ENVIRONMENTAL ASSESSMENT

for the

California American Water Slant Test Well Project

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Prepared For:

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Summary

Monterey Bay National Marine Sanctuary (MBNMS) proposes to authorize a short-term well pumping program proposed by California American Water (Cal Am or the Project Applicant). The Proposed Action is located in the MBNMS and adjacent on-shore areas within the City of Marina, Monterey County, California. The project requires MBNMS authorizations for activities prohibited in MBNMS by Subpart M of the National Marine Sanctuary Program regulations, including (1) a discharge of pumped, untreated groundwater into MBNMS, and (2) drilling into and disturbance of submerged lands within MBNMS.

Cal Am would construct a slant test well in the coastal foredunes and conduct a 24-month pumping and testing program to obtain information regarding the geologic, hydrogeologic and water quality characteristics of the underlying aquifers in the project area. The data obtained over the 24-month test period would be used to facilitate the planning and final design of a proposed subsurface intake system and desalination plant to serve as the primary future water supply source for the Monterey Peninsula. The Proposed Action includes a discharge of untreated pumped water into waters of MBNMS via an existing wastewater ocean outfall pipe extending approximately 2 miles offshore. The potential environmental impacts of the Proposed Action are discussed and analyzed in this Environmental Assessment (EA).

This EA was prepared in accordance with the National Environmental Policy Act of 1969 (42 United States Code §4321 *et seq.*), as implemented by the Council on Environmental Quality Regulations (40 Code of Federal Regulations §1500-1508); and National Oceanic and Atmospheric Administration Administrative Order 216-6, *Environmental Review Procedures for Implementing the National Environmental Policy Act*, of May 20, 1999.

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SECTION 1. INTRODUCTION

1.1 Project Background and History

California American Water (Cal Am), the project applicant, proposes development of a slant test well, which would extend diagonally under the floor of the Pacific Ocean and into submerged lands of Monterey Bay National Marine Sanctuary (MBNMS) through the Dune Sand Aquifer, Salinas Valley Aquitard (if present in the project area), and 180-Foot Aquifer or its equivalent unit at this location (referred to herein as the 180-FTE). The slant test well is proposed for information gathering purposes. It would operate as a test facility for a temporary period (maximum 24-month pumping period) to provide field data concerning the geologic, hydrogeologic, and water quality characteristics of the project site. The overall project, including construction and decommissioning activities, is expected to take no longer than 3 years.

MBNMS is serving as National Environmental Policy Act (NEPA) Lead Agency for issuance of required authorizations to allow discharge into MBNMS waters and drilling into and disturbance of submerged lands in MBNMS. The City of Marina is serving as California Environmental Quality Act (CEQA) Lead Agency for issuance of the primary local permits and CEQA environmental clearances. Multiple other local, state, and federal agencies are acting as Cooperating Agencies under NEPA and/or Responsible Agencies under CEQA, due to their discretionary approval authority over some component of the Proposed Action. Cooperating or Responsible Agencies include the U.S. Fish and Wildlife Service (USFWS), NOAA's National Marine Fisheries Service (NOAA Fisheries), California Coastal Commission (CCC), California State Lands Commission, Central Coast Regional Water Quality Control Board (CCRWQCB), Monterey Bay Unified Air Pollution Control District (MBUAPCD), Monterey County Department of Environmental Health, and Monterey Regional Water Pollution Control Agency (MRWPCA).

The data obtained through operation of the Proposed Action would be used in the design and planning of a potential subsurface intake system and desalination plant that has been proposed to serve as the primary future water supply source for the Monterey Peninsula known as the Monterey Peninsula Water Supply Project (MPWSP). The MPWSP would include a full-scale subsurface intake system (if determined to be feasible through the results yielded by the temporary slant test well) and is subject to separate environmental review and regulatory permitting processes that are currently ongoing. The NEPA Lead Agency for the MPWSP is currently being determined. The CEQA Lead Agency for the MPWSP is the California Public Utilities Commission (CPUC).

To facilitate the environmental planning and design of the MPWSP, a Hydrogeologic Working Group (HWG) has been established to develop a workplan of on-going steps of data collection and analysis necessary for refinement of the North Marina Ground Water Model, which is the tool being developed to evaluate the short- and long-term hydrogeologic impacts from operation of the MPWSP. The HWG is comprised of a team of hydrogeologic experts representing the interests of various stakeholders of groundwater use and management in the region, including:

- Cal Am – a privately-owned water and wastewater company and the project applicant for the slant test well and MPWSP;
- CPUC – the CEQA lead agency for the full-scale MPWSP;
- CEMEX, Inc. – the property owner of the proposed location of the slant test well and MPWSP;
- Salinas Valley Water Coalition – a non-profit public benefit corporation that was organized in 1991 to promote the fair representation and evaluation of water issues in Monterey County. The Salinas Valley Water Coalition collaborates with and supports the Monterey County Water Resources Agency (MCWRA) in its pursuit of long-term balance of supply and demand of water in the Salinas Valley Groundwater Basin and its effort to halt seawater intrusion; and the
- Monterey County Farm Bureau – a private, non-profit association of farmers and ranchers throughout Monterey County that collaborates with other agricultural organizations to advocate for the agricultural community and environment.

The slant test well project has been identified as a critical step of data collection in the HWG workplan.

It is possible that, if the MPWSP is successfully developed, Cal Am will request that the slant test well be converted into a permanent facility and connected to the future subsurface intake system and desalination plant as one of several permanent subsurface intake wells. The potential environmental effects associated with construction, conversion and permanent operation of the slant test well and all other proposed permanent subsurface intake wells is currently being reviewed in the separate NEPA and CEQA process being completed for the full-scale MPWSP and an Environmental Impact Statement and Environmental Impact Report are being or will be prepared. Due to uncertainty over whether the MPWSP will be approved and constructed as proposed, long-term operation of the slant test well has not been proposed by Cal Am at this time. Because no long-term operations are proposed and development and permanent operation of the test well is already being reviewed in the separate NEPA/CEQA process, no long-term operations are considered in this document. Permanent operation of the slant test well would not be permitted under the project approvals and permits currently being sought.

While the slant test well's relation to the larger project is recognized, the slant test well's present data gathering purpose is independent of the full-scale MPWSP. The slant test well pumping program would provide a better understanding of the potential effects of the full-scale system and allow better informed agency coordination and public review of the MPWSP. The slant test well, even as a separate temporary project, requires authorizations from MBNMS for the proposed discharge and disturbance of submerged lands, and a coastal development permit from the City of Marina and CCC, which triggers NEPA/CEQA review. Therefore, this Environmental Assessment (EA) analyzes the development of the slant test well, temporary test pumping for up to 24 months, and decommissioning of the slant test well and related appurtenant infrastructure at the end of the test period.

1.2 Purpose and Need for Action

1.2.1 Purpose

The purpose of the slant test well (Proposed Action) is to obtain current, site-specific field data concerning geologic, hydrogeologic, and water quality characteristics of the Dune Sand Aquifer, Salinas Valley Aquitard (if present in the project area), and 180-Foot Aquifer (or its equivalent). The slant test well facility has been proposed to gather technical data related to the feasibility, siting, and final design of a subsurface intake system that would serve as the water supply source for the MPWSP.

1.2.2 Need

The Salinas Valley Groundwater Basin (SVGB or Basin) is currently in overdraft. Groundwater extractions and outflows to the ocean needed to repel seawater intrusion currently exceed groundwater inflow into the Basin. The overdraft condition is important because it limits the availability of fresh water supplies to Basin users.

Legal decisions affecting the Carmel River and Seaside Groundwater Basin have further constrained existing water supplies. In 1995, the California State Water Resources Control Board (SWRCB) issued an order (WR 95-10) that found, among other matters, that Cal Am was diverting approximately 10,730 acre feet per annum of water from the Carmel River without a valid basis of right. The order directed Cal Am to minimize its diversions from the Carmel River, mitigate the environmental effects of its diversions, and prepare a plan of specific actions to develop or obtain a legal alternative water supply source (SWRCB 1995). In 2009, the SWRCB found that Cal Am was still diverting approximately 7,150 acre feet per annum from the Carmel River without a valid basis of right and issued a Cease and Desist Order directing Cal Am to diligently implement actions to terminate its unlawful diversions from the Carmel River and end all unlawful diversions no later than December 31, 2016 (Order WR 2009-0060).

The MPWSP is the culmination of a long history of local, regional, and statewide planning efforts aimed at increasing the sustainability of water supplies in the SVGB. The project applicant has proposed (through separate permit application packages) development of a subsurface intake system and desalination plant to broaden its water supply portfolio to meet the long-term needs of Basin users on the Monterey Peninsula. The subsurface intake system and desalination plant (MPWSP) would serve as the primary future water supply source for the Monterey Peninsula.

The lithologic and aquifer parameter data that would be obtained through the Proposed Action is needed to finalize the design of the full-scale subsurface intake system that would supply ocean water, or highly brackish ground water, to the proposed desalination plant. The pumping program is needed to improve the precision of ground water modeling that is required to determine the potential for and proportion of extracted water that would come from inland sources. This information is needed for refinement of the North Marina Ground Water Model, which is the tool being developed to evaluate the short- and long-term hydrogeologic impacts that would result from operation of the MPWSP. The Model would then be used to finalize the number, capacity, location, and design criteria of the MPWSP intake wells. Water quality information obtained from the

Proposed Action is also needed to predict the length of operation that would be required for the extracted water to reach stable salinity, and to verify and refine construction means and methods, schedule requirements, and minimization and avoidance measures for implementation of the MPWSP intake wells.

1.3 Applicable Regulatory Requirements

All applicable federal, state, and local laws and regulations were considered during preparation of the EA. The following is a summary of selected statutes, regulations, and Executive Orders (EO) pertinent to the Proposed Action.

1.3.1 Federal Statutes and Regulations

National Environmental Policy Act of 1969, as amended

NEPA requires federal agencies to take into consideration the environmental consequences of proposed actions as well as input from state and local governments, Indian tribes, the public, and other federal agencies during their decision-making process. MBNMS has prepared this EA and supporting documents in accordance with the goals and requirements set forth in Section 102 of this act.

Council on Environmental Quality Regulations

The Council on Environmental Quality (CEQ) was established under NEPA to ensure that all environmental, economic, and technical considerations are given appropriate consideration in this process. The CEQ regulations were developed to implement Section 102 of NEPA, which provides a mandate and a framework for federal agencies to consider all reasonably foreseeable environmental effects of their proposed actions and to inform the public in the decision-making process. The CEQ regulations are intended to inform federal agencies on the process of complying with the procedures and achieving the goals of NEPA. MBNMS has prepared this EA in accordance with the requirements of the CEQ regulations.

NOAA Administrative Order 216-6, Environmental Review Procedures for Implementing the National Environmental Policy Act, of May 20, 1999

Each federal agency is responsible for adopting procedures for complying with NEPA. National Oceanic and Atmospheric Administration (NOAA) Administrative Order 216-6 describes NOAA's policies, requirements, and procedures for complying with NEPA and the implementing regulations of CEQ and the Department of Commerce (DOC) in Department Administrative Order 216-6. The order addresses any federal action subject to NOAA's control and responsibility with the potential to result in significant adverse environmental effects. This EA has been prepared in accordance with the standards and procedures set forth in NOAA Administrative Order 216-6.

National Marine Sanctuaries Act of 1972

The National Marine Sanctuaries Act authorizes the Secretary of Commerce to designate and manage areas of the marine environment with special national significance due to their conservation, recreational, ecological, historical, scientific, cultural, archeological, educational, or aesthetic qualities as national marine sanctuaries. The Secretary of

Commerce has delegated management responsibilities of national marine sanctuaries to the Office of National Marine Sanctuaries (ONMS). NOAA's Monterey Bay National Marine Sanctuary was designated in 1992 as a federally protected marine sanctuary off of California's central coast. Activities in MBNMS are managed by ONMS pursuant to the National Marine Sanctuary Program regulations.

National Marine Sanctuary Program Regulations, originally codified in 1974 and subsequently amended

National Marine Sanctuary Program regulations (codified at 15 CFR Part 922) describe and define the boundaries of designated national marine sanctuaries, identify activities that are prohibited in the sanctuaries, and establish a system of permitting and/or authorizations to allow the conduct of certain types of activities that would not otherwise be allowed. The regulations are used by ONMS to implement the National Marine Sanctuaries Act and national marine sanctuary management plans. Each sanctuary has its own set of regulations set out in a separate subpart within 15 CFR Part 922. Subpart M contains the regulations specific to MBNMS.

Subpart M sets out general prohibitions against certain activities within MBNMS, including (1) discharging or depositing any material or other matter within MBNMS, and (2) drilling into, dredging, or otherwise altering the submerged lands of MBNMS (among other prohibitions). These activities are not allowed in MBNMS unless authorized through a lease, permit, license, approval, or other authorization issued by MBNMS (Section 922.132).

The Proposed Action would include a discharge of untreated groundwater into MBNMS and drilling into and disturbance of submerged lands within MBNMS. Therefore, the project applicant has filed an application with MBNMS for authorizations of the proposed discharge and disturbance of submerged lands as required by Subpart M of the National Marine Sanctuary Program Regulations. MBNMS approval would consist of two authorizations: (1) an authorization of the CCC coastal development permit for disturbance of submerged lands within MBNMS, and (2) an authorization of the CCRWQCB NPDES permit for the discharge of untreated groundwater into MBNMS.

Guidelines for Desalination Plants in the Monterey Bay National Marine Sanctuary, prepared May 2010

The Guidelines for Desalination Plants in MBNMS were developed to ensure that any future desalination plants in the sanctuary would be properly sited, designed, and operated in a manner that results in minimal impacts to the marine environment. The Guidelines include policies for early agency collaboration, exhaustion of alternatives other than desalination, a thorough analysis of potential impacts (including cumulative impacts), a preference for subsurface intake systems, and guidelines for brine discharge, among others.

Because the project does not propose development of a desalination plant, the Guidelines are not directly relevant to the Proposed Action. However, the Proposed Action is intended to further inform the design and planning of the MPWSP subsurface intake system and desalination plant project. Therefore, authorizations from MBNMS would

generally consider the Proposed Action's consistency with the policies set forth in the Guidelines.

Coastal Zone Management Act of 1972, as amended

The Coastal Zone Management Act states that federal actions must be consistent with approved State coastal management programs to the maximum extent practicable. California's coastal management program was implemented by the California Coastal Act of 1976. The California Coastal Act is the State's approved coastal management program applicable to the Proposed Action. The applicant must prepare a federal Coastal Consistency Determination for approval by the CCC federal consistency staff.

Endangered Species Act of 1973, as amended

Section 7 of the Endangered Species Act (ESA) requires federal agencies to consult with the U.S. Fish and Wildlife Service (USFWS) and/or NOAA's National Marine Fisheries Service (NOAA Fisheries) to ensure that undertaking, funding, permitting, or authorizing an action is not likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Critical habitat, as defined under the act, exists only after USFWS or NOAA Fisheries officially designates it. Critical habitats are: 1) areas within the geographic area that have features essential to the conservation of the species and that may require special management consideration or protection; and 2) those specific areas outside the geographic area occupied by a species at the time it is listed that are essential to the conservation of the species.

MBNMS has consulted with USFWS, who has reviewed a Biological Assessment prepared by the project applicant, and determined that an incidental take permit for coverage under the ESA would not be necessary for the Proposed Action. MBNMS has also consulted with NOAA Fisheries regarding the Proposed Action; however, NOAA Fisheries has indicated that it has no concerns associated with the project and no further consultation would be necessary. MBNMS, USFWS, and the project applicant are in the process of completing an informal consultation process under Section 7 of the ESA, including development of avoidance, minimization, and mitigation measures to avoid impacts to special status species and sensitive habitat in the project area.

Clean Air Act of 1963, as amended

The Clean Air Act requires any federal entity engaged in an activity that may result in the discharge of air pollutants to comply with all applicable air pollution control laws and regulations (federal, state, or local). This act directs the attainment and maintenance of the National Ambient Air Quality Standards for six different criteria pollutants: carbon monoxide, ozone, particulate matter, sulfur oxides, nitrogen oxides, and lead.

In compliance with this act, MBNMS has considered the potential air quality impacts associated with the Proposed Action and has contacted the local air pollution control district (MBUAPCD) in preparation of this EA. MBUAPCD has not responded with any concerns or comments regarding the Proposed Action.

Clean Water Act of 1977, as amended

Section 402 of the Clean Water Act establishes the National Pollutant Discharge Elimination System (NPDES) and identifies conditions under which a permit is required for the discharge from a point source into navigable waters of the U.S. The project applicant will be required to obtain the required permits prior to any discharge into waters of the U.S. and has initiated negotiations with the SWRCB and MRWPCA for issuance of a new or amendment of the existing NPDES permit to include the proposed discharge of untreated groundwater into MBNMS.

Marine Mammal Protection Act of 1972, as amended

All marine mammals are protected under the Marine Mammal Protection Act (MMPA), which was enacted based on the finding that marine mammals have proven to be resources of great international significance and their species or stocks should not be permitted to fall below their optimum sustainable population level. The MMPA prohibits, with certain exceptions, the "take" of any marine mammals in U.S. waters and by U.S. citizens on the high seas. Take is defined as "to harass, hunt, capture, collect, or kill, or attempt to harass, hunt, capture, or kill any marine mammal."

NOAA Fisheries has the responsibility of implementing the MMPA, and does so through issuance of incidental harassment/take authorizations and permits, enforcement actions, and preparation of species status reviews and conservation plans. MBNMS has consulted and coordinated with NOAA Fisheries through project referrals and personal and written communications. NOAA Fisheries has confirmed that they do not have any concerns associated with the Proposed Action and no formal consultation or authorization would be required.

Migratory Bird Treaty Act of 1918, as amended

The Migratory Bird Treaty Act (MBTA) provides for the protection of migratory birds and prohibits their unlawful take or possession. The act bans "taking" any native birds; "taking" can mean killing a wild bird or possessing parts of a wild bird, including feathers, nests, or eggs. Exceptions are allowed for hunting game birds and for research purposes, both of which require permits. MBNMS has considered potential impacts to migratory birds in this EA consistent with the requirements of the MBTA.

National Historic Preservation Act of 1966, as amended

Major federal projects must comply with Section 106 of the National Historic Preservation Act (NHPA), which mandates that potential impacts to significant historic properties be considered prior to approval of such projects. Significant historic properties are defined as sites, districts, buildings, structures, and objects eligible for the National Register of Historic Places. Consideration of these resources is to be made in consultation with the relevant State Historic Preservation Officer (SHPO) and other interested agencies and parties.

The Proposed Action would be located at the site of a sand mining facility that has been in operation for over 100 years and includes multiple structures and appurtenant equipment and facilities that are 50 years or older. Therefore, MBNMS and the City of

Marina (as CEQA Lead Agency) directed preparation of a Cultural Resources Survey Report (SWCA 2014) to assess the project area for potential historic resources and analyze the potential for impacts on historic properties as a result of the Proposed Action. The Cultural Resources Survey Report was provided to SHPO for review in May 2014 and is included in this Draft EA as Appendix C for further public and agency review consistent with the NHPA.

Native American Graves Protection and Repatriation Act of 1990

The Native American Graves Protection and Repatriation Act (NAGPRA) requires protection and repatriation of Native American cultural items found on, or taken from, federal or tribal lands and requires repatriation of cultural items controlled by federal agencies or museums receiving federal funds. MBNMS has considered Native American resources in preparation of the EA and included measures to ensure compliance with NAGPRA. Should previously unidentified cultural resources, especially human remains, be encountered during construction, work will stop immediately at that location and MBNMS's cultural resources staff will be notified to ensure proper treatment of these resources consistent with NAGPRA.

Farmland Protection Policy Act of 1994

The Farmland Protection Policy Act is intended to minimize the impact federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. For the purpose of the act, farmland includes prime farmland, unique farmland, and land of statewide or local importance. Farmland does not have to be currently used for cropland to be subject to the act's requirements. It can be forestland, pastureland, cropland, or other land, but not water or urban built-up land. MBNMS has considered potential adverse impacts to farmland in preparation of this EA, consistent with this Act.

Fish and Wildlife Coordination Act of 1934, as amended

The Fish and Wildlife Coordination Act requires coordination with federal and state wildlife agencies (USFWS and California Department of Fish and Wildlife [CDFW]) for the purpose of mitigating losses of wildlife resources caused by a project that impounds, diverts, or otherwise modifies a stream or other natural body of water.

MBNMS has consulted and coordinated with USFWS and CDFW in regards to the Proposed Action, and has received comments from both agencies identifying potential concerns and making recommendations for avoiding or reducing the potential for any significant adverse environmental effect on sensitive species or habitats. The comments received from USFWS and CDFW have been incorporated into this EA consistent with this Act.

Noise Pollution and Abatement Act

The Noise Pollution and Abatement Act requires that all federal agencies establish mechanisms for setting emission standards for source of noise, including motor vehicles, aircraft, etc. The act also enables local governments to address noise mitigation in land use planning efforts. MBNMS has considered potential noise-related effects associated with the Proposed Action in preparation of this EA, consistent with this Act.

Noxious Weed Act of 1974, as amended

This act requires that all federal agencies develop a management program to control undesirable plants on federal lands under the agency's jurisdiction; establish and adequately fund the program; implement cooperative agreements with state agencies to coordinate management of undesirable plants on federal lands; and establish integrated management systems to control undesirable plants targeted under cooperative agreements. MBNMS has considered noxious weeds and other non-native species in preparation of this EA, consistent with this Act.

Executive Order 13112, Invasive Species, February 3, 1999

EO 13112 seeks to improve coordination between federal agencies in efforts to combat invasive plant and animal species. EO 13112 established the National Invasive Species Council as a high-level, interdepartmental federal advisory panel to provide leadership and planning in the prevention and control of invasive species nationwide. MBNMS has considered invasive and other non-native species in preparation of this EA, consistent with this Act.

Executive Order 11988, Floodplain Management, May 24, 1977

EO 11988 requires federal agencies to avoid to the extent possible both long- and short-term adverse impacts associated with occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. MBNMS has considered impacts associated with development in floodplains and other areas at risk of inundation in a significant storm event in preparation of this EA. Measures to avoid the placement of structures in such areas have been included, consistent with this EO.

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, February 11, 1994

EO 12898 directs federal agencies to identify and address, as appropriate, disproportionately high and adverse human health and environmental effects of their programs, policies, and activities on minority populations and low-income populations. MBNMS has considered the Proposed Action's potential to adversely affect minority or low-income populations and determined that no disproportionate effects would occur, as discussed in Section 4.2.2 below, consistent with this EO.

1.3.2 State Statutes and Regulations

California Environmental Quality Act of 1970, as amended

CEQA was enacted in California shortly after the passage of NEPA at the federal level to institute a statewide policy of environmental protection. CEQA requires state and local agencies within California to follow a protocol of analysis and public disclosure of environmental impacts of proposed projects and adopt all feasible measures to mitigate those impacts. CEQA makes environmental protection a mandatory part of every state and local decision-making process and is not limited to state actions.

The City of Marina is the CEQA Lead Agency for the Proposed Action and is in the process of completing CEQA review. A draft Initial Study and Mitigated Negative Declaration (IS/MND) is currently being circulated for public review and comment.

California Code of Regulations, Title 14, Chapter 3: Guidelines for Implementation of the California Environmental Quality Act

The CEQA Guidelines were developed by the California Office of Planning and Research to implement the requirements of CEQA. The process, procedure, timing, and manner for environmental review under CEQA is set out in the CEQA Guidelines. Appendix G of the CEQA Guidelines establishes a set of thresholds which agencies can use to determine the level of significance associated with a particular impact. The City of Marina has prepared the public review Draft IS/MND in accordance with the procedures set out in the CEQA Guidelines.

California Coastal Act of 1976, as amended

The California Coastal Act constitutes California's coastal management program for the purposes of the Federal Coastal Zone Management Act. The California Coastal Act is intended to "protect, maintain, and, where feasible, enhance and restore the overall quality of the coastal zone environment and its natural and artificial resources." By state law, the coastal zone is established by the CCC, which has the authority to permit, restrict, or prohibit certain development within the coastal zone. The Coastal Act mandates protection of public access, recreational opportunities, and marine and land resources within the coastal zone. This umbrella legislation mandates local governments to prepare a land use plan and schedule of implementing actions to carry out the policies of the Coastal Act within local jurisdictions.

The Proposed Action project area includes areas adjacent to the coast subject to both original jurisdiction of the CCC, as well as areas that are locally managed under the CCC-approved and adopted City of Marina Local Coastal Program (LCP). The City of Marina maintains original jurisdiction over actions proposed in areas subject to the LCP, while the CCC retains appellate jurisdiction over those areas in the event the City's decision is appealed. Therefore, coastal development permits are required from the CCC and the City of Marina.

MBNMS and the City of Marina have considered the requirements of the California Coastal Act in preparation of the EA and IS/MND and have consulted with the CCC in regards to the Proposed Action, consistent with this Act. The applicant has also filed application packages with the CCC and the City of Marina for issuance of a coastal development permit for the Proposed Action. CEQA environmental clearance is currently underway.

California Endangered Species Act of 1984, as amended

California has a parallel mandate to the federal ESA, which is embodied in the California Endangered Species Act (CESA). The CESA ensures legal protection for plants listed as rare or endangered, and wildlife listed as threatened or endangered. The CDFW regulates activities that may result in the "take" of such species. The CDFW also maintains a list of

California Special Concern (CSC) species based on limited distribution, declining populations, diminishing habitat, or unusual scientific, recreational, or educational value. Under state law, the CDFW is empowered to review projects for their potential to impact state-listed species and CSC species, and their habitats. MBNMS and the City of Marina have consulted with CDFW in regards to the Proposed Action, and have incorporated CDFW comments as required by CESA.

California Native Plant Protection Act of 1977, as amended

Certain plants are listed as rare or endangered by the California Native Plant Society (CNPS), but have no designated CESA status. CDFW has authority during the CEQA process to review potential impacts to rare plant species and require mitigation to reduce the level of significance. The CEQA Guidelines require that a reduction in numbers of a rare or endangered species be considered a significant effect and provides for assessment of unlisted species as rare or endangered under CEQA if the species can be shown to meet the criteria for listing. Unlisted plant species on the CNPS's Lists 1A, 1B, and 2 are typically considered under CEQA. MBNMS and the City of Marina have consulted with CDFW in regards to the Proposed Action, and have incorporated CDFW comments as required by CESA.

Porter-Cologne Water Quality Control Act of 1967

The Porter-Cologne Water Quality Control Act requires the SWRCB and nine Regional Water Quality Control Boards (including CCRWQCB) to adopt water quality criteria to protect state waters. These criteria include the identification of beneficial uses, narrative and numerical water quality standards, and implementation procedures. The Porter-Cologne Water Quality Control Act also requires the SWRCB and RWQCBs to ensure the protection of water quality through the regulation of waste discharges to land.

MBNMS and the City of Marina have consulted with SWRCB and the CCRWQCB in regards to the Proposed Action. The applicant has also initiated negotiations with SWRCB regarding the issuance or amendment of appropriate NPDES permits to include permit coverage for the proposed discharge of untreated groundwater into MBNMS.

California Clean Air Act of 1988, as amended

The California Clean Air Act requires all areas of the state to achieve and maintain California ambient air quality standards by the earliest practicable date. California standards are generally more stringent than the federal standards; thus, emission controls to comply with the state law are more stringent than necessary for attainment of the federal standards. The law requires that regional Air Pollution Control Districts adopt and enforce regulations to achieve and maintain the state ambient air quality standards for the area under its jurisdiction. Pursuant to the requirements of the law, MBUAPCD develops a Clean Air Plan that undergoes subsequent updates as required.

MBNMS and the City of Marina have assessed the Proposed Action for consistency with the California Clean Air Act and MBUAPCD Clean Air Plan, and have sought comments from MBUAPCD regarding potential air quality impacts of the Proposed Action.

MBUAPCD has not responded with any concerns or comments. The applicant must coordinate with MBUAPCD for all required construction and/or operational permits.

1.3.3 Local Statutes and Regulations

City of Marina Local Coastal Program

As mandated by the California Coastal Act, the City of Marina Local Coastal Program (LCP) is the implementing policy document that reflects the goals and policies of the Coastal Act specifically as they apply to the coastal zone within the city. The LCP is contained in two volumes: the Local Coastal Land Use Plan (LCLUP) and Local Coastal Program Implementation Plan (LCPIP). The LCLUP includes guidance to address local coastal program policy, establish and protect public access to and along the beach, and develop coastal land use designations that are consistent with the policies of the LCLUP and the California Coastal Act. The critical coastal planning issues identified in the LCLUP include: (1) the future of the dunes, including the role of sand mining; (2) the future of vernal ponds; and (3) the establishment of uses that will be compatible with the existing environmental sensitive habitat constraints present in the City's coastal zone as well as with the California Coastal Act. The LCPIP provides implementation measures to carry out the LCLUP.

MBNMS has considered the requirements of the LCP in preparation of the EA, and the City of Marina has incorporated all applicable requirements into the IS/MND. Approval of the Proposed Action and issuance of a coastal development permit by the City and/or CCC will require a finding of consistency with the LCP by the City and CCC. The finding of consistency will be used to support any authorizations issued by MBNMS.

City of Marina General Plan

California state law requires each City and County to adopt a general plan "for the physical development of the county or city, and any land outside its boundaries which bears relation to its planning." The California Supreme Court has called the general plan the "constitution for future development." The general plan expresses the community's development goals and embodies public policy relative to the distribution of future land uses, both public and private. California statute requires seven topic areas be included in the general plan. These are land use, circulation, housing, open space, safety, conservation, and noise. The General Plan provides the blueprint for future growth in the City.

The City of Marina is responsible for implementing the goals and policies of the City's General Plan and has incorporated those goals in the draft IS/MND.

1.4 Glossary of Acronyms

The following acronyms are used throughout the EA.

180-FTE	180-Foot Equivalent Aquifer
bgs	below ground surface
BMPs	Best Management Practices
bmsl	below mean sea level
Cal Am	California American Water
Cal-EPA	California Environmental Protection Agency
CBC	California Building Code
CCC	California Coastal Commission
CCRWQCB	Central Coast Regional Water Quality Control Board
CDFW	California Department of Fish and Wildlife
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CGS	California Geological Survey
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CSC	California Special Concern species
CSIP	Castroville Seawater Intrusion Project
dB	decibel
dBA	A-weighted decibel
DOC	California Department of Commerce
DPS	distinct population segment
DWR	California Department of Water Resources
EA	Environmental Assessment
EFH	essential fish habitat
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FEMA	Federal Emergency Management Agency
FMMP	California Department of Conservation's Farmland Mapping and Monitoring Program
GHG	greenhouse gases
gpm	gallons per minute
HWG	Hydrogeologic Working Group
LCLUP	Local Coastal Land Use Plan

LCP	Local Coastal Program
LCPIP	Local Coastal Program Implementation Plan
MBNMS	Monterey Bay National Marine Sanctuary
MBTA	Migratory Bird Treaty Act
MBUAPCD	Monterey Bay Unified Air Pollution Control District
MCWRA	Monterey County Water Resources Agency
MLD	most likely descendant
MPWSP	Monterey Peninsula Water Supply Project
MRWPCA	Monterey Regional Water Pollution Control Agency
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NCCAB	North Central Coast Air Basin
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act of 1966, as amended
NOAA	National Oceanic and Atmospheric Administration
NOAA Fisheries	NOAA National Marine Fisheries Service
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
PG&E	Pacific Gas & Electric Company
PM_{10}	Inhalable Particulate Matter
SHPO	State Historic Preservation Officer
SMGB	California Department of Conservation State Mining and Geology Board
SR 1	State Route 1
SVGB or Basin	Salinas Valley Groundwater Basin
SWRCB	California State Water Resources Control Board
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
VdB	weighted decibel scale
VOC	volatile organic compounds

SECTION 2. DESCRIPTION OF PROPOSED ACTION

2.1 Project Site

The project is proposed adjacent to the coastline in the City of Marina, an incorporated coastal community in the central coast of California, northwest Monterey County. The City of Marina is situated approximately 5 miles west of the City of Salinas and 7 miles north/northeast of the City of Monterey. The land components of the project are proposed in the northwest portion of Marina, at the site of an existing CEMEX, Inc. sand mining operation located adjacent to the coast, west of Lapis Road and State Route 1. The Proposed Action also includes project components that would occur offshore in the waters and submerged lands of MBNMS. The Proposed Action is centrally located within MBNMS, which encompasses offshore waters along California's entire central coast.

Figures 1, 2, and 2a, below, show the project vicinity and location.

The CEMEX parcel encompasses approximately 400 acres in total (refer to Figure 2 for reference). Of those, approximately 104 acres have experienced some disturbance associated with sand mining activities that have occurred at the site since 1906. Currently, approximately 50 acres experience heavy levels of disturbance associated with ongoing mining activities. The remainder of the site consists of undeveloped dune habitat with varying degrees of disturbance (moderate to low). Existing uses within actively mined areas of the project site include sand dredging, truck traffic, sand processing operations, administrative buildings, sand stockpiles and push piles, dredging ponds, internal graded access roads, sand mining equipment and materials, a paved parking area, and related appurtenances and infrastructure. The past mining activities at the CEMEX site predated existing regulations that govern mining and/or land uses within the City of Marina and/or CCC jurisdictional areas. Therefore, the mining activities are considered "grandfathered" and are not currently permitted under any local, state, or federal coastal permits or use permits.

The Proposed Action has been designed to avoid the undisturbed dune areas to the extent feasible and utilize areas of the parcel already experiencing some level of disturbance associated with the existing mining activities and truck traffic. The majority of proposed development would occur within and directly adjacent to an existing graded access road that extends through the CEMEX facility. The access road currently used by heavy equipment and trucks on a daily basis to access various areas on the site.

