map, narrative descriptions of the land use map, and the recreational access component. Marina Local Coastal Land Use Plan Policies related to land use and recreation and applicable to the project are presented in **Table 4.8-2**.

City of Marina Zoning Ordinance

The purpose of the Zoning Ordinance of the City of Marina (Title 17 of the Marina Municipal Code) is to "promote and protect the public health, safety, peace, morale, comfort, convenience and general welfare, and for the accomplishment thereof…" (Chapter 17.02.030). The document sets forth a plan of development for the city and establishes districts and standards to guide, control, and regulate the city's future growth and development. The Zoning Ordinance also implements the city's Local Coastal Program.

City of Seaside General Plan

The City of Seaside General Plan, adopted in 2004, provides goals, policies, and a framework for decision-making and coordinated planning. The Land Use Element describes the balance of land uses, examines patterns of development, and considers water supply. City of Seaside General Plan policies related to land use and recreation and applicable to the project are presented in Table 4.8-2.

City of Seaside Local Coastal Program Land Use Plan

Seaside's Local Coastal Program Land Use Plan was comprehensively updated in 2012. The Land Use Plan provides specific goals, policies, and implementation actions that govern land and water use within Seaside's coastal zone. The Land Use Plan is organized into subareas, including a general coastal zone chapter, supported by the Laguna Grande, Roberts Lake, Beach, and Del Monte subarea chapters that focus on specific issues in each subarea. Seaside Local Coastal Program Land Use Plan Policies related to land use and recreation and applicable to the project are presented in **Table 4.8-2**.

City of Seaside Zoning Ordinance

The City of Seaside adopted its existing Zoning Ordinance (Title 17 of the Seaside Municipal Code) in 2006, and adopted substantial revisions in February of 2014. The purpose of the Seaside Zoning Ordinance is "to protect and to promote the public health, safety, comfort, convenience, prosperity, and general welfare of residents, and businesses in the City (Chapter 17.10.10)." This is accomplished through the provision of standards and guidelines for the continuing orderly growth and development of Seaside. The Zoning Ordinance is used by the City to carry out the goals, objectives, and policies of the General Plan and Local Coastal Program. The City's Coastal Zoning Ordinance (Title 18, Section 18.10) serves as the City's Local Coastal Program - Coastal Implementation Plan, and sets forth additional regulations for properties within Seaside's coastal zone.

City of Monterey General Plan (Not Applicable to MPWSP)[4]

The *City of Monterey General Plan* is a statement of the community's vision for the future. Adopted in 2005 and amended through 2010, the General Plan is a long-range, comprehensive plan that coordinates all major components of the community's physical development for

[4] There are no project components proposed within the city of Monterey coastal zone. Therefore, the Monterey Local Coastal Land Use Plans, which are presently undergoing revision, are not discussed in this section.

1020 years. The Land Use and Open Space Elements contain goals, policies, and programs for land use designations, infrastructure and public services, and open space conservation. The *City of Monterey General Plan* is not applicable to the project as no project components proposed for the City of Monterey would require a Use Permit (Caraker, 2014).

City of Monterey Zoning Ordinance

The purpose of the City of Monterey Zoning Ordinance (Chapter 38 of the City Charter) is to protect and promote the public health, safety, and general welfare of Monterey, and to implement the policies of the General Plan. This is done through the establishment of land use, development, and administrative regulations to control the use and development of property. The Zoning Ordinance applies to pipelines proposed within the city boundaries.

MPWSP Consistency with Applicable Land Use and Recreation Plans and Policies

In keeping with CEQA's interest in addressing a project's potential conflicts with applicable regulatory requirements related to land use, **Table 4.8-2** describes the regional and local land use plans, policies, and regulations pertaining to land use and recreation that are relevant to the MPWSP. Also included in **Table 4.8-2** is an analysis of the project's potential conflicts with such plans, policies, and regulations. Where the analysis concludes the MPWSP would not conflict with the applicable plan, policy, or regulation, the finding is noted and no further discussion is provided. Where the analysis concludes that the MPWSP may conflict with the applicable plan, policy, or regulation, the reader is referred to Section 4.8.5, Direct and Indirect Effects of the Project, for additional discussion. In that subsection, the significance of the potential conflict is evaluated. Where the effect of the potential conflict would be significant, feasible mitigation is identified to resolve or minimize that conflict.

Land Use Plan and Zoning Designations

This subsection describes the land use plan and zoning designations on lands for which MPWSP components are proposed and provides a preliminary assessment of the project's potential to conflict with those designations. In most instances, the local land use regulations provide for conditional authorization of public utilities facilities with a Use Permit and/or Coastal Development Permit (CDP). In order for the local jurisdiction to issue such a permit, the body charged with permit administration must first make findings that the project meets the criteria for permit issuance (e.g., protective of public health, safety, and welfare). Land use policies and regulations flow from these concepts. Accordingly, determinations of a project's consistency with such criteria often include consideration for a project's compatibility with established land use policies and regulations. Thus, a project's consistency with local land use policies and regulations can serve as an indicator of its likelihood of meeting the criteria necessary for issuance of a Use Permit.

