

4.3 HYDROLOGY, DRAINAGE, AND STORMWATER RUNOFF

Information in this section was compiled from the *Geotechnical/Hydrogeologic Report for Huntington Beach Seawater Desalination Plant* by Poseidon Resources Corporation (2007a); the *Water Quality Control Plan for the Santa Ana River Basin (8)* by the Santa Ana Regional Water Quality Control Board (2008); the Federal Emergency Management Agency Flood Insurance Rate Map, Map Number 06059C0263J (revised December 3, 2009); the *County of Orange General Plan* (September 13, 2005), *City of Irvine General Plan* (June 13, 2006); the U.S. Geological Survey (USGS) National Map Viewer (USGS 2005); the *Updated Preliminary Review of Geotechnical Constraints and Geologic Hazards, Poseidon Resources Seawater Desalination Project, Huntington Beach, California* (Appendix C to the SEIR); and the *Drainage Area Management Plan* prepared by the County of Orange, cities of Orange County, and the Orange County Flood Control Division (2003).

This section addresses additional changes to federal, state, and local regulations that have occurred since the initial analysis was completed for the 2005 Recirculated Environmental Impact Report (REIR) and incorporates more detailed descriptions of potential impacts resulting from urban runoff and alteration to existing runoff patterns. Hydrological impacts are the same for the stand-alone scenario as they are for the co-located scenario, and thus the following analysis is applicable for both scenarios.

EXISTING CONDITIONS

REGIONAL DRAINAGE CONDITIONS

The proposed project site is situated within the Santa Ana River Basin, which has a total drainage area of approximately 1,700 square miles. In general terms, the Santa Ana River Basin is a group of connected inland basins and open coastal basins drained by surface streams flowing generally southwestward to the Pacific Ocean (SARWQCB 2008). The Santa Ana River empties into the Pacific Ocean approximately 1.5 miles downcoast (southeast) of the project site. The flow of the Santa Ana River is intermittent and only substantial during storms. Long-term annual precipitation near the coast averages 18.1 inches, of which 90% occurs between November and April. The Pacific Ocean lies approximately 2,000 feet south of the project site. The coast near the proposed project site is fronted by a broad, sandy beach and is backed by lowlands.

PROPOSED DESALINATION FACILITY SITE

On-Site Drainage

The proposed desalination facility and associated product water storage tank are completely surrounded by containment berms of approximately 10 to 15 feet in height as a precaution against accidental fuel oil spillage. These berms prevent on-site stormwater from leaving project site boundaries. Stormwater collects within the storage tank area and evaporates. Wetland hydrology is not present on the site (Glenn Lukos Associates 2010). The Tank 1 containment area has been used by the Huntington Beach Generating Station (HBGS) as stormwater storage. Runoff from HBGS was actively pumped into the area around Tank 1 during and immediately following storm events, but this stormwater operation has ceased.

Surrounding Drainage Conditions

The general topography of the project site vicinity slopes gently to the southwest, toward the Pacific Ocean. Runoff upstream and downstream of the subject site generally follows this slope, emptying into one of the three primary drainage facilities in the region, which consist of the Huntington Beach Channel, the Talbert Channel, and the Santa Ana River. All three drainage facilities are owned and operated by the Orange County Flood Control District (OCFCD). All surface runoff within the vicinity of the project site eventually flows into the Pacific Ocean. The Pacific Coast Highway/Newland Street storm drain collects urban runoff from an area west and north of HBGS, including the adjacent RV/trailer park. The closest storm channel near the project site is the OCFCD Huntington Beach Channel (DO1), located adjacent to the site to the north and east. The Huntington Beach Channel confluences with the Talbert Channel (DO2) downstream and eventually flows into the Pacific Ocean. The OCFCD maintains the Huntington Beach Channel to provide 100-year regional flood protection. Work performed on the channel by OCFCD would be operations and maintenance related (Jones, pers. comm. 2009).