Figure 1. Project Vicinity Map

Figure 2. Project Location Map – Terrestrial Area

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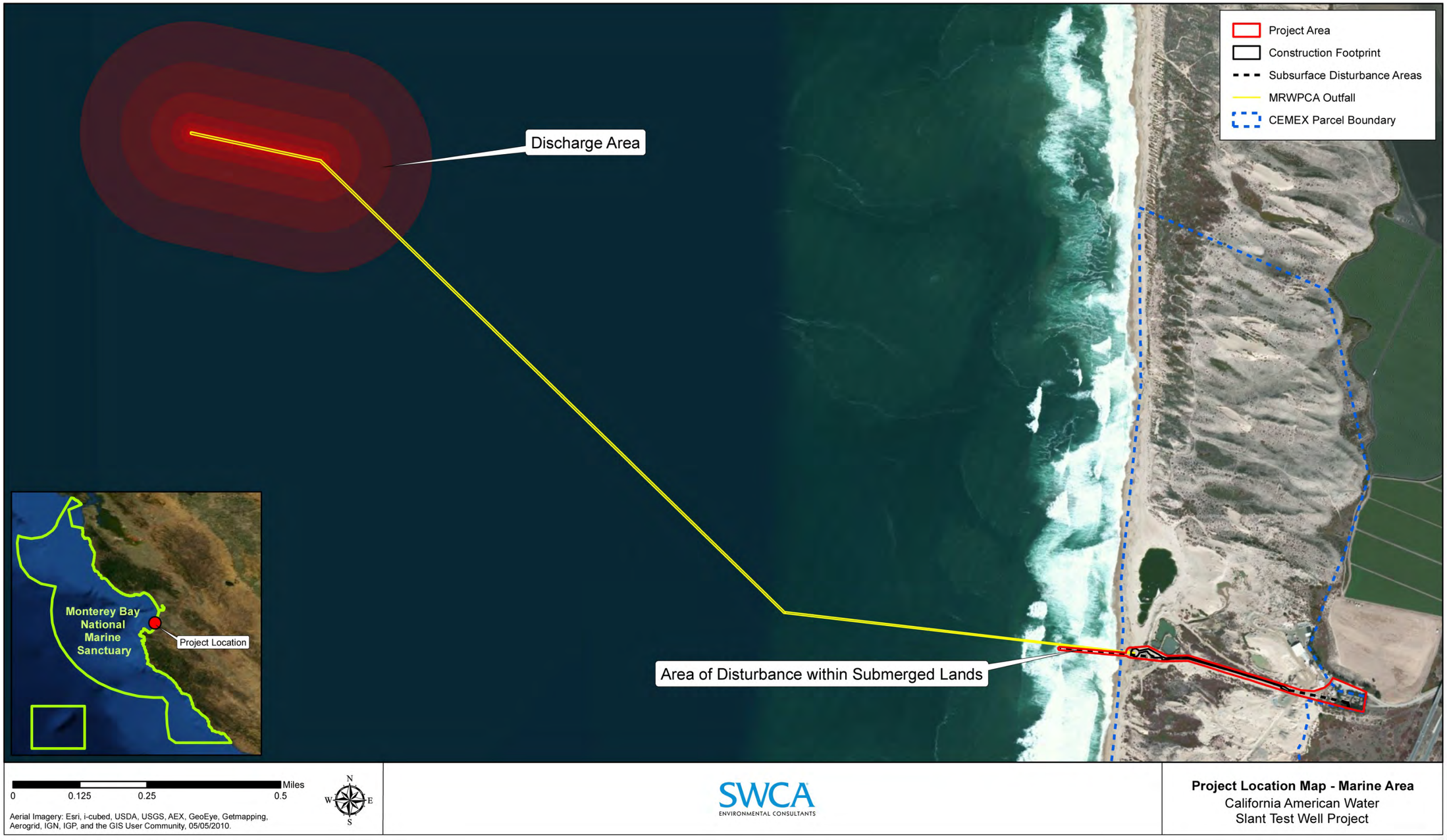
Figure 2a. Project Location Map – Marine Area



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2.2 Proposed Action

The Slant Test Well project proposes the construction, temporary operation, and decommissioning of a slant test well, four monitoring well clusters, and related infrastructure. The project would occur over a period of approximately 2 to 3 years. Once constructed, the temporary slant test well would operate for a maximum period of 24 months and would then be decommissioned in accordance with the regulations of the California Department of Water Resources (DWR), as more fully described below.

2.2.1 Project Components

The Proposed Action includes development of the temporary slant test well facilities, as well as four vertical monitoring well clusters to monitor changes in groundwater levels and water quality during operation of the slant test well.

Slant Test Well

The slant test well facilities would include: the slant test well, wellhead vault, and submersible well pump; test water flow measurement and sampling equipment; test water disposal facilities, including pipeline connection to an existing ocean outfall pipe via an existing subsurface manhole; temporary sedimentation tanks; and electrical facilities, including a buried 4-inch conduit that would extend approximately 0.38 mile east of the slant test well and connect to an existing power source near the entrance of the CEMEX site. Figures 3 through 3e, below, show the proposed project development plans.

The slant test well would be completed using up to 22-inch diameter casing and up to 12-inch diameter screen of "Super Duplex" Stainless Steel, a specialty metal designed for use in seawater environments. The wellhead vault would be approximately 5 feet wide, 10 feet long, and 5 feet deep for a total size of approximately 250 cubic feet. It would be buried at the slant test well site at an approximate depth of 5 feet, with the top of the vault (cover) flush with existing surface elevation. The cover would be a traffic-rated metal-hinged hatch; therefore, CEMEX traffic could drive over the vault without damage. The wellhead vault would hold flow-metering equipment, water quality monitoring equipment, and a sampling station.

Monitoring Well Clusters

Up to four vertical monitoring well clusters would be drilled in order to measure changes in groundwater levels and water quality during operation of the slant test well. Information from the monitoring wells would be regularly downloaded to monitor field water quality parameters (including pH, conductivity, temperature, salinity, oxidation reduction potential, and dissolved oxygen) and water levels recorded to the nearest 0.01 feet. The proposed water quality analytical suite has been developed by the HWG, and is provided below. After preliminary sampling, the suite of analytes will be reviewed to determine if all the analytes are required for future sampling, or if other analytes should be added.

Table 1. Proposed Water Quality Analytical Suite

Constituent	Units	Method Reporting Limit	Method
Physical Properties			
Color	Color Units	3.0	SM 2120B/EPA 110.2
Odor	T.O.N.		EPA 140.1
Oxidation-Reduction Potential (Field)	mV	-	Field Meter - Myron L 6PII
pH (Lab)	Units	0.10	SM 4500 H+B
pH (Field)	Units	-	Field Meter - YSI Pro Plus
Turbidity (Laboratory)	NTU	0.20	EPA 180.1/SM 2130B
Turbidity (Field)	NTU	-	Field Meter - Hach 2100P
Temperature (Field)	°C	-	Field Meter - YSI Pro Plus
Dissolved Oxygen (Field)	mg/L	-	Field Meter - YSI Pro Plus
Silt Density Index (Field)	-	-	ASTM D4189-07
Threshold Odor Number	T.O.N.	1.0	EPA 140.1/SM 2150
Total Dissolved Solids (Lab)	mg/L	10	SM 2540 C
Total Dissolved Solids (Field)	mg/L	-	Field Meter - YSI Pro Plus
Specific Conductance (Lab)	µmhos/cm	1	SM 2510 B
Specific Conductance (Field)	µS/cm	-	Field Meter - YSI Pro Plus
General Minerals			
Total Cations	meq/L	-	Calculation
Total Anions	meq/L	-	Calculation
Alkalinity as $CaCO_3$	mg/L	3	SM 2320 B
Bicarbonate Alkalinity as HCO_3	mg/L	3	SM 2320 B
Carbonate Alkalinity as $CaCO_3$	mg/L	3	SM 2320 B
Hydroxide Alkalinity as $CaCO_3$	mg/L	3	SM 2320 B
Total Hardness as $CaCO_3$	mg/L	3	Calculation
Aluminum	µg/L	1	EPA 200.7
Arsenic	µg/L	1	EPA 200.7 / EPA 200.8
Barium, Dissolved	µg/L	0.01	EPA 200.7
Boron, Dissolved	µg/L	0.5	EPA 200.8
Bromide, Dissolved	mg/L	0.1	EPA 326.0
Calcium, Dissolved	mg/L	1	EPA 200.7
Chloride, Dissolved	mg/L	1	EPA 300.0
Copper, Total	µg/L	50	EPA 200.7
Fluoride, Dissolved	mg/L	0.10	EPA 300.0 / SM 4500 FC
Iodide, Dissolved	mg/L	0.1	USGS I-2371 / EPA 9056A
Iron, Dissolved	µg/L	100	EPA 200.7 / EPA 200.8
Iron, Total	µg/L	100	EPA 200.7 / EPA 200.8
Lithium	µg/L	10	EPA 200.7 / EPA 6010B
Magnesium, Dissolved	mg/L	1	EPA 200.7
Manganese, Dissolved	µg/L	20	EPA 200.7 / EPA 200.8
Manganese, Total	µg/L	20	EPA 200.7 / EPA 200.8
MBAS	mg/L	0.050	SM 5540 C / EPA 200.8
Nitrogen, Nitrate as NO_3	mg/L	1	EPA 353.2 / EPA 300.0
Nitrogen, Nitrite, Dissolved	mg/L as N	1	SM 4500 NO_2B
Nitrogen, NO_2 + NO_3	mg/L as N	1	EPA 300.0
Nitrogen, Ammonia, Dissolved	mg/L as N	0.1	SM 4500 NH_3H / EPA 350.1
Nitrogen, Ammonia + Organic, Diss. (TKN)	mg/L as N	0.1	EPA 351.2
Phosphorus, Dissolved	mg/L as P	0.01	EPA 365.3
Phosphorus, ortho, Dissolved	mg/L as P	0.01	EPA 365.3
Potassium, Dissolved	mg/L	1	EPA 200.7
Silica, Dissolved	mg/L	1	SM 4500 SiE
Sodium, Dissolved	mg/L	1	EPA 200.7
Strontium, Dissolved	mg/L	0.1	EPA 200.7 / EPA 200.8
Sulfate as SO_4, dissolved	mg/L	0.5	EPA 300.0
Zinc, Total	µg/L	50	EPA 200.7

Constituent	Units	Method Reporting Limit	Method
Radiology / Age Dating Methods			
Delta-Deuterium	δ^2H	-	TC/EA/IRMS
Delta Oxygen-18	$\delta^{18}O$	-	TC/EA/IRMS
Tritium	TU	-	-
Tritium, prec. est.	TU	-	-
Volatile Organic Compounds			
VOCs plus Oxygenates (MTBE)	µg/L	varies	EPA 524.2
EPA Organic Methods			
EDB and DBCP	µg/L	varies	EPA 504.1
Chlorinated Pesticides & PCB's as DCP	µg/L	varies	EPA 508
Chlorinated Acid Herbicides	µg/L	varies	EPA 515
Nitrogen & Phosphorus Pesticides DEHP, DEHA, Benzo(a)Pyrene	µg/L	varies	EPA 525
Carbamates	µg/L	varies	EPA 531.1
Glyphosate	µg/L	varies	EPA 547
Endothall	µg/L	varies	EPA 548.1
Diquat	µg/L	varies	EPA 549.1
Dioxin (2,3,7,8 TCDD)	µg/L	varies	EPA 1613

Each monitoring well cluster would include two or three individual monitoring wells, including two wells at different depths into the targeted Dune Sand and 180-FTE Aquifers. If a third monitoring well is included in a cluster, it would be drilled into the 400-Foot Aquifer, to evaluate the response of that aquifer to slant test well pumping. One of the monitoring well clusters would be located in the immediate vicinity of the slant test well insertion point and wellhead vault, and the others would be located further inland, either within the existing graded CEMEX access road or the disturbed area at the east end of the project area. As proposed, the monitoring well clusters would be decommissioned upon project completion consistent with DWR regulations.

Outfall Connection

The water pumped from the aquifers would be discharged into MBNMS waters via an existing ocean outfall pipeline used by the MRWPCA for treated wastewater disposal. The existing outfall pipeline is buried as it crosses the CEMEX property generally south of the access road (refer to Figure 3, which shows the 20-foot wide outfall easement). A 12-inch diameter discharge pipe would extend approximately 250 feet from the wellhead vault to an existing junction structure located on the MRWPCA outfall in the foredune area of the project site. The discharge pipe would be constructed approximately 3 feet below grade and would connect to the pressure lid on the junction structure, which is also currently below surface.

Figure 3. Proposed Action Development Plans

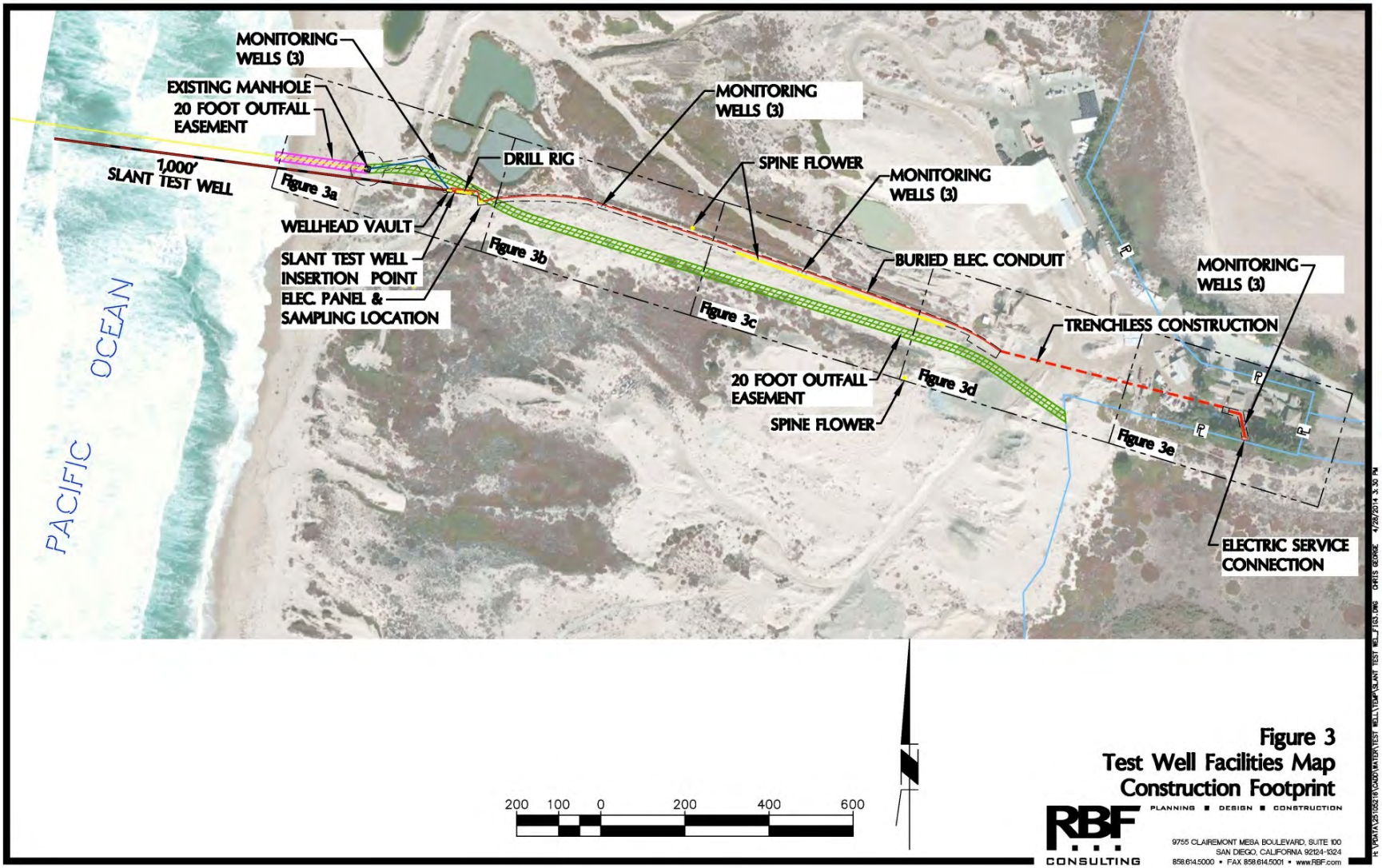


Figure 3a. Detailed Project Development Plans (Sheet 1 of 5)

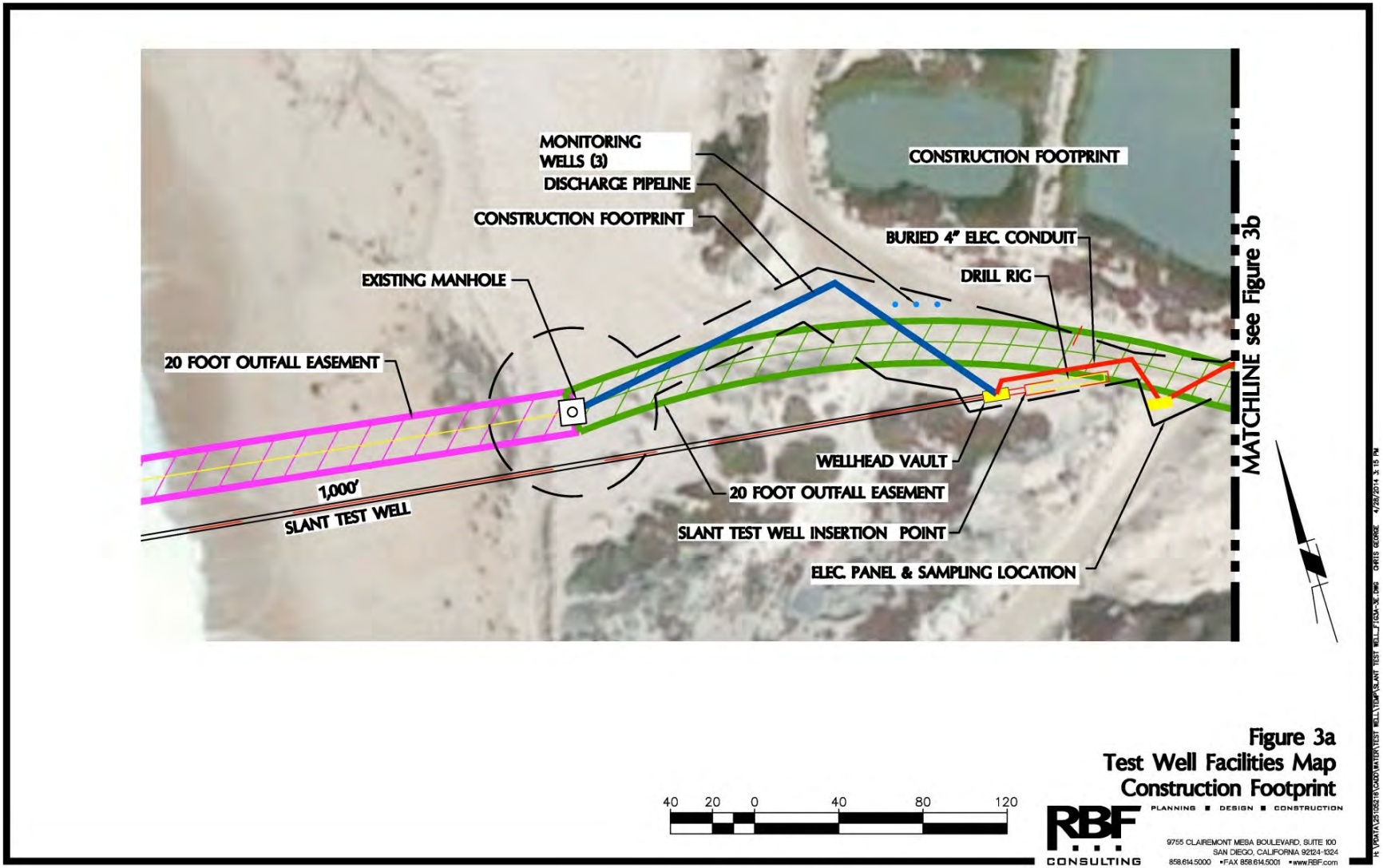


Figure 3a
Test Well Facilities Map
Construction Footprint

Figure 3b. Detailed Project Development Plans (Sheet 2 of 5)

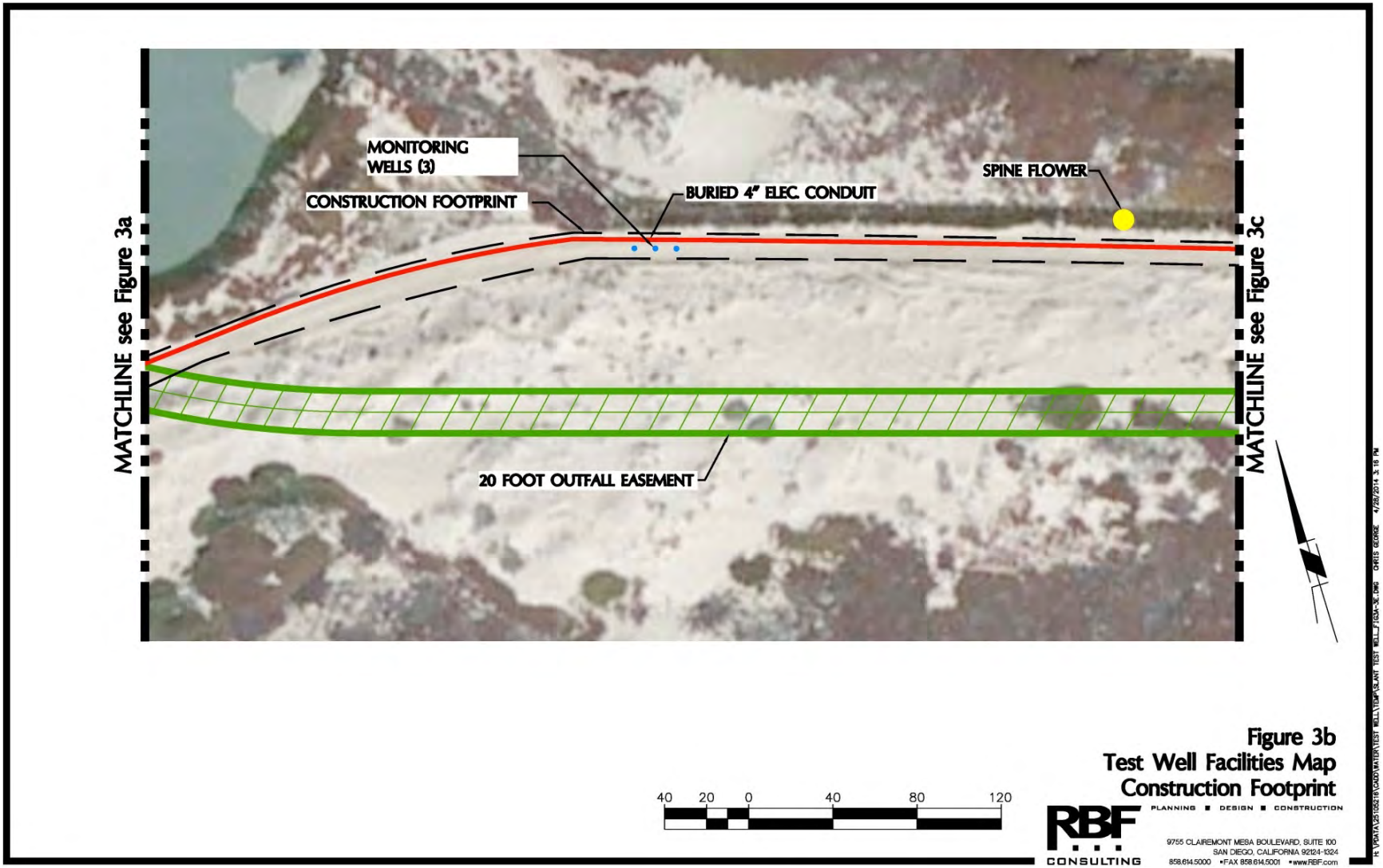


Figure 3c. Detailed Project Development Plans (Sheet 3 of 5)

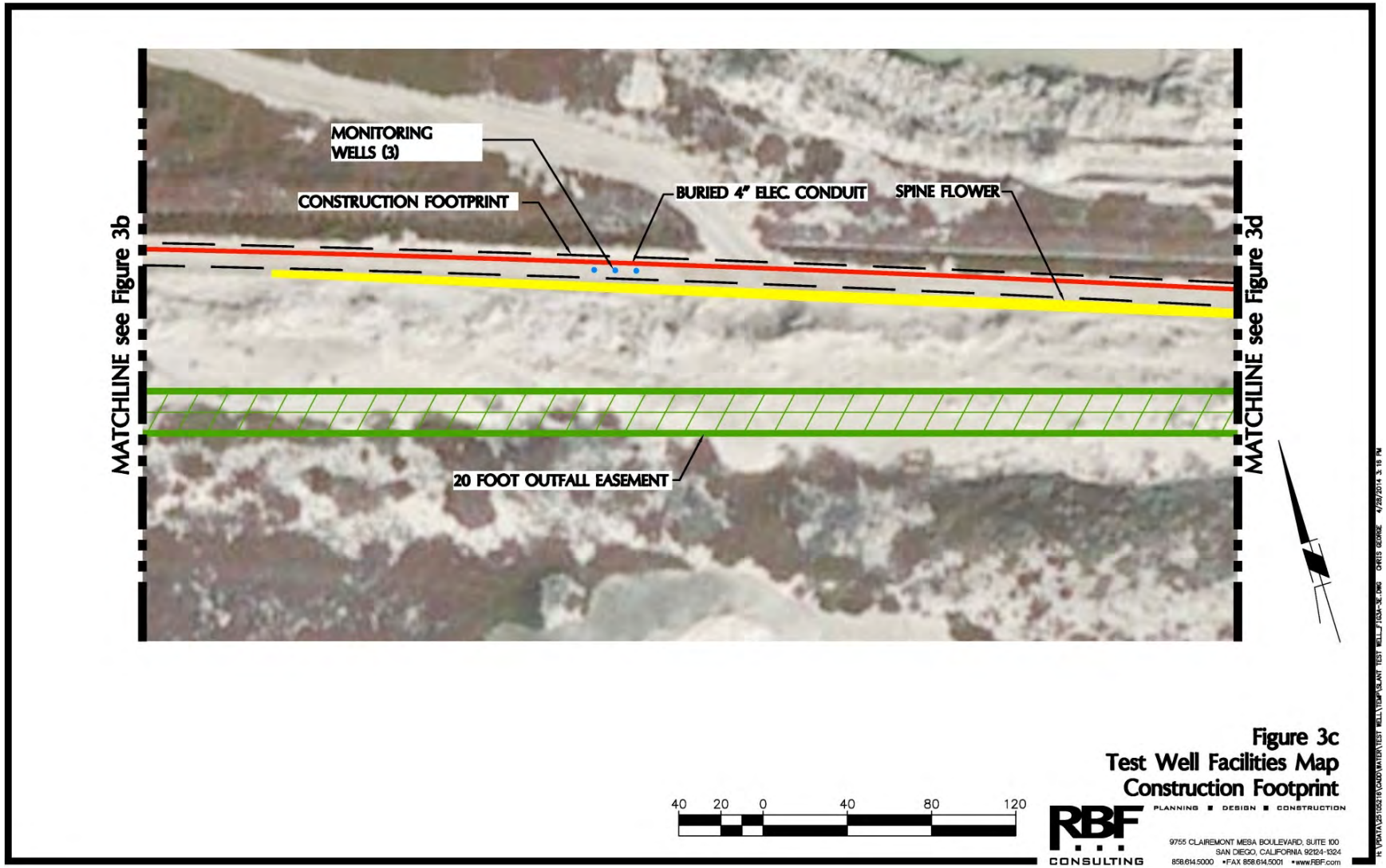


Figure 3d. Detailed Project Development Plans (Sheet 4 of 5)

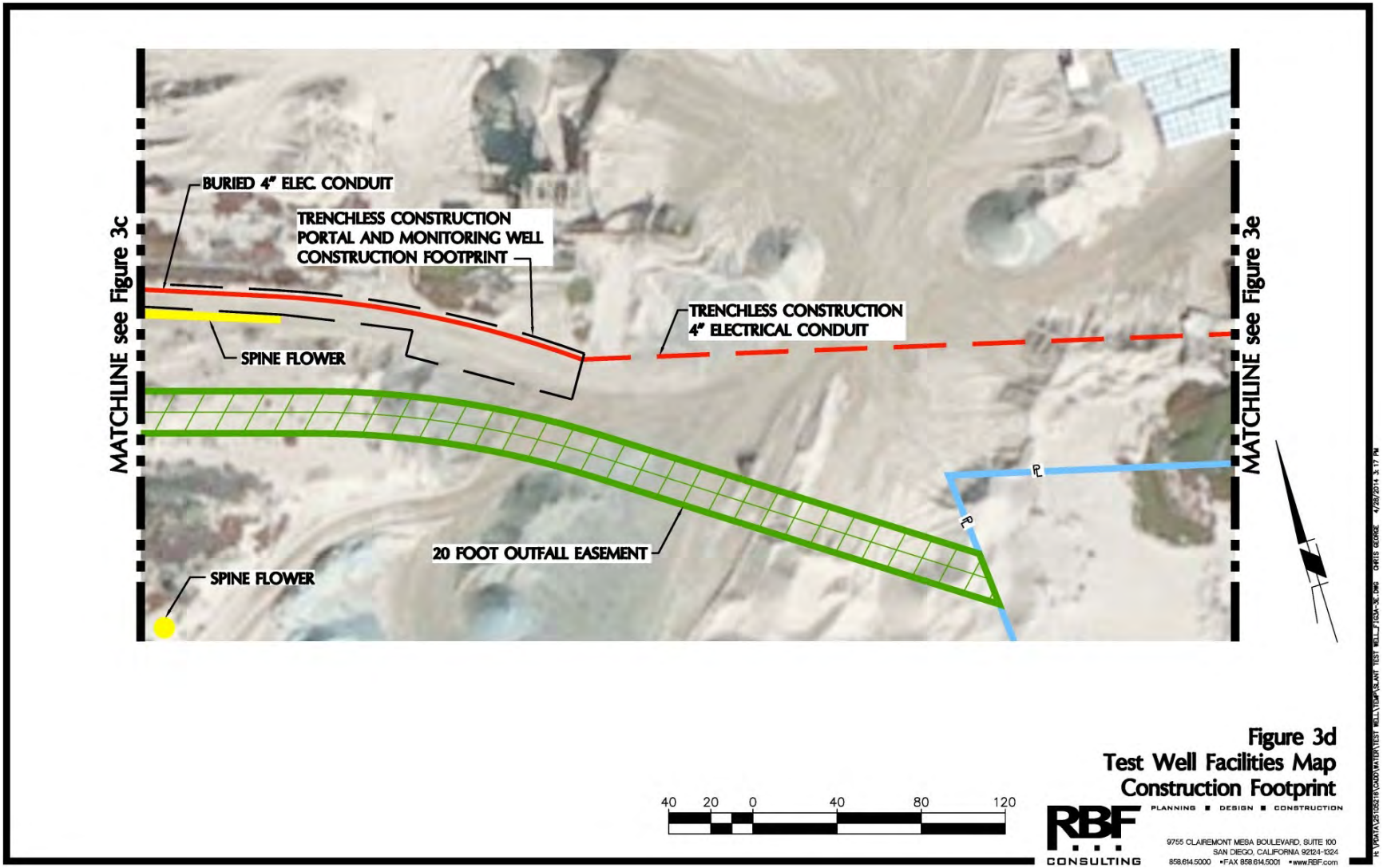
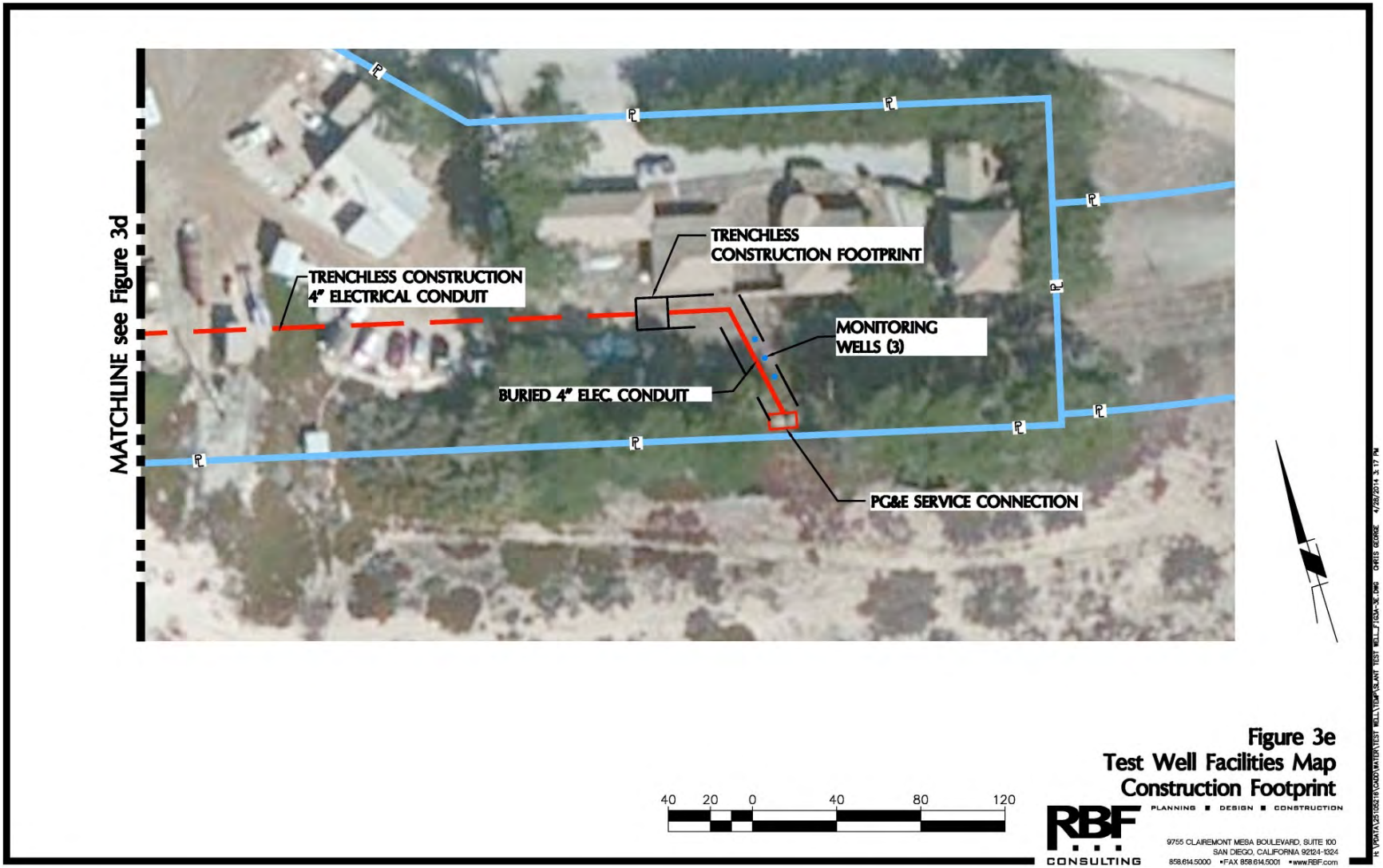


Figure 3e. Detailed Project Development Plans (Sheet 5 of 5)



Electrical Connection

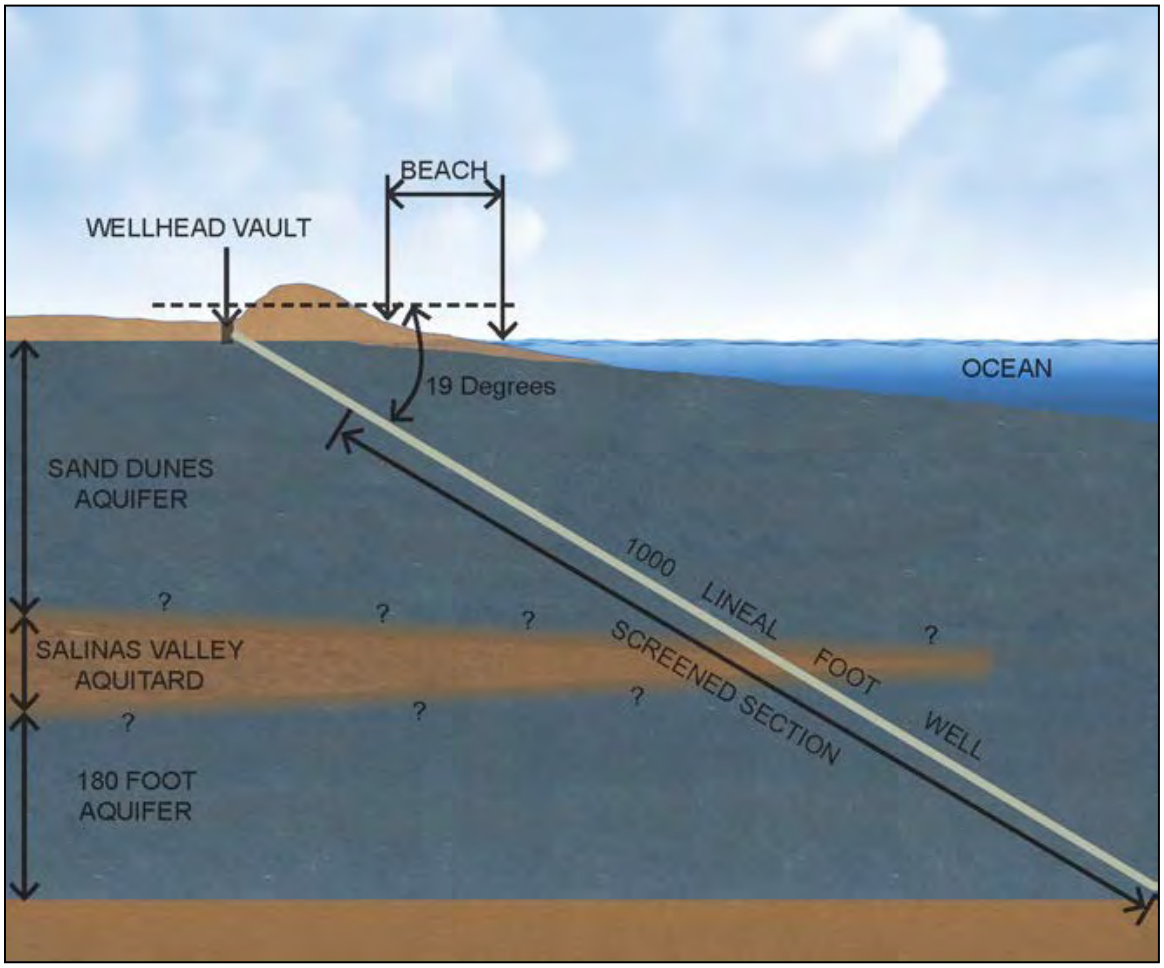
Electrical power for pumping operations would be provided by a new pole-mounted transformer connected to Pacific Gas & Electric Company's (PG&E) existing service at the CEMEX site, located approximately 0.38 mile (2,000 feet) east of the slant test well insertion point. A 4-inch diameter buried electrical conduit would be installed to convey power to an aboveground electrical/control panel located adjacent to the slant test well. The electrical panel would be approximately 5 feet tall, 6 feet wide, and 2.5 feet deep.