TABLE 4.8-2
APPLICABLE REGIONAL AND LOCAL LAND USE PLANS AND POLICIES RELEVANT TO LAND USE AND RECREATION

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)	City of Marina Local Coastal Land Use Plan	Policies	Subsurface Slant Wells, new Transmission Main, Source Water Pipeline, and new Desalinated Water Pipeline	***Policy 1:*** To insure access to and along the beach, consistent with the recreational needs and environmental sensitivity of Marina Coastal area.	This policy is intended to protect the public's right of access to and along the shoreline – a public recreational resource.	Consistent: Project construction may have short-term effects on public shoreline access (i.e., increased traffic) during the construction period, but none would preclude or otherwise have direct effects on public shoreline access. With coastal erosion, there is potential for the beach to retreat back to the subsurface slant wells (Site 1), which could affect access along the shoreline. This issue is addressed further in Section 4.2, Geology, Soils, and Seismicity. Specifically, please refer to Table 4.2-6 for additional discussion of the project's conformity with applicable Coastal Act policies related to beach erosion.
City of Marina (coastal zone)	City of Marina Local Coastal Land Use Plan	Policies	Subsurface Slant Wells, Transmission Main, Source Water Pipeline, and new Desalinated Water Pipeline	***Policy 8:*** To prohibit further degradation of the beach environment and conserve its unique qualities.	This policy is intended to protect the beach environment and associated uses from impacts of development.	Consistent: By locating the slant well system several hundred feet inland of the beach, within the CEMEX property's former mining area, impacts on the beach environment would be avoided. With coastal erosion, there is potential for the beach to retreat back to the subsurface slant wells (Site 1, which could degrade the beach environment. This issue is addressed further in Section 4.2, Geology, Soils, and Seismicity. Specifically, please refer to **Table 4.2-6** for additional discussion of the project's conformity with applicable Marina Local Coastal Land Use Plan policies related to beach erosion.
City of Marina (coastal zone)	City of Marina Local Coastal Land Use Plan	Policies	Subsurface Slant Wells, new Transmission Main, Source Water Pipeline, and new Desalinated Water Pipeline	***Policy 32:*** To minimize adverse environmental affects, by concentrating new development within or adjacent to areas of existing development in the coastal zone.	This policy is intended to protect coastal resources from the impacts of sprawling new development.	Consistent: The proposed subsurface slant well site is in the vicinity of existing sand mining operations; pipelines would be located primarily in existing utility corridors and roadway rights-of-way.
City of Marina (coastal zone)	City of Marina Local Coastal Land Use Plan	Policies	Subsurface Slant Wells, new Transmission Main, Source Water Pipeline, and new Desalinated Water Pipeline	***Policy 41:*** To give priority to coastal-dependent development on or near the shoreline and ensure that environmental effects are mitigated to the greatest extent possible.	This policy is intended to protect Marina's existing coastal land uses and resources from incompatible land uses, and to preserve future opportunities for use of shoreline areas for developments that are compatible with those uses and resources.	Consistent: The seawater intake system is the only MPWSP component proposed for a parcel adjacent to Marina's shoreline. The proposed development is coastal dependent as it requires proximity to the shore to function. The seawater intake system would not conflict with existing adjacent land uses. With coastal erosion, there is potential for the beach to retreat back to the subsurface slant wells (Site 1), which could affect access along the shoreline. This issue is addressed further in Section 4.2, Geology, Soils, and Seismicity. Specifically, please refer to **Table 4.2-6** for additional discussion of the project's conformity with applicable Marina Local Coastal Land Use Plan policies related to beach erosion.
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Community Design and Development	Subsurface Slant Wells, new Transmission Main, Source Water Pipeline, and new Desalinated Water Pipeline	***Policy 4.112***: The policies of the Community Land Use Element are designed to protect areas with significant agricultural or natural-habitat value from being displaced by development, and they are designed to protect and conserve air, water and energy resources.	This policy is intended to protect important agricultural, biological, air, water, and energy resources from impacts of development.	The project's implications for agricultural, biological, air, and energy resources are discussed in EIR/EIS Sections 4.16, 4.6, 4.10, and 4.18, respectively. The project's implications for surface water and groundwater resources are discussed in EIR/EIS Sections 4.3 and 4.4. Specifically, refer to **Tables 4.16-2, 4.6-2, 4.10-3, 4.18-2, 4.3-5,** and **4.4-6** for additional discussion of the project's conformity with applicable Marina General Plan policies related to these resource areas, respectively.
City of Marina (coastal zone and inland areas)	City of Marina General Plan	Community Infrastructure	Subsurface Slant Wells, new Transmission Main, Source Water Pipeline, and new Desalinated Water Pipeline	***Primary Policy 3.3.14:*** Support water resource programs, including desalinization and reclamation efforts, to provide an adequate water supply to accommodate General Plan permitted growth.	This policy is intended to ensure water availability within the planning area to accommodate future growth.	Consistent: The project would facilitate the production and transmission of desalinated water, which would be available for use within the Marina General Plan area.

TABLE 4.8-2 (Continued)
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO LAND USE AND RECREATION

Project Planning Region	Applicable Plan	Plan Element/ Section	Subject Project Components	Specific Goal, Policy, or Program	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Policies and Programs
City of Seaside (coastal zone)	City of Seaside Local Coastal Program Land Use Plan	Public Access and Recreation	New Transmission Main	***Policy PAR-DM 1.1.B –*** *Management of Public Access and Recreational Opportunities – Southern Pacific Railroad:* The City shall maintain (keep free of debris, trash, etc.) the portions of the Southern Pacific Railroad right-of way transportation corridor that are within the Del Monte Subarea (III.B.3.b.3).	This policy is intended to protect public access to and use of recreational facilities.	Consistent: Project construction may have short-term, temporary, and direct effects on the TAMC right-of-way and/or Monterey Peninsula Recreational Trail access (i.e., closures during pipeline installation). However, the pipelines would be buried underground and would not substantially impede long-term public access and recreation to or along the right-of-way and/or trail.
City of Seaside (coastal zone)	City of Seaside Local Coastal Program Land Use Plan	Coastal Zone	New Transmission Main	***Policy NCR-CZ 1.1.C –*** *Coastal Resources:* New development shall be located in areas where it will not have a significant adverse effect either individually or cumulatively on natural coastal resources and public access and recreation.	This policy is intended to protect coastal resources, public access, and recreation from significant adverse effects associated with new development.	Consistent: The new Transmission Main and new Monterey Pipeline would be located within existing developed or disturbed utility corridors and road/railroad rights-of-way. Public access through work areas would be temporarily disrupted during construction. However, the pipelines would be buried underground and would not substantially impede long-term public access and recreation.
City of Seaside (coastal zone)	City of Seaside Local Coastal Program Land Use Plan	Coastal Zone	New Transmission Main	***Policy PAR-CZ 1.1.B –*** Protection of Public Access and Recreational Opportunities: Maximize and protect public access including pedestrian and bicycle connectivity and recreational opportunities in the coastal zone consistent with resource conservation principles, public safety, public rights, and the rights of private property owners.	This policy is intended to protect the public's right of access to shoreline access points – a public recreational resource.	Consistent: The new Transmission Main and new Monterey Pipeline would be located within existing developed or disturbed utility corridors and road/railroad rights-of-way. Public access through work areas would be temporarily disrupted during construction. However, the pipelines would be buried underground and would not substantially impede long-term public access and recreation.
City of Seaside (coastal zone)	City of Seaside Local Coastal Program Land Use Plan	Coastal Zone	New Transmission Main	***Policy LUD-CZ 2.1.B –*** *Compliance with Land Use Plan Policies:* New development shall be required to demonstrate compliance with the Land Use Plan policies applicable to the particular project under consideration.	This policy is intended to ensure new development is compatible with adjacent land uses and that coastal resources and public access are protected.	Consistent: The new Transmission Main and new Monterey Pipeline would be buried below ground and would not present any land use conflicts. Furthermore, CalAm would be required to demonstrate land use plan policy consistency through the Coastal Development Permit application process, prior to project implementation.
City of Seaside (coastal zone)	City of Seaside Local Coastal Program Land Use Plan	Coastal Zone	New Transmission Main	***Policy LUD-CZ 2.1.D -*** *Coastal Development Permit Required:* A Coastal Development Permit shall be required for all development within the coastal zone.	This policy is intended to ensure that all development proceeds in a manner that is consistent with the coastal resource planning and management policies of the Seaside Local Coastal Program and the Coastal Act.	Consistent: As noted in Chapter 3, Project Description, CalAm would apply for all necessary local permits, including a Coastal Development Permit
City of Seaside (coastal zone & inland area)	Seaside General Plan	Land Use	New Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, ASR Pump-to-Waste Pipeline, ASR Settling Basin, and Terminal Reservoir	***Policy LU-5.1:*** Review development proposals to ensure that adequate water supply, treatment, and distribution capacity is available to meet the needs of the proposed development without negatively impacting the existing community.	This policy is intended to ensure that adequate water supply, treatment, and distribution capacity is available.	Consistent: The purpose of the project is to improve the reliability and sustain adequacy of water supply, treatment, and distribution capacity. Discussed more fully in Chapter 2, Water Demand, Supplies, and Water Rights, the MPWSP is sized to meet the requirements of SWRCB Orders 95-10 and 2009-0060, and the 2006 groundwater basin adjudication, along with existing and anticipated future demands of existing water entitlement holders, the anticipated economic recovery of the local hospitality industry, and development of existing legal lots of record.
City of Seaside (coastal zone & inland area)	Seaside General Plan	Land Use	New Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, ASR Pump-to-Waste Pipeline, ASR Settling Basin, and Terminal Reservoir	***Policy LU-5.2:*** Work cooperatively with local and regional water suppliers to ensure adequate water reserves.	This policy is intended to ensure adequate water reserves.	Consistent: The purpose of the project is to improve the reliability and sustain adequacy of water supply, treatment, and distribution capacity locally and regionally. Additional discussion of CalAm and MPWSP coordination with other water providers in the region is provided in Chapter 3.
City of Seaside (coastal zone & inland area)	Seaside General Plan	Land Use	New Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, ASR Pump-to-Waste Pipeline, ASR Settling Basin, and Terminal Reservoir	***Policy LU-5.4:*** Promote the use of recycled water for irrigation of parks, golf courses, and public landscaped areas in the community.	This policy is intended to promote the use of recycled water for irrigation.	Consistent: The MPWSP would not preclude opportunities to promote and expand use of recycled water for irrigation in Seaside.