The proposed seawater desalination facility is in the vicinity of four wetlands that are in different stages of restoration: Newland Marsh, Magnolia Marsh, Brookhurst Marsh, and Talbert Marsh. The marshes (except Newland Marsh) are managed by the Huntington Beach Wetlands Conservancy and together they comprise approximately 135 acres of wetlands habitat. The approximately 40-acre Magnolia Marsh is located east of the HBGS facility, along Pacific Coast Highway between the power plant site and Magnolia Street. As of February 2010, the OCFCD, in coordination with the Huntington Beach Wetlands Conservancy, is removing a portion of the Huntington Beach Channel levee to restore the Magnolia Marsh (Jones, pers. comm. 2009). Just east of Magnolia Marsh, located along Pacific Coast Highway between Magnolia Street and Brookhurst Street, is the approximately 70-acre Brookhurst Marsh. Further east of the Brookhurst Marsh is the 25-acre Talbert Marsh. The 65-acre Newland Marsh is located along Beach Boulevard and Pacific Coast Highway and extends behind a mobile home park to the east to Newland Street and is owned by the California Department of Transportation. This marsh is currently not being restored and remains degraded (Huntington Beach Wetlands Conservancy 2007).

Water Quality (Groundwater)

The proposed desalination facility site is approximately 400 yards north of the Pacific Ocean. The Huntington Beach Channel, located immediately north and east of the site, has surface water of approximately 6 to 10 feet below the subject site. The average depth to groundwater is between 5 and 9 feet below ground surface (bgs) at the subject site. The groundwater beneath the site is predominately saltwater since the site is situated to the south of the saltwater intrusion layer. Tidal influence appears to have some effect on the depth of groundwater level at the desalination facility site (Poseidon Resources Corporation 2007a).

Water Quality (Surface Water)

As mentioned previously, stormwater at the existing storage tank area is allowed to evaporate or percolate into the ground. No beneficial uses for surface water exist on site. Existing site runoff for the project vicinity contains moderate amounts of pollutants typical of urban areas, including oil and grease from automobiles, as well as incidental fertilizer and pesticides from routine maintenance of existing vegetation.

Tsunamis and/or Seiche Waves

Tsunamis are long-period sea waves seismically generated by seafloor displacements. Previous evaluations put the potential risk of tsunami for the City of Huntington Beach as very low. The proposed project site is located within the moderate tsunami run-up area (City of Huntington Beach, General Plan, Environmental Hazards Element, 1996). Heights of the 100- and 500-year tsunamis along the coastal area of Huntington Beach are 5 feet and 7.5 feet, respectively (Margorien 2010); therefore, a potential hazard is present. The proposed desalination facility site is at approximately 5 feet above mean sea level. Of more concern are seiche waves caused by tsunamis captured and reflected within the enclosed area of an inner harbor, such as Huntington Harbour. Seiche area damage is most severe in the same area as tsunami hazards. However, the project site is not in the immediate vicinity of a harbor. There is, however, a potential for seiches to impact the subject site because it is situated adjacent to the Huntington Beach Channel.

OFF-SITE PIPELINE ALIGNMENT AND UNDERGROUND PUMP STATIONS

Proposed Pipeline Alignment

The proposed off-site product water delivery pipelines being considered would be adjacent to a wide variety of land uses. The proposed pipeline routes would be located primarily within existing roads or easements that are generally flat and would be located entirely underground (refer to Figure 3-3a and 3-3b). The areas are generally drained by curb/gutter storm drain systems (for portions of the alignment within streets), on-site stormwater drainage systems (for portions within easements and other areas), and infiltration.

OC-44 Booster Pump Station

The proposed OC-44 pump station site is unpaved and slopes gently to the northeast (although in general, the area slopes to the north). The site is situated at an approximate elevation of 250 feet above mean sea level and is located approximately 0.5-mile north of the San Joaquin Reservoir. No storm drain system exists on site, and the site is drained via surface flow to the northeast. Because the bypass station site is situated approximately 3.5 miles from the Pacific Ocean, inundation by tsunamis and/or seiche waves is not expected to occur.