The Proposed Action includes a radio telemetry system that would communicate an alarm in the event of any system malfunction. The telemetry system would be designed to shut down the slant test well if the water level in the well drops below a certain level, if the pump vibrates excessively, or if excessive pressure is detected in the discharge system. The telemetry system would signal this automatic shutdown, as well as any loss of power supply, to a remote location. The telemetry equipment would be mounted in the electrical panel. A radio antenna would be mounted on the panel which would extend an additional 2 to 3 feet above the panel.

The slant test well insertion point and wellhead vault would be situated approximately 450 feet inland of the mean sea level shoreline, at an approximate elevation of 25 feet. The slant test well would be drilled in a westerly direction at an approximately 19-degree angle from horizontal to a maximum distance of 1,000 feet. If the bottom of the 180-FTE is encountered at a drill length of less than 1,000 feet, the elevation/depth of the floor of the 180-FTE Aquifer would be confirmed through hydrogeologic analysis of excavated materials and the well would be terminated, such that the terminus of the well would be located at the bottom of the 180-FTE Aquifer.

The terminus of the well would be located approximately 500 feet offshore at a depth of 300 feet below mean sea level (and an estimated 290 feet below the surface of the ocean floor). The exact length and angle of the well may be adjusted slightly based on preliminary site investigations and information obtained during installation of the monitoring wells.

Figure 4. Slant Test Well – Representative Illustration (Not to Scale)



2.2.2 Site Access

Site access would be provided via State Route 1 (SR 1), Lapis Road, and the existing internal CEMEX access road. Parking has not yet been negotiated with the property owner; however, it is anticipated that parking during all phases of the project would be located within the existing paved CEMEX parking area.

Development of the Proposed Action would occur in three phases, as more fully described below.

2.2.3 Phase 1 – Project Construction

Phase 1 would entail construction of all components of the Proposed Action. Construction is expected to last approximately 4 to 5 months, and the anticipated sequence of construction would generally be as follows, with some steps occurring concurrently:

1. Mobilize monitoring well drill rig;

2. Drill and develop monitoring well clusters;
3. Demobilize monitoring well drill rig;
4. Excavate and place wellhead vault structure (pre-cast);
5. Install test water discharge piping, meter, and sampling facilities; construct connection to the outfall and install temporary sedimentation tanks;
6. Mobilize slant test well drill rig;
7. Drill and install slant test well (through openings provided in wellhead vault);
8. Develop slant test well and conduct initial testing, aquifer testing, and short-term pumping program;
9. Demobilize slant test well drill rig and temporary sedimentation tanks;
10. Install underground electrical conduit, cable and electrical panel, and telemetry;
11. Remove upper section of well casing to terminate in wellhead vault;
12. Install submersible well pump and make final electrical and piping connections;
13. Backfill around wellhead vault;
14. Demobilize all construction equipment; and,
15. Re-grade CEMEX access road per property owner requirements.

Areas of Disturbance

Proposed areas of ground disturbance (i.e., the "construction footprint") are shown in Figures 3 through 3e, above. The total anticipated construction footprint encompasses approximately 0.75 acre. Construction staging, equipment storage, a portable restroom facility and hand washing station, refueling area, and grading and excavated materials storage would be located within this area.

The Proposed Action would result in the total excavation of approximately 650 cubic yards of material, as described below. Approximately 425 cubic yards would be used to backfill previously excavated areas and 225 cubic yards would be disposed of at an approved landfill site, likely the Monterey Peninsula Landfill.

- Slant Test Well and Monitoring Wells: Approximately 200 cubic yards of drill cuttings would be generated during the drilling of the slant test well and monitoring well clusters. This material would be trucked from the site and disposed of at an approved landfill.

- Wellhead Vault: Approximately 50 cubic yards of sand would be excavated to install the wellhead vault. Approximately 40 cubic yards of the excavated material would be used to backfill around the structure. The remaining 10 cubic yards of material would be hauled to an approved landfill site for disposal.

- Outfall Connection: Approximately 150 cubic yards of sand would be excavated during construction of the 12-inch diameter pipe connection to the outfall. This

material would be temporarily stored next to the excavated trench and then used to backfill the trench following placement of the pipe. The material displaced by the pipe (approximately 8 cubic yards) would be hauled to an approved landfill site for disposal.

- Electrical Conduit: Approximately 250 cubic yards of sand would be excavated during installation of the electrical conduit. This material would be temporarily stored adjacent to the excavated trench and trenchless construction portals and then used to backfill the trench and excavated portals following placement of the conduit. The amount of material displaced by the conduit (approximately 7 cubic yards) would be hauled to an approved landfill site for disposal.

Construction Methods

The temporary slant test well would be drilled by using a dual rotary closed system drilling method, which allows boreholes to be drilled at shallow angles in loose alluvial materials without the use of drilling fluids other than water. Dual rotary drilling advances a temporary outer casing that stabilizes the borehole as an internal rotating drill string removes formation materials using reverse circulation. Drill cuttings are discharged to a series of tanks for settling and cleaning. Clean water is then recirculated back to the borehole to complete the loop through the closed system.

The monitoring well clusters would be drilled using a sonic drilling method, a relatively new drilling method that includes high frequency mechanical oscillations to fluidize the soil particles. One of the main advantages of sonic drilling is the ability to continuously core unconsolidated and some consolidated formations with a minimal amount of disturbance and compaction. The sonic drilling method also allows drilling without the use of drilling fluids or water, although water is generally used during advancement of the outer casing to help cool the core barrel and prevent heat-related effects on the integrity of core samples.

Each monitoring well would be constructed in a separate borehole (i.e., one screened interval per well) to ensure proper sealing and separation between aquifers and ensure representative aquifer sampling is achieved. After each borehole has been drilled and tested, the borehole will be enlarged and a 4-inch-diameter single completion PVC monitoring well would be constructed. Each of the monitoring wells would be 4 inches in diameter, drilled to depths ranging between approximately 150 and 400 feet below ground surface. The individual monitoring wells within each cluster would be separated by distances of approximately 5 to 10 feet.

Neither the dual rotary or sonic drilling method involves the use of any drilling additives. Drilling of the wells would require approximately 15,000 gallons of water per monitoring well and 10,000 gallons of water per day, over an approximately 46-day drilling period, for the slant test well. Water would be supplied from the City of Marina's domestic water supply.

Approximately 250 linear feet of 12-inch diameter buried pipe would be installed to convey pumped groundwater from the slant test well to the existing wastewater ocean

outfall junction structure, which consists of a large subsurface vault that connects the land and ocean portions of the outfall pipe. The pipe would be installed approximately 3 feet below grade using an open trench construction method and connected to the structure's existing pressure lid. The top of the existing junction structure (pressure lid) is located approximately 3 to 6 feet below the existing ground elevation and would need to be exposed to make the connection. A cone-shaped excavation approximately 3 to 6 feet deep and 10 to 30 feet in diameter (measured at ground surface) would be needed to expose the junction structure and finalize the connection.

Approximately 2,000 linear feet of 4-inch buried electrical conduit would be installed to power the submersible slant test well pump and appurtenant equipment. Approximately 1,400 linear feet within the CEMEX access road would be installed approximately 3 feet below grade using an open trench construction method. The remaining 600 linear feet of the conduit would be installed using trenchless construction techniques to avoid actively mined and developed areas at the east end of the project site (refer to Figures 3, 3d, and 3e). A pole-mounted transformer would be installed on an existing PG&E power pole at the location shown on Figure 3e. At the west end of the project site, the conduit would be connected to the aboveground electrical panel and the service connection from the panel to the wellhead vault would be installed below grade via an open trench method.

Following construction, the CEMEX access road would be re-graded and the road restored to pre-existing conditions consistent with property owner requirements. It is anticipated that the following construction equipment would be utilized during this phase:

- Slant well dual rotary drilling rig
- Monitoring well sonic drilling rig
- Fluid separation system
- Drill power plant
- Flatbed truck
- Dump truck
- Boom truck crane
- Forklift
- Skip loader
- Excavator (for wellhead vault and trenchless construction portals)
- Excavator (for electrical conduit)
- Electrical cable pulling machine
- Horizontal directional drill rig (for electrical conduit)
- Water truck
- Worker transport truck

Construction Schedule and Personnel

Approximately seven to 15 construction crew personnel would be required at the site during construction. Construction activities would be restricted to the snowy plover non-nesting season (October 1 through February 28) to avoid impacts to nesting plovers and other sensitive species. It is anticipated that the construction activities would primarily be conducted during daylight hours on Mondays through Fridays for a period of up to 5 months. However, development of the slant test well, including initial testing, aquifer

testing, and short-term pumping program (item 8 in the anticipated sequence of construction described above), would need to be continuous for between 24 and 72 hours and additional periods of nighttime construction activities may be necessary during project construction to avoid conflicts with CEMEX mining operations.

2.2.4 Phase 2 – Project Operation

The slant test well would operate continuously, 24 hours a day for a period of up to 24 months. Routine operation would include continuous extraction of water from the Dune Sand and 180-FTE Aquifers and discharge into MBNMS via the existing outfall pipe. The water flow rate during the operational period would vary from 1,000 gallons per minute (gpm) to 2,500 gpm. The slant test well would have a well screen (the filtering device that serves as the intake portion of the well) that is continuous through both aquifers and would be designed such that the Dune Sand and 180-FTE Aquifers could be separately pumped and analyzed.

One or two well operators would routinely visit the site on a weekly basis during the operational phase to check operation of the slant test well pump, meter, and water quality measurement equipment, and to collect water quality samples. The routine samples would be taken from an aboveground sampling tap located at the electrical panel/sampling station. The operators would utilize the existing CEMEX access road to access the monitoring wells and the slant test well during the operational phase.

This phase would also include a one-time repositioning of the packer device that is used to isolate one aquifer for testing and pumping. This special operation would involve removal of the submersible pump and pump column, removal of the initial packer, insertion of the second packer, and replacement of the pump. This modification would take 2 to 3 days to accomplish. Equipment and operations required for the repositioning of the device, including temporary laydown of the pump column, would be located within the original construction footprint shown in Figure 3a.

2.2.5 Phase 3 – Project Decommissioning

At the conclusion of the 24-month operational phase, the slant test well, monitoring wells, and all related appurtenances and infrastructure would be decommissioned and removed. Decommissioning activities would be restricted to the snowy plover non-nesting season (October 1 through February 28) to avoid impacts to nesting plovers and other sensitive species. In the event the operational phase is completed outside of the permissible construction period, then the slant test well and all related facilities would remain dormant in their existing location, until decommissioning could be completed the following non-nesting season. If the applicant subsequently seeks conversion of the slant test well into a permanent facility, other project components, such as the monitoring wells and discharge pipeline and connection to the MRWPCA junction structure, would still be decommissioned and removed during the first non-nesting season following project operation.

The slant test well and all monitoring wells would be decommissioned (sealed) pursuant to the requirements of State of California Well Standards Bulletin 74-81 and 74-90, Part

III Section 23. An application to destroy the slant test well and monitoring wells would be submitted to the Monterey County Environmental Health Bureau, Drinking Water Protection Services Unit, for approval. All well facilities and structures would be removed to a depth of 5 vertical feet below ground surface, and the wells would be sealed with neat cement (or sand-cement) sealing material.

The wellhead vault, electrical panel and sampling station, buried electrical conduit, discharge pipe and outfall connection would all be excavated and removed, followed by backfilling and compaction of the excavated vault location and trenches.

Project decommissioning would take approximately 4 weeks. All decommissioning activities would occur within the original construction footprint. Re-grading of the CEMEX access road would be necessary at the conclusion of decommissioning activities consistent with property owner requirements.

2.3 Required Entitlements

The project would be required to obtain the following regulatory approvals.

Table 2. Required Entitlements

Agency	Entitlement Required
Monterey Bay National Marine Sanctuary	▪ Authorizations for discharge into MBNMS waters and drilling into and disturbance of submerged lands ▪ NEPA Lead Agency Environmental Compliance
California Coastal Commission	▪ Coastal Development Permit
City of Marina	▪ Coastal Development Permit ▪ CEQA Lead Agency Environmental Certification/ Adoption ▪ Grading Permit ▪ Electrical Permit
Central Coast Regional Water Quality Control Board	▪ Discharge Permit ▪ Clean Water Act Section 401 Permit (Water Quality Certification) ▪ Stormwater Pollution Prevention Plan (SWPPP), if total disturbance is 1 acre or greater
Monterey Bay Unified Air Pollution Control District	▪ Operational or Construction Permits, if necessary
Monterey County Department of Environmental Health, Drinking Water Protection Services Program	▪ Well Construction Permits (for each well) ▪ Well Destruction Permits (for each well)
Monterey Regional Water Pollution Control Agency	▪ Authorization/Approval (for use of outfall)
U.S. Fish and Wildlife Service	▪ Informal ESA Section 7 consultation
State Historic Preservation Office	▪ NHPA Section 106 consultation
California State Lands Commission	▪ Lease ▪ Abandonment Agreement at decommissioning

SECTION 3. DESCRIPTION OF ALTERNATIVES

3.1 Planning History of Proposed Action

As discussed above, the Proposed Action and the full-scale MPWSP are the culmination of a long history of regional water quality planning efforts engaged in by numerous private and public agencies, organizations, and individuals. The Proposed Action was identified as a necessary test facility by the HWG, which is made up of a range of recognized experts in geology, hydrogeology, and modeling, representing various stakeholders of groundwater use and management in the project area. The HWG was developed pursuant to the terms of a negotiated settlement agreement between an even larger group of interested stakeholders, including:

- California American Water
- City of Pacific Grove
- County of Monterey
- LandWatch Monterey County
- Monterey County Water Resources Agency
- Monterey Peninsula Water Management District
- Planning and Conservation League
- Sierra Club
- Citizens for Public Water
- Coalition of Peninsula Businesses
- Division of Ratepayers Advocates
- Monterey County Farm Bureau
- Monterey Peninsula Regional Water Authority
- Monterey Regional Water Pollution Control Agency
- Salinas Valley Water Coalition
- Surfrider Foundation

Per conversations with the CPUC and other MPWSP stakeholders, the range of alternative sites was limited by the project's need to evaluate the geologic, hydrogeologic, and water quality characteristics of the specific area being considered for siting of the full-scale MPWSP. The siting of the MPWSP (and therefore also the slant test well) was a result of review of existing geologic and hydrogeologic information and analysis regarding sites that may have the potential to support a successful subsurface intake system. A reduced action alternative (i.e., that incorporates a reduction in the size or scale or duration of the Slant Test Well Project) could fail to meet the need of the Proposed Action, as reduced pumping activities may not provide the information needed to accurately update the North Marina Ground Water Model and predict response of the aquifers and Salinas Valley Groundwater Basin to pumping for the full-scale system.

Various alternative locations in the immediate vicinity were considered for the proposed slant test well project, including two sites located at the southern extent of the CEMEX property (at the terminus of a Monterey Peninsula Regional Park District beach access path), one site at the extreme northern boundary of the CEMEX property within the beach swash zone (the zone of wave action on the beach), and one site located approximately 550 feet north of the CEMEX sand dredging pond. A north CEMEX site option located higher on the beach was also considered. Several southerly sites were considered, including one at the California Department of Parks and Recreation (State Parks) parking lot at the terminus of Reservation Road, approximately 1 mile south of the

project area. These sites were all determined to be less preferable than the location identified in the Proposed Action based on the results of multiple investigations and discussions, including:

- Preparation of a Biological Assessment;
- Preliminary ground water modeling;
- Discussions with CEMEX concerning site acquisition, access, and electrical power supply;
- Discussions with PG&E regarding electrical service;
- Discussions with MRWPCA regarding the ocean outfall;
- Discussions with the City of Marina regarding Coastal Act permitting concerns;
- Discussions with stakeholders, including the CPUC's technical advisory group on subsurface intake feasibility;
- Discussions with the Monterey Peninsula Regional Parks District regarding access; and
- Discussions with the CDFW, MBNMS, USFWS, and Point Reyes Bird Observatory.

Consultation with MBNMS, USFWS, U.S. Army Corps of Engineers (USACE), and NOAA Fisheries resulted in a determination that a project within the beach swash zone would be unacceptable due to a multitude of regulatory prohibitions and standards. Consultation with the CCC and Monterey Peninsula Regional Parks District identified a need to site the project at a location that avoided significant effects to sensitive habitat areas and recreational beach uses and access. Discussions with the City of Marina identified LCP requirements that the project be sited to avoid undisturbed areas of the Marina coastal dunes.

Coordination with CEMEX identified the existing CEMEX mining facility as a potential location for project development. The CEMEX site is currently subjected to heavy levels of disturbance associated with intensive sand mining activities and would therefore accommodate protection of undisturbed dune habitat. The CEMEX site also provided access via existing graded roadways within the dunes. Coordination with the MRWPCA and PG&E revealed that utilization of the existing ocean outfall and electrical service extending through or provided at the CEMEX site would be possible, thereby eliminating the potential for impacts as a result of lengthy electrical connections, access routes, or discharge pipeline or haul routes. Development of the slant test well would eliminate any need to conduct in-water disturbance and the private ownership and lack of public access and use of the large parcel would minimize impacts to recreational uses and resources.

Through the consultation efforts and preliminary environmental constraints analyses described above, it was determined that the range of appropriate location and size of the slant test well project was limited due to a range of project design requirements and

regulatory standards. Therefore, only the Proposed Action has moved forward for review at the proposed CEMEX location.

3.2 Alternative 1 – Proposed Action

The Proposed Action includes the development and implementation of a 2-3 year test project with a maximum 24-month pumping and monitoring program from a subsurface slant test well drilled into the submerged lands of MBNMS. The project includes development of a series of adjacent monitoring well clusters to obtain information regarding the geologic, hydrogeologic, and water quality characteristics of the underlying aquifers in the project area. Disturbance activities would be predominantly limited to actively disturbed coastal dune areas within the CEMEX mining facility, but would also include discharge of untreated pumped groundwater into MBNMS and drilling into submerged lands of MBNMS. The data obtained through monitoring/testing would be used to facilitate the planning and final design of the proposed subsurface intake system and desalination plant to serve as the primary future water supply source for the Monterey Peninsula. The potential environmental impacts of the Proposed Action are discussed and analyzed in the EA.

3.3 Alternative 2 – No Action

The No Action Alternative assumes that no action would occur and existing conditions would be maintained. The No Action Alternative would not involve any well or infrastructure development and no geologic, hydrogeologic or water quality testing and sampling activities would occur. The No Action Alternative does not meet the need to further model, assess, and define the feasibility, siting, and design of a future subsurface intake system to supply the MPWSP. Without the proposed research activities, Cal Am would be limited in its ability to effectively evaluate and assess the appropriate final design parameters, action alternatives, and potential for long-term effects of the full-scale system on the Salinas Valley Groundwater Basin. Evaluation of the No Action Alternative, although it does not meet the project objectives, is a core requirement of NEPA analysis (40 Code of Federal Regulations [CFR] 1502.14(d)) and is therefore carried forward for analysis in the EA.

SECTION 4. IMPACT TOPICS CONSIDERED IN THE EA

This section of the EA lists the environmental topic areas determined to be relevant to the Proposed Action. The topics were selected based on federal laws and regulations, review of the Proposed Action, site visits and field surveys, preparation of technical reports and analyses, agency consultation and coordination, and review of the Initial Study completed by the City of Marina pursuant to CEQA. The topics analyzed in the EA include the physical, biological, and human environment resources that could be directly, indirectly, or cumulatively impacted as a result of implementation of the Proposed Action.

This section also provides a brief discussion of environmental topic areas that were dismissed from further analysis in the EA due to the lack of impacts that would occur as a result of the Proposed Action. The rationale for determining no adverse impacts would occur is provided for each dismissed topic area, but these topics are not considered further in the EA.

4.1 Impact Topics Considered in the EA

The following topics were identified through early agency consultation and environmental scoping, and by staff of MBNMS. The existing condition and potential for adverse environmental impacts on these topic areas are addressed in Sections 5: *Affected Environment* and Section 6: *Environmental Consequences* of the EA.

- Physical Environment
  - Geology, Soils, and Geologic Hazards
  - Water Supply and Quality
  - Hydrology and Floodplains
  - Air Quality and Greenhouse Gas Emissions
  - Hazardous Waste and Hazardous Materials
  - Noise
- Terrestrial Biological Environment
  - Special Status Species
  - Habitats and Natural Communities
  - Wetlands and Riparian Vegetation
  - Invasive Species
- Marine Biological Environment
  - Special Status Species
  - Habitats and Natural Communities
  - Invasive Species
- Human Environment
  - Cultural Resources
  - Land Use and Safety

- Utilities
- Parks and Recreation
- Visual/Aesthetic Resources

4.2 Impact Topics Dismissed From Further Analysis

The following impact topics were considered during scoping but dismissed from further analysis because these resources were thought to be unaffected or negligibly affected by the Proposed Action.

- Physical Environment
  - Mineral Resources
  - Paleontology
- Human Resources
  - Growth
  - Farmlands and Timberlands
  - Economic Justice
  - Socioeconomics
  - Traffic and Transportation

A brief rationale for dismissing these issues from further analysis is provided below.

4.2.1 Physical Environment

Mineral Resources

The Proposed Action would be located in an interior portion of the CEMEX sand mining facility, which contains known mineral resources (Silica Sand) that have been actively mined since 1906. According to the Reclamation Plan prepared for the CEMEX site pursuant to the California Surface Mining and Reclamation Act of 1975, site operations include the mining and processing of between 250,000 and 1,000,000 cubic yards of sand per year (RMC Lonestar 1989).

The Proposed Action would involve construction, operation, and decommissioning activities interspersed within the actively mined site, including the excavation and off-site disposal of approximately 225 cubic yards of material, comprised predominantly of drill cuttings and limited (25 cubic yards) surface excavation materials not needed for backfill. These materials, particularly the surface sands, are potentially valuable mineral resources; however, based on information identified in the 1989 Reclamation Plan, the amount of material that would be made unavailable (25 cubic yards) constitutes between 0.01 and 0.0025 percent of the annual range of production. The amount of minable material that would be removed from the CEMEX site is negligible in the context of ongoing mining activities at the site.

There is a limited potential for pumping activities to impact water levels in adjacent CEMEX wells or dredge and settling ponds. Drawdown, if it occurred, would not

constitute a significant change from existing conditions, as the water levels in the ponds experience wide fluctuations due to mining needs and activities. The potential for drawdown is not expected to adversely affect CEMEX operations and Cal Am proposes continual coordination with CEMEX throughout the temporary pumping period to ensure no significant impact on existing mining operations would occur.

The California Department of Conservation State Mining and Geology Board (SMGB) was consulted regarding the Proposed Action. In a March 20, 2014 letter, SMGB confirmed that they had no concerns with the project, because based on their review no preclusion of existing surface mining operations or completion of currently approved reclamation activities would occur. The Proposed Action would not result in long-term or permanent adverse impacts on the CEMEX facility or mining operations in general.

Paleontology

Fossils are generally found in geologic deposits of sedimentary rock (i.e., sandstone, siltstone, mudstone, claystone, or shale) and are generally regarded as older than 10,000 years (the generally accepted boundary marking the end of the last Pleistocene glacial event and the beginning of the current period of climatic amelioration of the Holocene). Sedimentary deposits are generally necessary for fossil preservation to adequately isolate and preserve the organism from destructive chemical and physical processes.

The project site is underlain by eolian (wind-deposited or wind-formed) sand, referred to as the Flandrian and Pre-Flandrian dune complexes, as well as sand deposited by ocean wave action. The potential for paleontological resources to exist in eolian deposits is very low. Deeper sub-surface sediments through which the slant test well and monitoring wells would extend may have increased potential for containing fossils or other paleontological resources; however, this potential is also considered to be low due to the limited nature of disturbance.

4.2.2 Human Environment

Growth

The population of the City of Marina is 19,718, which reflects a 5,383 decrease from the 2000 population of 25,101, potentially caused by closure of the former Fort Ord Military Reservation in 1994 (U.S. Census 2000 and 2010). Based on the City's current Housing Element (2008-2014), jobs and housing available at U.S. Army Fort Ord caused Marina's population to swell 28 percent from 1980 to 1990, and then drop 27 percent from 1990 to 2000 when the base closed in 1994. Housing growth since 2000 has been minimal, as confirmed by building permit statistics and California Department of Finance annual updates (City of Marina 2009).

The Proposed Action does not include any permanent residential, commercial, or other use that may provide job growth opportunities. Unlike the potential future full-scale MPWSP project, the temporary test well would not provide any extension of existing infrastructure or serve as a new water source that would accommodate additional growth in the area. The project would potentially generate a short-term population increase of up to 15 construction crewmembers and their families during project construction and

decommissioning phases. This increase would likely be comprised of workers from the local work force who would not cause long-term adverse effects on existing or future populations.

Farmlands and Timberlands

Agriculture is the largest industry in Monterey County. The most productive and lucrative farmlands in the County are located within the Salinas Valley, generally located in the northern and central portions of the County. The Salinas Valley accounts for nearly all of the agricultural production in the County and is locally known as the "Salad Bowl of the World" because of its voluminous production of vegetable crops. The main types of crop production consist of cool season vegetables, strawberries, wine grapes, and nursery crops.

There are no agricultural parcels within the City of Marina; however, unincorporated areas adjacent to the CEMEX site include agricultural uses within Monterey County. The entire 400-acre CEMEX parcel is within the Other Land designation of the California Department of Conservation's Farmland Mapping and Monitoring Program (FMMP), which indicates that it is generally not well suited for agricultural production. Inland areas adjacent to the CEMEX parcel are currently in agricultural production, zoned for agricultural use, and in some cases under Williamson Act contracts as well, which restrict use of the land for anything other than agricultural purposes.

The project could generate road and/or construction dust, which in excessive amounts can damage adjacent row crops. However, construction activities are limited and would occur at distances of approximately 300 feet or greater from the nearest agricultural land. The project would not generate significant traffic trips and access roads adjacent to agricultural fields are paved; therefore, fugitive dust from roads would not be a significant concern. Any dust generated from the Proposed Action would be negligible in relation to the sand mining activities within the CEMEX parcel.

The Proposed Action would pump groundwater from the Dune Sand and 180-FTE Aquifers, but groundwater within these aquifers in the project area is generally unsuitable for agricultural uses as a result of seawater intrusion. Wells outside of the immediate area of the slant test well are not expected to experience significant drawdown and any effects associated with drawdown would be closely monitored by the applicant. Preliminary models indicate that no drawdown would occur at the closest off-site well; however, the applicant further proposes to continually coordinate with adjacent landowners to ensure no effects on agricultural water supplies would occur. These issues are addressed further in Sections 5.1.2 and 6.1.2, Water Supply and Quality, below.

Because no direct impact to farmlands or significant drawdown of agricultural water resources in the project vicinity would occur, no adverse effects on farmlands would result.

Environmental Justice

The project proposes geologic, hydrogeologic, and water quality testing and would not result in disproportionate impacts on any segment of the population. The City of Marina is not characterized by a large population of any minority or low-income group when compared to Monterey County or the state of California as a whole and no outside populations would experience disproportionate adverse effects of the Proposed Action. Therefore, no impacts associated with environmental justice would occur.

Socioeconomics

An adverse socioeconomic effect would occur if the Proposed Action adversely impacted a particular sector of the economy, productivity, competition, prices, or jobs, or degraded or otherwise negatively altered the characteristics of the existing environment as it relates to local communities, visitor population, regional economies, or concessionaires and contractors. Temporary disturbances and hydrogeologic testing within the largely undeveloped and inaccessible CEMEX parcel would not affect any sector of the local economy, including tourism or agriculture. Little to no impact on CEMEX operations or the local or regional economy would occur and the Proposed Action would not adversely affect the larger community.

Traffic and Transportation

The project site would be accessed via SR 1, Del Monte Boulevard, Lapis Road, and the existing internal CEMEX access road. SR 1 is a four- and six-lane freeway through the City of Marina and provides regional as well as statewide access for the Monterey Peninsula. Del Monte Boulevard is a four-lane arterial that extends between grade-separated interchanges with SR 1 south of Reindollar Avenue and at Beach Road. Lapis Road is a two-lane road that provides access from Del Monte Boulevard to the entrance of the CEMEX facility.

Vehicle trips generated by the Proposed Action would be limited, consisting of up to 15 round-trip construction worker trips during construction and decommissioning phases, and one to two well operator trips per week during the operational phase. The project would not affect plans or modes of alternative transportation, including pedestrian or bicycle facilities, and is not expected to result in any measurable or long-term increase in the use or demand for these systems. Effects on area roadways would be negligible and no long-term impacts on transportation systems would occur.

SECTION 5. AFFECTED ENVIRONMENT

5.1 Physical Environment

5.1.1 Geology, Soils, and Geologic Hazards

Regional Geology

The project area is situated near the southerly margin of the northwesterly reach of the Salinas River Valley. The Salinas River Valley is located within the southern sub-province of the Coast Ranges geomorphic province of California. This sub-province extends south of San Francisco Bay to the Santa Ynez River. The Coast Ranges geomorphic province consists of many elongate mountain ranges and narrow valleys that extend approximately 600 miles from the California/Oregon border to the Santa Ynez River (approximately 150 miles south of the project area). These landforms are generally oriented parallel to the coastline as a result of northwest-trending strike-slip faulting within the region.

On-site Soils

The project area is predominantly comprised of dune land (Df), with the easternmost 400 feet containing Baywood sand, 2 to 15 percent slopes (BbC). The project area also includes small areas of Coastal Beaches (Cm) near the shoreline, water (W) at a pond location north of the CEMEX access road, and Oceano loamy sand, 2 to 15 percent slopes (OaD), near the entrance to the CEMEX facility. All surface disturbance would occur in dune land or Baywood sand; subsurface disturbance and drilling would extend into areas underlying coastal beaches and the soft sediment habitat of MBNMS. These soils are described below:

- Dune land – dune land consists of gently sloping to steep areas of loose wind-deposited quartz and feldspar sand on hummocks, mounds, and hills. Some dunes are partly stabilized by coastal or inland vegetation, and others are blowing, shifting, and/or encroaching onto adjacent lands. Drainage is excessive and permeability is rapid in dune land. Runoff is very slow or slow and the risk of soil blowing is high or very high. Dune land is used predominantly for recreation and some wildlife habitat.