TABLE 4.8-2 (Continued)
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO LAND USE AND RECREATION

Project Planning Region	Applicable Plan	Plan Element/ Section	Subject Project Components	Specific Goal, Policy, or Program	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Policies and Programs
City of Seaside (coastal zone & inland area)	Seaside General Plan	Conservation/Open Space Element	New Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, ASR Pump-to-Waste Pipeline, ASR Settling Basin, and Terminal Reservoir	***Policy COS-2.1:*** Work with regional and local water providers to ensure that adequate supplies of water are available to meet existing development and future growth.	This policy is intended to ensure that adequate supplies of water are available.	Consistent: The purpose of the project is to improve the reliability and sustain adequacy of water supply, treatment, and distribution capacity locally and regionally. Additional discussion of CalAm and MPWSP coordination with other water providers in the region is provided in Chapter 3.
City of Seaside (coastal zone & inland area)	Seaside General Plan	Conservation/Open Space Element	New Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, ASR Pump-to-Waste Pipeline, ASR Settling Basin, and Terminal Reservoir	***Policy COS-2.2:*** Encourage the production, distribution, and use of recycled water.	This policy is intended to encourage the use of recycled water.	Consistent: The MPWSP would not preclude opportunities to produce, distribute, and use recycled water in Seaside.
City of Seaside (coastal zone & inland area)	Seaside General Plan	Conservation/Open Space Element	New Transmission Main, ASR Conveyance Pipeline, ASR Recirculation Pipeline, ASR Pump-to-Waste Pipeline, ASR Settling Basin, and Terminal Reservoir	***Policy COS-2.3:*** Participate in and implement local and regional programs that promote water conservation as a means of improving water supply and water.	This policy is intended to promote water conservation.	Consistent: The project would not preclude opportunities to participate in and implement local and regional programs that promote water conservation as a means of improving water supply and water.
County of Monterey (inland areas)	Greater Monterey Peninsula Area Plan	Public Services and Facilities	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, and Ryan Ranch–Bishop Interconnection Improvements	***Policy GMP-5.2:*** Each development proposal shall be evaluated to determine the extent to which such development may help further the County's park and recreation facility goals, objectives, and policies.	This policy is intended to protect and enhance the County's parklands and recreational facilities.	Consistent: MPWSP construction would temporarily affect parklands and restrict access to recreational facilities. However, project components that could disrupt park access and recreation would be buried underground. As a result, the project would not adversely affect long-term park access or use.
County of Monterey (inland areas)	Monterey County Code	Chapter 10.72 – Desalinization Treatment Facility	MPWSP Desalination Plant	***Sections 10.72.010*** et seq. establishes: No person, firm, water utility, association, corporation, organization, or partnership, or any city, county, district, or any department or agency of the State shall commence construction of or operate any Desalination Treatment Facility (which is defined as a facility which removes or reduces salts from water to a level that meets drinking water standards and/or irrigation purposes) without first securing a permit to construct and a permit to operate said facility. Such permits shall be obtained from the Director of Environmental Health of the County of Monterey, or his designee, prior to securing any building permit.	This policy is intended to regulate ownership of desalination facilities within Monterey County.	*Pursuant to CPUC's October 31, 2012 decision affirming Administrative Law Judge (ALJ) Gary Weatherford's September 12, 2012 proposed "Decision Declaring Preemption of County Ordinance and the Exercise of Paramount Jurisdiction", this ordinance is not applicable to the MPWSP.*
County of Monterey (inland areas)	Monterey County General Plan	Land Use	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System–Hidden Hills and Ryan Ranch–Bishop Interconnection Improvements	***Policy LU-5.7:*** Industrially designated areas shall be compatible with surrounding land uses.	This policy is intended to ensure compatibility of adjacent land uses.	Consistent: The proposed MPWSP Desalination Plant would be sited next to the existing Monterey County Landfill and the MRWPCA Regional Wastewater Treatment Plant, and would not preclude continued use of nearby lands for agriculture and grazing.
County of Monterey (inland areas)	Monterey County General Plan	Land Use	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System–Hidden Hills and Ryan Ranch–Bishop Interconnection Improvements	***Policy LU-1.11:*** Development proposals shall be consistent with the General Plan Land Use Map designation of the subject property and the policies of this plan.	This policy is intended to ensure development proceeds in a manner that is compatible with existing and anticipated future development.	Consistent: Lands with a General Plan land use designation of Permanent Grazing may need to be redesignated to accommodate the proposed MPWSP Desalination Plant. As necessary, such conversion would occur through the requisite local planning and permit review processes. The proposed MPWSP Desalination Plant would be compatible with the adjacent Monterey County Landfill and the MRWPCA Regional Wastewater Treatment Facility.