Coastal Junction Booster Pump Station

The Coastal Junction pump station site is proposed for location in a church parking lot within the City of Irvine. The site exists as a flat, paved area, at an approximate elevation of 50 feet above mean sea level. The site vicinity generally slopes gently to the west. The site vicinity can be characterized as developed/urbanized. The San Diego Creek, a major drainage facility for the region, is situated adjacent to the church parking lot to the north. The existing site is served by an on-site stormwater drainage system. Because the site is located over 3 miles from the ocean, inundation by tsunamis and/or seiche waves is not expected to occur.

OC-35 Pump Station

Proposed improvements to the OC-35 pump station consist of replacement of a pump and do not involve further physical modifications to the pump station that would be affected by hydrogeologic conditions. Therefore, no further analysis is provided for this project feature.

Magnolia and Brookhurst Pump Stations

The proposed Magnolia pump station site is unpaved and includes a disturbed right of way (ROW). The site is flat and includes permeable soils. Storm drains are present along Brookhurst Street and Bixby Avenue located adjacent to the proposed site. Because the pump station site is situated approximately 8.2 miles from the Pacific Ocean, inundation by tsunamis and/or seiche waves is not expected to occur.

The proposed Brookhurst pump station site is unpaved and includes a disturbed ROW. The site is situated to the east of a concrete drainage channel that conveys flows to the southwest. Because the pump station site is situated approximately 7.6 miles from the Pacific Ocean, inundation by tsunamis and/or seiche waves is not expected to occur.

Bristol Pump Station

The proposed Bristol pump station site is unpaved and is developed in nature with recreational uses consisting of ornamental landscaping within Carl Thorton Park. The site is situated to the west of a drainage channel, and storm drains exist along West Segerstrom Avenue. Because the pump station site is situated approximately 6.7 miles from the Pacific Ocean, inundation by tsunamis and/or seiche waves is not expected to occur.

OC-44 Bypass Station

The proposed OC-44 bypass station site is located in an area containing ornamental landscaping associated with the Santa Ana Country Club. The site is situated immediately adjacent to a concrete drainage channel to the northeast. A storm drain system exists adjacent to the site along Santa Ana Avenue that conveys flows to the concrete drainage channel located to the northeast. Because the bypass station site is situated approximately 4.6 miles from the Pacific Ocean, inundation by tsunamis and/or seiche waves is not expected to occur.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The proposed project must satisfy the requirements of several federal and state regulatory agencies, including the following:

- The Orange County Fourth-Term National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit (administered by the Santa Ana Regional Water Quality Control Board (SARWQCB))
- California's Nonpoint Source (NPS) Pollution Control Program (administered by the State Water Resources Control Board (SWRCB))
- The NPDES General Permit for Stormwater Discharges Associated with Construction Activity (administered by the SWRCB and discussed further in Section 4.9, Construction-Related Impacts)
- The project (specifically the co-located operating condition of the project) maintains an approved NPDES Order No. R8-2006-0034 (NPDES CA8000403), which was issued by

the SARWQCB¹ on August 25, 2006, and subsequently upheld by the SWRCB. Order No. R8-2006-0034 includes discharge prohibitions, effluent limitations and discharge specifications, and receiving water limitations (see Section 4.10, Ocean Water Quality and Marine Biological Resources).

FEDERAL PROGRAMS

The Environmental Protection Agency (EPA) is the primary federal agency responsible for management of water quality in the United States. The Clean Water Act (CWA) is the federal law that governs water quality control activities initiated by the EPA and others. Section 303 of the CWA requires the adoption of water quality standards for all surface water in the United States. Under Section 303(d), states are required to develop lists of water bodies that do not meet water quality objectives after required levels of treatment by point-source dischargers. Total Maximum Daily Loads (TMDLs) for all pollutants for which these water bodies are listed must be developed to bring them into compliance with water quality objectives (33 U.S.C. 1251 et seq.).