- Baywood sand – Baywood sand is a gently sloping to rolling soil on stabilized sand dunes. Permeability is rapid and runoff is slow to medium. The erosion hazard is slight to moderate, but if vegetative cover is removed, the soil is subject to soil blowing and water erosion. Baywood sand in Monterey County has limited use for grazing and browsing wildlife.

- Coastal Beaches – coastal beaches occurs on narrow sandy beaches and adjacent sand dunes. It is partly covered by water during high tides and is exposed during low tides. Drainage is excessive to very poor and permeability is very rapid. Runoff is slow, but the erosion hazard is very high because of wind and wave action. Coastal beaches are used predominantly for recreation.

- Oceano loamy sand – Oceano loamy sand is an undulating to rolling soil on eolian dune-like hills. Permeability is rapid. Runoff is slow to medium, and the erosion hazard is slight to moderate. This soil is used mostly for range.

- Shallow Soft Bottom Habitat – Soft sediment habitat within MBNMS is influenced by the movement of bottom sediments by large waves. Wave action produces a coarse, poorly consolidated, well sorted (i.e., low variation in grain size) beach deposit that is easily moved behind the surf zone. Large waves lift these surface sediments into a granular suspension, tossed shoreward and then seaward by the passing waves. Extreme storm waves can remove as much as a meter of surface sediments at water depths greater than 10 meters. The physical stability of the beach deposit increases with increasing water depth as wave-generated bottom currents decrease. As a result, bottom sediments grade from coarse to fine sand with increasing water depth and decreasing wave disturbance (http://montereybay.noaa.gov/sitechar/shallow1.html).

Faults and Seismic Environment

The entire Monterey Bay area is located within a seismically active area; however, there are no known active faults in the immediate proximity of the project site. The closest Alquist-Priolo zoned fault is the San Andreas Fault, located approximately 18 miles northeast of the project area. The largest known earthquake on the San Andreas Fault was a magnitude 8.3 earthquake that occurred on April 18, 1906. Additional known active faults in the project vicinity include the Reliz Fault, Rinconada Fault, Monterey Bay Fault, Palo Colorado Fault, Navy Fault, Chupines Fault, and Vergeles Fault, all located within approximately 15 miles or less of the project site. The closest is the Blanco section of the Reliz Fault Zone, located approximately 830 feet northeast of the project area.

Geologic Hazards

The majority of the project site is within the surficial sediment of Quaternary dune deposits (Qd) – loose dune sand and drift sand. The easternmost portion of the site is within older surficial sediments of Quaternary older dune deposits (Qod) – older stabilized dune and drift sand. These units and the on-site soils described above are susceptible to liquefaction, settlement, dune sloughing, and lateral spreading.

Liquefaction is a phenomenon where earthquake-induced ground motion causes relatively cohesion-less (saturated or partially saturated) soil to lose strength and stiffness, causing it to act like a liquid. One of the primary factors controlling the potential for liquefaction is depth to groundwater. Liquefaction only occurs below the water table, but after it occurs, it can propagate upward into overlying non-saturated soil. Geotechnical analysis of the project area indicates that the site has a moderate potential for liquefaction in two layers at approximate depths between 26 and 28 feet below ground surface (bgs) and 42 and 48 feet bgs (GeoSoils 2014).

Given the potential for liquefaction, the project area is also susceptible to liquefaction-induced settlement (downward movement) and lateral spreading (sliding). The anticipated total ground surface settlement potential was determined to be approximately

1.5 to 3 inches, with a differential settlement of approximately 0.75 to 2 inches over a 50-foot horizontal span.

The project area is located within a sand dune complex comprised of relatively dry, cohesion-less, and poorly consolidated sands near the surface. Sloughing is expected to occur on dune slopes until the angle of repose (the steepest angle of relative to the horizontal plane to which a material can be piled without sliding) is reached (likely 30 to 35 degrees from horizontal). Soils in the project area generally have very limited clay content, and therefore low potential for expansion.

5.1.2 Water Supply and Quality

Groundwater Supply

The Proposed Action is within the SVGB, which extends approximately 100 miles inland from Monterey Bay in the northwest to the headwaters of the Salinas River in the southeast. Major aquifers are named for the depth at which they occur in the basin and include the 180-Foot Aquifer, 400-Foot Aquifer, and 900-Foot or Deep Aquifer. A near-surface water-bearing zone comprised of dune sands, commonly referred to as the Dune Sand Aquifer, also exists, but is not considered a viable water source due to its poor quality. The Dune Sand Aquifer is not regionally extensive and is not a recognized sub-basin within the SVGB (SWRCB 2013).

Groundwater recharge in the lower portion of the Salinas Valley is largely a result of infiltration along the channel of the Salinas River and its tributaries. This accounts for approximately 50 percent of the total recharge within the SVGB. Approximately 40 percent of the total recharge is from irrigation return water and the remaining 10 percent is a result of precipitation, subsurface inflow, and seawater intrusion. Approximately 95 percent of outflow from the Basin is a result of pumping, with the remaining 5 percent caused by riparian vegetation evapotranspiration. Groundwater withdrawal outpaces groundwater recharge of fresh water, which has resulted in overdraft conditions. The DWR estimates a current overdraft of approximately 21,000 acre feet annually (SWRCB 2013).

Groundwater Quality

Historic and current pumping of the 180-Foot Aquifer has caused significant seawater intrusion into the Salinas Valley Groundwater Basin, which was first documented in the 1930s. The MCWRA uses the Secondary Drinking Water Standard upper limit of 500 milligrams per liter (mg/L) concentration for chloride to determine the seawater intrusion front and impairment to a source of water.

MCWRA currently estimates seawater has intruded into the 180-FTE Aquifer approximately 5 miles inland and into the 400-Foot Aquifer approximately 3 miles inland as shown on Figures 5 and 6. This seawater intrusion has resulted in the degradation of groundwater supplies, requiring numerous urban and agricultural supply wells to be abandoned or destroyed. In MCWRA's latest groundwater management plan (2006), an estimated 25,000 acres of land overlies water that has degraded to 500 mg/L chloride.

Figure 5. Historic Seawater Intrusion Map – 180-Foot Aquifer

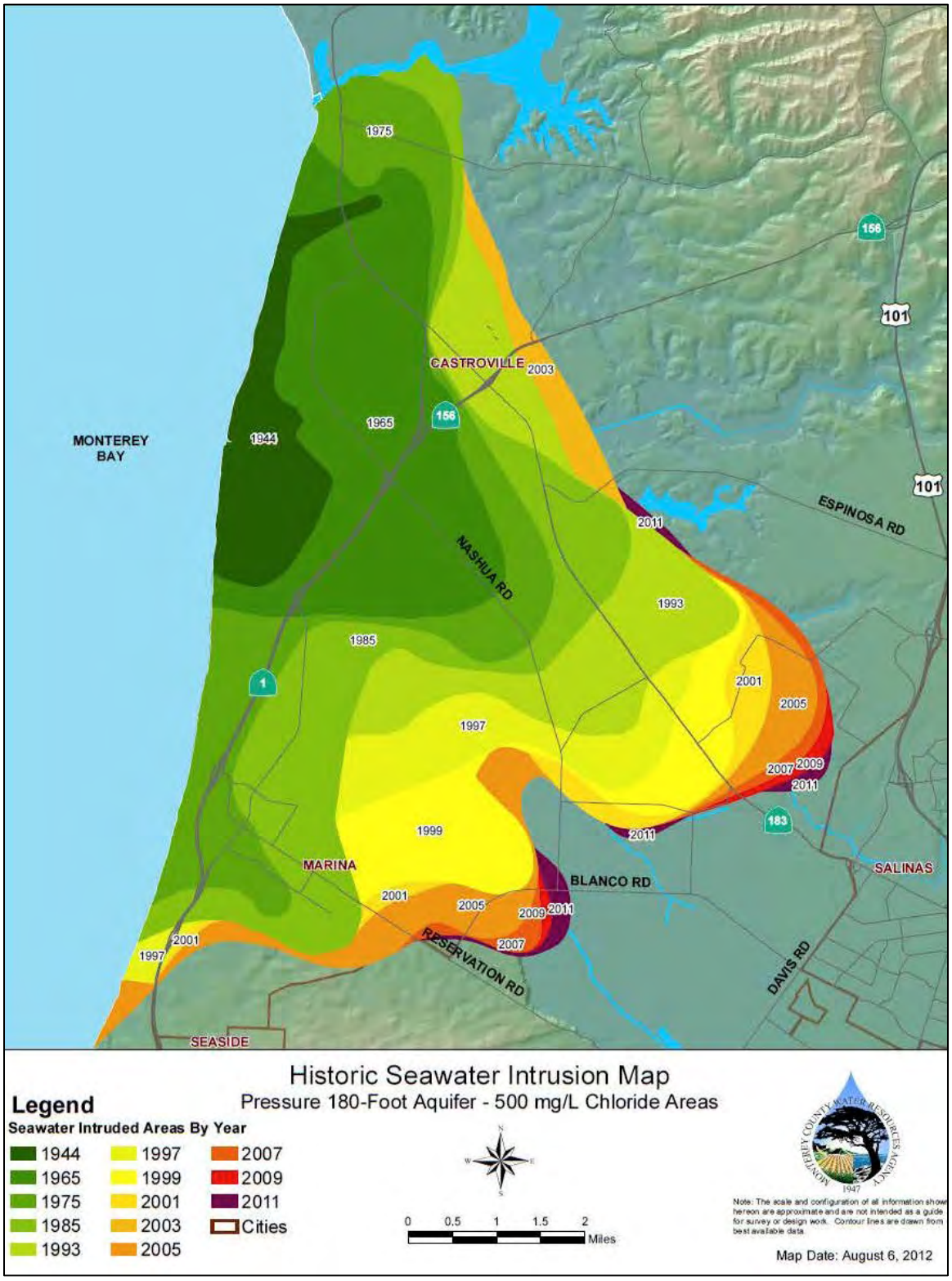
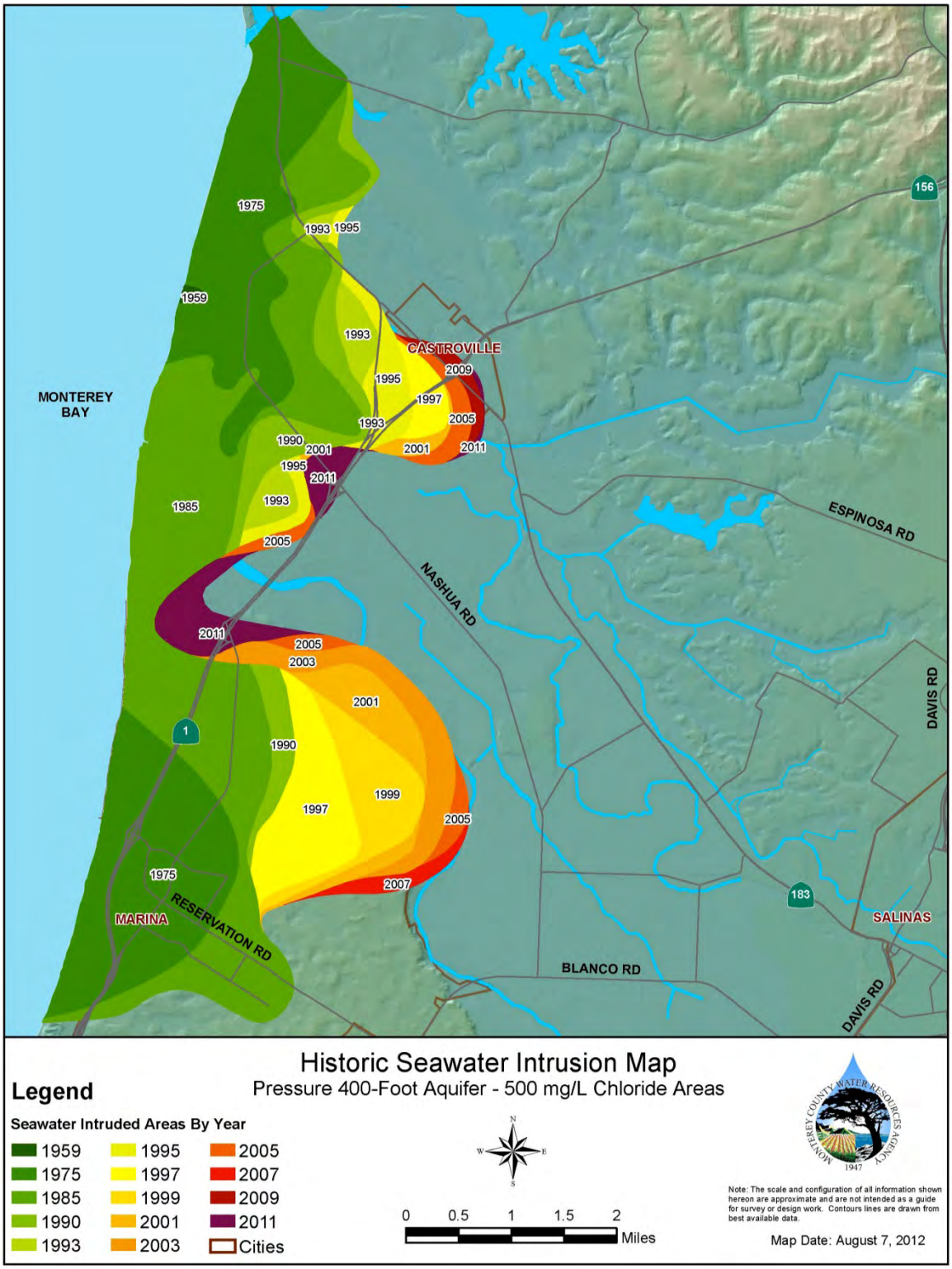


Figure 6. Historic Seawater Intrusion Map – 400-Foot Aquifer



The CCRWQCB's Basin Plan indicates that application of irrigation water with chloride levels above 355 mg/L may cause severe problems to crops and/or soils with increasing problems occurring within the range of 142-355 mg/L. The MCWRA and the CCRWQCB show impairment to the water in the intruded area for drinking and agricultural uses. Since this groundwater is impaired, it is unlikely that this water is or will be put to beneficial use.

Local agencies have taken steps to reduce the rate of seawater intrusion and enhance groundwater recharge in the SVGB, including limiting groundwater extractions and installation of new groundwater extraction facilities in certain areas within the seawater intrusion zone. To enhance groundwater recharge, efforts have also been made to increase fresh water percolation through the Castroville Seawater Intrusion Project (CSIP) which was completed in 1998. The CSIP is a program operated by the MRWPCA that reduces groundwater pumping from seawater intruded areas and distributes recycled wastewater to agricultural users within the SVGB. The program provides a form of groundwater recharge by effectively reducing groundwater extraction in those areas of the Basin. Despite these and other efforts, seawater intrusion continues its inland trend into the Basin (SWRCB 2013).

Water samples taken from the exploratory borings at the CEMEX site indicate that both the Dune Sand Aquifer and the 180-FTE Aquifer contain saline (salt) water, and are therefore influenced by the sea. Groundwater quality sampling from the borings has shown that the chloride and total dissolved solids concentration in the Dune Sand and the 180-FTE Aquifers are very similar, reflecting the expected hydraulic continuity between the two. Groundwater quality data collected September 2013 through April 2014 at the CEMEX site is summarized below.

Table 3. Water Quality Data

Boring ID	Inland Distance from Shore (feet)	Water Quality Test Zone Number	Sample Depth	Aquifer Unit	Chloride (mg/L)	TDS (mg/L)
CX-B1WQ	350	Zone 6	51-61	Dune Sand	13,675	24,452
		Zone 5	84-94		14,755	28,111
		Zone 4	134-144	180-FTE	14,050	26,921
		Zone 3	182-192		17,995	32,034
		Zone 2	237-247		8,796	16,122
		Zone 1	274-284	400-Foot	14,184	24,888
CX-B2WQ	1,450	Zone 4	55-65	Dune Sand	14,464	26,968
		Zone 3	104-114	180-FTE	14,099	27,316
		Zone 2	161-171		7,408	14,708
		Zone 1	215-225		13,026	23,936

Table 3. Water Quality Data

Boring ID	Inland Distance from Shore (feet)	Water Quality Test Zone Number	Sample Depth	Aquifer Unit	Chloride (mg/L)	TDS (mg/L)
CX-B4	2,700	Zone 5	58-68	Dune Sand	2,045	4,815
		Zone 4	110-120	180-FTE	11,044	24,000
		Zone 3	155-165		10,128	20,500
		Zone 2	248-258		13,566	27,200
		Zone 1	306-316	400-Foot	14,013	29,800

5.1.3 Hydrology and Floodplains

Surface Hydrology

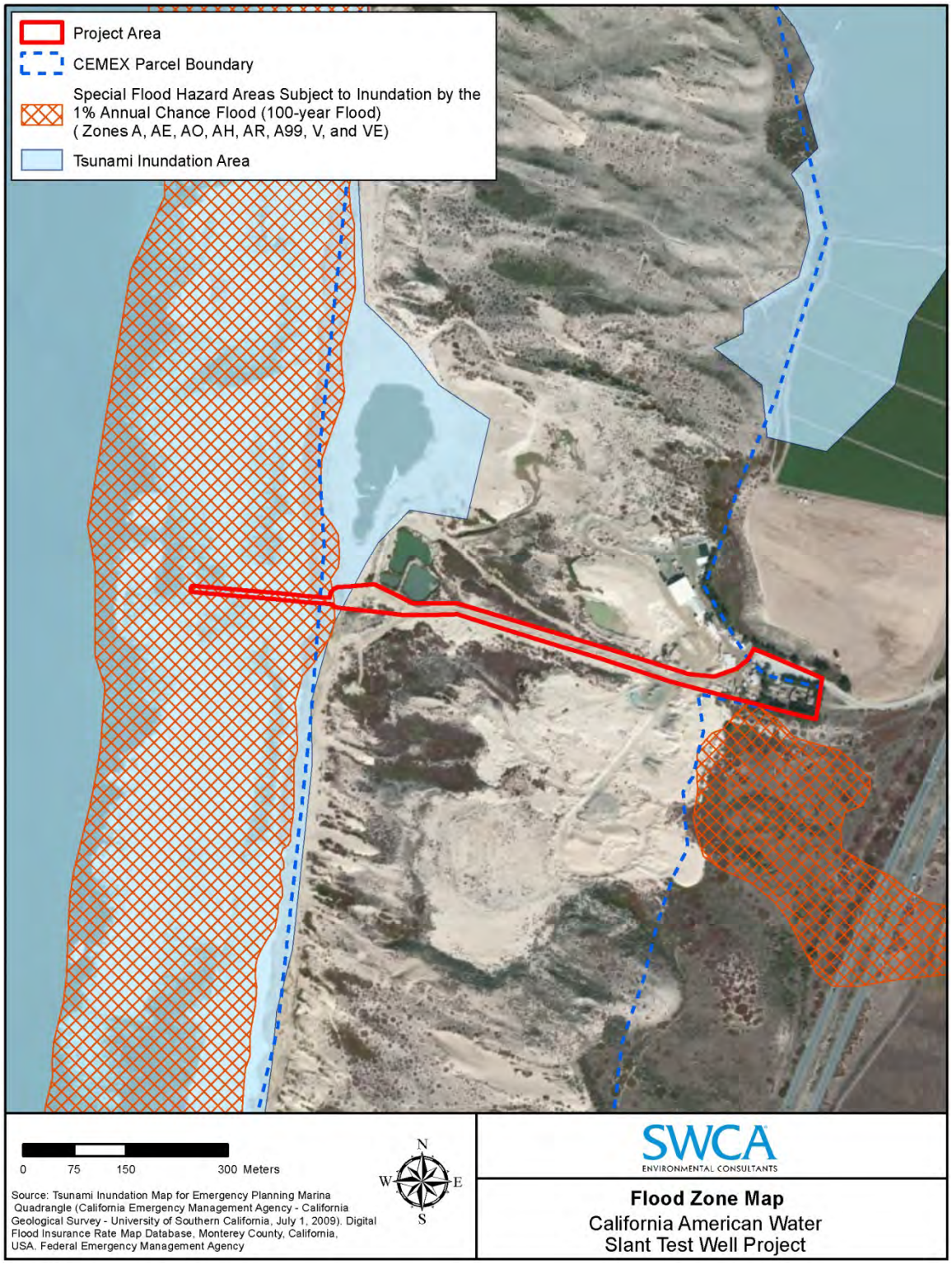
Figure 7 shows the existing hydrologic conditions of the project area. Portions of the CEMEX parcel along the shoreline are within the 100-year flood zone, which is delineated by the Federal Emergency Management Agency (FEMA) to identify areas with a flood elevation that would be subject to inundation or flooding in the event of a 100-year storm. A 100-year storm is an event of a magnitude that has 1 percent chance of occurring in any given year. The FEMA 100-year flood zone in this location is delineated fairly closely to the shoreline except along the Salinas River north of the project site, where the flood zone includes large areas of relatively flat agricultural fields adjacent to the channel. FEMA has designated the flood zone along the CEMEX shoreline as a coastal flood zone, with hazards related to velocity (wave action). The westernmost portion of the project area extends up to the eastern limits of the 100-year flood zone.

In general, the height of the dunes on the CEMEX parcel protects the inland area from tsunami and wave run-up danger. However, a small portion of the project area located on the seaward side of the foredunes is within the Monterey County tsunami inundation area as identified by the California Geological Survey (CGS).

Monterey Bay's southern coast is experiencing coastal erosion more rapidly than any other region in the state of California. Erosion at the coastal dunes between the mouth of the Salinas River and Monterey Harbor has been measured at rates between 1.0 and 6.0 feet per year. A statewide study by the California Energy Commission found that approximately 4.4 square miles of coastline in Monterey County is susceptible to erosion from expected sea level rise, and predicted that coastal dunes will retreat by up to 1,300 feet.

Surface hydrology and stormwater runoff in the project area is guided by the undulations of the dunes. Runoff flows naturally towards the Pacific Ocean or collects in low spots between the dunes and percolates into the ground.

Figure 7. Flood Zone Map



Subsurface Hydrogeology

Based on existing data from recent subsurface exploratory borings conducted at the CEMEX site, the project vicinity is immediately underlain by the Dune Sand Aquifer, which generally occurs throughout the project vicinity at depths ranging from ground surface to approximately 50 feet below mean sea level (bmsl). The Dune Sand Aquifer has been described as a silty, fine to medium or fine to coarse-grained quartz sand (Geoscience 2013). Throughout the Salinas Valley, the Dune Sand Aquifer and underlying 180-FTE Aquifer are separated by a thick, impermeable layer of confining blue clay known as the Salinas Valley Aquitard. The limited permeability of the clay in the Salinas Aquitard restricts the flow of groundwater between the two aquifers, maintaining a distinct hydraulic separation between the two.

However, the Salinas Valley Aquitard is known to thin out as it approaches the ocean in some areas and recent exploratory borings taken at the CEMEX site indicate a lack of the confining layer at that location. The aquifer material that underlies the Dune Sand Aquifer at the project site is hydrostratigraphically equivalent (consisting of similar bodies of rock) to the 180-Foot Aquifer of the Salinas Valley, though the geologic materials encountered in borings at the CEMEX site were formed in a different depositional environment. However, the sediments at the CEMEX site are located at similar elevations as those of the 180-Foot Aquifer; therefore, the unit is referred to as the 180-Foot equivalent aquifer (180-FTE), which assumes that, although geologically different, the two are hydraulically connected. The 180-FTE at the project site generally ranges from approximately 50 to 200 feet bmsl.

Because the Salinas Valley Aquitard does not exist at the project site, or exists only in limited sporadic patches, it is anticipated that some level of hydraulic conductivity and communication currently exists between the Dune Sand and 180-FTE Aquifers. Distinction between the two is determined at the depth where the relatively uniform sand of the Dune Sand Aquifer changes to bedded material of the underlying terrace deposits.

The 180-FTE Aquifer is underlain by the 400-Foot Aquifer, which exists at depths ranging between 250 bmsl to the total depth of borings (approximately 550 bmsl). Borings indicate that these two aquifers are at least partially separated by a lower aquitard (180/400-Foot Aquitard); however, water samples indicate that these aquifers are also hydraulically connected.

5.1.4 Air Quality

The city of Marina is within the North Central Coast Air Basin (NCCAB), which forms an area of more than 5,100 square miles consisting of Monterey, Santa Cruz, and San Benito Counties. The Monterey Bay Unified Air Pollution Control District (MBUAPCD) is the agency responsible for regulating air quality within the NCCAB by implementing applicable regional, state and federal rules and regulations for any direct and area sources of criteria air pollutants and toxic air contaminants.

Ambient air quality standards are set to establish levels of air quality that must be maintained to protect the public from the adverse effects of air pollution. Based on the

MBUAPCD website, as of January 2013, the NCCAB is in attainment of all federal ambient air quality standards. However, under generally more stringent state standards, the NCCAB is currently nonattainment for ozone, 8-hour standard, and Inhalable Particulate Matter (PM_{10}). Table 3, below, lists the NCCAB's current attainment status.

Table 4. North Central Coast Air Basin Attainment Status

Pollutant	State Standards[1]	National Standards
Ozone (O_3)	**Nonattainment[2]**	Attainment/Unclassified[3]
Inhalable Particulates (PM_{10})	**Nonattainment**	Attainment
Fine Particulates ($PM_{2.5}$)	Attainment	Attainment/Unclassified[4]
Carbon Monoxide (CO)	Monterey County – Attainment San Benito County – Unclassified Santa Cruz County – Unclassified	Attainment/Unclassified
Nitrogen Dioxide (NO_2)	Attainment	Attainment/Unclassified[5]
Sulfur Dioxide (SO_2)	Attainment	Attainment[6]
Lead	Attainment	Attainment/Unclassified[7]

Notes:
1) State designations based on 2009 and 2011 air monitoring data.
2) Effective July 26, 2007, the Air Resources Board (ARB) designated the NCCAB a nonattainment area for the State ozone standard, which was revised in 2006 to include an 8-hour standard of 0.070 ppm.
3) On March 12, 2008, the U.S. Environmental Protection Agency (EPA) adopted a new 8-hour ozone standard of 0.075 ppm. In April 2012, EPA designated National Climate Change Action Plan attainment/unclassified based on 2009-2011 data, with a design value of 0.070 ppm.
4) In 2006, EPA revised the 24-hour standard for $PM_{2.5}$ from 65 to 35 µg/m3. In 2009, EPA designated the NCCAB as attainment/unclassified.
5) In 2011, EPA indicated it plans to designate the entire state as attainment/unclassified for the 2010 NO_2 standard. Final designations have yet to be made by EPA.
6) In June 2011, the ARB recommended to EPA that the entire state be designated as attainment for the 2010 primary SO_2 standard. Final designations have yet to be made by EPA.
7) On October 15, 2008 EPA substantially strengthened the national ambient air quality standard for lead by lowering the level of the primary standard from 1.5 µg/m3 to 0.15 µg/m3. Final designations were made by EPA in November 2011.
8) Nonattainment pollutants are highlighted in Bold.

To achieve compliance with the state air quality standards, the MBUAPCD adopted the Air Quality Management Plan in 1991 (most recently revised in 2008), which established control measures for achieving and maintaining attainment with the state ozone standard. Ozone, the primary constituent of smog, is formed in the atmosphere through complex chemical reactions involving volatile organic compounds (VOC) and nitrogen oxides (NO_x) in the presence of sunlight. The primary sources of VOC in the NCCAB are on- and off-road motor vehicles, cleaning and surface coatings, solvent evaporation, landfills, petroleum production and marketing, and prescribed burning. Primary sources of NO_x are on- and off-road motor vehicles, stationary source fuel combustion, and industrial processes. The basin also experiences air quality impacts associated with transported Bay Area NO_x emissions.

Greenhouse gases (GHG) are gases that absorb infrared radiation in the atmosphere, and are different than criteria pollutants. The primary GHGs that are emitted into the atmosphere as a result of human activities are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated gases. These are most commonly emitted through the burning of fossil fuels (oil, natural gas, and coal), agricultural practices, decay of organic waste in landfills, and a variety of other chemical reactions and industrial processes (e.g., the manufacturing of cement).

CO_2 is the most abundant GHG and is estimated to represent approximately 80-90 percent of the principal GHGs that are currently affecting the earth's climate. According to the California Air Resources Board, transportation (vehicle exhaust) and electricity generation are the main sources of GHG in the state.

5.1.5 Hazardous Waste and Hazardous Materials

Based on a search of the California Department of Toxic Substance Control's EnviroStor database and the SWRCB's Geotracker system, there are no environmental cleanup sites, including leaking underground tank sites, land disposal sites, military sites, or other cleanup sites, on the CEMEX parcel or in the project vicinity. However, the project area has been altered by over 100 years of industrial mining activity, and disturbed dune habitat within the construction footprint contains tailings, equipment, and materials associated with past mining activities. The construction footprint also includes the past known location of a rail spur that extended along the CEMEX access road, which could indicate the presence of hazardous substances or contaminated soils associated with previous use of the rail for industrial activity.

5.1.6 Noise

Noise is defined as unwanted sound. Sound becomes unwanted when it interferes with normal activities, causes actual physical harm, or when it has adverse effects on health. Sound is produced by the vibration of sound pressure waves in the air or water. Sound pressure levels are used to measure the intensity of sound and are described in terms of decibels. The decibel (dB) is a logarithmic unit, which expresses the ratio of the sound pressure level being measured to a standard reference level. A-weighted decibels (dBA) approximate the subjective response of the human ear to a broad frequency noise source by discriminating against very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies that are audible to the human ear.

The City of Marina's General Plan includes land use policies contained in the Community Land Use Element designed to avoid conflicts between noise-sensitive uses and major noise sources. Identified noise-sensitive uses are residences, schools, and parks. Maximum allowable exterior noise exposure in industrial areas is 70 decibels (up to 80 decibels would be conditionally acceptable).

The City's Municipal Code establishes standards for construction noise in Chapter 9.24 and 15.04. Pursuant to the Municipal Code, construction activities are limited by the following conditions:

- When adjacent to a residential use, including transient lodging, construction noise is limited to the hours of 7:00 a.m. and 7:00 p.m. on every day of the week except Sundays and holidays, when construction activities are limited to the hours of 10:00 a.m. to 7:00 p.m.

- During daylight savings time, construction activities adjacent to residential uses can be extended by 1 hour, to 8:00 p.m.

- No construction activities may result in a decibel level of more than 60 decibels for 25 percent of an hour at any receiving property line.

The 400-acre CEMEX parcel serves as a large buffer between the project area and any surrounding noise-sensitive uses on the land portion of the project area. The nearest residences are located in the Marina Dunes RV Park over 0.5 mile south of the project area, and the closest park is the Marina Dunes Preserve located approximately 0.6 miles south of the project area. The closest schools are Ione Olson Elementary School and Miss Barbara's Child Development Center, located over 1.25 miles south of the project area. Although not specifically identified as a noise-sensitive use in the City's General Plan or Municipal Code, the beach area immediately to the west is used by the public for recreational purposes, which can be sensitive to excessive noise. Marine species, such as fish and marine mammals, can also be sensitive to excessive noise.

Ambient noise at the project area is dominated by wind and wave action at the shoreline, as well as traffic on SR 1 and within the CEMEX mining facility. Existing underwater ambient noise sources include motorized boats, vibration from structures constructed in the water, airborne sound that is transmitted into the water (i.e., from aircraft), clanking of anchor chains, etc.

5.2 Terrestrial Biological Environment

5.2.1 Special Status Species

Based on the existing data and site inspections, the Proposed Action would be constructed within and directly adjacent to an existing unimproved access road on the CEMEX property and among foredune habitat at the access road terminus. The existing access road traverses disturbed coastal sand dunes, a habitat type that can support a variety of special-status species. A Biological Resources Assessment prepared for the Proposed Action (Zander 2013) evaluated numerous special-status species for occurrence in and near the project area and determined five special-status species are known to occur in or near the project area.

Monterey Spineflower

Monterey spineflower (*Chorizanthe pungens* var. *pungens*) is an annual herb that occurs at elevations between 3 and 450 meters in chaparral cismontane woodland, coastal dunes, coastal scrub, and valley and foothill grassland on sandy soils. Monterey spineflower is federally threatened under the Endangered Species Act and has a CNPS rare plant ranking of 1B.2.

Monterey spineflower individuals were identified in the proposed project area during surveys conducted in April 2013 and in adjacent bare sand areas of the sand dunes and in some areas along the edge of the CEMEX access road (refer to Figure 8). Monterey spineflower individuals were not observed, nor are they expected to occur, in the active roadbed proposed for use during the project due to regular vehicular disturbance and grading associated with ongoing CEMEX operations. All of the observed spineflower occurrences were east of the existing CEMEX settling ponds and outside of the anticipated project area of disturbance.

Smith's Blue Butterfly

Smith's blue butterfly (*Euphilotes enoptes smithi*) is a federally endangered species that occurs in a variety of habitats, including coastal dunes, and is dependent on coast buckwheat (*Eriogonum latifolium*) and seacliff buckwheat (*E. parvifolium*) throughout its life. Adults are active mid-June to early September, but typically stay in close proximity to the host plants. Based on surveys conducted in 1985 and 1986, the California Natural Diversity Database (CNDDB) shows occurrences of Smith's blue butterfly in the project vicinity (CNDDB 2013). Surveys conducted by Thomas Reid Associates in 1996 and 1997 also indicate that this species occurs in the area. The Biological Resources Assessment documents observations of numerous coast buckwheat plants along the CEMEX access road through the project area, but none within the active roadbed or anticipated project area of disturbance.

Western Snowy Plover

The Pacific coast population of western snowy plovers (*Charadrius nivosus*) is listed as federally threatened and is considered a California Special Concern (CSC) species by the CDFW. Both resident and migratory individuals compose the coastal snowy plover population. The Pacific coast population frequents sandy beaches and estuarine shores, and requires sandy, gravelly, or friable soil substrates for nesting. The species' nesting season extends from March 1st through September 30th. Nests typically occur in flat, open areas, with sandy or saline substrates, with vegetation and driftwood usually sparse or absent.

Snowy plover survey data provided by Point Blue (Point Blue 2013) shows that snowy plovers are known to utilize the western portion of the project site for nesting and wintering. The most recent nesting data available (Point Blue 2014, unpublished data) identified 50 nesting attempts along the CEMEX parcel with 17 successfully hatched for a 34 percent successful hatch rate. The nests are generally located between the shoreline and the base of the foredunes. However, some nests have been located around the CEMEX ponds and adjacent to the CEMEX access road (refer to Figure 8).