TABLE 4.8-2 (Continued)
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO LAND USE AND RECREATION

Project Planning Region	Applicable Plan	Plan Element/ Section	Subject Project Components	Specific Goal, Policy, or Program	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Policies and Programs
County of Monterey (inland areas)	Monterey County General Plan	Public Services	Source Water Pipeline, MPWSP Desalination Plant, new Desalinated Water Pipeline, Brine Discharge Pipeline, Pipeline to CSIP Pond, Castroville Pipeline, Carmel Valley Pump Station, Main System–Hidden Hills and Ryan Ranch–Bishop Interconnection Improvements	**Policy PS-13.2:** All new utility lines shall be placed underground, unless determined not to be feasible by the Director of the Resource Management Agency.	This policy is intended to protect the existing visual and architectural character of the planning area.	Consistent: All proposed pipelines would be placed below ground.
County of Monterey (coastal zone)	North County Land Use Plan	Land Use and Development	Source Water Pipeline and new Desalinated Water Pipeline	***Key Policy 4.3.4:*** All future development within the North County coastal segment must be clearly consistent with the protection of the area's significant human and cultural resources, agriculture, natural resources, and water quality.	This policy is intended to provide long-term resource management and protection.	Impacts related to cultural, agricultural, and biological resources and water quality, are discussed in EIR/EIS Sections 4.15, 4.16, 4.6, 4.3, respectively. Specifically, please refer to **Tables 4.15-6, 4.16-2, 4.6-2,** and **4.3-5** for additional discussion of the project's conformity with applicable North County Land Use Plan policies related to these resource areas, respectively.
County of Monterey (coastal zone)	North County Land Use Plan	Land Use and Development	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 4.3.5.4:*** Where there is limited land, water, or public facilities to support development, coastal dependent agriculture, recreation, commercial and industrial uses shall have priority over residential and other non-coastal dependent uses.	This policy is intended to preserve and protect opportunities for coastal-related and coastal-dependent uses within coastal areas where the availability of land, water, or public facilities is limited.	Consistent: The Source Water Pipeline and new Desalinated Water Pipeline are coastal-dependent or coastal-related, due to their reliance on coastal areas for water intake and transmission. These facilities would be buried below ground and would not otherwise limit use of land, water, or public facilities in the coastal zone.
County of Monterey (coastal zone)	North County Land Use Plan	Land Use and Development	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 2.3.5.6:*** Industrial uses shall be located near major transportation facilities and population centers. The only industrial facilities appropriate for the area are coastal or agriculture-dependent industries which do not demand large quantities of fresh water and contribute low levels of air and water pollution. Industries not compatible with the high air quality needed for the protection of agriculture shall be restricted.	This policy is intended to protect air quality and water availability in the coastal zone, and the agricultural operations dependent thereon.	Consistent: The Source Water Pipeline is coastal dependent. The Source Water Pipeline and new Desalinated Water Pipeline are public utilities. They would be buried below ground and they would have no long-term impact on air quality or traffic within the North County Land Use Plan area, nor would they require large quantities of fresh water. Traffic and air quality impacts are addressed in EIR/EIS Sections 4.9 and 4.10, respectively. Water availability impacts are addressed in EIR/EIS Sections 4.3 and 4.4. Specifically, please refer to **Tables 4.9-2, 4.10-3, 4.3-5,** and **4.4-6** for additional discussion of the project's conformity with applicable North County Land Use Plan policies related to these resource areas, respectively.
County of Monterey (coastal zone)	North County Land Use Plan	Land Use and Development	Source Water Pipeline and new Desalinated Water Pipeline	***Policy 4.3.5.8:*** Development within the North County coastal zone shall be consistent with the land uses shown on the plan map and as described in the text of this plan.	This policy is intended to protect coastal resources and direct development is a way that is consistent with the Coastal Act.	Consistent: The Source Water Pipeline and new Desalinated Water Pipeline would be sited along existing roadway and railroad rights-of-way and would not preclude land uses shown on the plan map.
County of Monterey (coastal zone)	North County Land Use Plan	Land Use and Development	Source Water Pipeline and new Desalinated Water Pipeline	***Specific Policy 4.3.6 F4:*** A basic standard for all new or expanded industrial uses is the protection of North County's natural resources. Only those industries determined to be compatible with the limited availability of freshwater and the high air quality required by agriculture shall be allowed. New or expanded industrial facilities shall be sited to avoid impacts on agriculture of environmentally sensitive habitats.	This policy is intended to protect air quality and water availability in the coastal zone, and the agricultural operations dependent thereon.	Consistent: The Source Water Pipeline and new Desalinated Water Pipeline are not industrial facilities, would be buried below ground, and would have no long-term impact on natural resources, air quality, or water availability within the North County Land Use Plan area. Biological resources and air quality impacts are addressed in EIR/EIS Sections 4.6 and 4.10, respectively. Water availability impacts are addressed in EIR/EIS Sections 4.3 and 4.4. Specifically, please refer to **Tables 4.6-2, 4.10-3, 4.3-5,** and **4.4-6** for additional discussion of the project's conformity with applicable North County Land Use Plan policies related to these resource areas, respectively.

TABLE 4.8-2 (Continued)
APPLICABLE REGIONAL AND LOCAL PLANS AND POLICIES RELEVANT TO LAND USE AND RECREATION

Project Planning Region	Applicable Plan	Plan Element/ Section	Subject Project Components	Specific Goal, Policy, or Program	Relationship to Avoiding or Mitigating a Significant Environmental Impact	Project Consistency with Policies and Programs
Fort Ord Reuse Authority (Seaside)	Fort Ord Reuse Plan	Land Use	New Transmission Main, ASR Conveyance Pipeline, ASR Pump-to-Waste Pipeline, ASR Recirculation Pipeline, ASR Settling Basin, Terminal Reservoir, and Ryan Ranch–Bishop Interconnection Improvements	***Residential Land Use Policy B-1:*** The City of Seaside shall encourage land uses that are compatible with the character of the surrounding districts or neighborhoods and discourage new land use activities which are potential nuisances and/or hazards within and in close proximity to residential areas.	This policy is intended to minimize nuisance and hazards that could result from incompatible land uses.	Consistent: The Terminal Reservoir would be constructed in a mostly undeveloped area designated for single-family residential development. The facility would not conflict with existing or future land uses, as several water storage tanks and pump stations presently exist within Seaside neighborhoods. Pursuant to the Seaside Municipal Code (Title 17), which applies to the proposed Terminal Reservoir site and has been certified by FORA as consistent with the Base Reuse Plan Policies, Utility Facilities are permitted in Seaside's Residential Zones with a Use Permit. Other project components subject to the Base Reuse Plan's Seaside planning area would be constructed at or below ground, and therefore would be compatible with existing land use character. Additional discussion of land use compatibility is presented in Section 4.14, Aesthetic Resources. The Ryan Ranch-Bishop Interconnection Improvements would be constructed below ground surface and would have no effect related to nuisance, hazard, or other land use compatibility issue.

SOURCES: City of Marina, 1982, 2000; City of Seaside, 2004b, 2013; FORA, 1997a; Monterey County, 1999, 2010.

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Determinations of consistency with these criteria are reserved for the governing body with jurisdiction. However, for purposes of environmental review and public disclosure, this EIR/EIS provides a preliminary assessment of project consistency with applicable local land use policies and regulations. Analyses of consistency in this EIR/EIS are presented in each Chapter 4 environmental topic's Regulatory Framework subsection (e.g., Section 4.2 of this Land Use, Land Use Planning, and Recreation section) and appear in tables entitled "Regional and Local Land Use Policies Relevant to [subject impact topic]". As noted in the preceding subsection, where potential conflicts are identified, the reader is referred to the respective environmental topic's subsection entitled Direct and Indirect Effects of the Project where the potential conflict is further evaluated.