In 1972, provisions of the CWA were amended so that discharge of pollutants to waters of the United States from any point source is effectively prohibited unless the discharge is in compliance with an NPDES permit. The 1987 amendments to the CWA added Section 402(p), which established a framework for regulating municipal, industrial, and construction stormwater discharges under the NPDES program. On November 16, 1990, EPA published final regulations that established application requirements for stormwater permits for municipal separate storm sewer systems (MS4s) serving a population of over 100,000 (Phase I communities) and certain industrial facilities, including construction sites greater than 5 acres. On December 8, 1999, EPA published the final regulations for communities under 100,000 (Phase II MS4s) and operators of construction sites between 1 and 5 acres (33 U.S.C. 1251 et seq.). The most recent Phase II Small Municipal Separate Storm Sewer System (MS4) General Permit 5-year term expired on May 1, 2008 (issued in 2003). Pursuant to the General Permit, §H.21, Continuation of Expired Permit, the General Permit remains in effect until a new General Permit is issued or the State Water Board rescinds the General Permit (SWRCB 2009a).

The new NPDES General Permit for Storm Water Associated with Construction Activities issued by the California SWRCB Order No. 2009-0009-DWQ (NPDES No. CAS000002) was adopted on September 2, 2009, and shall become effective on July 1, 2010, to replace Order 99-08-DWQ. This new permit requires that construction and demolition sites meet more stringent, measurable standards for discharge management, as opposed to the existing permit, which requires only that sites implement best management practices (BMPs) to the maximum extent practicable (no quantitative or measurable standards are required under the existing permit). New requirements include a risk-based permitting approach, Numeric Action Levels and Numeric Effluent Limitations, postconstruction standards for discharges, increased BMP requirements, as well as increased monitoring and reporting requirements (SWRCB 2009a).

STATE PROGRAMS

The Porter-Cologne Water Quality Control Act (California Water Code 13000, et seq.) is the principal legislation for controlling stormwater pollutants in California. The act requires development

¹ Order No. R8-2006-0034 (NPDES CA8000403), Waste Discharge Requirements for the Poseidon Resources LLC Seawater Desalination Facility Discharge to the Pacific Ocean. August 25, 2006.

of basin plans for drainage basins within California. Each plan serves as a blueprint for protecting water quality within the various watersheds. These basin plans are used in turn to identify more specific controls for discharges (e.g., wastewater treatment plant effluent, urban runoff, and agriculture drainage). Under the Porter-Cologne Act, specific controls are implemented through permits called Waste Discharge Requirements issued by the nine Regional Water Quality Control Boards (RWQCBs). For discharges to surface waters, the Waste Discharge Requirements also serve as NPDES permits. The Porter-Cologne Act was amended in 2009 to include both Article 3, §13148: Self-generating Water Softener Salinity Input Controls in Specified Hydrologic Regions, and Chapter 27, §16100: California Watershed Improvement Act of 2009. The Watershed Improvement Act includes watershed improvement plan development and requirements. These amendments took effect January 1, 2010.

NPS pollution, also known as polluted runoff, is the leading cause of water quality impairments in California. Section 319 of the CWA requires that each state prepare and submit a report that “identifies those navigable waters within the State which, without additional action to control nonpoint sources of pollution, cannot reasonably be expected to attain or maintain applicable water quality standards” (33 U.S.C. 1251–1387).

To comply with this directive, the SWRCB adopted California’s NPS Control Program (NPS Program) in 1988. The NPS Program was updated in January 2000 to the plan for California’s Nonpoint Source Pollution Control Program (Program Plan). The chief way in which the plan fulfills the requirement of CWA Section 319 is through the implementation of management measures. Management measures serve as general goals for the control and prevention of NPS pollution. The most recent Nonpoint Source Annual Progress Report for the Federal Clean Water Act Section 319 Program was conducted for the 2007–2008 year (SWRCB 2009b).

The project site is included within the Water Quality Control Plan for the Santa Ana River Basin (also known as the Santa Ana River Basin Plan, SARWQCB 2008). This basin plan identifies specific controls for discharges as well as implementation standards to achieve such controls. The proposed project would be subject to all applicable rules and regulations contained within the Water Quality Control Plan for the Santa Ana River Basin.