The shoreline along the CEMEX parcel is within designated critical habitat for the Pacific Coast distinct population segment (DPS) of the western snowy plover and is within Recovery Unit 4 – Sonoma to Monterey Counties, California (as defined in the Western Snowy Plover Recovery Plan [USFWS 2007]). The CEMEX shoreline lies within the Moss Landing to Monterey specific location (CA-65) and the Lonestar Beach and interior areas subarea of Recovery Unit 4 (Zander 2013). According to the Recovery

Plan, the management potential for plovers in Recovery Unit 4 is highest in CA-65 and the Lonestar Beach subarea management potential is second only to the Salinas River National Wildlife Refuge within CA-65 (Zander 2013).

California Legless Lizard

The California legless lizard (*Anniella pulchra*) is considered a CSC by CDFW. It is an elusive, fossorial (sub-surface) lizard that occurs in loose soils of coastal dunes and other communities, from immediately above the mean high tide line through sand dunes and inland to sandy areas associated with oak woodlands, grasslands, and maritime chaparral. The species burrows into sand and leaf litter beneath plants to forage for insects and other invertebrates. Undisturbed dune habitat near the proposed project area supports suitable habitat for legless lizards; however, areas proposed for development generally lack native vegetation that is associated with typical legless lizard habitat.

Coast Horned Lizard

The coast horned lizard (*Phyrnosoma coronatum* [*blainvillii*]) is considered a CSC species by CDFW. It is a relatively large horned lizard, with numerous pointed scales along the sides of the body and over the back. The species range extends from northern California to the tip of Baja California, distributed throughout foothills and coastal plains in areas with abundant, open vegetation such as chaparral or coastal sage scrub. The species typically occupies open country, especially sandy areas, washes, flood plains, and wind-blown deposits in a wide variety of habitats, including coastal dunes such as those in the vicinity of the project, that support bushes for cover and abundant ants or other insects for foraging. Undisturbed dunes near the proposed project area may provide suitable habitat for coast horned lizard; however, the species is not expected to occupy the disturbed roadbed and adjacent areas due to the absence of appropriate vegetation.

5.2.2 Habitats and Natural Communities

The proposed project is located in critical habitat for western snowy plover. The dune habitat located in the project area supports rare and endangered species; therefore, it is afforded special consideration in the City of Marina LCP. These resources are addressed individually below.

Critical Habitat

The western portion of the project area is located in CA 22, Monterey to Moss Landing critical habitat unit for western snowy plover (refer to Figure 8). Whenever a species is proposed for listing as endangered or threatened under the ESA, the USFWS must consider whether there are areas of habitat that are essential to the species' conservation. Those areas may be designated as critical habitat, which indicates that the area is considered essential for the conservation of the species and may require special management and protection. A critical habitat designation does not prohibit further development; however, federal agencies are required to ensure that their activities do not adversely modify critical habitat to the point that it will no longer aid in the species' recovery.

The most recent designation of Monterey spineflower critical habitat does not include any portion of the project area.

Rare and Endangered Species Habitat – City of Marina Local Coastal Program

The foredune and hind dune habitats in the project area support several rare and endangered plant and wildlife species. The City of Marina LCP requires any development within protected species' habitat to be evaluated at a project-specific level to determine the presence of "Primary Habitat" and "Secondary Habitat" areas. Primary Habitat includes "habitat for all identified plant and animal species which are rare, endangered, threatened, or are necessary for the survival of an endangered species" and "all native dune vegetation, where such vegetation is extensive enough to perform the special role of stabilizing Marina's natural sand dune formations" (City of Marina 1982).

According to the LCP, identified Primary Habitat shall be protected and preserved. All development must be sited and designed so as not to interfere with the natural functions of Primary Habitat. Secondary Habitat (or support habitat adjacent to areas of Primary Habitat) must also be identified. All development in the Secondary Habitat area must be sited and designed to prevent significant adverse impacts on the adjacent Primary Habitat areas.

A Rare and Endangered Species Habitat Assessment was prepared by SWCA in April 2014. Primary and Secondary Habitat areas were identified in and adjacent to the project area (refer to Figure 9). Primary Habitat Areas consist of coastal dunes and sandy beach that have potential to support special-status species, as well as several man-made ponds associated with the existing CEMEX plant, due to their likely classification as "wetlands" under the CCC's definition. Other areas of the project site support coast buckwheat and/or seacliff buckwheat, which are necessary for the survival of the federally endangered Smith's blue butterfly. These areas also meet the LCP's definition for Primary Habitat.

Secondary Habitat areas generally include a 100-foot buffer around the Primary Habitat areas, though much of this buffer area consists of heavily disturbed mining areas associated with ongoing CEMEX operations and provides only limited suitable habitat for special-status species. Figure 9 shows identified areas of Primary and Secondary Habitat.

5.2.3 Wetlands and Riparian Vegetation

The CEMEX facility operates a dredging pond and three settling ponds adjacent to the proposed work area. The westernmost dredging pond is located in the sandy beach and foredunes approximately 400 feet north of the proposed slant test well insertion point. This dredging pond receives surface flows from the Pacific Ocean during incoming tides and/or storm events. Therefore, the dredging pond has a hydrological connection to the Pacific Ocean and is subject to USACE jurisdiction. The three settling ponds are located between the dredging pond and the proposed work area. The settling ponds are within as little as 35 feet of the proposed work area. Based on 2005 aerial imagery, the settling ponds have a surface hydrological connection to the dredging pond, at least occasionally.

The occasional connection is likely dependent on the status of CEMEX activities and the available sand in the dredging pond. Since the settling ponds have a hydrologic connection to the dredging pond, it is likely that they would be subject to USACE jurisdiction. None of the ponds support significant wetland vegetation; therefore, USACE would likely consider the ponds to be "other waters of the United States." This designation would trigger the need for USACE permits if any dredging or filling was proposed in the ponds. Because Cal Am does not propose any work in the ponds or any activities that would result in dredging or fill of the ponds; no USACE permits are necessary. MBNMS has sought comments from USACE on two separate occasions during preparation of the Draft EA, but USACE did not provide any response or otherwise indicate concerns or issues associated with the Proposed Action.

The CCC does not use the same parameters as USACE to define wetlands. The CCC regulations (Title 14 of the California Code of Regulations) establish a one-parameter definition that only requires evidence of a single wetland indicator (hydric soils, wetland hydrology, or hydrophytic vegetation) for a feature to be considered a wetland. Despite the fact that the ponds are man-made and actively disturbed in support of industrial mining uses, based on the site conditions it is likely that the CCC would consider the dredging and settling ponds to be state-regulated wetlands.

The City of Marina's LCP identifies the presence of several vernal ponds within the coastal zone, which are subject to additional LCP policies and protective measures. The closest vernal pond to the project area is Vernal Pond Number 4, located approximately 1 mile south of the project area, just east of the Marina Coast Water District facilities.

5.2.4 Invasive Species

Due to the ongoing disturbances and edge-related effects associated with the sand dredging and mining activities, coastal dunes within the project area are heavily dominated by iceplant (*Carpobrotus* spp.); however, remnant central dune scrub species are scattered throughout the project area. Central dune scrub species observed in surveyed areas include mock heather (*Ericameria ericoides*), sagewort (*Artemisia pycnocephala*), common sand aster (*Corethrogyne filaginifolia*), silver dune lupine (*Lupinus chamissonis*), and deerweed (*Acmispon glaber*). Other less dominant species observed include beach-bur (*Ambrosia chamissonis*), beach knotweed (*Polygonum paronychia*), golden yarrow (*Eriophyllum confertiflorum*), beach evening primrose (*Camissonia cheiranthifolia*), coast buckwheat (*Eriogonum latifolium*), live-forever (*Dudleya caespitosa)*, sand verbena (*Abronia latifolia*), and Nuttal's milk-vetch (*Astragalus nuttallii* var. *nuttallii*). The colonization of these plant species appears to be hindered by the dominance of iceplant on the dunes and from the continuous movement of beach sand by prevailing winds and/or as a result of past mining activities.

Figure 8. Existing Biological Setting – Terrestrial Area

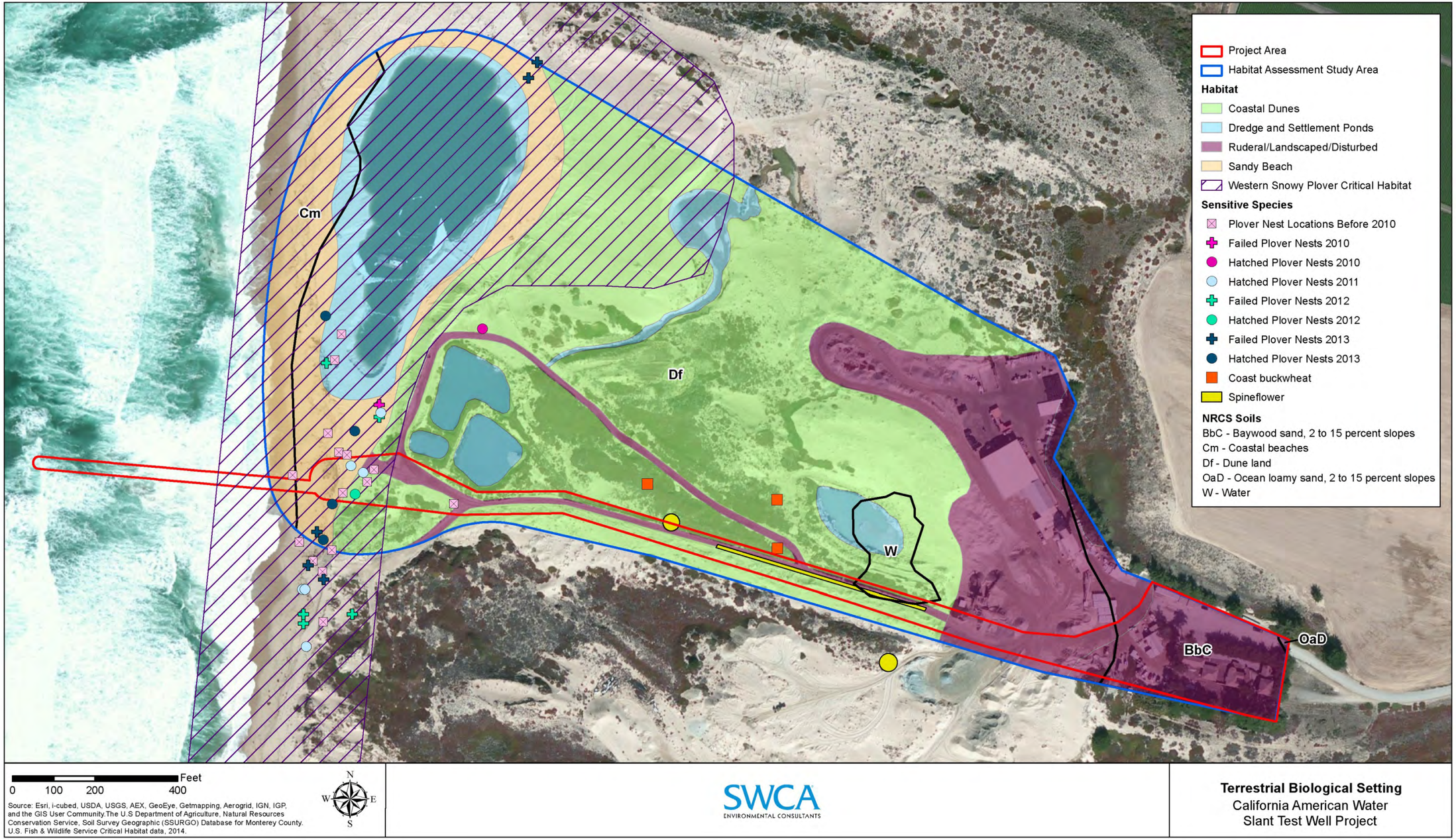


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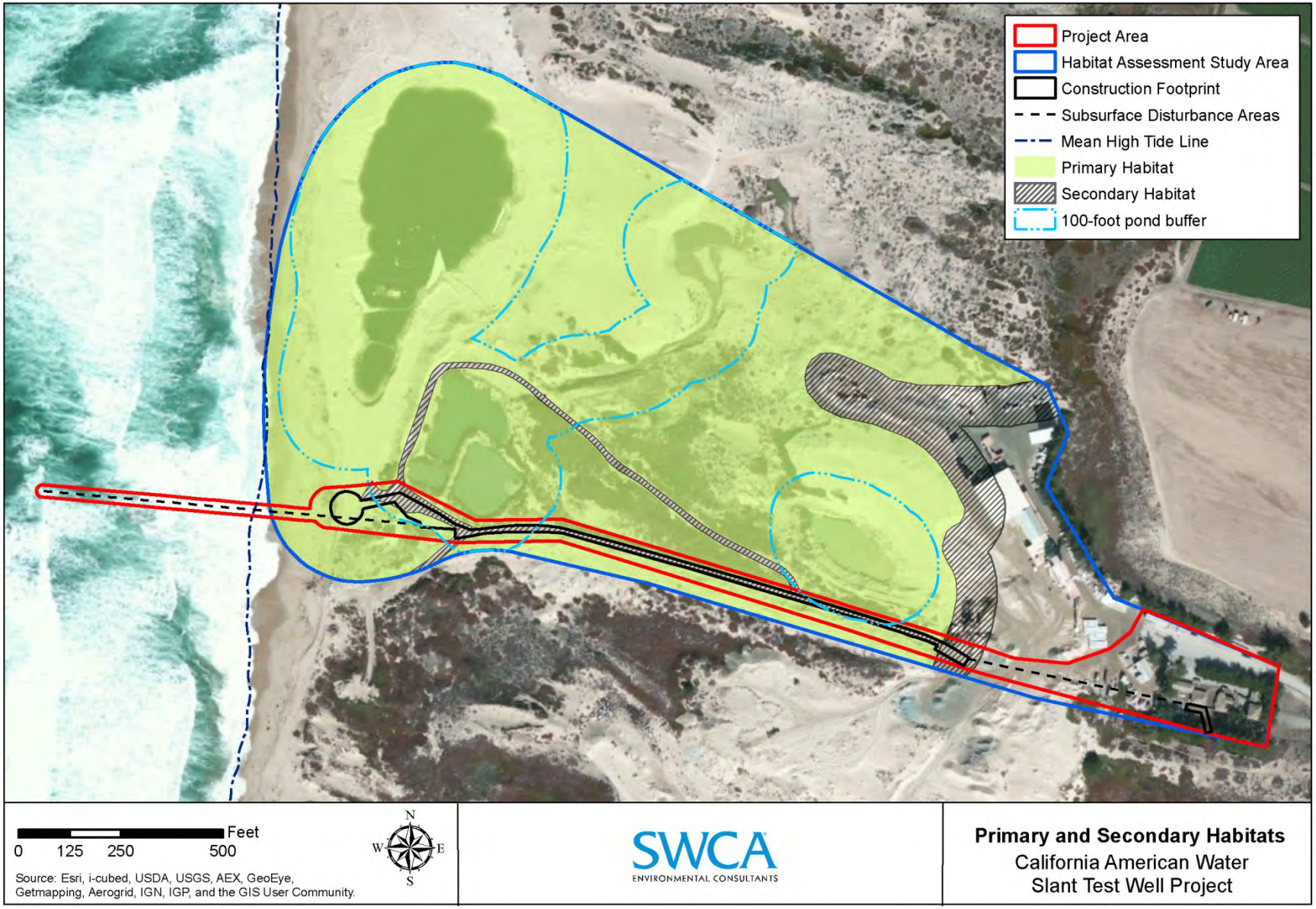
Figure 9. Local Coastal Program Primary and Secondary Habitats



5.3 Marine Biological Environment

5.3.1 Special Status Species

The project area includes an area within MBNMS where test water would be discharged via an existing wastewater outfall and where drilling would occur within submerged lands of MBNMS (refer to Figure 2a, above). MBNMS was designated as a federally protected area in 1992 and is managed by NOAA's ONMS. MBNMS includes coastal waters from Rocky Point, Marin County, to Cambria, San Luis Obispo County. MBNMS includes 276 miles of shoreline, which is approximately one quarter of California's coast. It extends an average distance of 30 miles from shore, encompasses 4,601 square nautical miles of ocean, and at its deepest point, reaches 12,713 feet (more than 2 miles) (MBNMS 2014).

MBNMS includes 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, 4 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 highly productive biological communities host one of the highest levels of marine biodiversity in the world, including 27 federally listed threatened and endangered species (MBNMS 2008). Federally listed species include six species of large whales, the Southern sea otter (*Enhydra lutris nereis*), Steller sea lion (*Eumetopias jubatus*), Guadalupe fur seal (*Arctocephalus townsendi*), California clapper rail (*Rallus longirostris obsoletus*), western snowy plover, marbled murrelet (*Brachyramphus marmoratus*), four species of sea turtles, six species of salmon or steelhead, the tidewater goby (*Eucyclogobius newberryi*), and black abalone (*Haliotis cracherodii*) (MBNMS 2008). MBNMS is also a meeting place for the geographic ranges of many species. It lies at the southern end of the range for some species, like the Steller sea lion (occurring from central California north to Alaska and Japan), and the northern end of the range for other species, like giant kelp (*Macrocystis pyrifera*) (occurring from San Francisco south to Baja California, Mexico) (MBNMS 2008).

MBNMS includes one of four major coastal upwelling regions worldwide. The MBNMS Final Management Plan describes the upwelling process as follows:

> *"Coastal upwelling occurs along the western edges of continents, where winds from the northwest drive oceanic surface waters away from shore due to the Coriolis effect. These shallow, relatively warm waters are replaced by deep, colder and nutrient rich waters driving high primary productivity, allowing phytoplankton to bloom, which in turn support zooplankton, providing a key prey resource for higher-order predators such as fishes, birds, and whales. Globally, these upwelling regions rival the productivity of tropical rain forests, and account for nearly 95 percent of the annual global production of marine biomass, in spite of only representing 0.1 percent of the ocean's total surface area."*

The seasonal upwelling that occurs within MBNMS 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). The nearshore midwater zone contains over 80 species of fish, sharks, and rays including flatfish such as halibut, sand dabs, flounder, turbot, and sole, which are closely associated with sandy habitats, as well as surfperch, rockfish, gobies, and sculpins which are normally associated with rocky habitats. Midwater schooling fish include anchovy, herring, smelt, sardines, and silversides.

Figure 10 shows the existing setting of the marine portion of the project area.

Marine Mammals

All MBNMS marine mammals are protected under the Marine Mammal Protection Act. Several marine mammals are also protected under the ESA. Marine mammals that are known to occur within MBNMS include:

- Steller sea lion (*Eumetopias jubatus*) – Federally threatened
- Guadalupe fur seal (*Arctocephalus townsendi*) – State and Federally Threatened
- Southern sea otter (*Enhydra lutris nereis*) – Federally threatened, State fully protected
- Blue whale (*Balaenoptera musculus*) – Federally endangered
- Fin whale (*Balaenoptera physalus*) – Federally endangered
- Humpback whale (*Megaptera novaeangliae*) – Federally endangered
- North Pacific right whale (*Eubalaena glacialis*) – Federally endangered, State fully protected
- Sperm whale (*Physeter macrocephalus*) – Federally endangered
- Sei whale (*Balaenoptera borealis*) – Federally endangered
- Killer whale (*Orcinus orca*) – Federally endangered
- Gray Whale (*Eschrichtius robustus*) – Delisted, though known to occur during migration
- Short-finned pilot whale (*Globicephala macrorhynchus*) – Not listed
- Baird's beaked whale (*Berardius bairdii*) – Not listed
- Beaked whales (*Mesoplodon* spp.) – Not listed
- Cuvier's beaked whale (*Ziphius cavirostris*) – Not listed
- Northern elephant seal (*Mirounga angustirostris*) – State fully protected
- Northern fur seal (*Callorhinus ursinus*) – Not listed, but considered vulnerable
- Harbor porpoise (*Phocoena phocoena*, San Francisco-Russian River stock, Monterey Bay stock, and Morro Bay stock) – Not listed

  (http://sanctuarysimon.org/monterey/sections/specialSpecies/index.php)

Marine mammals most likely to occur in the vicinity of the MRWPCA outfall include the California sea lion, Harbor seal, southern sea otter, and humpback whale. The southern sea otter is common along the Monterey Bay Coast and the humpback whale is

sometimes seen at the head of Monterey Canyon and is somewhat likely to be present in the project area. Seasonally, grey whales come in close to shore, and there are sightings of harbor porpoise and multiple species of dolphins.

Special Status Fishes

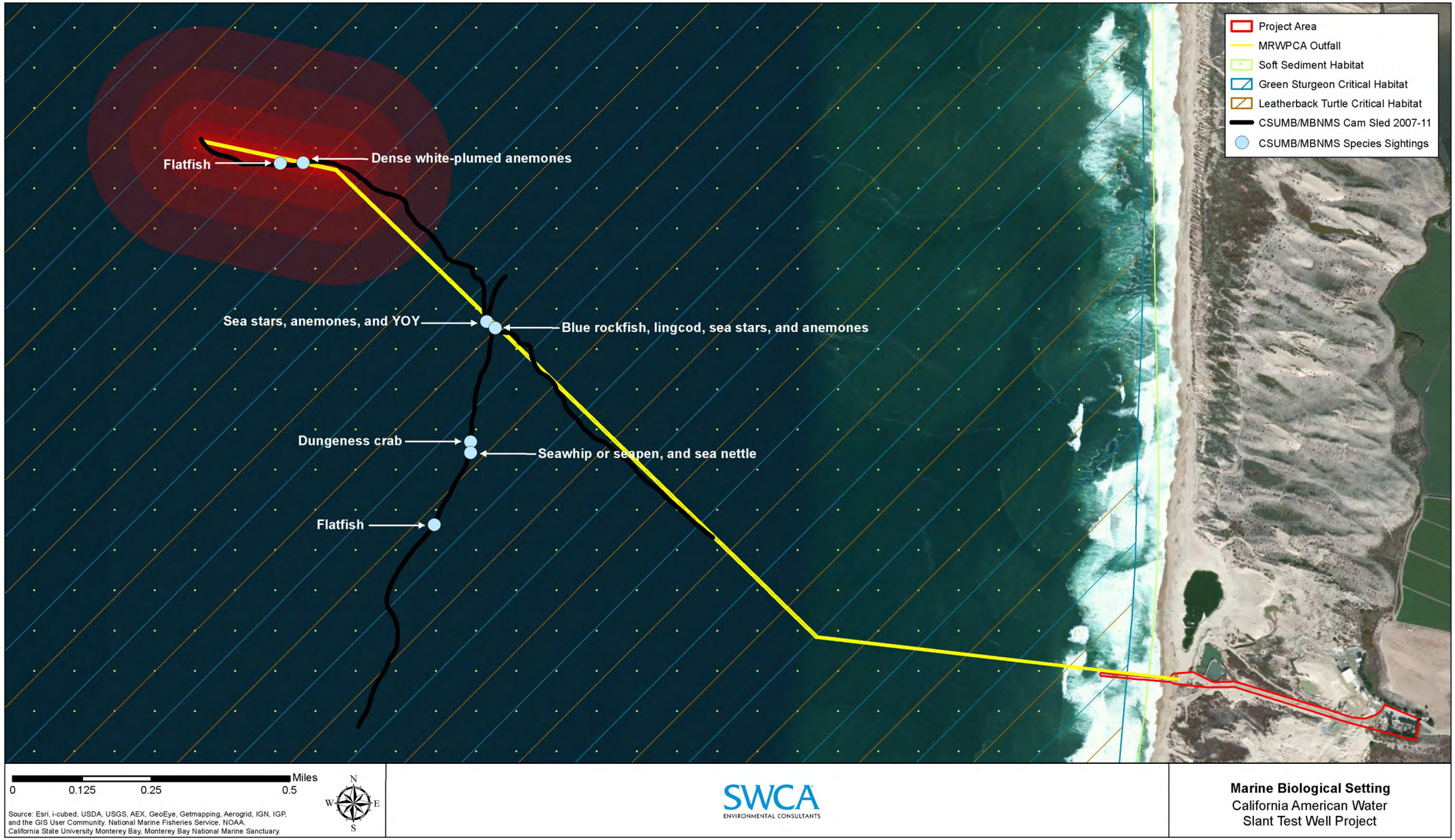
Several federally or state listed fish species are known to occur in MBNMS:

- Steelhead (*Onchorhynchus mykiss irideus,* south-central California coast distinct population segment [DPS], and central California coast DPS) – Federally threatened
- Chinook salmon (*Oncorhynchus tshawytscha,* central Valley Spring evolutionarily significant unit [ESU]) – Federally and state threatened
- Chinook salmon (*Oncorhynchus tshawytscha,* Central Valley Fall and Late Fall ESU) – Federal and state species of special concern
- Chinook salmon (*Oncorhynchus tshawytscha,* Sacramento River winter-run ESU) – Federally and state endangered
- Coho salmon (*Oncorhynchus kisutch,* central California Coast ESU) – Federally and state endangered
- River lamprey (*Lampetra ayresii*) – State species of special concern
- North American Green sturgeon (*Acipenser medirostris*, Southern DPS) – Federally threatened and state species of special concern
- White sturgeon (*Acipenser transmontanus*) – Federally endangered
- Longfin smelt (*Spirinchus thaleichthys*) – State threatened
- Eulachon (*Thaleichthys pacificus*, Southern DPS) – Federally threatened and state species of special concern
- Tidewater goby (*Eucyclogobius newberryi*) – Federally endangered and state species of special concern
- Cowcod (*Sebastes levis*) – Federal species of concern and considered overfished
- Bocaccio (*Sebastes paucispinis*) – Federal species of concern and considered overfished and state critically endangered
- Basking shark (*Cetorhinus maximus*, N. Pacific subpopulation) – State endangered

  (http://sanctuarysimon.org/monterey/sections/specialSpecies/index.php)

Steelhead and salmon are anadromous species that use both fresh and salt water at different stages in their life cycle (incubation and juvenile rearing in freshwater, maturation at sea, and adult migration into rivers for reproduction). Adults or smolts may use the marine project area in migration to and from coastal streams, and as rearing during early marine residency. Like salmon, sturgeon are anadromous, migrating to the ocean and returning to fresh water to spawn. Green sturgeon are known to forage in estuaries and bays ranging from Monterey Bay to British Columbia. Tidewater goby can be flushed from Elkhorn Slough during tidal events, and the basking shark has been sighted in nearshore waters in Monterey Bay.

Figure 10. Existing Biological Setting – Marine Area



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Invertebrates

Invertebrate species in MBNMS include squid, sponges, anemones, jellies, worms, corals, tunicates, snails, octopus, clams, and arthropods such as barnacles, crabs, and spot prawns. Thousands of various species of invertebrates populate MBNMS. Most invertebrate species are not harvested commercially, with the exception of squid, spot prawn, and Dungeness crab, rock crab, and octopus. Various types of invertebrates are found in all habitats from the sandy beach to intertidal, mid-water, and deep sea.

Black abalone (*Haliotis cracherodii*) is a federally endangered marine invertebrate known to occur in MBNMS. Black abalone are herbivorous gastropods (the same taxonomic class as snails and slugs) that live in rocky ocean waters. Black abalone are reported to be most abundant intertidally, from the mid to lower intertidal zones and potentially down to depths of 6 meters (19.7 feet).

Sea Turtles

Four species of federally listed sea turtles are known to exist within MBNMS: green sea turtle (*Chelonia mydas*), leatherback sea turtle (*Dermochelys coriacea*), loggerhead sea turtle (*Caretta caretta*), and olive ridley sea turtle (*Lepidochelys olivacea*). In the Pacific Ocean, breeding colony populations on the Pacific coast of Mexico of both green sea turtles and olive ridley sea turtles are listed as endangered; all others are listed as threatened.

5.3.2 Habitats and Natural Communities

MBNMS encompasses eight different marine and shoreline habitat areas, including rocky shores, kelp forests, sandy bottoms, estuaries, submarine canyons, deep sea, open ocean, and seamounts. Areas that would potentially be affected by the Proposed Action are described below. Other areas, including rocky shores, estuaries, submarine canyons, deep sea and seamounts, are located outside of the potentially affected area. The marine project area contains designated critical habitat for leatherback sea turtles and green sturgeon, and is also located within designated essential fish habitat (EFH) for groundfish, coastal pelagic species, and Pacific salmon. Each of these habitats is briefly discussed below.

Kelp Forests

Kelp provides a unique and diverse habitat utilized by numerous species, including marine mammals, fishes, other algae, and invertebrates. Just beyond the breaking waves, several species of kelp grow from the hard substrates. Although some individuals can persist for up to three years, the overall structure of the kelp forest is very dynamic. Kelp canopy cover varies seasonally; it is thickest in late summer and thins or disappears when large winter swells remove weakened older adults. The following spring, the next generation of individuals takes advantage of the thin canopy cover and increase in available light to grow rapidly. This, in addition to nutrient rich waters caused by upwelling, allows some species of kelp to grow up to 12 inches per day. The measured productivity (per square foot of sea floor) of a kelp forest is among the highest of any natural community.

In central California, the two primary canopy-forming species in kelp forests are giant kelp (*Macrocystis pyrifera*) and bull kelp (*Nereocystis luetkeana*). Both can be found in the same kelp forest, but giant kelp is more typical of the Monterey Bay area. Some vertebrates, such as sea otters and many fishes, reside within kelp forests; others, such as seabirds, harbor seals, sea lions, and gray whales, visit kelp forests while foraging for food. Giant kelp and other algae also support large populations of benthic invertebrates, which in turn attract higher-order predators.

Sandy Bottoms

Most of the ocean floor within MBNMS is covered with sand or mud. The lack of hard substrate and shifting sand prevent algae or seaweeds from growing. However, many organisms live in the sand, generally in two broad zones: a shallow region dominated by infaunal crustaceans, and a deeper area dominated by tube-dwelling and sedentary polychaete worms. Nearshore areas may have dense beds of sand dollars, and deeper areas may have high numbers of brittle stars and sea pens.

Open Ocean

Although oceans cover 70 percent of the Earth's surface, only 5 percent of the Earth's surface consists of typical marine ecosystems, like coral reefs or kelp forests. The remaining 65 percent make up the open ocean ecosystem, which typically lies well offshore where the water depth is greater than 330 feet. The waters of MBNMS are part of the eastern Pacific Ocean. Open ocean waters are 13,100 feet deep on average and in the Pacific basin reach a maximum depth of 36,000 feet.

Essential Fish Habitat

The Proposed Action is located within designated EFH for groundfish, coastal pelagic species, and Pacific salmon. EFH is broadly defined by the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and the Sustainable Fisheries Act to include "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." EFH is identified for any species managed under a federal fishery management plan. The MSA requires that federal agencies consult with NOAA Fisheries when taking any action that may adversely affect EFH. The MSA defines an adverse effect as any impact that reduces the quality and/or quantity of EFH (50 CFR 600.810).

Critical Habitat

The project area includes designated critical habitat for leatherback sea turtle and green sturgeon (refer to Figure 10). NOAA Fisheries designated critical habitat for the threatened southern DPS of green sturgeon in 2009, which extends from Monterey Bay north to Cape Flattery in Washington. Green sturgeon are long-lived, slow-growing fish, and are the most marine-oriented of the sturgeon species. Green sturgeon utilize both freshwater and saltwater habitat and are believed to spend the majority of their lives in nearshore oceanic waters, bays, and estuaries. Younger green sturgeon reside in freshwater, with adults returning to freshwater to spawn when they are approximately 15 years in age and over 4 feet in length (http://www.nmfs.noaa.gov/pr/species/fish/greensturgeon.htm#habitat).

The leatherback sea turtle is the largest turtle and one of the largest living reptiles on earth. The leatherback is the only sea turtle that doesn't have a hard bony shell, but rather a carapace make of thick, leathery connective tissue. Leatherbacks are known as pelagic (open ocean) animals, but also forage in coastal waters and are the most migratory and wide ranging of sea turtle species. NOAA Fisheries designated approximately 16,910 square miles of critical habitat for leatherbacks along California's central coast in January 2012, stretching from Point Arena in Mendocino County to Point Arguello in Santa Barbara County (http://www.nmfs.noaa.gov/pr/species/turtles/leatherback.htm)

Although not in the project area, critical habitat for black abalone is designated along the majority of California's central coast both approximately 20 miles north and 10 miles south of the project area. Critical habitat for Steller sea lions includes the rookeries at Año Nuevo Island, approximately 40 miles northwest of the project site.

5.3.3 Non-native Species

The presence of non-native aquatic species, some of which can be highly invasive and difficult to control, are increasingly common in coastal habitats worldwide. Estuaries, in particular, harbor large numbers of introduced species. Within MBNMS, approximately 40 non-native species are known to exist in Elkhorn Slough approximately 6.5 miles north of the project area, and another small number of species recently reported in nearshore coastal waters. Non-native species in MBNMS include terrestrial plants and algae (European dune grass, sea rocket, brown alga), invertebrates (sponges, anemone, snails, mussel, clams), and vertebrates (yellowfin goby, American shad, striped bass).

5.4 Human Environment

5.4.1 Cultural Resources

The project area is within the traditional boundaries of the Mutsun sub-group of the Costanoan people, who occupied the region during the Late Period (A.D. 1300-1769). According to historic accounts, the kalenta ruk tribelet of the Mutsun branch occupied the Monterey Peninsula near the project area. The Spanish designation for this tribelet was San Carlos. Mutsun speakers occupied the lands inland from the coast around the Pajaro and upper Salinas rivers, and numbered approximately 2,700 in 1770. The rich resources of the ocean, bays, valleys, and mountains provided Ohlone-speaking peoples with food and all their material needs.

The Native American population in this region came into contact with European culture at the beginning of Spain's land exploration and settlement in A.D. 1769. Traditional lifeways were altered drastically during the late 1700s to early 1800s when the Spanish placed their capital at Monterey, built forts at Monterey and San Francisco, and established seven Franciscan missions to convert native peoples to Christianity and the European way of life. Large-scale epidemics swept through the mission population and remaining villages. It is estimated that the combined Costonoan population fell from a pre-contact total of 10,000 down to 2,000 by the end of the mission period in 1834.

The City of Marina General Plan identifies areas of high archaeological sensitivity as the terraces and beaches along the Salinas River, the peripheries of vernal ponds, and coastal beaches.