In all but one instance related to specific MPWSP components' compatibility with established land use policies related to biological resources (i.e., Impacts 4.6-4), potential land use policy and regulation conflicts are resolvable with the implementation of recommended mitigation. And in those instances in which potential conflicts could remain after mitigation is implemented, the proposed use would not be fundamentally inconsistent with intent of the respective site's established land use and zoning classification, nor would the effects substantially conflict with the public health, safety, and welfare criteria underlying most Use Permit decisions. Therefore, based upon the analyses presented herein, the local body overseeing land use and development decisions should be able to make the consistency findings necessary for Use Permit and/or CDP issuance.

Subsurface Slant Wells

The subsurface slant wells are proposed in a retired portion of the CEMEX sand mining operation in northern Marina. This area is identified on the land use plan as Habitat Reserve and Other Open Spaces, and zoned for Coastal Conservation and Development (CD) uses. According to the *City of Marina General Plan*, lands designated as Habitat Reserve and Other Open Spaces are "intended for permanent retention in open space to protect significant plants and wildlife inhabiting these areas" (City of Marina, 2000). The *City of Marina General Plan* recognizes the presence of the CEMEX sand mining facility and provides for the continuation, modification, and expansion of sand mining activities on the property in accordance with the provisions of the Local Coastal Program and Reclamation Plan (City of Marina, 2000). The *City of Marina Local Coastal Program* and zoning regulations provide for conditional approval of coastal-dependent industrial land uses, including, but not limited to surf zone and offshore sand extraction and dune mining, within the CD district (City of Marina, 1982; 2009). CalAm will need to obtain a CDP from the City of Marina for implementation of the subsurface slant wells. Per the above discussion of project consistency with applicable land use policies and regulations, the City of Marina should be able to make findings in support of CDP issuance for the subsurface slant wells. With the requisite CDP, the proposed subsurface slant wells would not conflict with land use plan and zoning designations.

MPWSP Desalination Plant

The MPWSP Desalination Plant would be located in unincorporated Monterey County. The site is identified as Permanent Grazing (PG) in both the *Monterey County General Plan* Land Use Map and County Zoning Map. Per the *Monterey County General Plan*, the PG designation allows a

range of uses that conserve and enhance productive grazing lands. According to the *Monterey County General Plan*, greenhouse operations notwithstanding, building coverage on PG lands shall be limited to 5 percent of the property (Monterey County, 2010). The Monterey County Zoning Ordinance provides for public and quasi-public uses, such as public utilities, within PG districts provided applicants obtain a Use Permit (Monterey County, 1997). The minimum building site is 40 acres. Per the zoning regulations, projects such as the MPWSP involving building coverage in excess of the 5 percent limit would require a variance. Chapter 21.72 establishes and outlines the process for obtaining a variance. The variance notwithstanding, per the above discussion of project consistency with applicable land use policies and regulations, the County of Monterey should be able to make findings in support of Use Permit issuance for the MPWSP Desalination Plant. Through adherence to the variance process, and with the Zoning Administrator's finding that the criteria for a variance have been met, the MPWSP Desalination Plant would not conflict with land use plan and zoning designations.

Pipelines North of Reservation Road

Conveyance facilities north of Reservation Road would include the Source Water Pipeline and optional alignment, new Desalinated Water Pipeline and optional alignment, Castroville Pipeline and optional alignments, Brine Discharge Pipeline, and Pipeline to CSIP Pond. These facilities would be constructed within portions of Marina and unincorporated Monterey County. Pipeline alignments would generally follow the TAMC right-of-way, Monterey Peninsula Recreational Trail, and existing road rights-of-way. Land uses along these pipeline alignments are identified on the land use plans as Habitat Reserve and Other Open Space Preserve (coastal Marina); Agricultural Preservation and Light Industrial (coastal Monterey County); and Mixed Use, Low Density Residential, Farmland, and Permanent Grazing (inland Monterey County). Zoning designations for these lands include Coastal Conservation and Development (coastal Marina); Resource Conservation, Coastal Agricultural Preservation, and Light Industrial (coastal Monterey County); and Permanent Grazing, Farmland, Mixed Use, Low Density Residential, and Public/Quasi-Public uses (inland Monterey County). Marina (Section 17.06.020.D) and Monterey County (Sections 20.64.160.C and 21.64.160.C) zoning regulations allow public utility distribution and transmission facilities in all zone districts. Marina and Monterey County require project applicants to obtain one or more approvals (such as a Use Permit or a CDP, and/or planning commission review) prior to construction of any portion of the pipelines. Per the above discussion of project consistency with applicable land use policies and regulations, the City of Marina and Monterey County should be able to make findings in support of Use Permit and/or CDP authorization, as applicable, for MPWSP pipelines north of Reservation Road. With the requisite Use Permit and/or CDP, as applicable, the proposed pipelines would not conflict with underlying land use plan and zoning designations.

ASR-5 and ASR-6 Wells

The proposed ASR-5 and ASR-6 Wells would be constructed along the east side of General Jim Moore Boulevard in Seaside, entirely on federally-owned land within the former Fort Ord military base. As noted previously, land use decisions in this area are under the jurisdiction of the U.S. Army and are guided by the *Real Property Master Plan*. The U.S. Army analyzed the

potential land use effects of the proposed ASR-5 and ASR-6 Wells in the *Final Environmental Assessment and Finding of No Significant Impact, Monterey Bay Regional Water Project – Aquifer Storage and Recovery*. The *Environmental Assessment* concluded the proposed ASR-5 and ASR-6 Wells would have no impact with respect to conflict with any applicable land use plans, policies, or regulations (RBF Consulting, 2010). As these components would be constructed entirely within lands under federal jurisdiction and not subject to local land use regulation, no determination regarding potential conflicts with established land use and zoning designations is provided.

Pipelines South of Reservation Road

Conveyance facilities south of Reservation Road would include the new Transmission Main and optional alignment, ASR pipelines, Main System–Hidden Hills Interconnection Improvements, and Ryan Ranch–Bishop Interconnection Improvements. These components would cross portions of the cities of Marina, Seaside, Monterey, and unincorporated Monterey County. The proposed pipeline alignments would generally follow the Monterey Peninsula Recreational Trail, TAMC right-of-way, and other road rights-of-way. Land use plan designations for property within or adjacent to these pipeline alignments range from Parks and Open Space Preserve, to Military and Industrial. Zoning along the pipeline alignments also spans a similarly broad range of designations. As noted for conveyance pipelines north of Reservation Road, Marina and Monterey County zoning regulations allow public utilities in all zone districts with a Use Permit, Coastal Development Permit, and/or planning commission review. Zoning regulations for the cities of Seaside and Monterey also allow major public utilities in all such districts with a Use Permit. Per the above discussion of project consistency with applicable land use policies and regulations, the cities of Seaside and Monterey should be able to make findings in support of Use Permit authorization, as applicable, for MPWSP pipelines south of Reservation Road. With the requisite Use Permit, as applicable, the proposed pipelines would not conflict with underlying land use plan and zoning designations.