LOCAL PROGRAMS

Since 1990, the City of Huntington Beach (City) has cooperated with other Orange County cities (the “permittees”) in complying with the NPDES permits issued by the SARWQCB. The result of this cooperation has been the development of numerous common stormwater programs that have been integrated in the area-wide Drainage Area Management Plan (DAMP) (County of Orange, Cities of Orange County, and OCFCD 2003).

As a result of the NPDES permits issued in early 2002 (third-term permits), the DAMP underwent significant changes and restructuring as part of the formation of the 2003 DAMP. During the fourth-term permit application process, a proposed 2007 DAMP was submitted along with the Report of Waste Discharge; however, the proposed 2007 DAMP was never adopted. As such, the 2003 DAMP remains the active guiding document for drainage and discharge management in Orange County (Sharp, pers. comm. 2010). As part of the fourth-term permit, the draft 2007 DAMP is the guiding document until it is revised. The 2003 DAMP contains model program guidance that was developed through a collaborative effort among all permittees, as well as interested agencies, organizations, and the public. The 2003 DAMP requires that each permittee, including the City,

prepare a Local Implementation Plan (LIP) as an appendix to the 2003 DAMP. The City's LIP describes the activities that the City has previously undertaken and is currently undertaking to meet the requirements of the fourth-term permits and to make meaningful improvements in urban water quality. The LIP will be revised with the adoption of the fourth-term permit. The LIP is intended to serve as the basis for City compliance during the 5-year period of the fourth-term permit.

The 2003 DAMP requires the implementation of site design, source control, and treatment control BMPs. The enforcement mechanisms for the DAMP are the Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4) Draining the Watersheds of Orange County, the Incorporated Cities of Orange County, and the OCFCD within the Santa Ana Region. The permit is also generally known as the SARWQCB Municipal NPDES Permit No. CAS618030.

IMPACTS

SIGNIFICANCE CRITERIA

Under Appendix G of the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.), a project may be considered to have a significant environmental effect in regard to hydrology/water quality if it:

- Violates any water quality standards or waste discharge requirements
- Substantially depletes groundwater supplies or interferes substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)
- Substantially alters the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river in a manner that would result in substantial erosion or siltation on or off site
- Substantially alters the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increases the rate or amount of surface runoff in a manner that would result in flooding on or off site
- Creates or contributes runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provides substantial additional sources of polluted runoff
- Otherwise substantially degrades water quality
- Places housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map
- Places within a 100-year flood hazard area structures, which would impede or redirect flood flows

- Exposes people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam
- Contributes to inundation by seiche, tsunami, or mudflow
- Potentially impacts stormwater runoff from postconstruction activities
- Results in a potential for discharge of stormwater pollutants from areas of material storage, vehicle or equipment fueling, vehicle or equipment maintenance (including washing), waste-handling, hazardous materials handling or storage, delivery areas, loading docks or other outdoor work areas
- Results in the potential for discharge of stormwater to affect the beneficial uses of the receiving waters
- Creates or contributes significant increases in the flow velocity or volume of stormwater runoff to cause environmental harm
- Creates or contributes significant increases in erosion of the project site or surrounding areas

Impacts in regard to long-term hydrology, drainage, and stormwater quality are discussed subsequently. As the proposed off-site pipeline alignment and underground pump stations would be subsurface, there are no anticipated long-term impacts in regard to hydrology, drainage, and/or water quality. A discussion of short-term, construction-related impacts in regard to hydrology and water quality is included in Section 4.9, Construction-Related Impacts.

LONG-TERM WATER QUALITY IMPACTS

Water Quality Degradation or Violation of Water Quality Standards/Waste Discharge Requirements

Fertilizers and Pesticides

The proposed desalination project would incorporate both native and nonnative landscaping on site. Nonnative vegetation may require periodic fertilization and pest control. The use of fertilizers and pesticides would comply with City standards and Integrated Pest Management Policy and Guidelines Implementation, as well as the guidelines set forth in the Orange County Management Guidelines for such activities. Based on the size of the landscaped areas, the small amounts of fertilizers and pesticides needed, and the fact that the site landscape would be maintained per local and County of Orange standards, it is unlikely that use of these chemicals would be of environmental concern to the groundwater, adjacent ocean waters, or surrounding uses. The long-term use of fertilizers and pesticides is not anticipated to degrade water quality or result in a violation of water quality standards or waste discharge requirements; therefore, impacts would be less than significant. However, a Water Quality Management Plan (WQMP) would be prepared for the proposed project, which would identify applicable BMPs and control measures as identified within the countywide NPDES DAMP.