The project area is located within a sand mining facility that has been in operation since 1906. Numerous structures and equipment at the CEMEX parcel are more than 50 years old; therefore, a Cultural Resources Survey Report was prepared for the Proposed Action (SWCA 2014). One historic district with nine contributing built environment resources were identified, recorded, and evaluated.

The Lapis Sand Mining Plant was established in 1906 by the E.B. and A.L. Stone Company. The Oakland, California based construction firm believed the sand from the surrounding dunes to be ideal for concrete production and needed a steady supply of the building material in the aftermath of the 1906 San Francisco earthquake and subsequent fires. The Stone Company purchased the land from John A. Armstrong, an early settler and rancher who sold the company 400 acres at $2 per acre with the stipulation that a fence be built to keep his cattle out of the sand dunes. Initial development of the plant included the construction of a small superintendent's residence and the Lapis Siding, a rail line which connected to the Southern Pacific Monterey Branch mainline rail. Using a locomotive crane, sand was scooped by dragline or crane directly into railroad cars and shipped to the San Francisco Bay Area with little or no processing.

The Lapis Sand Mining Plant historic district includes the following contributors: Sorting Plant, Washing Plant, Canal Flume, Lapis Siding, Superintendent's Residence, Bunkhouse, Garage/Office, Maintenance Shop, and Scale House and Office. There are a number of small ancillary buildings spread throughout the property that are associated with the above-mentioned resources. In addition there are a number of settling ponds and a dredging pond that were initially developed as part of the modernization of the facility in 1959-60. The geographic boundaries and location of these features have frequently shifted since their initial development. According to historic photographs, the current dredging boat and crane that floats atop the dredging pond was put into operation sometime after 1966.

Cultural resources are present within the offshore marine environment as well, and are protected by MBNMS regulations. Archeologists estimate approximately 1,276 reported vessel (shipwrecks or aircraft) losses within the waters of MBNMS, and 718 prehistoric sites along its shores (MBNMS 2014).

5.4.2 Land Use and Safety

The project site has a zoning designation of Coastal Conservation and Development District (C-D) with a Coastal Development Permit Combining District (C-P) overlay, and is designated Habitat Reserve and Other Open Space in the City of Marina General Plan. It is within the California Coastal Zone and extends through areas subject to both original and appellate jurisdiction of the CCC. The portion of the slant test well that extends through the shoreline and offshore into submerged lands of MBNMS, and the discharge

area at the end of the outfall, is within the jurisdiction of MBNMS and California State Lands Commission.

Existing uses include industrial mining activities conducted by CEMEX throughout the project area, including sand dredging, washing and processing, use of heavy equipment and trucks, sand and equipment stockpiles or push piles, and transfer of mined materials off-site for sale.

5.4.3 Utilities

Wastewater treatment in the city of Marina is provided by the MRWPCA. The MRWPCA operates an existing wastewater ocean outfall that extends through the CEMEX site and approximately 2 miles offshore. The outfall consists of four miles of 5-foot-diameter reinforced concrete pipeline and appurtenances that convey treated wastewater from the Regional Treatment Plant located 2 miles north of the City of Marina for ocean disposal. The land portion of the pipeline is buried, while the balance (about half) lies on or below the ocean floor in Monterey Bay. The outfall currently conveys secondary effluent during a majority of the year, but flow decreases to near zero during the agricultural growing season when the treatment facilities are used to produce recycled water for irrigation. MRWPCA produces recycled water sometime during February through December. Typically all wastewater is recycled during the five months of April through August.

Specifically, the outfall consists of 12,745 feet of 5-foot (60-inch) diameter pipe on land before transitioning underwater. The portion of the outfall that is underwater is approximately 10,392 feet in length and is 5 feet (60 inches) in diameter, except the last 907 feet of the diffuser at the end of the outfall, which is 48 inches in diameter. The 500 feet of 60-inch-diameter diffuser section contains 65 2-inch ports fitted with 4-inch duckbill valves. The 907-foot long 48-inch-diameter diffuser section contains 106 2-inch outlet ports fitted with 4-inch duckbill valves. The end of the outfall diffuser is at a depth of 106.9 feet bmsl.

The ocean portion of the outfall pipeline is fitted with a pressurized junction structure on the beach, which connects to the 12,745-foot-long, 60-inch-diameter land portion of the outfall pipeline.

The city of Marina's solid waste is collected by the Carmel-Marina Corporation and disposed of at the Monterey Regional Waste Management District's Monterey Peninsula Landfill, located north of the city, approximately 1.5 miles east of the CEMEX parcel. The City's General Plan indicates that the 475-acre landfill has adequate capacity to accommodate waste management needs in the service area for approximately 90 years.

5.4.4 Parks and Recreation

According to the City of Marina's General Plan, the City has a total of 96.7 acres devoted to local and community-serving parks and recreational uses, including a sports center, teen center, equestrian center, and school playfields. The present ratio of City park and recreation land to population is consistent with the City's standard of 5.3 acres per 1,000

residents. Outdoor recreational assets within Marina provide further recreational opportunities, including over 650 acres of state and regional coastal parkland.

Recreational uses in the vicinity of the project area are limited to lateral public beach access seaward of mean high tide and recreational uses (i.e., swimming, fishing, and boating) in MBNMS. The remainder of the project area, including the sandy beach and dune areas above mean high tide, is privately owned by CEMEX.

5.4.5 Visual / Aesthetic Resources

The majority of the project site is located within the highly scenic Marina Dune Complex, between SR 1 and the Pacific Ocean. The dune complex extends across the entire 400-acre CEMEX parcel and beyond, and the area just north of the project site is considered the best-preserved area of Marina Dune native habitat. The dunes provide a distinct contrast to the pattern of agricultural and urbanized lands in adjacent areas and this area of north Marina is locally considered to be the "scenic gateway to the Monterey Peninsula."

The large dune complex is highly visible from SR 1, particularly to southbound traffic (northbound views are oriented more inland). From SR 1, unobstructed views of the CEMEX site extend approximately 1 mile to the north, to the Del Monte Boulevard/Neponset Road overpass, and approximately 0.5 mile to the south, where intervening dunes and topography begin to block views. Views of interior portions of the CEMEX parcel and the project site are almost entirely obstructed by surrounding dunes and vegetation on the eastern perimeter of the parcel. Views of the ocean and sandy beach from SR 1 are largely blocked due to the height and depth of the dunes.

The CEMEX parcel is privately owned and does not provide public access. Therefore, views of the interior portions of the large parcel are limited by lack of access and the height of dunes and vegetation along the perimeter. However, there is lateral public coastal access along the shoreline (seaward of the high tide line), and the western portion of the CEMEX parcel and the project site can be seen from the public areas of the beach.

The number of viewers from SR 1 would be very high due to high vehicular use of this route. Due to the private ownership and distance from existing public coastal accessways (the nearest beach access is from Dunes Drive, approximately 0.9 mile to the south), viewers from the public beach area would be low.

SECTION 6. ENVIRONMENTAL CONSEQUENCES

6.1 Physical Environment

6.1.1 Geology, Geologic Hazards, and Soils

Proposed Action Alternative

The Proposed Action is located in an area with multiple geological characteristics that could contribute to unstable earth/soil conditions, including high groundwater elevation, liquefaction potential, and high potential for seismic activity, ground shaking, and seismic settlement. Due to its location adjacent to the Pacific Ocean, the site is also at risk of scour, storm surge, tsunami and coastal inundation and erosion.

The Proposed Action does not propose the development of any habitable structures; therefore, no risk associated with loss of human life would occur. The placement of structures within these soil conditions creates the risk for structural instability, damage, failure, and/or collapse. The proposed project would require earthmoving activities, grading and excavation that would potentially create increased water runoff, de-stabilization of soils, steepened slopes, and removal of vegetation, all of which could lead to increased surface runoff and soil erosion.

Development of the project would be required to meet or exceed the most current requirements of the California Building Code (CBC), which have been developed to establish the minimum requirements necessary for structural design to safeguard the public health, safety, and general welfare through structural strength, stability, access, and other standards. Conformance to the CBC criteria does not constitute any guarantee that significant structural damage or ground failure will not occur in the event of a significant event in the region. However, compliance typically indicates that risks to people and structures, including those related to unstable soil conditions, are properly safeguarded against according to generally accepted engineering practices.

A geotechnical investigation has been conducted for the project, which included a comprehensive assessment of geologic and seismic hazards at the site, including the potential for mass wasting/landslides, volcanic hazards, expansive and compressive soils, corrosive soils, flooding and inundation, subsidence, coastal erosion, faults and seismicity, ground acceleration and seismic shaking parameters, liquefaction, settlement, lateral spreading, and tsunamis (GeoSoils, Inc. 2014). Based on the findings of the investigation, it was determined that the site is suitable for the Proposed Action from a geotechnical engineering and geologic viewpoint, provided the recommendations presented in the study were properly incorporated into design and construction phases of development.

The geotechnical investigation outlined the appropriate engineering techniques that should be designed into the slant test well, wellhead vault, monitoring wells and related structures, including a designation of appropriate construction materials to withstand the corrosive coastal environment, fill requirements, engineering standards to withstand preliminary settlement and potential differential settlement under a design-level

earthquake, and measures related to temporary slopes and excavations to account for the shifting nature of the dunes. Through compliance with the CBC and recommendations in the geotechnical investigation, the structural components of the project would be designed to withstand anticipated seismic and geologic stresses according to current established engineering practices. Recommendations have also been identified to reduce the potential for dune sloughing, including limits on the height and gradient of slopes, and excavated areas would be backfilled with previously excavated material and restored to their original contour, thereby reducing long-term changes in on-site surface runoff or soil erosion. Mitigation is identified that ensures project compliance with these standards during project development (see Appendix A).

No Action Alternative

The No Action Alternative would not result in any structural development and would have no impact on geologic features and would not be subject to any risk associated with geologic hazards.

6.1.2 Water Supply and Quality

Proposed Action Alternative

Water Supply

The temporary slant test well would pump between 1,000 and 2,500 gpm of water from the 180-FTE and Dune Sand Aquifer over a maximum 24-month operational period. The proposed rate of pumping would equal an approximate extraction of between 4.5 and 11 acre feet of water per day, and 3,226 to 8,064 acre feet over the life of the project.

Extraction of this amount of water has the potential to cause drawdown of groundwater levels in areas immediately surrounding the intake portion of the well. The project applicant has analytically modeled the potential for drawdown as a result of the slant test well and estimates that a maximum drawdown of approximately 4 feet in water levels could occur near the center of the vertical projection of the slant well screen. At a distance of 2,500 feet from the well, drawdown is estimated to be approximately 0.3 feet (4 inches). The zone of potential drawdown is not expected to extend beyond the CEMEX parcel in any measurable amount and significant impacts at any off-site wells in the project vicinity are not anticipated. Figure 11 shows the preliminary modeled drawdown contours.

According to information from the SWRCB's Groundwater Ambient Monitoring & Assessment (GAMA) database, there are approximately 14 wells within 2 miles of the MPWSP (CEMEX) site. All of these wells are within the seawater intruded portion of the Basin. Areas in the immediate vicinity of the slant test well that could potentially experience minimal amounts of drawdown are not likely to have usable water supplies in the Dune Sand or 180-FTE Aquifers due to the extent of seawater intrusion in that area. Therefore, drawdown of water in surrounding wells would not constitute a significant effect on a usable water source.

Figure 11. Preliminary Modeled Drawdown Contours

Cal Am is coordinating closely with adjacent well owners regarding any concerns they may have associated with drawdown of their water supplies and has proposed to closely monitor the rate of drawdown and implement mitigation measures in the event actual drawdown exceeds current estimates provided through analytic modeling. Mitigation has been included that requires preparation of an approved groundwater monitoring plan prior to pumping activities (refer to Appendix A). Possible mitigation measures include monetary compensation (i.e., for increased pumping costs or for upgraded wells), provision of replacement water from alternative sources, or a reduction in pumping activities if the reduction would not substantially interfere with the project need.

Pumping activities would be of a limited duration and would not create a long-standing use or right to water within the aquifers. The water pumped from the aquifers would primarily be tidally influenced groundwater and is not expected to significantly reduce available freshwater supplies for existing or planned land uses. The effects of the pumping program would be closely monitored through its duration to determine the precise amount of drawdown caused by the slant test well. Due to the minimal extent of drawdown anticipated, and the unusable condition of wells in the Dune Sand and 180-FTE Aquifers in the project area, it is not anticipated that implementation of available mitigation options would be necessary.

Approximately 226,000 gallons (0.7 acre foot) of water would be needed for drilling activities and would be obtained from the City of Marina's domestic water supply. The City's supplies would be sufficient for project construction needs.

Water Quality

The project would pump seawater from an underground, tidally influenced aquifer and discharge it into MBNMS waters without any desalination or treatment. Water quality sampling during exploratory borings taken at the CEMEX site indicate that water in subsurface aquifers is heavily intruded by seawater. No potential contaminants or high levels of constituents were observed and all tested water was determined to be within water quality limits set by the California Ocean Plan.

NPDES is a program, authorized by the Clean Water Act, to control water pollution by regulating point sources that discharge pollutants into waters of the United States to ensure water quality is adequate to preserve the designated beneficial use(s) of a particular water body. Designated beneficial uses of the Pacific Ocean include water contact and non-contact recreation, navigation, commercial and sport fishing, marine habitat, rare and endangered species habitat, and wildlife habitat. To meet water-quality objectives, NPDES permits include effluent limits, which serve as the primary mechanism for controlling discharges of a particular pollutant into receiving waters.

The California Ocean Plan was adopted by the SWRCB in 1972 (most recently amended in 2010). The Ocean Plan establishes water quality objectives and programs of implementation to achieve and maintain its objective of protecting beneficial uses of the Pacific Ocean. In addition to the beneficial uses identified by the NPDES Program, the following additional beneficial uses of the Pacific Ocean have been identified under the

Ocean Plan: aesthetic enjoyment, mariculture (the cultivation of marine organisms for food and other products in the open ocean), preservation and enhancement of designated Areas of Special Biological Significance, fish migration, fish spawning and shellfish harvesting, and industrial water supply.

The proposed discharge of test waters would be subject to the requirements of an NPDES permit for the MRWPCA outfall that includes the additional pumped water. The NPDES permit would incorporate requirements of the Ocean Plan. Pumped water would be tested for a range of analytes prior to discharge into MBNMS (refer to Table 1) and through regular sampling and monitoring throughout project operation. Discharged water is expected to be in compliance with the Ocean Plan without the need for any treatment prior to discharge or dilution upon discharge into MBNMS to meet Ocean Plan standards. Proposed discharge via the existing MRWPCA outfall would be conducted in accordance with applicable permitting requirements and through consultation with the CCRWQCB and MRWPCA. Therefore, no impacts to water quality are expected.

The SWRCB conducted a preliminary analysis of the potential effects associated with the MPWSP based on currently available information in an April 3, 2013, *Draft Review of California American Water Company's Monterey Peninsula Water Supply Project*. In its report, the SWRCB concluded that because of the existing state of seawater intrusion, which results from a landward (inland) gradient or slope of groundwater flow, more of the water captured by the proposed MPWSP pumping activities would come from the up-gradient (seaward) direction and a much smaller proportion of the water captured by the pumping would be from the down-gradient (inland) direction. Water captured from the seawater direction would likely consist mostly of seawater, whereas water captured from the down-gradient direction would have a greater likelihood of capturing some portion of freshwater. Therefore, because the existing gradient indicates more water will be captured from the seaward direction, there is a reduced possibility that the wells will capture freshwater.

Pumping activities that capture substantial amounts of up-gradient seawater could slightly reduce the landward gradient flow of groundwater in the area influenced by pumping activities. This would equate to a slowing of seawater intrusion (SWRCB 2013). Therefore, the Proposed Action is not expected to exaggerate existing seawater intrusion in the project area.

Borings at the CEMEX site do not include evidence of any confining clay layer separating the Dune Sand and 180-FTE Aquifers at the project location, and water quality samples indicate hydraulic connectivity and communication between the two aquifers. Therefore, cross-contamination between the aquifers as a result of drilling and pumping from the slant test well would not be a concern, as the two aquifers are already in hydraulic continuity.

There is a low potential that the well would capture discharged MRWPCA wastewater from the ocean. However, the diffuser portion of the outfall is located almost 9,000 feet (over 1.5 miles) away from the nearest portion of the slant test well screen. Previous modeling of a full-scale subsurface intake system that included six subsurface intake slant

wells approximately 1 mile south of the project area (the North Marina Project, which predated the MPWSP) estimated that full-scale pumping activities could affect a 2-mile radius zone of influence. The zone of influence for the slant test well has not been determined; however, the risk of a single well capturing discharged wastewater 1.5 miles away is considered negligible. The addition of untreated seawater intruded groundwater into the outfall during periods when treated wastewater is flowing may slightly improve water quality by diluting the treated wastewater prior to discharge into MBNMS.

No Action Alternative

No test pumping would occur under the No Action Alternative and no impacts associated with water supplies or quality would occur.

6.1.3 Hydrology and Floodplains

Proposed Action Alternative

Due to the limited disturbance proposed, the project would not significantly alter the existing drainage pattern of the site or area. No surface water channels would be altered as a result of the Proposed Action, and all disturbed areas would be restored to pre-existing conditions to the extent feasible at the conclusion of construction activities.

No habitable structures are proposed as part of the Proposed Action; therefore, the harm associated with a risk of inundation or erosion is greatly reduced. Preparation of a drainage plan and sedimentation and erosion control plan would be required prior to issuance of a grading permit to ensure that project construction and the installation of sub-surface or surface-level structures would not result in significant erosion or siltation and would not significantly change the rate, flow or course of surface runoff. Effects associated with surface runoff would be negligible.

The westernmost portion of the project area is within the tsunami inundation area identified by the California Geological Survey and directly adjacent to the 100-year flood zone. The City of Marina's LCP indicates that wave run-up is generally blocked by the dunes in the project area, yet the Marina coastline is generally experiencing the effects of long-term coastal erosion. Despite the limited duration of the project, the slant test well and related facilities are proposed in an area that could be potentially impacted by coastal erosion or flooding, particularly in a significant storm event.

The City's LCP includes prohibitions regarding the placement of structures on the ocean-side of the dunes, in areas subject to wave erosion in the next 50 years, or in the tsunami run-up zone. Support facilities for coastally dependent industry are the only exception. The risk of inundation as a result of coastal erosion and wave run-up during a significant storm event has been estimated by ESA-PWA (formerly Phillip Williams & Associates, now a part of Environmental Science Associates [ESA]) for the MPWSP (ESA-PWA 2014) (refer to Figure 12). Based on the ESA-PWA study, the slant test well and wellhead vault would be in an area of potential inundation in a worst-case scenario event.

Figure 12. Coastal Erosion Storm Hazard Map

To maintain consistency with the City's LCP and to mitigate potential effects associated with inundation and structural damage to slant test well facilities, which could, in turn, result in a need for additional maintenance and repair activities, the slant test well and wellhead vault should be sited outside of areas subject to wave erosion through the duration of the project. There are adequate locations situated within adjacent areas of the CEMEX access road that could accommodate the wellhead vault and the project applicant has identified a preliminary location within the CEMEX access road southeast of the settling ponds where relocation would be feasible.

The new location, approximately 240 feet to the east, would create a greater buffer between the Proposed Action and sensitive snowy plover habitat and recreational use along the beach and would more than double the distance between the slant test well and the CEMEX settling ponds. Therefore, no adverse secondary impacts to resources would occur. Although the discharge pipeline and outfall connection would be within the storm erosion hazard zone, this use would fall within the LCP exception for support facilities for a coastally dependent use.

Well destruction or decommissioning proposes removal of physical structures within 5 vertical feet of the surface elevation. Therefore, it is possible that components of the slant test well and monitoring wells remaining at the site after the decommissioning phase of the project would eventually be exposed as a result of coastal erosion and bluff retreat over the next 100 years. All proposed infrastructure associated with the Proposed Action would be required to be removed to a depth of 40 feet below ground surface to avoid any potential for future resurfacing of project components. Removal of well casing down to 40 feet would not be technically or economically restrictive and would ensure no potential for long-term effects of the project would occur.

No Action Alternative

The No Action Alternative would not create any changes in existing hydrology or floodplains. No structures subject to potential damage as a result of inundation, erosion, runoff, or flooding would be constructed and no impacts would occur.

6.1.4 Air Quality and Greenhouse Gas Emissions

Proposed Action Alternative

Air Quality

The project would generate vehicle emissions from construction equipment and worker trips. Earthwork (i.e., trenching and excavation) would generate fugitive dust during construction and decommissioning activities. Construction-related emissions would be short-term and limited to the construction and decommissioning phases of the project.

Operational effects would include vehicle emissions from routine site inspections and the one-time repositioning of the packer device. Entrained road dust would not be a significant concern, as access roads to the CEMEX site are paved, and the potential for increased emissions associated with project-generated traffic congestion would be negligible due to the marginal number of trips that would occur. Due to the limited duration of the project, operational air quality effects would also be short-term and

limited to the maximum 24-month operational period. Adverse impacts to air quality would be significantly reduced due to the limited nature of the actions proposed and duration of the project.

The U.S. Environmental Protection Agency (EPA) sets National Ambient Air Quality Standards for six common air pollutants: ozone, particulate matter, nitrogen dioxide, carbon monoxide, lead, and sulfur dioxide. The NCCAB is in attainment of all federal air quality standards. The California Air Resources Board also administers California ambient air quality standards for the ten air pollutants designated in the California Clean Air Act. State standards are generally more stringent than the federal standards.

The MBUAPCD has developed specific criteria pollutant emission thresholds, which meet or exceed state and federal air quality thresholds. These standards are implemented through criteria established in the MBUAPCD's 2008 CEQA Air Quality Guidelines, which identify the level of construction and operational activity that could result in significant impacts if not mitigated. Both construction-related activities and operational uses that would occur as a result of the Proposed Action are substantially lower than the generally more stringent state thresholds for significant air quality impacts.

The project is a short-term testing facility and would not cause any growth-inducing effects or cause an exceedance of established population projections to occur, which may indirectly generate additional emission sources. The Proposed Action would be subject to standard dust control and ozone mitigation measures and operating permits required by the MBUAPCD for construction equipment. Adverse air quality impacts associated with the Proposed Action would be negligible.

Greenhouse Gas Emissions

GHG and climate change are national and even global issues that must be considered on a large scale. Most individual activities would not cause an individually significant GHG effect. Therefore, the potential significance of a project's impact on GHGs and climate change must be considered in the context of the project's contribution of GHG in combination with all other sources.

The number one contributor to GHGs is motor vehicle emissions. Due to the short duration and marginal number of vehicle trips associated with the Proposed Action, adverse effects on GHG emissions would be negligible.

No Action Alternative

The No Action Alternative would not result in the emission of any air pollutants and no impacts to air quality or GHG emissions would occur.

6.1.5 Hazardous Waste and Hazardous Materials

Proposed Action Alternative

The Monterey County Health Department Division of Environmental Health is responsible for regulating the operations of businesses and institutions that handle hazardous materials or generate hazardous wastes in the County. As part of the State-

mandated Certified Unified Program administered by the California Environmental Protection Agency (Cal-EPA), the Department of Environmental Health coordinates regulation and enforcement on programs related to hazardous materials and hazardous wastes.

The Proposed Action would not result in the routine transport, use, or disposal of hazardous materials and would not significantly change existing land uses or cause a routine or permanent increase in the potential for hazardous substances to be used in the project area. A significant upset event during project operation could cause damage to the well structures or discharge system resulting in a spill of pumped seawater and/or MRWPCA-treated wastewater into the surrounding area. However, this risk is minimized by engineering design standards and the short duration of the project. Pumped test water is anticipated to be predominantly comprised of untreated seawater that would not generate concerns related to hazardous materials in the event of a spill. Therefore, the project would not create a significant hazard to the public through foreseeable accident or upset during the operational phase.

Oils, gasoline, lubricants, fuels, and other potentially hazardous substances would be used and stored on-site during construction and decommissioning activities. However, such use would be short term and subject to standard requirements for the handling of hazardous materials. Should a spill or leak of these materials occur during construction activities, sensitive biological resources within the project vicinity could be adversely affected. Mitigation has been identified to reduce potential effects, including preparation of a Hazardous Material Spill Prevention, Control, and Countermeasure Plan, which includes measures for preventing spills and outlines spill prevention and cleanup procedures.

Drilling activities can create the potential for frac-out, an inadvertent leak of drilling lubricants, particularly when drilling underlies sensitive habitats, waterways, or areas of concern for cultural resources. The Proposed Action does not propose the use of any drilling fluids other than water; therefore, frac-out is not a concern.

There are no environmental cleanup sites, including leaking underground tank sites, land disposal sites, military sites, or other cleanup sites, on the CEMEX parcel or in the project vicinity. However, the project area has been altered by almost 100 years of industrial mining uses, and disturbed dune habitat within the construction footprint contains tailings, equipment, and materials associated with past mining activities. The construction footprint also includes the past known location of a rail spur that extended along the CEMEX access road to the beach. The rail spur was used to haul sand from the beach to the main rail line. A portion of the rail spur still exists in the easternmost portion of the project area.

There is the potential that construction or decommissioning activities could result in the inadvertent discovery or disturbance of buried hazardous materials or contaminated soils associated with past mining and railroad activities at the site, including abandoned septic systems or buried refuse pits. Based on a review of the site's mining history and location, and the limited area of project disturbance, the risk of disturbing unknown buried

hazardous materials is low. Avoidance and minimization measures have been identified to further minimize the potential for effects and to ensure proper plans are in place in the event of an inadvertent discovery, including consultation and coordination with CEMEX prior to construction activities and positive location of any known existing or abandoned subsurface deposits or structures. Therefore, impacts associated with the use or disturbance of hazardous materials would be minimal.

No Action Alternative

The No Action Alternative would not involve the use or potential disturbance of any hazardous substances. No impacts would occur.

6.1.6 Noise

Proposed Action Alternative

The Proposed Action would not result in the development of any permanent noise sources, as the use would be temporary and limited to the 24-month operational period. Operational noise would be negligible due to the limited project activities, construction methods proposed, and subsurface location of most project components. Short-term construction and decommissioning activities would involve the use of heavy machinery, drill rigs, earthmoving equipment, and other activities that would result in a temporary increase in ambient noise levels. Recreational beach users adjacent to the CEMEX parcel would be the user group most likely to be impacted by construction and decommissioning activities. However, proposed construction activities would be limited in duration and would not be substantially different than existing mining operations occurring on the CEMEX site.

The project proposes two on-shore drilling methods that would constitute the most dominant noise sources: sonic drilling for installation of the monitoring well clusters and dual rotary drilling for construction of the slant test well. The sonic drilling method utilizes high frequency resonant energy created from mechanical oscillations to liquefy (or fluidize) the immediately surrounding soil material allowing the drill head to rapidly penetrate the substrate. The dual rotary drilling method involves a slow rotation of the outer temporary casing and the internal dual wall reverse drill string.

Based on a noise evaluations completed to evaluate worker safety during drilling activities, noise from sonic drills typically ranges between 106 dBA at 0 feet from the drill to 96 dBA at a distance of 25 feet from the drill. Noise levels generated from dual rotary drilling typically range from 105 dBA at 0 feet from the drill to 84 dBA at 50 feet (Layne Christensen Company 2000). Drilling noise of approximately 105 dBA would be expected to decrease by as much as 40 dBA over the distance between the proposed drilling activities and the public beach areas (350 feet or more), resulting in potential public exposure to up to 65 dB of noise. Wave and wind noise at that location would likely be the controlling noise source along the public shoreline.

The project would result in short-term construction noise in a predominantly unoccupied industrial area, but construction noise is not anticipated to differ substantially from the ongoing mining operations. There are no identified sensitive land uses in the project

vicinity that would be affected by project-related noise and sound levels generated from construction and on-shore drilling are not anticipated to transfer to the aquatic environment, particularly at a level that would be distinguishable above ambient in-water background noise (i.e., the sound of waves, boats, etc.), as discussed in further detail in Section 6.3.1, below.

Cal Am has proposed the use of noise blankets to minimize construction-related impacts on snowy plovers. Noise blankets are sound absorbing and blocking barriers that can be erected to encapsulate noisy equipment and block sound at the source. The use of noise blankets around drill rigs would attenuate adverse noise impacts on sensitive wildlife species and recreational users. Due to the limited duration of construction and decommissioning activities and relative isolation of the project area, impacts associated with exposure or generation of excessive noise levels would not be significant. Potential effects on marine species associated with increased noise and vibration is discussed in further detail in Section 6.3.1, Special Status Species, below.

Groundborne vibration is measured in terms of the velocity of the vibration oscillations. As with noise, a weighted decibel scale (VdB) is used to quantify vibration intensity. Excessive vibration is typically associated with blasting activities or high impact actions (i.e., percussive pile driving).

Construction of the project may generate minimal ground borne vibration or noise associated with earthmoving and drilling activities. However, no high impact or percussive construction activity would occur, and groundborne vibration would be generally consistent with that of other standard construction activities. No sensitive land uses are located within proximity of the project area that would raise significant concerns associated with vibration. Although recreational uses along the beach and existing CEMEX structures and uses would be considered sensitive, the proposed construction activities would not generate groundborne vibration to an extent that would be detectible at the shoreline. Therefore, adverse impacts associated with noise and groundborne vibration would not be significant. Refer also to Section 6.3.1, below, for additional analysis of potential effects on marine species associated with construction vibration.

No Action Alternative

The No Action Alternative would not generate any noise or vibration above existing ambient levels. No noise impacts would occur.

6.2 Terrestrial Biological Environment

6.2.1 Special Status Species

Proposed Action Alternative

Monterey Spineflower

As proposed, the project would include excavation activities in proximity to known Monterey spineflower occurrences. The project construction and decommissioning phases would be implemented in the fall and winter months when live Monterey spineflower are not likely to be present. However, the Monterey spineflower seed bank

would remain during the dormant (non-vegetative) winter season at the locations where live individuals were located. During this time, grading or vehicular traffic that removes or turns over the top soil containing Monterey spineflower seed could hinder the germination success of the seed in the following season.

The operational phase of the project would be conducted over 24 months and would span the growth and blooming period of Monterey spineflower. During this time, vehicle and foot traffic has the potential to crush or otherwise disturb live Monterey spineflower individuals.

Measures have been incorporated into the Proposed Action that would minimize the potential for impacts to Monterey spineflower, including multiple season surveys to identify and flag all known previous spineflower occurrences, avoidance of all flagged areas, biological monitoring during grading activities and excavation, and educational training for construction personnel. The Proposed Action would also require restoration of any disturbed dune habitat areas, including utilization of a plant cover and species composition/diversity that meets or exceeds adjacent undisturbed dune habitat on the CEMEX parcel. With implementation of identified avoidance and mitigation measures, potential impacts to the species would not be significant.

Smith's Blue Butterfly

Since project activities would be conducted in proximity to the host plant(s) for the federally endangered Smith's blue butterfly, the proposed project has the potential to impact Smith's blue butterfly and/or its habitat. Potential direct impacts include mortality of adult butterflies resulting from collision with project vehicle traffic during months when adult butterflies are active (i.e., windshield hits), or mortality of larvae or pupae if the host plant must be removed or disturbed during construction. Potential indirect impacts include loss of habitat if the host plant(s) must be removed during construction or operational activities, or if dust associated with project activities settles on the nectaries of buckwheat plants, adversely affecting the butterflies' food source.

All previously observed occurrences of buckwheat are outside of the proposed project disturbance areas and construction activities would be limited to the winter months outside of the butterfly flight season (June to September). Therefore, direct impacts to Smith's blue butterfly are not anticipated. However, indirect impacts on larvae or pupae stages of Smith's blue butterfly could potentially occur as a result of surface disturbance in close proximity to buckwheat plants. Measures have been incorporated into the project to minimize the potential for adverse indirect impacts to Smith's blue butterfly and buckwheat, including buffering and avoidance of areas known to contain buckwheat, biological monitoring during construction/decommissioning activities, and educational training for construction personnel. With implementation of the identified measures, potential impacts to Smith's blue butterfly and its host plants would be less than significant.

Western Snowy Plover

The potential effects on snowy plovers and their habitat are discussed in terms of (1) the construction and decommissioning phases and (2) the operational phase of the project.

Activities proposed during the construction and decommissioning phases of the project (particularly in the western portion of the project area) have the potential to result in direct disturbances of western snowy plovers and their habitat, including drilling of the slant test well and monitoring wells, installation and decommissioning of the proposed wellhead vault and electric panel / sampling location, and trenching and development of the discharge pipeline and connection to the existing outfall junction structure.

As proposed, these activities would occur during the winter months outside of the snowy plover nesting season. However, site grading and excavation for these project elements would re-contour and compact approximately 320 linear feet of historically occupied snowy plover nesting and wintering habitat. Based on recent surveys, the beach and dune habitats located to the north and south of the proposed wellhead vault and discharge pipeline are important roosting areas for wintering snowy plovers (Point Blue 2013). Currently, these areas are rarely used for recreation or other human activities due to the lack of access, and CEMEX operations within this area are generally limited to the periodic use of equipment to move dredge anchors around the dredge pond. Therefore, plovers in the area are not subject to substantial routine disturbances. Movement and noise associated with construction activities in proximity to wintering snowy plovers could disturb foraging and resting behaviors. In addition, the effects of human-induced sand disturbance in long-established plover nesting habitat are not well understood, but may affect localized breeding behavior and nesting success (Zander 2013). In some cases, increased human disturbance can cause birds to abandon habitat altogether (Zander 2013).

The operational phase of the project would occur over a 24-month timeframe which spans the nesting and wintering snowy plover seasons. Activities associated with the operational phase of the project, including weekly site visits and the one-time repositioning of the packer device, may result in adverse impacts to western snowy plover during their nesting and wintering periods. The aboveground features of the project (i.e., the electrical panel / sampling station, and monitoring well caps) could also provide new perching locations for avian predators, resulting in increased predation.

Snowy plovers are known to nest in the beach and dune areas immediately west of the proposed wellhead vault and have been documented in the immediate vicinity of the proposed electrical panel and sampling location (refer to Figure 8). Nesting records indicate that at least seven nesting attempts have occurred within the westernmost portion of the project area since 2011, with two successful hatches in 2011 and one in 2012 (Point Blue 2014, unpubl. data). Additional nesting attempts have occurred in adjacent beach areas over the same period.

A plover may establish a nest in areas that would be directly accessed during the operational phase of the project (i.e., on the surface above the wellhead vault or in the

immediate vicinity of the electrical panel / sampling station). Maintenance staff travelling to or from the site to collect water samples or perform other routine tasks may create noise or other disturbances that could cause adult snowy plovers to abandon their nests and move to a new location.