Terminal Reservoir

The proposed Terminal Reservoir would be located in Seaside, east of General Jim Moore Boulevard, in the former Fort Ord military base. The Terminal Reservoir site has a land use plan designation of Low Density Residential and is zoned for Single Family Residential (RS-8) uses. The Seaside Zoning Code (Section 17.22.030) allows utility facilities in Residential districts with a Use Permit. The Seaside Zoning Code considers water supply infrastructure to be utility facilities. Per the above discussion of project consistency with applicable land use policies and regulations, the City of Seaside should be able to make findings in support of Use Permit authorization. With the requisite Use Permit, the proposed Terminal Reservoir would not conflict with the site's land use and zoning designations.

Carmel Valley Pump Station

The Carmel Valley Pump Station would be constructed on lands in unincorporated Monterey County. The proposed site, which is located approximately 240 feet south of Carmel Valley Road (west of Rancho San Carlos Road), has land use plan and zoning designations Residential – Low

Density (LDR/2.5-D-S-RAZ). The Carmel Valley Pump Station would be consistent with the Residential – Low Density land use classifications. The County of Monterey Zoning Ordinance for Inland Areas (Section 21.14.050.B) allows public and quasi-public uses, including public utility facilities, in the LDR zone with a Use Permit. Public utility facilities include facilities for the "production, storage, transmission, distribution, and recovery of water…" (21.06.910). Per the above discussion of project consistency with applicable land use policies and regulations, Monterey County should be able to make findings in support of Use Permit authorization. With the requisite Use Permit, the proposed pump station would not conflict with underlying land use plan and zoning designations.

4.8.2.4 Special Districts

Transportation Agency for Monterey County (TAMC)

Portions of the new Desalinated Water Pipeline, new Transmission Main, and Castroville Pipelines, and their respective optional alignments, would be located generally within the TAMC right-of-way. For these segments an easement or encroachment permit may be required from TAMC (refer to Chapter 3, Project Description). TAMC has identified potential future plans to utilize its existing right-of-way to extend commuter service in Salinas and passenger service to and from the Monterey Peninsula. CalAm and the MWPSP design engineer are coordinating with TAMC to ensure the proposed facilities do not conflict with potential future TAMC plans for use of the right-of-way.

Monterey Peninsula Water Management District

The Monterey Peninsula Water Management District (MPWMD) manages the production of surface water supplies from the Carmel River and groundwater pumped from municipal and private wells in Carmel Valley and the Seaside coastal area. The MPWMD's jurisdictional boundary generally corresponds to CalAm's Monterey District service area, with the exception of an area north and east of Seaside and Sand City that is within the MPWMD's jurisdiction but is served by the Marina Coast Water District. MPWMD was created by the California Legislature in 1977 as a special district and approved by local voters in 1978. MPWMD regulates water allocation, delivery, and use within its jurisdictional boundary. The location of the facility or water source, quantity of water, and delivery determine the type of permit required from MPWMD and conditions of approval. Even if the proposed treatment facility is not located within MPWMD jurisdiction, the delivery and use of the desalinated water produced by the project ("product water") within the jurisdiction is still subject to MPWMD regulations. That is, if any of the proposed facility components are within the MPWMD's jurisdictional boundary, CalAm must apply for a Water System Expansion Permit (MPWMD, 2001). Portions of the proposed project would be within the MPWMD jurisdiction; therefore, CalAm would be required to obtain a Water System Expansion Permit for project operation.

4.8.3 Evaluation Criteria

Implementation of the proposed project would have a significant impact related to land use, land use planning, and recreational resources if it would:

- Physically divide an established community;
- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect;
- Conflict with any applicable habitat conservation plan or natural community conservation plan;
- Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated; or
- Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.
- Disrupt or preclude public access to or along the coast.

4.8.4 Approach to Analysis

The analysis considers the proposed project's potential to conflict with applicable plans, policies, and regulations governing land use decisions. This analysis addresses the potential for temporary impacts on land use and recreation during construction, as well as long-term impacts resulting from project siting and operations. Where the project would result in a significant impact or conflict with a regulatory requirement, mitigation measures are recommended to reduce the impact significance and/or resolve or minimize the potential regulatory conflict.

4.8.5 Direct and Indirect Effects of the Proposed Project

Based on the nature of the proposed project, the following significance criteria are not addressed further in the section:

Physically divide an established community. All of the linear facilities that are proposed as part of the project (e.g., pipelines) would be located underground, and the overlying areas would be restored after construction. Aboveground structures that would be constructed include the subsurface slant wells vaults and housings, MPWSP Desalination Plant, Terminal Reservoir, the ASR-5 and ASR-6 Wells (pump houses), and the Carmel Valley Pump Station. None of the aboveground facilities would divide an established community or established land uses. Thus, the criterion related to the division of an established community is not applicable to the proposed project and is not discussed further.

Conflict with any applicable habitat conservation plan or natural community conservation plan. This criterion is addressed in Impact 4.6-8 in Section 4.6, Terrestrial Biological Resources, of this EIR/EIS.

Increase the use of existing neighborhood and regional parks or other recreational facilities. The project does not propose to construct new homes or businesses and would

not increase the number of residents in the project area. The project would occur in the vicinity of and could be noticeable to users of recreational facilities, such as golf courses, parks, and ballfields. The project would not directly affect these types of facilities. Nor would the project be expected to cause permanent displacement of users from these facilities, such that other facilities experienced an increased level of use that resulted in physical impacts. Therefore, this significance criterion is not applicable to the proposed project and is not discussed further.

Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment. The proposed project does not include recreational facilities and would not result in the need for new or expanded recreational facilities. Thus, the significance criterion related to the construction or expansion of recreational facilities is not applicable to the proposed project and is not discussed further.

Disrupt or preclude public access to or along the coast during project operations. The proposed project does not involve any permanent aboveground facilities whose operations would affect coastal public access. All project facilities proposed within the Coastal Zone would be either buried below ground surface or sited on private land, outside of any public access areas. With coastal erosion, there is potential for the beach to retreat landward to the subsurface slant wells (Site 1), which could affect access along the shoreline. This issue is addressed further in Section 4.2, Geology, Soils, and Seismicity, which calls for coastal erosion monitoring and removal of portions of the slant well that could encroach into the public beach, prior to anticipated date of beach exposure. No other project components have potential to affect public access. Therefore, the significance criterion related to project operations impacts on public access to or along the coast is not discussed further.

Table 4.8-3 summarizes the MPWSP's impacts and significance determinations related to land use and recreation.