Urban Runoff

Stormwater shall be treated prior to off-site discharge to minimize impacts from urban pollutants. One of two sedimentation methods would be used for treatment:

- **Waste Filter Backwash Clarifiers:** The proposed desalination project facility would use clarifiers for the purpose of settling the waste stream generated during the backwash of the pretreatment filters. During rainy events, stormwater would be combined with the waste-filter backwash water and settled in the filter backwash clarifiers. This clarified water would then be combined with the desalination facility's concentrated seawater discharge and sent to the Pacific Ocean via the HBGS outfall. The waste-filter backwash clarifiers would be oversized to accommodate the treatment of stormwater.
- **Sedimentation in Separate Clarifiers:** As an alternative to combining on-site stormwater with the waste-filter backwash, stormwater directed to on-site storm drains could be treated in separate sedimentation clarifiers for stormwater treatment only. Subsequent to clarification, this water would be discharged via the HBGS outfall with the desalination facility's concentrated seawater discharge and HBGS cooling water.

The most viable stormwater treatment alternative would be selected during the design phase of the project, in close coordination with the City of Huntington Beach, RWQCB, and HBGS staff. The stormwater facilities would be designed to comply with all applicable requirements of the City of Huntington Beach and the RWQCB.

In addition, stormwater runoff would not affect adjacent sensitive land uses. Although the project site is situated near a wetland area (southeast of the site), the subject site would retain its exterior berms, not allowing stormwater to leave the project site, and would be graded so that all on-site stormwater would flow toward an on-site local stormwater drainage system. The on-site local stormwater drainage system that would be implemented as part of the proposed project would not have surface runoff discharge onto Pacific Coast Highway. The existing containment berms along the eastern, western, and southern boundaries of the subject site would remain, providing additional containment of any stormwater to the project site. The proposed project would also incorporate applicable BMPs to contain stormwater runoff, which may contain urban pollutants, such as petroleum by-products, trash, grease, pathogens, and pollutants that may occur in association with proposed desalination project operation. The project would be in compliance with all standards as administered by the RWRCB and County of Orange. Based on the project design features and required measures to avoid pollutant runoff, urban runoff resulting from development of the project would not substantially degrade water quality or result in a violation of water quality standards or waste-discharge requirements; therefore, impacts would be less than significant.

Water Quality Impacts to Nearby Coastal Wetlands from On-Site Spillage

The existing containment berm along the eastern border of the project site (to be left in place) would prevent direct spillage of product or by-product water onto the portion of wetlands situated to the east. The Huntington Beach Channel separates the proposed facility site from Newland Marsh, located northwest of the site. In the event of an accidental spill associated with proposed project operation of either product or by-product water, no significant effects would occur on the adjacent wetland/open space areas because water would not pass the physical separations. Soils of wetlands are already flooded by freshwater during the rainy season, forming standing pools.

Product water spills would do the same. Soils are already hypersaline, so spills of by-product water would contribute little to the salinity of soils. Spills into the local Huntington Beach Channel are also likely to have minimal impact. The channel already has multiple year-round freshwater inputs, so product water spills would have a less-than-significant impact. By-product water spills would be diluted by these freshwater inputs. However, if the channel is mostly oceanic at the time of a spill, salinities may be overly elevated. Species likely to be found in the channel, such as topsmelt, can tolerate wide variations in salinity. In addition, the applicant has prepared a Spill Prevention and Response Plan (SPRP) for the Huntington Beach Seawater Desalination Facility in January of 2007. The purpose of the SPRP is to eliminate or minimize the potential for an accidental discharge of chemicals used at the desalination facility. Once operational, the desalination facility will take steps necessary to minimize the potential for chemical releases at the site, including complying with all applicable laws and regulations, and fully implementing the procedures in the SPRP (Poseidon Resources Corporation 2007c). Refer to Section 4.8, Hazards and Hazardous Materials, for a detailed discussion of measures to minimize the potential for chemical releases at the project site. The project would not result in off-site runoff that would substantially degrade water quality, affect the beneficial uses of receiving waters, or result in a violation of water quality standards or waste discharge requirements; therefore, impacts would be less than significant.