The proposed routine site visits would also generally increase the amount of human presence in the area, which snowy plovers may perceive as threats, thus causing snowy plovers to move or fly to a new location. This type of disturbance may reduce foraging efficiency and opportunities for rest, which in turn may deplete energy reserves and result in lower reproductive success (Brown et. al. 2000; Zander 2013).

The proposed operational activities are not substantially different from existing conditions and on-going CEMEX mining operations within the western portion of the project area; however, the potential increase in activity, as noted above, may result in a marginal adverse impact on snowy plovers and their nesting behavior due to limited monitoring activities that would result in increased human presence in the project area. Mitigation is identified to minimize the risk of adversely affecting nesting and wintering plovers, including timing construction during the non-nesting season, biological training and monitoring, suspension of operational activities until authorized by USFWS in the event a nesting bird is found in areas near the wellhead that could be affected by operations, utilization of wire excluders to prevent roosting by avian predators, and re-contouring and restoration of habitat areas in consultation with Point Blue. Through avoidance of nesting plovers and implementation of additional minimization and mitigation measures, potential impacts would not be significant.

MBNMS initiated consultation with USFWS to determine the potential for impacts to snowy plover. USFWS has determined that formal consultation and an incidental take permit would not be necessary as long as earthmoving activities were restricted to the non-nesting season and additional appropriate mitigation was adopted. USFWS measures have been incorporated into the mitigation plan described in Appendix A.

California Legless Lizard

Vegetation in and adjacent to the project area provides suitable shelter and foraging habitat for California legless lizard. Project activities such as grading, trenching, and drilling that would uproot, trample, or crush vegetation have the potential to directly impact California legless lizard, and removal of vegetation or grading in dune areas that are not actively disturbed could result in indirect impacts through loss of habitat. As proposed, the majority of the project would be conducted in areas lacking suitable vegetation (i.e., within the CEMEX access road and adjacent sandy areas with little vegetative growth); therefore, California legless lizard habitat would largely be avoided. Pre-construction surveys and biological monitoring during project construction and decommissioning would minimize the risk of adverse effects within suitable habitat areas. With implementation of identified mitigation, potential for adverse impacts to the species would not be significant.

Coast Horned Lizard

Undisturbed dunes near the proposed project area may provide suitable habitat for coast horned lizard, but the species is not expected to occupy the disturbed roadbed and adjacent areas. While it is unlikely that coast horned lizards would occur in the project area, if they were to stray into the project area from adjacent dune scrub habitat during construction or operations, direct impacts could include injury or mortality associated with vehicle movements or grading, trenching, or drilling activities.

As proposed, the majority of the project would be constructed and operated in areas outside of suitable coast horned lizard habitat; therefore, the project would have low likelihood of causing impacts to the species. With implementation of identified mitigation measures, including pre-construction surveys and biological monitoring during project construction and decommissioning, potential for impacts to the species would not be significant.

No Action Alternative

The No Action Alternative would not involve any disturbance in the project area and no impacts related to the disturbance of sensitive plant or wildlife species occurring within the project area would occur.

6.2.2 Habitats and Natural Communities

Proposed Action Alternative

Construction, operation, maintenance, and decommissioning of the Proposed Action would require excavation, trenching, drilling, and heavy equipment access within heavily and moderately disturbed coastal dune and sandy beach habitat that support a variety of special-status species. The proposed project has the potential to impact western snowy plover critical habitat at the western end of the existing CEMEX access road, sensitive coastal dune habitat, and areas of Primary and Secondary Habitat as defined by the City of Marina's LCP.

The western portion of the project area is located in CA 22, Monterey to Moss Landing critical habitat unit for western snowy plover. Based on the adverse modification determination included with the designation of critical habitat for the Pacific Coast distinct population unit of the western snowy plover (77 Federal Register 36727), there are five activities that may affect critical habitat:

- Management actions in snowy plover habitat;
- Dredging and dredge spoil placement that permanently removes the essential physical or biological features of the habitat;
- Construction and maintenance of facilities that interfere with snowy plover nesting, breeding, or foraging, or that result in increases in predation;
- Stormwater and waste water discharge that could impact invertebrate abundance; and
- Flood control actions that alter the essential biological or physical features of the habitat.

The project area encompasses approximately 0.62 acre of designated snowy plover critical habitat at the western end of the CEMEX access road. Approximately 0.15 acre of critical habitat within the construction footprint would be directly disturbed as a result of excavation, trenching, and grading activities during project construction and decommissioning. The aboveground features of the project (i.e., the electrical panel / sampling station, and monitoring well caps) could also provide new perching locations for avian predators, resulting in increased predation. These activities could interfere with snowy plover nesting, breeding, and foraging known to occur in this area.

No flood control actions, dredging or permanent removal of habitat is proposed. Additionally, as discussed above, test water discharge would be subject to NPDES permit and Ocean Plan requirements and is not expected to adversely affect invertebrates or other marine species that serve as a plover food source.

The project is not expected to alter essential physical or biological features of the habitat to an extent that appreciably reduces the conservation value of critical habitat for snowy plover (Zander 2013). Action development would include measures to minimize long-term or permanent impacts on plover habitat, including minimizing the area of disturbance, installation of features (wire excluders) on above-ground components to deter avian predators, consultation with Point Blue biologists, construction during the plover non-nesting season, siting of the project in existing disturbed areas within or adjacent to the active CEMEX access road to the extent feasible, and re-contouring and restoration of disturbed areas upon completion of construction and decommissioning. Restoration activities would be performed in consultation with Point Blue and USFWS to ensure all essential physical and biological features of the habitat are restored in areas of disturbed dunes and sandy beach, including designated critical habitat areas. With implementation of these measures, no long-term or permanent effects on sensitive habitat would occur.

The proposed project has the potential to result in impacts to Primary and Secondary Habitat as defined by the City of Marina's LCP and identified in the Rare and Endangered Species Habitat Assessment (SWCA 2014). While the proposed project has been designed to minimize impacts to biological resources and associated habitat to the greatest extent feasible, impacts could result from grading, excavation, vehicle movements, or construction of the slant test well or monitoring wells, particularly in areas outside of the CEMEX access road. Construction and decommissioning activities could also result in erosion and hazardous material spills (i.e., fuel, oil, lubricants) in sensitive habitat areas.

The LCP does not prohibit development in Primary Habitat; however, all adverse effects must be fully mitigated. The project area encompasses approximately 1.9 acre of Primary Habitat and 0.68 acre of Secondary Habitat (SWCA 2014). Direct disturbance within the construction footprint would include 0.26 acre of Primary Habitat and 0.45 acre of Secondary Habitat (refer to Figure 9). The proposed project would be located in existing disturbed areas (predominantly within the CEMEX access road) to reduce impacts to sensitive habitat. However, portions of the project area located adjacent to the CEMEX

access road and/or west of the proposed wellhead vault are within identified Primary Habitat; therefore, any potential impacts must be fully mitigated.

Mitigation is identified below to eliminate permanent impacts to sensitive habitat, including minimization of the area of disturbance, re-contouring and restoration of disturbed dune and sandy beach habitat, an invasive species control program, siting of stockpiles and construction staging areas outside of sensitive habitat, spill response and cleanup measures, and consultation with Point Blue, the City of Marina, and USFWS. All disturbed surface areas would be restored upon completion of project construction and decommissioning phases through re-contouring of disturbed slopes and revegetation with native species. No long-term changes in habitat within the project area would occur.

No Action Alternative

The No Action Alternative would not involve any disturbance in the project area and no impacts related to the disturbance of sensitive habitats or natural communities occurring within the project area would occur.

6.2.3 Wetlands and Riparian Vegetation

Proposed Action Alternative

The proposed project would include earthwork and drilling within approximately 300 feet of the CEMEX dredging pond and as close as 30 feet of the three settling ponds. Although these ponds are man-made and used for industrial mining purposes, they likely qualify as other waters by USACE and wetlands under the CCC definition.

No project activities are proposed within the boundaries of the dredging or settling ponds and no direct removal, filling or hydrological interruption would occur. Currently, CEMEX traffic accesses the western portion of the CEMEX site via an internal graded access road that passes along the perimeter of the three settling ponds. Project activities within the roadway may force CEMEX traffic out of the currently traveled roadbed onto the shoulder in closer proximity to the ponds, potentially creating an increased risk of disturbance. However, alternative access routes to the ponds exist and the applicant would consult with the property owner to ensure project activities do not interrupt CEMEX operations. The ponds do not support significant sensitive vegetation or habitat due to the level of disturbance associated with their mining use and the abundance of ice plant. The disturbance proposed adjacent to the ponds would not be substantially different from existing CEMEX operations, and the ponds are protected from CEMEX activity along the access road by the height of dune features that surround them. Exclusionary fencing along the boundary of the roadway in the vicinity of the ponds has been included to ensure project activities do not force truck traffic north in closer proximity to the ponds.

There is a potential that pumping activities could cause drawdown within the surrounding areas of the aquifer, which could result in a lowering of water levels within the ponds. Due to their mining use, the ponds currently experience extreme fluctuations in water level, as water is frequently purged from the settling ponds to feed the dredge pond or percolate back into the ground. The high level of activity within the pond prevents the

establishment of any substantial wetland vegetation, though isolated species do occur within the banks of the ponds. If substantial drawdown did occur, it would be limited to the maximum operational phase of 24 months. Drawdown for that duration would not significantly impact any wetland species that exist in the vicinity of the ponds; those plants would be expected to recover as water levels are restored after conclusion of the pumping program.

The closest vernal pond (Vernal Pond Number 4) is located approximately 1 mile south of the project area and is not expected to experience any drawdown associated with the test pumping program. Therefore, the risk of impacts associated with drawdown would be low and resulting impacts would be minimal.

No Action Alternative

The No Action Alternative would not involve any disturbance adjacent to wetland features or pumping from groundwater sources. No impacts associated with actions in proximity of wetlands or associated with potential pond drawdown would occur.

6.2.4 Non-native Species

Proposed Action Alternative

The Proposed Action could result in the spread or introduction of non-native species, including invasive exotic plant species, within the coastal dunes via transport by construction equipment or operational vehicles or use of imported fill material (if necessary) at the time of project decommissioning. Measures would be implemented during construction activities to minimize the risk of spread of invasive species, including removal and disposal of exotic invasive species within areas of disturbance, development of an invasive species control program, use of imported fill (if necessary) from a source known to be free from invasive species, and habitat restoration, revegetation and monitoring to ensure successful establishment of native dune species in disturbed areas.

No Action Alternative

The No Action Alternative would not result in any disturbance activities that could result in the spread of invasive species. No impacts associated to the introduction or spread of invasive species would occur. The No Action Alternative would not include invasive species removal and the project area would remain in its existing condition.

6.3 Marine Biological Environment

6.3.1 Special Status Species

Proposed Action Alternative

The Proposed Action would involve drilling and trenching activities in the submerged lands of MBNMS as well as the discharge of pumped test water into MBNMS via an existing outfall pipe. On-shore activities involving surface disturbance would occur at a minimum of approximately 150 feet inland from mean high tide and no in-water activities are proposed other than the discharge. Subsurface disturbance associated with development of the slant test well would be within submerged lands of MBNMS. The

absence of in-water activities and disturbance significantly reduces any potential for adverse effects on marine species. However, marine species could be impacted by on-shore noise and vibration associated with project construction and drilling, and water quality impacts associated with the discharge could impact species in the vicinity and their habitat.

Noise and Vibration

Because there is no in-water construction proposed in the project area, only marine species that travel or rest out of the water or on the beach are likely to be affected by project construction. On-shore construction activities could disturb shorebirds or marine mammals that use the shoreline area and/or beach area in proximity of the project. High frequency human generated airborne noise may affect marine species that are above the surface of the water or on the beach. High sound levels or vibration can cause behavioral changes in marine mammals, mask their ability to detect important sounds due to background noise, and cause physical damage to hearing systems (Marine Mammal Commission 2007).

The terrestrial portions of the proposed work area are largely located in the fore and hind dune areas and are not expected to provide regular resting areas for pinnipeds (i.e., seals, sea lions, walruses). On occasion, a pinniped may haul out on the beach near the high tide line; however, the proposed work area is not a regular haul-out site. The potential for adverse effects on marine species resulting from airborne noise and vibration is low because of the distance between the proposed drilling activities and the marine environment. Drilling would occur a minimum of 300 feet inland and grading, excavation, and trenching activities would occur approximately 150 feet or more inland.

Sound levels generated from construction and on-shore drilling are not anticipated to transfer to the aquatic environment, particularly at a level that would be distinguishable above ambient in-water background noise (i.e., the sound of waves, boats, etc.). The applicant proposes to use noise blankets to reduce airborne noise effects on snowy plover; this mitigation would similarly serve to protect pinnipeds and other nearshore marine species from airborne noise impacts associated with project construction or decommissioning.

Substantial on-shore noise and vibration can potentially propagate through the sediment and into the ocean through the ocean floor, affecting nearshore fish and mammals. Based on consultation with NOAA Fisheries, the potential for adverse effects on marine species as a result of the proposed on-shore drilling activities would be very low. Both sonic and rotary drilling would produce noise and vibration; however, for a measurable sound pressure wave to propagate through substrates and enter the marine environment via the underlying sediment, a very large pulse of sound (such as those associated with high impact actions such as pile driving) would typically be required. No high impact or pulse-producing activities are proposed during construction or decommissioning of the project; therefore, the potential for noise or vibration effects on marine species is very low.

Water Quality

The discharge of test water into waters of MBNMS could potentially result in water quality impacts within the area of discharge if measures are not taken to ensure the test water meets applicable regulatory standards and is safe to discharge into MBNMS. Water samplings taken on-shore through exploratory borings indicates that pumped water would be comprised mostly of tidally influenced seawater and would not result in significant water quality concerns for marine species, based on compliance with existing regulations.

The existing outfall operates under NPDES permit #CA0048551 to discharge secondary treated wastewater from the MRWPCA's Regional Treatment Plant through a diffuser positioned 11,260 feet offshore at a depth of approximately 100 feet in Monterey Bay. MRWPCA-treated wastewater is reclaimed for agricultural irrigation during the summer months and released through the outfall in the wetter winter months. The proposed project would change the current discharge baseline by adding between 1,000 and 2,500 gpm (1.44 and 3.6 million gallons per day [mgd]) of groundwater for approximately 24 months. Historic flows of treated water in the outfall have ranged from 0 mgd during dry months, when water is being used for agricultural irrigation, to 20 mgd during rainy season months (Trussell 2012). The addition of pumped test water would equal an approximately 18 percent increase during high flow months and up to a 100 percent increase during low or no flow periods. Water samples at the CEMEX site indicate the water in the subsurface aquifer would meet all applicable standards of the NPDES Program and California Ocean Plan.

Cal Am is currently coordinating with MRWPCA to have the NPDES permit amended to include the temporary slant test well discharge. Project approvals would require that any test water discharge to be permitted under a new or modified NPDES permit and treated (if necessary) to meet all applicable NPDES and Ocean Plan requirements. The addition of pumped water to the pipe during periods of treated wastewater discharge would likely result in a beneficial impact on water quality, as the untreated seawater would mix with and dilute the treated wastewater in the pipe prior to discharge. Therefore, proposed discharges would not adversely affect water quality or marine species in the project vicinity.

No Action Alternative

The No Action Alternative would not involve any disturbance in the beach environment or discharge into MBNMS. No impacts related to the disturbance of sensitive marine species would occur.

6.3.2 Habitats and Natural Communities

Proposed Action Alternative

No in-water activities are proposed as part of the proposed slant test well project other than test water discharge via the existing MRWPCA outfall pipe. Any such discharge would be subject to NPDES permitting requirements and Ocean Plan water quality standards, which have been established with the specific goal of maintaining the quality of marine habitat, rare and endangered species habitat, and wildlife habitat within

MBNMS. Therefore, the potential for adverse effects to marine habitat would be minimal. NOAA Fisheries was consulted regarding the potential for adverse effects to the marine environment and EFH as a result of the proposed project. Because the project would pump from a tidally influenced aquifer and discharge would be subject to the requirements of a new or modified NPDES permit, NOAA Fisheries expressed that they had no concerns related to fisheries and that an EFH Assessment was not necessary.

No Action Alternative

The No Action Alternative would not result in any disturbance or discharge into the marine environment. No impacts to the marine environment would occur.

6.3.3 Invasive Species

Proposed Action Alternative

The project would not involve any in-water activity outside of the direct discharge of untreated pumped water into MBNMS via the existing MRWPCA outfall pipe. Therefore, the potential for introduction of invasive species into the marine environment would be very low.

No Action Alternative

The No Action Alternative would maintain existing conditions and would not create any potential for introduction of invasive species.

6.4 Human Environment

6.4.1 Cultural Resources

Proposed Action Alternative

The project area has been extensively surveyed for archaeological resources and no resources have been identified within the project area. However, the coastal region of Monterey County is considered highly sensitive with respect to archaeological resources due to the historic occupation and use of this area by Native American populations. All proposed disturbance activities would be conducted in coordination with a qualified archaeologist and construction and excavation activities would be monitored as necessary to ensure no unknown subsurface archaeological resources are disturbed. With implementation of these measures, the potential for significant adverse impacts to archaeological resources would be low.

The Cultural Resources Survey Report prepared under NHPA Section 106 for the Proposed Action identified a historic district within the project area. The Lapis Sand Mining Plant historic district includes several contributing structures that are located within the project area and in close proximity to proposed areas of project disturbance. Trenching and installation of electrical conduit in the eastern portion of the project area and within the CEMEX access road would involve excavation and earthmoving activities within 10 feet or less of the Lapis Siding and Canal Flume. Measures would be implemented during all disturbance activities to ensure impacts to historic resources were avoided, including siting of project components to avoid resources, installation of

construction fencing around any contributing resources within 10 feet of proposed construction activities to ensure incidental contact with structures by construction equipment does not occur, and construction monitoring.

Due to the limited nature of the Proposed Action, and because the project components would largely be placed below ground surface and would be virtually undetectable, no significant effect to on-site historic resources would occur after implementation of appropriate avoidance and mitigation measures.

The SHPO of the California Department of Parks and Recreation Office of Historic Preservation was consulted regarding the Proposed Action in accordance with Section 106 of the NHPA. Through that consultation, SHPO recommended that Native American monitors be present during ground disturbing activities associated with the Proposed Action, as requested by two local tribe representatives. SHPO concurred that the Lapis Sand Mining Plant Historic District is eligible for listing on the National Register of Historic Places with a period of significance from 1906 to 1960. SHPO concluded that a Finding of No Adverse Effect would be appropriate for the Proposed Action within implementation of the avoidance and mitigation measures identified in the Cultural Resources Survey Report. These measures and the additional recommended Native American monitoring have been included as required mitigation in Appendix A.

No Action Alternative

The No Action Alternative would maintain existing conditions and would not create any potential for disturbance of archaeological or historic resources within the project area. No impacts would occur.

6.4.2 Land Use and Safety

Proposed Action Alternative

The Proposed Action would be located within an active sand mining facility that is largely inaccessible to the public. The limited duration industrial uses proposed would be largely consistent with mining activities that have taken place at the CEMEX site for over 100 years. The coastal-dependent use is consistent with local coastal land use designations and zoning regulations.

Adverse effects on existing CEMEX operations would be minimized through coordination with the property owners. The Proposed Action would have minimal effect on recreational uses along the shoreline due to private ownership of the CEMEX parcel and lack of convenient public access, and any changes in land use associated with operation of the test pumping would be limited to the 24-month project duration.

The CEMEX site was chosen for the project after considerable coordination with affected state and federal resource agencies and consideration of multiple other coastal sites in the project vicinity. Because the Proposed Action would be centrally located within the actively-mined portion of the CEMEX site, the remainder of the 400-acre parcel serves as a substantial buffer to the nearest adjacent developed areas, thereby minimizing potential effects related to noise, air emissions, or hazards.

Trenching and drilling activities in the vicinity of the public beach areas could potentially create safety concerns if excavated trenches or heavy machinery are left exposed and unattended during the construction period. The number of beach users in this area during construction or decommissioning activities would be low. However, to eliminate any potential risks associated with open trenches and machinery in the vicinity of the public beach, an on-site safety monitor shall de designated to monitor construction activities, warn recreational users of dangerous conditions at the site, and direct construction crew in a manner that reduces potential safety risks. No heavy machinery would be left unattended within 500 feet of mean high tide and any excavation, drilling, or trenching activities within 500 feet of mean high tide shall be monitored 24 hours/day to ensure impacts associated with potential safety risks would be minimized.

Due to the short duration of the Proposed Action, existing industrial activities within the project site, and the general suitability of the CEMEX site for the use proposed, adverse effects to land uses would be negligible. Minimal safety concerns would be mitigated through construction requirements and monitoring.

No Action Alternative

The No Action Alternative would not result in any change in existing land use; no impacts would occur.

6.4.3 Utilities

Proposed Action Alternative

The Proposed Action would not require service through any new or expanded water or wastewater treatment facilities. Temporary construction demands would be met by portable restroom facilities, hand-washing stations, City of Marina domestic water supply, and bottled water (as necessary) for construction workers. The project proposes connection to the existing MRWPCA wastewater ocean outfall, which could interfere with or cause damage to existing wastewater infrastructure. Damage could lead to adverse effects, such as a spill of MRWPCA treated wastewater on the beach, or could create the need for structural repairs that would cause adverse environmental impacts, such as additional disturbance in the sandy beach or foredune areas.

MRWPCA was consulted regarding the Proposed Action through agency referral packages delivered on August 1, 2013 and February 28, 2014. MRWPCA indicated through their responses (September 13, 2013 and March 21, 2014) that they were supportive of the project. The following list summarizes MRWPCA's comments and concerns associated with connection and use of the outfall.

- Abandoned Ocean Outfall Construction Trestle – the first 2,000 feet of the ocean-portion of the outfall were built from a temporary trestle, by driving steel pipe into the sand and building a tracked roadway above for a mobile crane. The slant test well should be drilled outside the extent of the construction trestle to avoid contact with any original pipe that was not removed.

- Positive Location of Outfall – MRWPCA requested that the applicant positively locate the outfall prior to any drilling or trenching. Positive identification could occur through utilization of Underground Service Alert of Northern/Central California and Nevada (USA North 811), or if there is any uncertainty, the outfall should be pot-holed to determine its location. The connection pipeline that would be installed between the well and the junction structure is shown to cross the outfall twice. MRWPCA is concerned about the protection of the outfall and junction structure. Caution should be taken when digging close to MRWPCA facilities.

- Connection to Junction Structure – MRWPCA is also concerned about connection to the 42-inch by 84-inch pressure lid. The design should allow for access to the junction structure in the event of an emergency. In addition, because the junction structure can be under pressure, connection may need to be performed during low flow (night) conditions. The connection may require a significant number of MRWPCA personnel to attend various pump stations within the system.

  MRWPCA would need to conduct engineering review of the connection to the junction structure. It is preferred that the connection pipeline not be metallic. Connection to the existing cover would be acceptable only if a new cover is provided at the end of the project. The pipeline should be connected to and bolted to the structure directly.

  Although currently sub-surface, the manhole structure and cover were designed and built to be at surface grade. The connection should be designed to potentially be at or above grade. The manhole needs to be accessible for repair or maintenance throughout the test period.

- Staging and Heavy Equipment – staging areas and heavy equipment should be kept at a safe distance from MRWPCA's facilities, including the outfall pipeline, junction structure, and the buried concrete emergency by-pass channel that extends 196.5 feet seaward of the junction structure.

- Well Abandonment – MRWPCA assumes that the test well would be abandoned in place, as removal of the temporary well could adversely affect the outfall more than construction.

- Discharge of Seawater – MRWPCA is not currently permitted for receiving seawater at the junction structure and would only accept seawater if necessary approvals have been granted by the CCRWQCB. MRWPCA's previous conversations with CCRWQCB staff have indicated that discharging pumped seawater back into the ocean should not be difficult to accomplish; however, there may be some delay in getting proper permits in place.

- Corrosion of MRWPCA Facilities – the currently discharged secondary effluent is not very corrosive to the concrete pipes or metal appurtenances of the outfall. Seawater could be much more corrosive. MRWPCA wishes to confirm the

existing extent of corrosion of the junction structure and outfall prior to accepting seawater. A baseline corrosion study would be required.

- Sand – MRWPCA does not want sand entering the junction structure or outfall. Temporary sedimentation tanks are proposed for slant test well development; however, during operation the only sand removal would be via the well screening. They request mechanical screening or other mechanisms to prevent sand from entering MRWPCA facilities.

- Access to Flow Meter Data – MRWPCA would want the slant test well flow meter data telemetered to MRWPCA's Control Room. If a cell phone based system is used by Cal Am (similar to what MRWPCA uses in several locations), then access to instantaneous data may be adequate.

- Alarm System – the project includes an alarm system, whereby high back pressure (among other events) would shut down the slant test well pump and alert Cal Am. MRWPCA would like to be involved in determining what the alarm set point would be and to have the high pressure alert sent to MRWPCA's control room as well. The pressure shutdown should be connected to the telemetry system. Cal Am may need to design and integrate a backflow prevention device on the well to meet California Department of Public Health, Monterey County Environmental Health, or CCRWQCB requirements.

- Maintenance of Outfall – MRWPCA may need to access the outfall for future repair and maintenance. The proposed electrical conduit would cross the outfall pipeline. MRWPCA would not be responsible for repair or replacement of electrical conduit or wiring should it need to be removed to access the outfall.

- MRWPCA and Cal Am Agreement – MRWPCA and Cal Am need to enter into an agreement for accepting the test water. The agreement should address MRWPCA's concerns through engineering design and the terms of the agreement.

Disturbance of the abandoned outfall construction trestle could result in the need for additional excavation and pipe removal, thereby increasing disturbance and construction activities. If encountered or exposed, the pipe could also contain hazardous substances (such as asbestos-containing materials or lead), which could require special handling, worker safety and/or disposal measures. Disturbance or damage to the outfall pipe would require repairs, causing an increase in disturbance within the project area and associated environmental effects. It could also cause an interruption in MRWPCA disposal activities or result in a spill of treated wastewater.

The Proposed Action is not expected to result in substantial corrosion of the outfall due to the limited duration of the discharge and absence of brine (concentrated seawater) in the discharge (as would be proposed after desalination under the full-scale MPWSP). The project applicant will test the extent of existing corrosive intrusion on exterior portions of the pipe, which have been in place and exposed to seawater for over 30 years, to monitor

the extent of corrosion that would be expected during proposed long-term operations of the full-scale MPWSP.

Maximum daily flows of MRWPCA treated wastewater through the outfall has historically ranged from approximately 9 to 30 million gallons per day, with the highest flows occurring during rainy season months when the water is not needed for agricultural irrigation (Trussell 2012). Total capacity of the outfall varies based on the density (weight) of water being discharged, tide levels, and position of the ports on the diffuser portion of the outfall (open or plugged). A 2012 study associated with the MPWSP estimated total capacity of the outfall to be between approximately 66 and 95 gallons per day depending on these variable conditions (Trussell 2012). The Proposed Action would add up to 3.6 mgd to the outfall; therefore, the outfall would have sufficient capacity to accommodate the added volume of discharge water even under historic high-flow conditions (30 mgd + 3.6 mgd = 33.6 mgd < 66 mgd).

MRWPCA indicated through project consultation efforts that they believed all concerns could be addressed through engineering design and additional coordination with Cal Am, and implemented through the terms of an agreement or memorandum of understanding between Cal Am and MRWPCA. Mitigation is identified that would ensure the potential adverse environmental effects associated with connection to the MRWPCA outfall are addressed and minimized prior to development of the project, including requirements for engineering design review, positive location of the outfall prior to construction, and development of a back pressure alarm system.

No Action Alternative

The No Action Alternative would not result in any change in utilities, service systems, or existing infrastructure; no impacts would occur.

6.4.4 Parks and Recreation

Proposed Action Alternative

The Proposed Action would involve construction activities in proximity to recreational uses along the shoreline, resulting in visual effects, noise, and potential safety hazards. The proposed activities would be generally consistent with existing mining activities at the CEMEX site and would not constitute the only non-natural activities in the project area. Full-time (24 hours/day) safety monitoring would be necessary during any excavation or trenching activity within 500 feet of the public beach area.

The Proposed Action would not interrupt vertical beach access, and any recreational users affected by construction noise or activities would likely move to an adjacent area of the beach. Project operation would be largely undetectable from the shore. Therefore, marginal impacts to recreational resources would be limited to the proposed construction and decommissioning phases.

No Action Alternative

The No Action Alternative would not involve any disturbance in areas adjacent to public areas of the beach and no adverse effects on recreational uses would occur.

6.4.5 Visual / Aesthetic Resources

Proposed Action Alternative

Construction and decommissioning activities would create the greatest potential for visual impacts due to the presence of large drill rigs and/or heavy construction equipment and materials. Construction activities may be visible from SR 1, which is identified as an "Eligible State Scenic Highway – Not Officially Listed" by the California Scenic Highway Mapping System. Views of the Proposed Action would be focused largely in the eastern portion of the project area where drilling and trenching are proposed for the development of monitoring wells and placement of electrical conduit. However, these activities are expected to be largely blocked by intervening vegetation and generally indistinguishable from the existing mining infrastructure and activities occurring at the site, including heavy mining equipment and vehicles and sand mining, sorting, and processing facilities.

Construction of the outfall connection activities and slant test well area would be entirely or partially visible from public areas of the beach. Construction of the outfall connection would largely occur within the foredune area and recreational users on the beach would have unobstructed views of the outfall pipeline construction at a distance of less than 200 feet. However, the construction impacts would be short term in nature and would occur during the winter months, during the non-peak season for recreational beach use. This area is currently used by CEMEX trucks and heavy machinery to access the adjacent dredge pond, which has an 80-foot-long suction dredger in it. Therefore, project construction would not constitute the only non-natural use occurring in this area of the dunes. Visual effects of the construction equipment would be adverse, but minimized due to the intervening topography and vegetation, short action timeframe, and other existing industrial uses within the project area.

The proposed project would not result in any permanent source of light or glare that may affect nighttime views in the area. Short-term construction activities may occur during nighttime hours, which may require temporary lighting. However, these activities would be limited to the 4 to 5 month construction phase and 4-week decommissioning phase and buffered by the large vacant CEMEX parcel surrounding the project area. Maintenance or emergency repairs may be required during the 2-year operational period, which may occur during night hours and include the use of lighting. However, the use of lighting would also be short-term and limited to the period of activity. Construction or maintenance/repair lighting would constitute the only source of light in a large, otherwise unlit and undeveloped area, but would not be highly visible from public areas outside of the large CEMEX parcel. Therefore, visual impacts associated with project construction and decommissioning would not be significant.

During the operational phase, the slant test well, wellhead vault, and almost all other project infrastructure would be located below surface, with disturbed surface areas re-contoured and restored to their original condition. Minor components would remain exposed aboveground (pole-mounted electrical transformer, sampling caps at the monitoring wells, and the electrical panel, antenna, and test well sampling station). Mine

operators would also visit the site on a weekly basis during operation of the well, resulting in a marginal increase in activity at the CEMEX site.

The above-surface project components would be largely or entirely obstructed by dunes and vegetation. The electrical panel, antenna, and sampling station would be sited behind a large dune at the west end of the project site, but may still be visible from some areas of the beach. These components are not expected to be discernible within the actively mined areas from SR 1, and would be largely shielded from the beach. Due to the current mining operations in the immediate vicinity, the substantial shielding of the structures by existing topography and vegetation, and the limited duration of the project, visual impacts would be negligible.

No Action Alternative

The No Action Alternative would maintain the existing visual environment; no impact on visual resources would occur.

6.5 Cumulative Impacts

Cumulative impacts are defined as two or more individual effects which, when considered together are considerable, or which compound or increase other environmental impacts. NEPA requires that the lead agency identify cumulative impacts, determine their significance, and determine if the effects of the Proposed Action are cumulatively considerable.

Project-related impacts of the Proposed Action would be short-term, and predominantly limited to the area of direct disturbance and immediate vicinity (i.e., no significant impacts to area-wide air quality, water resources, or regional transportation facilities have been identified).

Potential adverse impacts associated with the Proposed Action and identified in the EA include impacts to sensitive terrestrial plant and wildlife species, disturbance of dune habitat, construction-related effects on recreational activities along the beach, development in proximity to significant historic resources, and potential inundation or damage during a significant storm event or as a result of long-term coastal erosion. The project's impacts would be very limited in duration and could be generally minimized or eliminated through application of standard avoidance, minimization, and mitigation measures.

Minimal impacts resulting from the Proposed Action could be compounded by development of additional related past, present and planned future projects in the project vicinity, including the full-scale MPWSP (if successfully developed). The MPWSP would result in additional disturbance of sensitive dune habitat in the project vicinity, potentially adversely affecting sensitive species and their habitats. Due to the larger scale of the MPWSP and permanent water supply infrastructural components that would be developed, it may not be feasible to utilize previously disturbed areas within the CEMEX sand mining facility to the extent possible under the Proposed Action. Therefore, additional areas of disturbance in less disturbed areas of dune habitat would likely occur.

However, as with the Proposed Action, it is anticipated that the MPWSP would be located almost entirely below surface. Disturbance to sensitive habitat areas would be predominantly limited to the construction phase and limited maintenance and repair activities, as needed. Disturbed dune habitat could be restored to its original condition through re-contouring slopes and revegetation with native species. Due to the limited duration of disturbance and potential beneficial effects of restoration activities, cumulative impacts to dune habitat and sensitive species in the dunes would not be significant.

The MPWSP would involve a discharge of salt brine (concentrated wastewater with a high level of salinity that exceeds naturally occurring levels in the ocean) through the MRWPCA outfall and into MBNMS. The brine discharge has the potential to result in water quality impacts in MBNMS that could adversely affect sensitive marine species or habitat. The addition of highly saline water to the outfall pipe could also result in corrosion of the outfall, necessitating repair and additional disturbance activities. Due to the limited duration of the Proposed Action and the planning, review, and construction schedule of the MPWSP, it is not anticipated that the discharges would occur simultaneously. There are limited water quality concerns associated with the Proposed Action, which would discharge untreated tidally influenced groundwater into MBNMS consistent with the Ocean Plan. Therefore, the Proposed Action would not significantly compound or increase the risk of water quality impacts associated with the brine discharge.