TABLE 4.8-3
SUMMARY OF IMPACTS – LAND USE AND RECREATION

Impacts	Significance Determinations
Impact 4.8-1: Consistency with applicable plans, policies, and regulations related to land use and recreation that were adopted for the purpose of mitigating an environmental effect.	LS
Impact 4.8-2: Disrupt or preclude public access to or along the coast during construction.	LSM
Impact 4.8-C: Cumulative impacts related to land use and recreation.	LSM

NOTES:
LS = Less than Significant
LSM = Less than Significant impact with mitigation

Impact 4.8-1: Consistency with applicable plans, policies, and regulations that were adopted for the purpose of mitigating an environmental effect. (*Less than Significant*)

Section 15125(d) of the CEQA Guidelines requires analysis of potential "conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning

ordinance) adopted for the purpose of avoiding or mitigating an environmental effect." There are numerous plans, policies, and regulations that either are implicated by relevant significance criteria or were adopted for environmental purposes and thus are evaluated under the appropriate topical sections of this EIR/EIS. As an example, Section 4.6, Terrestrial Biological Resources, evaluates whether the project would conflict with the provisions of an adopted Habitat Conservation Plant or similar plan. As such, consistency with applicable Habitat Conservation Plans is discussed in Section 4.6.

This section evaluates overall project consistency with applicable plans, policies, and regulations pertaining to land use and recreation. The applicable plans, policies, and regulations related to these topics are presented in **Table 4.8-2**, above. The table also establishes the relationship of the plan, policy, or regulation to avoiding or mitigating an environmental effect. The range of issues represented in **Table 4.8-2** include: land use compatibility and protection of land use values, development clustering, protection of public access and recreational opportunities, and coastal-dependency and priority land uses in the coastal zone. As presented in the table, the project would not be expected to conflict with plans, policies, and regulations related to these issue areas. Because many of the proposed pipelines would be installed along recreational trails, bike routes, and pedestrian paths, additional discussion regarding the proposed project's effects on recreational resources is provided below to support the analysis of project consistency with plans, policies, and regulations pertaining to recreational resources. Recognizing that the affected jurisdiction has the ultimate authority over consistency determinations, the table was prepared in consultation with the potentially affected jurisdictions. A more focused discussion of potential effects on public access to and along the coast is provided in **Impact 4.8-2**, below.

Construction activities associated with the Source Water Pipeline, new Desalinated Water Pipeline, new Transmission Main, Castroville Pipeline, Ryan Ranch–Bishop Interconnection Improvements, ASR pipelines, and their respective optional alignments, would overlap geographically with recreational trails, bicycle routes, and pedestrian pathways and could directly affect the use of such recreational facilities during the construction period. As discussed in Section 4.9, Traffic and Transportation (Impact 4.9-5), pipeline construction activities, including vehicle ingress and egress, equipment and materials staging, trenching, and stockpiling, could disrupt established bicycle and pedestrian facilities located along the pipeline alignments. However, since pipeline construction would proceed at a rate of 150 to 250 feet per day, the total duration of disturbance at any one location would generally be 1 to 2 weeks. Upon completion of construction, the areas disturbed during pipeline installation activities would be returned to their approximate pre-construction condition.

Construction of subsurface slant wells would occur within the CEMEX sand mining facility. The wells would be constructed approximately 500 feet landward of the back of beach. No work on the beach is proposed. Given their locations within a former sand mining site, landward of existing mining activities, subsurface slant well construction would not be expected to disrupt recreational beach use in the area. See **Impact 4.8-2** for additional discussion.

Construction of Terminal Reservoir would occur over 15 months. The proposed Terminal Reservoir Site is located just west of the Fort Ord National Monument; however, this portion of the National Monument is closed to the public due to munitions hazards. As a result, impacts (i.e., fugitive dust, construction noise, etc.) on recreational resources at the National Monument during construction of Terminal Reservoir are not anticipated. The lands immediately north of the Terminal Reservoir site are designated for Parks and Open Space (POS) and zoned for Open Space and Recreation (OSR); however, this area is currently closed to the public and it is not anticipated that this area will become publicly accessible prior to completion of construction activities at the Terminal Reservoir site. As a result, Terminal Reservoir construction would not result in substantial adverse effects on nearby recreational resources or uses.

The plans, policies, and regulations related to land use and recreation in **Table 4.8-2**, above, reflect the long-term visions of the respective jurisdictions with respect to land use and development and are not directly relevant to temporary construction activities. Further, construction-related effects on adjacent land uses and on recreational facilities would be temporary and no long-term disruptions would result. None of the project components would substantially conflict with plans, policies, or regulations that were adopted for the purpose of avoiding or mitigating an adverse environmental effect related to land use or recreation. Therefore, the proposed project would have a less-than-significant effect with respect to land use and recreational policy conflicts.

Impact Conclusion

Based upon an initial review of consistency, the MPWSP would not be expected to conflict with applicable land use policies related to land use and recreation that were adopted for the purpose of avoiding or mitigating an environmental effect. Although construction of the Source Water Pipeline, new Desalinated Water Pipeline, new Transmission Main, and the Ryan Ranch–Bishop Interconnection Improvements, Terminal Reservoir, and ASR pipelines could affect recreational facilities, any disruptions would be temporary and limited to the construction phase. Therefore, the proposed project would not substantially conflict with plans, policies related to land use or recreation. The impact would be less than significant.

Mitigation Measures

None proposed.

Impact 4.8-2: Disrupt or preclude public access to or along the coast during construction. (*Less than Significant with Mitigation*)

The National Marine Sanctuaries Act, the California Coastal Act, and local coastal programs, among other planning and regulatory documents applicable to the project area, each emphasize the importance of maintaining public access and recreation opportunities to and along the coast. As noted in Impact 4.8-1 and Section 4.9, Traffic and Transportation (Impact 4.9-5), project construction would temporarily disrupt transportation routes in the project area, some of which are used for recreation (e.g., Monterey Peninsula Recreational Trail). Potential effects on such

resources are not reanalyzed here. Rather, this impact evaluates the potential for project construction to disrupt existing vertical (i.e., between land and shore) and lateral (i.e., along the shoreline) access within the project area. An impact related to vertical or lateral access would be significant if project construction activities were to temporarily or permanently preclude the public's utilization of established vertical or lateral coastal public accessways.

Project components proposed for construction in locations within the Coastal Zone include the subsurface slant wells, Source Water Pipeline, new Desalinated Water Pipeline, and new Transmission Main. The Source Water Pipeline, and new Desalinated Water Pipeline are proposed for areas where no coastal public access impacts would occur; there is no vertical access in the vicinity of the Source Water Pipeline, and the new Desalinated Water Pipeline would be constructed well inland (approximately 0.7 to 0.9 miles) of the nearest vertical accessway. The remaining project components would be constructed outside of the Coastal Zone boundary, in areas where no potential effects on vertical or lateral public access would occur. As such, this section evaluates the potential effects on project construction on vertical and lateral access in the vicinity of the subsurface slant wells and the new Transmission Main.

Subsurface Slant Wells

The subsurface slant wells are proposed for the CEMEX property, which is located west of Highway 1, in northern Marina. There is no vertical public access within the CEMEX facility. Although use levels are low, the beach seaward of the CEMEX site is used by the public; the nearest vertical public accessways are located 1 mile south at Marina Dunes Preserve and 1.25 miles north at the Salinas River National Wildlife Refuge. All of the subsurface slant well construction activities would occur on private CEMEX property, approximately 500 feet inland of the beach. While some of this work may be visible from the publicly accessible beach, none would occur on the beach or in areas that would otherwise disrupt or preclude lateral access along the shore. As a result, construction of the subsurface slant wells would have a less-than-significant impact related to public access to or along the coast.