Although no significant impacts related to water quality are anticipated, the project would be subject to compliance with water quality measures imposed by the City of Huntington Beach, and a WQMP would be required to document compliance measures.

Depletion of Groundwater Supplies/Interference with Groundwater Recharge

The project would introduce additional impervious surfaces on the desalination facility site, resulting in an increase in runoff that would be conveyed to a storm drain system. However, due to the relatively small size of the project site (13 acres), changes in runoff patterns would not substantially interfere with groundwater recharge. In addition, due to the location of the project in proximity of the Pacific Ocean and the related effects of seawater intrusion, the project site does not contribute substantially to groundwater resources within the area. Therefore, impacts would be less than significant.

STORMWATER DRAINAGE CAPACITY

The proposed grading activities and development of the proposed project site are anticipated to increase the amount of impervious area, thereby increasing surface runoff. In addition, existing interior containment berms (which contain stormwater on site) would be removed, and the exterior berms that border the site would remain in place. An on-site local stormwater drainage system, designed pursuant to city requirements, would be implemented as part of the desalination facility site and product water storage tank. Stormwater flows would first be directed to catch basins by gravity and would then be directed to a stormwater pump via gravity lines. Stormwater would be tested for pollutants, and if necessary, treated using one of two sedimentation methods. As noted above, stormwater would be combined with the waste-filter backwash water and settled in the filter backwash clarifiers. The water would then be pumped to the 72-inch, by-product-concentrated seawater discharge that ultimately connects to the AES-HBGS outfall line. Aboveground product water-tank implementation would include an on-site stormwater system that would direct stormwater to the desalination facility's stormwater system. In addition, containment berms surrounding the western and northern side of the west tank site would be left in place, further containing stormwater on site. As alternative options, the desalination facility's on-site stormwater system could discharge

stormwater to the HBGS on-site stormwater system or the City of Huntington Beach's local stormwater system, both of which ultimately convey stormwater to the Pacific Ocean via the HBGS outfall. No stormwater would be discharged into the adjacent Huntington Beach Channel. A WQMP would be completed for the proposed project as required by the RWQCB. Therefore, the project would not create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems. It would not contribute significant increases in the flow velocity or volume of stormwater runoff to cause environmental harm or provide substantial additional sources of polluted runoff. Therefore, impacts would be less than significant. Although no significant impacts have been identified, a mitigation measure has been added to document standard requirements of the City of Huntington Beach that ensure adequate sizing and design of the stormwater drainage system, including water quality features (Mitigation Measure HWQ-1).

FLOOD, SEICHE, TSUNAMI, OR MUDFLOW HAZARDS

The proposed project site currently has a Federal Emergency Management Agency (FEMA) flood-zone designation of "X," with protection from the 1% annual chance (100-year) or greater flood hazard by a levee system. Areas of higher flood risk surround the site in the Huntington Beach Channel and adjacent wetlands. The Huntington Beach Channel and the surrounding wetlands are designed to handle excess runoff and high water levels during storm events. The project would not place facilities within a 100-year flood hazard area that would expose people or structures to substantial risk, nor would it place structures that would substantially impede or redirect flood flows. Impacts would be less than significant.

The project site and surrounding area is generally level and not prone to mudflow. Impacts would be less than significant.