The MPWSP is also likely to result in similar effects related to well drawdown and changes in the flow of groundwater (potential seawater intrusion). However, potential impacts of the Proposed Action were found to be insignificant due to the extent of existing seawater intrusion and unusable condition of adjacent wells. The separation in timing of pumping activities would further prevent any potential compounding of impacts. Therefore, cumulative impacts on water quality and supply would be insignificant.

The MPWSP would be exposed to similar site hazards, including coastal erosion, seismic shaking, and inundation during a significant storm event. However, neither project proposes the development of habitable structures within these areas. Although the MPWSP may remove an existing obstacle to growth by securing additional water supplies, future population growth would be sited to avoid geologic and hydrogeologic hazards as required by the City of Marina LCP and General Plan. Therefore, the Proposed Action's impacts associated with geologic and hydrogeologic hazards would not be significant.

Development of the MPWSP would also involve similar disturbance activities in proximity to historic resources and recreational uses. However, these impacts would be similarly limited in duration and through appropriate avoidance measures and construction monitoring.

Although the MPWSP has the potential to result in similar and greater adverse environmental effects as the Proposed Action, the incremental and temporary effects of

the Proposed Action, which are anticipated to be separated in time entirely from the MPWSP, would not significantly compound or increase the potential risk to environmental resources and would not constitute a measurable contribution that would be cumulatively considerable under NEPA.

Through implementation of identified avoidance, minimization, and mitigation measures, the Proposed Action would not result in impacts that would be individually limited but cumulatively considerable.

SECTION 7. PREPARERS AND COORDINATION

The EA was prepared by SWCA Environmental Consultants and MBNMS staff. Agency coordination was initiated through preparation of two sets of agency referral packages, which provided a description of the Proposed Action and a request for agency comments. Referral packages were delivered to interested agencies on August 1, 2013 and February 28, 2014. Comments were received from the following agencies through the agency referral process:

- U.S. Fish and Wildlife Service
- NOAA National Marine Fisheries Service
- City of Marina
- Monterey County Resources Management Agency
- Monterey County Water Resources Agency
- Monterey Peninsula Water Management District
- Monterey County Water Management District
- California Department of Conservation, State Mining and Geology Board
- California Public Utilities Commission
- California Department of Transportation
- California Coastal Commission
- California Department of Fish and Wildlife
- California State Lands Commission
- Monterey Regional Water Pollution Control Agency
- California State Parks
- Monterey County Health Department
- Monterey Peninsula Regional Park District
- California State Parks, Office of Historic Preservation
- Sierra Club

The following agencies were also contacted regarding the Proposed Action, but provided no comment.

- U.S. Army Corps of Engineers
- State Water Resources Control Board
- Transportation Agency for Monterey County
- Monterey Bay Unified Air Pollution Control District
- Marina Coast Water District
- Central Coast Regional Water Quality Control Board

SECTION 8. REFERENCES

Aries Consultants LTD. 2008. *Marina Municipal Airport Master Plan Update*. Prepared for City of Marina. February 2008. Morgan Hill, CA: Aries Consultants LTD.

BCR Consulting LLC. 2013. *Cultural Resources Assessment – Monterey Peninsula Water Supply Slant Test Well Project*. Prepared for RBF Consulting. October 1, 2013. Napa, CA: BRC Consulting LLC.

Brown, Jennifer A., Erica J. Burton, Sophie De Beukelaer. 2013. *The Natural Resources of Monterey Bay National Marine Sanctuary: A Focus on Federal Waters*. June 2013. Silver Spring, MD: Marine Sanctuaries Conservation Series ONMS-13-15, U.S. Department of Commerce, NOAA, ONMS.

Brown, S., C. Hickey, B. Harrington. (Eds.) 2000. *The U.S. Shorebird Conservation Plan*. Manomet, MA: Manomet Center for Conservation Sciences.

California Department of Conservation. 1992. *RMC Lonestar Lapis Sand Plant Reclamation Plan Final Environmental Impact Report*. January 1992. Sacramento, CA: California Department of Conservation, State Mining and Geology Board.

———. 2011. Monterey County Important Farmland 2010. Map. August 2011. Sacramento, CA: California Department of Conservation, Division of Land Resource Protection.

California Department of Water Resources (DWR). 1981. *Bulletin 74-81 – Water Well Standards: State of California*. December 1981. Sacramento, CA: California Department of Water Resources.

———. 1991. *Bulletin 74-90 (supplement to Bulletin 74-81) – California Well Standards*. June 1991. Sacramento, CA: California Department of Water Resources.

California Geological Survey. 2009. *Tsunami Inundation Map for Emergency Planning, State of California, County of Monterey, Marina Quadrangle.* July 1, 2009. Prepared in coordination with the California Emergency Management Agency and Tsunami Research Center at the University of Southern California.

California Regional Water Quality Control Board, Central Coast Region. 2008. *Waste Discharge Requirements for the Monterey Regional Water Pollution Control Agency Regional Treatment Plant, Order No. R3-2008-0008, NPDES No. CA0048551*. March 20, 2008.

City of Marina. 2000. *City of Marina 2000 General Plan*. Adopted October 31, 2000, Amended through December 2006. Marina, CA: City of Marina.

———. 2006. *Implementation Policies and Procedures for the California Environmental Quality Act*. Adopted May 2, 2006. Marina, CA: City of Marina.

———. 2009. *Zoning Ordinance*. Marina, CA: City of Marina.

———. 1982. *City of Marina Local Coastal Program*. Reformatted to Include Post-Certification Amendments, November 2013. Marina, CA: City of Marina.

———. 2009. *City of Marina Final Housing Element (2008-2014)*. Adopted by City Council September 1, 2009. Certified by HCD December 16, 2009.

City of Marina, Marina Coast Water District, Monterey County Water Resources Agency. 1996. *Annexation Agreement and Groundwater Mitigation Framework for Marina Area Lands*. March 1996. Marina, CA: City of Marina. Marina, CA: Marina Coast Water District. Salinas, CA: Monterey County Water Resources Agency.

ESA-PWA. 2014. *Memorandum: Analysis of Historic and Future Coastal Erosion with Sea Level Rise*. ESA-PWA. March 19, 2014. San Francisco, CA.

Federal Emergency Management Agency (FEMA). 2009. Flood Insurance Rate Map – Monterey County, California and Incorporated Areas. Map. Panel 185 of 2050, Map Number 06053C0185G. April 2, 2009. Oakland, CA: Federal Emergency Management Agency, Region IX.

Geoscience Support Services, Inc. Ground Water Resources Development. 2013. *Monterey Peninsula Water Supply Project, Hydrogeologic Investigation Work Plan.* Prepared for: California American Water and RBF Consulting. December 18, 2013. Claremont, CA.

GeoSoils, Inc. 2014. *Geotechnical Investigation, California American Water Temporary Slant Test Well Project, Marina, Monterey County, California*. April 3, 2014. Prepared for SWCA Environmental Consultants.

Hastings, M.C., A.N. Popper. 2005. *Effects of Sound on Fish*. California Department of Transportation. January 28, 2005. Sacramento, CA: Jones & Stokes.

ICF International. 2010. *Monterey County General Plan, Final Environmental Impact Report.* March 2010. Prepared for: Monterey County Resource Management Agency Planning Department.

Ironside and Associates. 1982. *City of Marina Local Coastal Land Use Plan*. Prepared for the California Coastal Commission and City of Marina. Certified April 20, 1982. Marina, CA: Ironside and Associates.

Layne Christensen Safety and Environmental Health Sciences Department. 2000. *Noise Evaluation, Foremost DR40 Barber Dual Wall Air Rotary Drill Rig*. Layne Christensen. Kansas City, Kansas.

———. 2010. *Draft Noise Evaluation, Rotosonic 550K Drilling Rig*. Layne Christensen. Kansas City, Kansas.

LexisNexis Municipal Codes. 2007. *Marina Municipal Code*. Updated 2007. Charlottesville, VA: LexisNexis Municipal Codes, Matthew Bender & Company, Inc.

LSA Associates, Inc. 1990. *Lapis Vegetation Plan*. April 19, 1990. Prepared for RMC Lonestar, Inc.

Marine Mammal Commission. 2007. *Marine Mammals and Noise, A Sound Approach to Research and Management.* March 2007. A Report to Congress from the Marine Mammal Commission.

Michael Brandman Associates. 2013. *Noise Impact Analysis Report, Sunset Gap Monitoring Wells Project, Orange County, California*. January 25, 2013. Prepared for the Orange County Water District. Fountain Valley, California.

Monterey Bay Unified Air Pollution Control District (MBUAPCD). 2008. *2008 Air Quality Management Plan for the Monterey Bay Region*. Revised August 2008. Monterey, CA: Monterey Bay Unified Air Pollution Control District.

———. 2008. *CEQA Air Quality Guidelines*. Revised February 2008. Monterey, CA: Monterey Bay Unified Air Pollution Control District.

———. 2013. *Triennial Plan Revision 2009 – 2011*. Adopted on April 17, 2013. Monterey, CA: Monterey Bay Unified Air Pollution Control District.

Monterey Bay National Marine Sanctuary (MBNMS). 2014. *Quick Facts: The Sanctuary at a Glance*. Available at: http://montereybay.noaa.gov/intro/mbnms_quickfacts.html. Accessed on April 11, 2014.

———.2008. *Monterey Bay National Marine Sanctuary Final Management Plan.* October 2008. Prepared as part of the Joint Management Plan Review. U.S. Department of Commerce. NOAA. National Ocean Service. Office of National Marine Sanctuaries.

Monterey County. 2010. *2010 Monterey County General Plan.* October 26, 2010. Monterey County, CA: Monterey County.

National Oceanic and Atmospheric Administration (NOAA). 2013. *Draft Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammals.* December 23, 2013. Available at: http://www.nmfs.noaa.gov/pr/acoustics/draft_acoustic_guidance_2013.pdf. Accessed on March 28, 2014.

Point Blue Conservation Science. 2014. *Nesting of the Snowy Plover in the Monterey Bay Area, California in 2013.* January 2014. Point Blue Conservation Science Publication #1976.

RBF Consulting. 2013. *Application Package for the Temporary Slant Test Well Project, Marina, CA*. Prepared on behalf of California American Water. July 2, 2013. Temecula, CA: RBF Consulting.

Richardson, W.J., C.R. Greene, Jr., C.I. Malme, and D.H. Thomson. 1995. *Marine Mammals and Noise*. New York: Academic Press.

RMC Lonestar. 1989. *Reclamation Plan, Lapis Plant, City of Marina, County of Monterey*. August 1989. Revised October 11, 1989.

San Luis Obispo County Air Pollution Control District. 2012. *CEQA Air Quality Handbook, A Guide for Assessing the Air Quality Impacts for Projects Subject to CEQA Review*. April 2012. San Luis Obispo, California.

Sea Engineering, Inc. (SEI). 2014. *Technical Memorandum: Review of Coastal Erosion analysis by ESA PWA (2014) for the California American Water Temporary Slant Test Well Environmental Impact Evaluation*. SEI. April 18, 2014.

State Water Resources Control Board. 2013. *Draft Review of California American Water Company's Monterey Peninsula Water Supply Project*. April 3, 2013. California Environmental Protection Agency, SWRCB.

———.1995. *Cease and Desist Order, In the Matter of the Unauthorized Diversion and Use of Water by the California American Water Company. Order WR 2009-0060*. July 6, 1995. California Environmental Protection Agency, SWRCB.

———.2009. *Order on Four Complaints Filed Against The California American Water Company, Carmel River, Monterey County. Order No. WR 95-10*. October 20, 2009. California Environmental Protection Agency, SWRCB.

SWCA Environmental Consultants. 2014. *Cultural Resources Survey Report for the California American Water Temporary Slant Test Well Project, City of Marina, Monterey County, California*. May 2014. Prepared for the City of Marina and MBNMS.

———. 2014. *Rare and Endangered Species Habitat Assessment for the California American Temporary Slant Test Well Project*. May 2014. Prepared for the City of Marina.

Trussell Technologies, Inc. 2012. *Technical Memorandum, MRWPCA Outfall Capacity*. April 18, 2012. Prepared for California American Water.

U.S. Department of Agriculture (USDA), Soil Conservation Service. April 1978. *Soil Survey of Monterey County, California.* Prepared in cooperation with the U.S. Forest Service and University of California Agricultural Experiment Station.

U.S. Environmental Protection Agency, Office of Wastewater Management. 2014. *NPDES Permit Program Basics, Water Permitting 101*. Available at: http://cfpub.epa.gov/npdes/home.cfm?program_id=45. Accessed on April 13, 2014.

U.S. Geological Survey (USGS). 2007. Geologic Map of the Marina and Salinas Quadrangles (DF-353), Monterey County, California. Map. Available at: http://ngmdb.usgs.gov/Prodesc/proddesc_83294.htm. Accessed October 20, 2013.

USGS, in cooperation with the Monterey County Water Resources Agency. 2002. *Geohydrology of a Deep-Aquifer System Monitoring-Well Site at Marina, Monterey County, California.* Available at: http://pubs.usgs.gov/wri/wri024003/pdf/wrir024003.pdf. Accessed October 20, 2013.

USGS, Eittreim, Stephen L., et al. 1997. *Southern Monterey Bay Continental Shelf Investigations: Former Fort Ord Restricted Zone, Open File Report 97-450*. U.S. Department of the Interior, USGS. Menlo Park, California.

Wadell Engineering Corporation. 2006. *Draft Marina Municipal Airport. Comprehensive Land Use Plan*. Prepared for the City of Marina. April 2006. Burlingame, CA: Waddell Engineering Corporation.

Willis, M.R., M. Broudic, M. Bhurosah, and I. Masters. October 6, 2010. *Noise Associated with Small Scale Drilling Operations*. Third International Conference on Ocean Energy, Bilbao.

Zander Associates. 2013. *Technical Memorandum: Biological Resources Assessment – MPWSP Temporary Slant Test Well Project*. Prepared for RBF Consulting. October 2013. San Rafael, CA: Zander Associates.

APPENDIX A.
AVOIDANCE, MINIMIZATION, AND MITIGATION MEASURES

The following avoidance, minimization, and mitigation measures would be made conditions of MBNMS approval and agreed to by Cal Am and incorporated into the CCC coastal development permit conditions and CCRWQCB NPDES permit prior to issuance of required authorizations for the Proposed Action. The measures would be implemented throughout the duration of the project, as appropriate, to minimize potential effects associated with project development and operation. Compliance with the below measures would be confirmed through regular project monitoring and reporting by a MBNMS-approved biological monitor.

1. Prior to construction, the applicant shall retain a qualified biological monitor(s), approved by MBNMS, to ensure compliance with all measures identified in the project environmental documents, authorizations, and permits. Monitoring shall occur throughout the duration of construction and decommissioning activities, or as directed by relevant regulatory agencies. Monitoring may be reduced during project operation, as determined through consultation with MBNMS, USFWS, and CDFW.

2. A qualified biologist(s) shall conduct preconstruction surveys for special-status species as described below.

    a. Because of the dynamic nature of sand dunes and the tendency for Monterey spineflower to establish in recently-disturbed areas, surveys for Monterey spineflower and buckwheat shall be conducted within the entire project area during the blooming period for the spineflower (April-June) in the year prior to construction to identify and record the most current known locations of these species in the project vicinity. Surveys shall be conducted by a qualified botanist, and shall include collection of Global Positioning System (GPS) data points for use during flagging of sensitive plant species locations and avoidance buffers prior to construction.

    b. A preconstruction survey shall be conducted for special-status species no more than 14 days prior to construction. If project construction takes place during the avian nesting season (February 15th through September 1st), the survey shall encompass all suitable nesting habitat within 500 feet of the project. Should active nests be identified, avoidance buffers shall be established (typically 250 feet for passerines and up to 500 feet for raptors) until a qualified biologist can confirm that nesting activities are complete. Variance from the no disturbance buffers may be implemented when there is compelling biological or ecological reason to do so. Any variance requested by the applicant shall be supported by a qualified biologist and subject to MBNMS, USFWS, and CDFW approval.

c. One to two weeks prior to initiation of construction and decommissioning activities, a qualified biologist, in consultation with Point Blue, shall field evaluate the nature and extent of wintering snowy plover activity in the project area and shall make avoidance recommendations regarding construction activities to minimize disturbance to plovers. The applicant shall comply with all Point Blue and biologist avoidance recommendations.

d. Preconstruction surveys shall be conducted by a qualified biologist(s) for California legless lizard and coast horned lizard prior to disturbance of any suitable habitat. Surveys shall utilize hand search methods in areas of disturbance where these species are expected to be found (i.e., under shrubs, other vegetation, or debris on sandy soils). Any individuals located during the survey shall be safely removed and relocated in suitable habitat outside of the proposed disturbance area.

3. Prior to construction, operational, and decommissioning activities, a qualified biologist shall conduct an environmental awareness training for all construction personnel, which at a minimum shall include: descriptions of the special-status species that have potential to occur in the project area; their habitat requirements and life histories as they relate to the project; the avoidance, minimization, and mitigation measures that will be implemented to avoid impacts to the species and their habitats; the regulatory agencies and regulations that manage their protection; and, consequences that may result from unauthorized impacts or take of special-status species and their habitats. The training shall include distribution of an environmental training brochure, and collection of signatures from all attendees acknowledging their participation in the training. Subsequent trainings shall be provided by the qualified biologist as needed for additional construction or operational workers through the life of the project.

4. Prior to construction, a qualified biologist shall coordinate with construction crews to identify and mark the boundaries of project disturbance, locations of special-status species and suitable habitat, avoidance areas, and access routes. GPS data collected during preconstruction surveys completed in 2012 and 2013, and in 2014 in accordance with measure number 2, above, shall be used to flag the known locations of Monterey spineflower and buckwheat for avoidance during construction. Avoidance buffers shall be established and flagged or fenced as necessary to avoid surface disturbance or vegetation removal. The monitoring biologist shall fit the placement of flags and fencing to minimize impacts to any sensitive resources. At a minimum, the biologist shall direct the placement of highly visible exclusion fencing (snow fence or similar) at the following locations:

a. Around sensitive snowy plover habitat areas that do not require regular access;

b. Areas along the northern edge of the CEMEX access road in the vicinity of the settling ponds; and

c. In between the work area and any identified occurrence of Monterey spineflower or buckwheat within 10 feet of the existing access road or work area.

All delineated areas of temporary fencing shall be shown on grading plans and shall remain in place and functional throughout the duration of construction and decommissioning activities.

5. A qualified biologist(s) shall be present during all project construction and decommissioning activities, and as needed during operational activities, to monitor for special-status species and to limit potential impacts to suitable habitat. The biologist(s) shall monitor construction equipment access and shall have authority to halt work activities, if the potential for impacts to special-status species or habitat is identified, until the issue can be resolved. The qualified biologist(s) shall immediately report any observations of special-status species to the project applicant, MBNMS and any additional relevant regulatory agencies (CDFW, USFWS), as necessary.

6. During the operational phase of the Proposed Action, a qualified biologist shall consult with Point Blue monitors on a weekly basis during the plover nesting season to stay current with nesting activity in the vicinity of the slant test well. If active plover nests are located within 250 feet of the sampling station, access routes, or any other areas to be accessed during project operation, avoidance buffers shall be established to minimize potential disturbance of nesting activity, and the biologist shall coordinate with and accompany Cal Am operational staff as necessary during the nesting season to guide access and activities to avoid impacts to nesting plovers. The biologist shall contact MBNMS and USFWS immediately if a nest is found in areas that could be affected by project operations, as described above. Operations shall be immediately suspended until written authorization to proceed is provided by USFWS.

7. To ensure Point Blue has adequate staff and funding to complete necessary monitoring and coordination throughout development and operation of the slant test well project, Cal Am shall provide any necessary funding to Point Blue in an amount agreed upon by Point Blue and Cal Am. A copy of the funding agreement shall be provided to MBNMS and USFWS.

8. All construction and decommissioning activities shall be conducted between October 1st and February 28th, outside of the blooming period for Monterey spineflower, the active flight season for adult Smith's blue butterflies and active larval stage of the species, and the nesting season for western snowy plover and other avian species protected by the MBTA. Construction activities shall be restricted to the designated and flagged/fenced construction areas and CEMEX access road. No construction equipment, materials, or activity shall occur outside

of the specified areas. This measure shall be included on all construction and grading plan sets.

9. In order to minimize potential for vehicular collision with special-status species, all construction, decommissioning, and operational traffic shall maintain speeds of 10 miles per hour or less on access roads within the CEMEX parcel. All personnel shall conduct a visual inspection for special-status species around and under all vehicles prior to moving them. This measure shall be included on all construction and grading plan sets.

10. Noise blankets shall be installed to provide visual and sound attenuation during all drilling operations to minimize potential disturbance of wintering western snowy plover. This measure shall be included on all construction and grading plan sets.

11. Wire excluders or similar anti-perching devices shall be incorporated into the top of all aboveground structures (e.g., electrical panel) to deter perching by avian predators. This measure shall be included on all construction and grading plan sets.

12. Construction personnel shall be required to keep all food-related trash items in sealed containers and remove them daily to discourage the concentration of potential predators in snowy plover habitat. Following construction, all trash and construction debris shall be removed from work areas and properly disposed of at a certified landfill. All vegetation removed from the construction site shall be taken to a certified landfill to prevent the spread of invasive species. These measures shall be included on all construction and grading plan sets.

13. Prior to issuance of MBNMS authorizations, the applicant shall develop a Restoration Management Plan (Plan) consistent with the requirements of the City of Marina LCP. At a minimum, the Plan shall include a description of the following methods and metrics: areas of habitat to be disturbed; areas of habitat to be restored, which shall at minimum include all areas of disturbance in designated Primary or Secondary Habitat, except for areas actively used by CEMEX for mining purposes; ratios of plants to be replaced based on a minimum replacement of 3:1, or as otherwise directed by regulatory agencies; timing of restoration activities; monitoring of restoration success; and any required reporting to relevant agencies. The Plan shall also include all relevant conditions of approval or requirements related to site restoration from permits or authorizations issued by regulatory agencies for the project. The applicant shall seek input and/or review of the Plan from relevant regulatory agencies prior to finalization, including at a minimum MBNMS, USFWS, CDFW, and the CCC. The Plan shall be implemented 1) during and immediately following construction, and prior to operation of the test well, and 2) during and immediately following decommissioning activities.

14. After construction, all disturbed areas shall be restored and revegetated to preconstruction contours and conditions to the extent feasible, in accordance with

the Restoration Management Plan. Following decommissioning of the test well, all disturbed areas shall be re-contoured and revegetated as determined necessary and in coordination with applicable agencies and representatives of Point Blue to ensure that the optimum ground configuration is obtained for potential nesting plovers and other special-status species that may occur in the area.

15. To ensure that restoration efforts are successful and unanticipated events are expeditiously managed, restored areas shall be monitored following planting and during operation of the test well and for five years following planting and decommissioning of the test well. Success criteria will include plant cover and species composition/diversity, which shall meet or exceed adjacent undisturbed dune habitat on the CEMEX parcel as determined by the biological monitor. Success criteria shall, at a minimum, be consistent with the requirements of the existing Lapis Revegetation Plan prepared for the RMC Lonestar Lapis Sand Plant (25 percent average vegetative cover and species diversity of all species listed in Group A of the Plan present and providing at least 1 percent cover).

16. During construction and decommissioning activities, the biological monitor(s) shall ensure that the spread or introduction of invasive plant species is avoided to the maximum extent possible through the following measures, which shall be included in all construction and grading plan sets:

    a. When practicable, invasive exotic plants in the project area shall be removed and properly disposed of at a certified landfill.

    b. The use of imported soils for fill shall be limited to the extent possible. Soils currently existing on-site shall be used for fill material to the extent feasible. If the use of imported fill material is necessary, the imported material must be obtained from a source that is known to be free of invasive plant species, or the material must consist of purchased clean material.

    c. The Restoration Management Plan shall include an invasive species control program and shall emphasize the use of native species expected to occur in the area.

17. Prior to issuance of MBNMS authorizations, the project applicant shall provide MBNMS with a valid NPDES permit or other evidence of CCRWQCB approval for the proposed slant test well discharge. The NPDES permit or approval shall incorporate all relevant standards of the California Ocean Plan and compliance with the Ocean Plan shall be evidenced prior to discharge into the outfall pipe.

18. Prior to issuance of MBNMS authorizations, the applicant shall submit a grading plan identifying all stockpile and staging areas. Stockpiles and staging areas shall not be placed in areas that have potential to experience significant runoff during the rainy season. All project-related spills of hazardous materials within or adjacent to project sites shall be cleaned up immediately. Spill prevention and

cleanup materials shall be on-site at all times during construction. Cleaning and refueling of equipment and vehicles shall occur only within designated staging areas. The staging areas shall conform to standard Best Management Practices (BMPs) applicable to attaining zero discharge of storm water runoff. No maintenance, cleaning or fueling of equipment shall occur within Primary or Secondary Habitat areas, or within 50 feet of such areas. At a minimum, all equipment and vehicles shall be checked and maintained on a daily basis to ensure proper operation and to avoid potential leaks or spills. The grading plan shall be subject to review and approval by MBNMS.

19. A qualified archaeologist that meets the Secretary of the Interior's professional qualifications standards in archaeology (National Park Service 1983) shall be retained to provide archaeological services for the project. Archaeological services for the project shall at minimum include the following:

    a. Prior to initiation of ground-disturbing activities, an archaeological monitor working under the direction of the qualified archaeologist shall conduct a brief awareness training session for all construction workers and supervisory personnel. The training shall explain the importance of and legal basis for the protection of significant archaeological resources. Each worker should learn the proper procedures to follow in the event that cultural resources or human remains/burials are uncovered during ground-disturbing activities, including those that occur when an archaeological monitor is not present. These procedures include work curtailment or redirection and the immediate contact of the site supervisor and the archaeological monitor. It is recommended that this worker education session include visual images or samples of artifacts that might be found in the project vicinity, and that the session take place on-site immediately prior to the start of ground-disturbing activities.

    b. An archaeological monitor working under the direction of the qualified archaeologist shall monitor all ground disturbance in areas within 100 feet of the historic buildings within the eastern portion of the project area. These include the Superintendent's Residence, Bunkhouse, Garage/Office, Maintenance Shop, and Scale House and Office. The timing and duration of the monitoring may be adjusted during project implementation by the qualified archaeologist, in consultation with MBNMS, whose decision shall be informed by the apparent sensitivity of the sediments in the project area once they are exposed.

    c. The project applicant shall coordinate with representatives from the Ohlone/Coastanoan-Esselen Nation and Amah Mutsun Tribal Band of Mission San Juan Bautista to designate a Native American monitor to be present during ground disturbing activities associated with the project. Documentation of such coordination shall be provided to MBNMS prior to construction activities. The timing and duration of the monitoring may be

adjusted during project implementation by the qualified archaeologist, in consultation with MBNMS, whose decision shall be informed by the apparent sensitivity of the sediments in the project area once they are exposed.

20. In the event that archaeological resources (artifacts or features) are exposed during ground-disturbing activities, construction activities in the immediate vicinity (25 feet) of the discovery shall be halted while the resources are evaluated for significance by the qualified archaeologist. Construction activities could continue in other areas. If the discovery proves to be significant, additional work, such as archaeological data recovery or project redesign, may be warranted and would be discussed in consultation with MBNMS.

21. In the event of inadvertent discovery of human remains, no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. The County Coroner shall be notified of the find immediately. If the human remains are determined to be prehistoric, the coroner will notify the Native American Heritage Commission, which will determine and notify a most likely descendant (MLD). The MLD shall complete the inspection of the site within 48 hours of notification, and may recommend scientific removal and nondestructive analysis of human remains and items associated with Native American burials. The California Health and Safety Code Section 7050.5 process shall be noted on project grading and construction plans and reviewed during the construction worker awareness training session.

22. The project area shall be redesigned to avoid significant adverse effects to historic resources; in particular, direct impacts to the Lapis Siding that is identified as a contributor to the Lapis Sand Mining Plant Historic District shall be avoided. Because the Siding extends through the eastern portion of the construction footprint, the construction plans shall be redesigned to locate all project components and construction activities in adjacent areas that do not contain structures associated with the Lapis Sand Mining Plant historic district. Avoidance of impacts to historic district contributors in close proximity to construction activities shall be accomplished by installing flagging or safety fencing around, or covering with plywood, any adjacent buildings or structures that are within 5 feet of mechanized equipment.

23. The project shall be designed to meet or exceed all applicable requirements of the California Building Code. Design and construction of the project shall meet or exceed all applicable conclusions and recommendations in the Geotechnical Investigation for the California American Water Temporary Slant Test Well Project, Marina, Monterey County, California, dated April 3, 2014 (GeoSoils 2014).

24. Prior to construction, the applicant shall prepare a Hazardous Material Spill Prevention, Control and Countermeasure Plan to minimize the potential for, and

effects of, spills of hazardous or toxic substances or the inadvertent discovery of buried hazardous materials during construction or decommissioning of the project. The plan shall be submitted for review and approval by MBNMS, and shall include, at minimum, the following:

a. A description of storage procedures and construction and decommissioning site maintenance and upkeep practices;

b. Identification of a person or persons responsible for monitoring implementation of the plan and spill response;

c. Identification of BMPs to be implemented to ensure minimal impacts to the environment occur, including but not limited to the use of containment devices for hazardous materials, training of construction staff regarding safety practices to reduce the chance for spills or accidents, and use of non-toxic substances where feasible;

d. Positive location of any past or current septic systems on the CEMEX parcel in the vicinity of construction activities, and a plan for avoiding impacts to any known or unknown buried refuse disposal locations;

e. A description of proper procedures for containing, diverting, isolating, and cleaning up spills, hazardous substances and/or soils, in a manner that minimizes impacts on sensitive biological resources;

f. A description of the actions required if a spill or inadvertent discovery occurs, including which authorities to contact and proper clean-up procedures; and

g. A requirement that all construction personnel participate in an awareness training program conducted by qualified personnel approved by MBNMS. The training must include a description of the Hazardous Materials Spill Prevention, Control and Countermeasure Plan, the plan's requirements for spill prevention, information regarding the importance of preventing spills, the appropriate measures to take should a spill or inadvertent discovery occur, and identification of the location of all clean-up materials and equipment.

25. Prior to issuance of MBNMS authorizations, the applicant shall submit an erosion control plan for approval by MBNMS, which shall identify standard BMPs to be implemented to address both temporary and permanent measures to control erosion and reduce sedimentation. The plan shall be prepared by an appropriately certified professional 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-November of the year that construction begins. Site monitoring by the applicant's erosion-control specialist shall be undertaken and a follow-up report shall be prepared that documents the progress and/or completion

of required erosion-control measures both during and after construction and decommissioning activities. No synthetic plastic mesh products shall be used in any erosion control materials. All plans shall show that sedimentation and erosion control measures are installed prior to any other ground disturbing work.

26. Prior to commencement of construction activities and throughout project operation, the applicant shall consult with the property owner (CEMEX) regarding construction/decommissioning operations and schedule. The project applicant shall provide advance notice of construction activities and construction shall be scheduled during non-peak hours to avoid disruption of existing mining activities to the extent feasible. If construction activities within the CEMEX access road would conflict with CEMEX operations, such construction shall be conducted during non-operational mining periods (i.e., nighttime or weekends). Construction activities shall be conducted to avoid any need for the grading or use of any new access roads for use by CEMEX.

27. The slant test well and wellhead vault shall be sited to avoid areas identified in the coastal erosion memorandum prepared by ESA-PWA (March 2014) as subject to coastal erosion or storm surge inundation during the duration of the project. The slant test well location shall avoid all identified sensitive plant species and shall be limited to the graded area of the CEMEX access road to the maximum extent feasible. The slant test well location shall be situated entirely south of the northern boundary of the CEMEX access road, and shall not encroach north of the graded roadway in closer proximity to the CEMEX settling ponds or Canal Flume.

28. At project decommissioning, the slant test well and all related infrastructure shall be removed to an ultimate depth of no less than 40 feet below existing ground surface to eliminate the possibility for future re-surfacing and exposure of submerged well casing or related project components as a result of coastal erosion and shoreline retreat. Removal of the well would take place upon completion of the test pumping and/or in segments over time as mutually agreed upon by MBNMS, MRWPCA, Cal Am, the California State Lands Commission, and other identified regulatory agencies. If removal to the total required depth of 40 feet below ground surface is not feasible immediately upon completion of the test pumping due to potential risk to the MRWPCA outfall, the applicant shall provide evidence of a bond with the City to ensure future removal measures would be appropriately supported and timed to prevent any future resurfacing of the well casing or other project components.

29. The applicant shall prepare a monitoring plan for MBNMS review and approval. The plan shall include, at minimum, the following. The plan shall determine, through preliminary monitoring and sampling prior to pumping activities, a baseline condition of groundwater levels and quality, including the reasonable range of natural fluctuations, in the Dune Sand, 180-FTE, and 400-Foot Aquifers. The effects of pumping activities on groundwater levels and quality in the Dune Sand, 180-FTE, and 400-Foot Aquifers shall be monitored throughout the

duration of pumping activities. Monitoring activities shall be conducted through regular assessment of the proposed on-site monitoring wells, as well as through additional coordination with surrounding well owners, including CEMEX and adjacent agricultural water users, to identify changes in off-site water levels to the maximum extent feasible.

A drawdown of 1 foot above natural fluctuations on groundwater levels shall be considered a significant adverse effect on water supply. If pumping activities reflect a drawdown of 1 foot or greater on any adjacent well, compensatory mitigation shall be required. Feasible mitigation shall include, but not be limited to, consultation with the affected water user, monetary compensation (i.e., for increased pumping costs or for upgraded wells), and provision of replacement water from alternative sources. If compensation or other remediation is found to be unfeasible, pumping activities shall be adjusted so that no more than 1 foot of drawdown on adjacent water wells would result.

The plan shall designate a person or persons to monitor implementation of the monitoring plan and order implementation of mitigation if necessary. The name and telephone number of the person(s) shall be listed in the monitoring plan and provided to MBNMS prior to the start of construction. The plan shall include a requirement for regular reporting (no less than annually) on the results of the monitoring activities, and the reports shall be submitted to MBNMS and other relevant regulatory agencies.

30. Cal Am shall enter into a negotiated agreement or memorandum of understanding with the Monterey Regional Water Pollution Control Agency regarding connection and use of the ocean outfall. At minimum, the agreement shall include MRWPCA engineering design review, USA North 811 positive location of the outfall, construction trestle, and any related infrastructure, CCRWQCB approval or permits for discharge of seawater through the MRWPCA outfall, and access to flow meter data and alarm system triggers and signals.