New Transmission Main

The segment of the new Transmission Main proposed within the Coastal Zone would be constructed within or adjacent to the TAMC right-of-way or the Monterey Peninsula Recreational Trail. Along the proposed new Transmission Main alignment to the north, the Monterey Peninsula Recreational Trail and TAMC right-of-way run north-south adjacent to Fort Ord Dunes State Park; the State Park provides public opportunities for vertical access. In this area, the Monterey Peninsula Recreational Trail serves as a primary bicycle and pedestrian access route from Marina, Sand City, and Seaside to the park. The proposed new Transmission Main and optional alignment would intersect three Fort Ord Dunes State Park entrances. From north to south, these include the Beach Range Road access, the 8th Street access, and the Divarty Street/1st Street access.

At Beach Range Road, the Fort Ord Dunes State Park is accessible via the at-grade intersection with the Monterey Peninsula Recreational Trail. Pipeline construction at the Beach Range Road/Monterey Peninsula Recreational Trail intersection would impede access into the park. At

8th Street, the park is accessible via bridge over the Monterey Peninsula Recreational Trail and TAMC right-of-way. The new Transmission Main would be constructed beneath the bridge and would not impede park access. At Divarty Street/1st Street, the park is accessible via a tunnel beneath the TAMC right-of-way and Monterey Peninsula Recreational Trail. The new Transmission Main would be constructed beneath the bridge and would not impede park access. At Divarty Street/1st Street, the park is accessible via a tunnel beneath the TAMC right-of-way and Monterey Peninsula Recreational Trail. The new Transmission Main would be constructed atop the tunnel, alongside the trail. However, temporary tunnel closures during pipeline installation over the tunnel would be required for public safety reasons.

Pipeline construction activities would progress at a rate of 150 to 250 feet per day. As such, construction-period impacts at park entrances would typically be limited to a period of one or two weeks. During this period, the public's ability to access Fort Ord Dunes State Park through the above-listed entrances would be impeded. Temporary closures of these entrances would affect access into the Park at specific locations. However, other entrances would remain open and public access to and use of existing vertical and lateral public accessways within Fort Ord Dunes State Park would not be obstructed. Following construction, the affected Park entrance areas would be returned to their approximate pre-construction condition. No permanent effects on park access would result.

The effects of new Transmission Main construction on public access to vertical and lateral public accessways within Fort Ord Dunes State Park would be significant. **Mitigation Measure 4.9-1, Traffic Control and Safety Assurance Plan**, would require the preparation and implementation of a traffic control safety plan that would apply to all project construction activities that could affect the public right-of-way, including roads and trails leading into Fort Ord Dunes State Park, and include measures that would provide for continuity of vehicular, pedestrian, and bicyclist access. With implementation of Mitigation Measure 4.9-1, the effects of new Transmission Main construction on public access would be reduced to a less-than-significant level.

Impact Conclusion

Construction-related impacts on public access to or along the coast would be significant for the new Transmission Main. These impacts could be reduced to a less-than-significant level with implementation of the mitigation measure identified below.

Mitigation Measures

Mitigation Measure 4.9-1 applies to all MPWSP facilities and associated construction activities; however, with respect to disruptions to coastal public access, only construction of the proposed new Transmission Main and optional alignment would require implementation of this measure to reduce impacts to a less-than-significant level.

Mitigation Measure 4.9-1: Traffic Control and Safety Assurance Plan.

(See Section 4.9, Traffic and Transportation, Impact 4.9-1, for description.)

4.8.6 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 4.8-C: Cumulative impacts related to land use and recreation. (*Less than Significant with Mitigation*)

As analyzed in Section 4.8.5, above, the proposed project would not divide an established community, increase the use of existing neighborhood parks or other recreational facilities, include or require the construction of recreational facilities, or disrupt or preclude public access to or along the coast (operations phase); therefore, it could not cause or contribute to any cumulative impact related to these issues. The potential for the proposed project to individually or cumulatively conflict with an applicable habitat conservation plan or natural community conservation plan is addressed in Section 4.6, Terrestrial Biological Resources, and is not addressed in this section.

The geographic scope of potential cumulative impacts on land use and recreation encompasses the lands and recreational resources that would be affected by proposed project construction. The timeframe during which the proposed project could contribute to cumulative land use and recreation effects includes the construction phase. A significant cumulative impact on land use and recreation would result if the construction-phase effects of the MPWSP, combined in space and time with those of cumulative projects, would create a conflict with applicable land use plans or policies or to impede coastal public access.

As discussed in Impact 4.8-1, the proposed project would disrupt use of and/or access to recreational facilities within the project area, which could result in a conflict with applicable land use plans, policies, and regulations related to protecting public access to such facilities (see Table 4.8-2). However, these effects would be temporary, mainly limited to the construction period, and no long-term effects would result. Because the applicable land use plans, policies, and regulations pertaining to public access and recreational opportunities reflect the long-term visions of the respective jurisdictions with respect to land use and development, they are not directly relevant to temporary construction activities. Therefore, the proposed project would not substantially conflict with any plans, policies, or regulations related to land use or recreation that were adopted for the purpose of avoiding or mitigating an environmental effect. The residual impacts on public access and recreational opportunities following the completion of construction would be negligible, if any. Therefore, the proposed project would not have a cumulatively considerable contribution to a significant cumulative impact related to conflicts with plans, policies, and regulations adopted to protect public access or recreational facilities (*less than significant*).

As discussed in Impact 4.8-2, proposed project construction would temporarily obstruct specific Fort Ord Dunes State Parks entry points, and thus disrupt public access to existing vertical and lateral coastal accessways within the park. The Fort Ord Dunes Campground project (No. 46 in Table 4.1-2) is the only cumulative project whose effects could combine with those of the proposed project to further impact coastal public access within the park. The implementation

schedule remains unknown. However, if the two projects were constructed at the same time or in sequence, the duration of disruption to Beach Range Road access and the Divarty Street/1st Street access points could be extended. As discussed in Impact 4.8-2, the impacts of the proposed project would be temporary, limited to the construction phase, and affected areas would thereafter be returned to their approximate pre-construction condition. During the construction period, alternative access entry points into the park would remain open, and vertical and lateral access within the park would not be impacted; however, the cumulative impact resulting from more than one project affecting coastal public access would be significant. Following implementation of **Mitigation Measure 4.9-1 (Traffic Control and Safety Assurance Plan)**, the contribution of the proposed project to this potentially significant cumulative impact would be reduced to a level that is not cumulatively considerable because signage would be posted in advance of and during construction to notify bicyclists and pedestrians of construction activity and advise them about detour routes, and construction schedules would minimize impacts during periods of heavy recreational use (*less than significant with mitigation*).

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