Tsunamis are long-period sea waves seismically generated by seafloor displacements. The proposed project site is located within the moderate run-up tsunami area (City of Huntington Beach, General Plan, Environmental Hazards Element, 1996). Heights of the 100- and 500-year tsunamis along the coastal area of Huntington Beach are 5 feet and 7.5 feet, respectively (Margorien 2010). The proposed desalination facility site is at approximately 5 feet above mean sea level. Previous evaluations put the risk of tsunami for the City of Huntington Beach at very low (Poseidon Resources Corporation 2007a). Although no significant impacts have been identified, a mitigation measure has been added that ensures planning measures have been prepared to minimize or reduce risks to property and human safety from tsunami during operation.

Also of concern are seiche waves caused by tsunamis captured and reflected within the enclosed area of an inner harbor, such as Huntington Harbour. Seiche area damage is most severe in the same area as tsunami hazards. However, the project site is not in the immediate vicinity of a harbor. There is a potential for seiches to impact the subject site because it is situated adjacent to the Huntington Beach Channel. The magnitude of seiche waves impacting the project site are anticipated to be lower than those of a tsunami, given the frictional energy dissipation of water running along the bottom and walls of the Huntington Beach Channel. In addition, given that the existing 10- to 15-foot-high containment berm along the eastern boundary of the project site would remain (running along the Huntington Beach Channel), the likelihood of seiches impacting the site is considered low (Poseidon Resources Corporation 2007a). Impacts would be less than significant.

IMPACTS INVOLVING THE POTENTIAL FOR INUNDATION BY SEICHE, TSUNAMI, OR MUDFLOW WOULD BE LESS THAN SIGNIFICANT

Alteration to the Existing Drainage Pattern of the Site or Area that could Cause Erosion or Flooding

As previously noted, the project would result in increases in impervious surfaces and modifications to runoff patterns on the site. However, the alterations to drainage would not permanently expose substantial amounts of ground surfaces, would not create slopes or other conditions that would result in long-term erosion of the project site or surrounding areas, nor would it create siltation impacts that would cause substantial flooding risks. Therefore, impacts would be less than significant.

SUMMARY OF IMPACTS

Although no significant impacts related to water quality are anticipated, the project would be subject to compliance with water quality measures imposed by the Regional Water Quality Control Board or the City of Huntington Beach, and a water quality management plan would be required to document compliance per the required mitigation measures.

The project would not create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems, or contribute significant increases in the flow velocity or volume of stormwater runoff to cause environmental harm, or provide substantial additional sources of polluted runoff. Although no significant impacts have been identified, a mitigation measure has been added to document standard requirements of the Regional Water Quality Control Board or City of Huntington Beach that ensure adequate sizing and design of the stormwater drainage system.

Although no significant impacts have been identified in relation to potential impacts from a tsunami, a mitigation measure has been added that ensures planning measures have been prepared to minimize or reduce risks to property and human safety from tsunami during operation.

MITIGATION MEASURES

LONG-TERM WATER QUALITY IMPACTS

HWQ-1 The City of Huntington Beach shall require that, prior to the issuance of grading permits, the applicant's Licensed Civil Engineer prepare a hydrology and hydraulic study to identify the effects of potential stormwater runoff from the project on the existing storm drain flows for the 10-, 25-, and 100-year design storm events. The study shall identify existing runoff and, proposed runoff, in addition to existing storm drain system capacity at the site discharge location to the nearest down-gradient main junction. The applicant shall design site drainage and document that the proposed project would not increase peak storm event flows over existing conditions for the design storm events.

HWQ-2 Prior to the issuance of building permits (not including demolition permits), an appropriate on-site drainage system that integrates permanent stormwater quality features shall be installed for the project.

HWQ-3 Prior to issuance of grading permits, the applicant shall submit to the City for approval a plan outlining the specific planning measures to be taken to minimize or reduce risks to property and human safety from tsunami during operation. Planning measures could include but would not be limited to the following: (a) Provision of tsunami safety information to all facility personnel, in addition to posting signage on site; (b) identification of the method for transmission of tsunami watch and warnings to facility personnel and persons on the site in the event a watch or warning is issued; and (c) identification of an evacuation site for persons on site in the event of a tsunami warning.

UNAVOIDABLE SIGNIFICANT IMPACTS

None have been identified.

INTENTIONALLY LEFT BLANK