Item No. 10

December 9, 2011

**ERRATA SHEET**

**CHANGES TO TENTATIVE ORDER NO. R8-2011-0046**

**WASTE DISCHARGE REQUIREMENTS**
**FOR**
**POSEIDON RESOURCES (SURFSIDE) L.L.C.**
**HUNTINGTON BEACH DESALINATION FACILITY**

(Language deleted is ~~struck through~~)
(Language added is **bold and shaded)**

1. Revise the first full paragraph on page 9 of Finding C, of Order No. R8-2001-0046 as follows:

> When operating in a temporary stand-alone mode, the Facility's intake flow will be approximately 126.7 MGD- a volume which is less than HBGS's currently permitted intake flow of 514 MGD. Such operations will lead to reductions in the intake volumes, flow velocities, temperature and impingement and entrainment effects which occur under the HGBS's current operations with significantly higher intake volumes (between 2006 and 2010 the HBGS' annual average intake ranged from 200 MGD to 268 MGD with a maximum daily flow of 507 MGD). In addition, HBGS has provided for marine life mitigation for more than an average annual flow of 126.7 MGD, and is mandated by the State Water Board to provide for such mitigation until it permanently ceases to use the once-through cooling water system or permanently stops generating electricity. As a result, the marine life effects of the Facility's temporary stand-alone operation ~~would~~ **should** not require additional impingement and entrainment mitigation. **To ensure that any entrainment and/or impingement effects have been minimized in accordance with California Water Code Section 13142.5(b), the Facility will cap its temporary, stand-alone flows to a 12-month running average that shall not exceed the available mitigation credits, or the Discharger otherwise shall provide sufficient mitigation, as determined by the Executive Officer.**

2. Revise the last two paragraphs of Finding C, of Order No. R8-2011-0046, pages 9 and 10, as follows:

> **The Regional Board has found that the 66.8 acre wetlands mitigation program that AES Huntington Beach is currently funding provides sufficient mitigation to address any impacts caused by the intake of an average flow of 126.7 MGD of seawater. If AES were to discontinue support for the marine life mitigation program, continuation of these mitigation efforts by the Discharger may be considered the best mitigation measures to feasibly address any impacts caused by its continued use of the intake structures pursuant to Water Code Section 13142.5(b).**

~~If AES Huntington Beach were to discontinue support for the marine life mitigation program, the Discharger would be required to fund AES's existing 66.8-acre tidal wetlands mitigation program, or to incorporate mandated feasible design or technology features capable of reducing or eliminating such entrainment-related effects and thereby reducing or eliminating the requirement to fund the marine life mitigation program.~~

~~The Regional Water Board finds that if the Facility were to operate in long-term stand-alone mode, by continuing the maintenance of AES's existing 66.8-acre tidal wetlands mitigation program, the Facility would be deemed to have utilized the best marine life mitigation measure feasible and would comply with the mitigation requirements under CWC Section 13142.5(b).~~ Details regarding compliance with CWC Section 13142.5(b) are provided in the Fact Sheet, Attachment F to this Order.

3. Modify Attachment F- Fact Sheet, page F-9, item 2, as follows:

2. Spent Filter Backwash Water - The pretreatment filters will be cleaned (backwashed) to remove the intake seawater solids that accumulate in the ~~media beds~~ **filtration units**. The desalination plant will use filtered seawater for backwash. The amount of backwash water used will be between 3 to 6.3 percent (average of 4 percent) of the total intake seawater flow required for desalination. For a 50-MGD facility, operating at 50-percent recovery, the average and maximum amounts of filter backwash water will be 4.0 MGD and 6.3 MGD, respectively. ~~The spent filter backwash water will flow from the filters to the desalination plant effluent outfall to the AES HBGS cooling system discharge pipe.~~ The spent filter backwash water will have the same salinity as the intake ocean water (34,000 mg/L).

   **The handling of the spent filter backwash will depend upon the choice of the filtration technology to be used by the Facility. Under the media filtration option, ferric chloride or ferric sulfate coagulant will be added to the influent to enhance removal of particulate matter. The coagulant would be removed from the filter during the filter backwash cycle, collected in a sedimentation basin (solids handling facility), removed as sludge, and disposed of at a landfill. The decant from the sedimentation basin will be directed to the Facility inlet or to the HBGS discharge pipeline. The membrane filtration option does not require the use of coagulant. Under this option, the backwash water would be discharged directly to the discharge pipeline. However, the membrane filtration system would require periodic chemical cleaning. The spent cleaning solution would be collected in a separate tank, neutralized and discharged to the sanitary sewer.**

4. Modify the last paragraph on page F-30 and the first paragraph on page F-31 of Attachment F- Fact Sheet, as follows:

When operating in temporary stand-alone mode, the Facility's intake flow will be approximately 126.7 MGD – a volume which is less than HBGS's currently permitted intake flow of 514 MGD. The Facility's reduced intake flow rate will reduce the existing permitted intake volume, velocity, temperature and number of organisms impinged and entrained from the ocean waters. HBGS has provided for marine life mitigation for more than a 12-M average flow of 126.7 MGD, and it will continue to provide for such mitigation until it permanently ceases to use the once-through cooling water system or permanently stops generating electricity. As a result, the marine life effects of the Facility's temporary stand-alone operation ~~would~~ **should** not require additional marine life mitigation. **To ensure that any entrainment and/or impingement effects have been minimized in accordance with California Water Code Section 13142.5(b), the Facility will cap its temporary, stand-alone flows to a 12-month running average that shall not exceed the available mitigation credits, or the Discharger otherwise shall provide sufficient mitigation, as determined by the Executive Officer.**

The Regional Water Board finds that when the Facility is operating in a temporary stand-alone mode **as described herein**, all marine life related effects are mitigated. The Regional Water Board further finds that, while operating in temporary standalone mode, the Facility is in compliance with California Water Code Section 13142.5(b) and meets the requirements of best available mitigation to minimize the intake and mortality of marine life.

5. Modify the second paragraph on page F-32 of Attachment F- Fact Sheet, as follows:

**If the Discharger submits a Report of Waste Discharge for approval of its long-term, stand-alone operations, the Regional Board will consider whether, by continuing the maintenance of AES's existing 66.8-acre tidal wetlands mitigation program,** ~~The Regional Water Board finds that~~ the Facility's long-term stand-alone operational scenario is in compliance with the mitigation requirements of Section 13142.5(b).

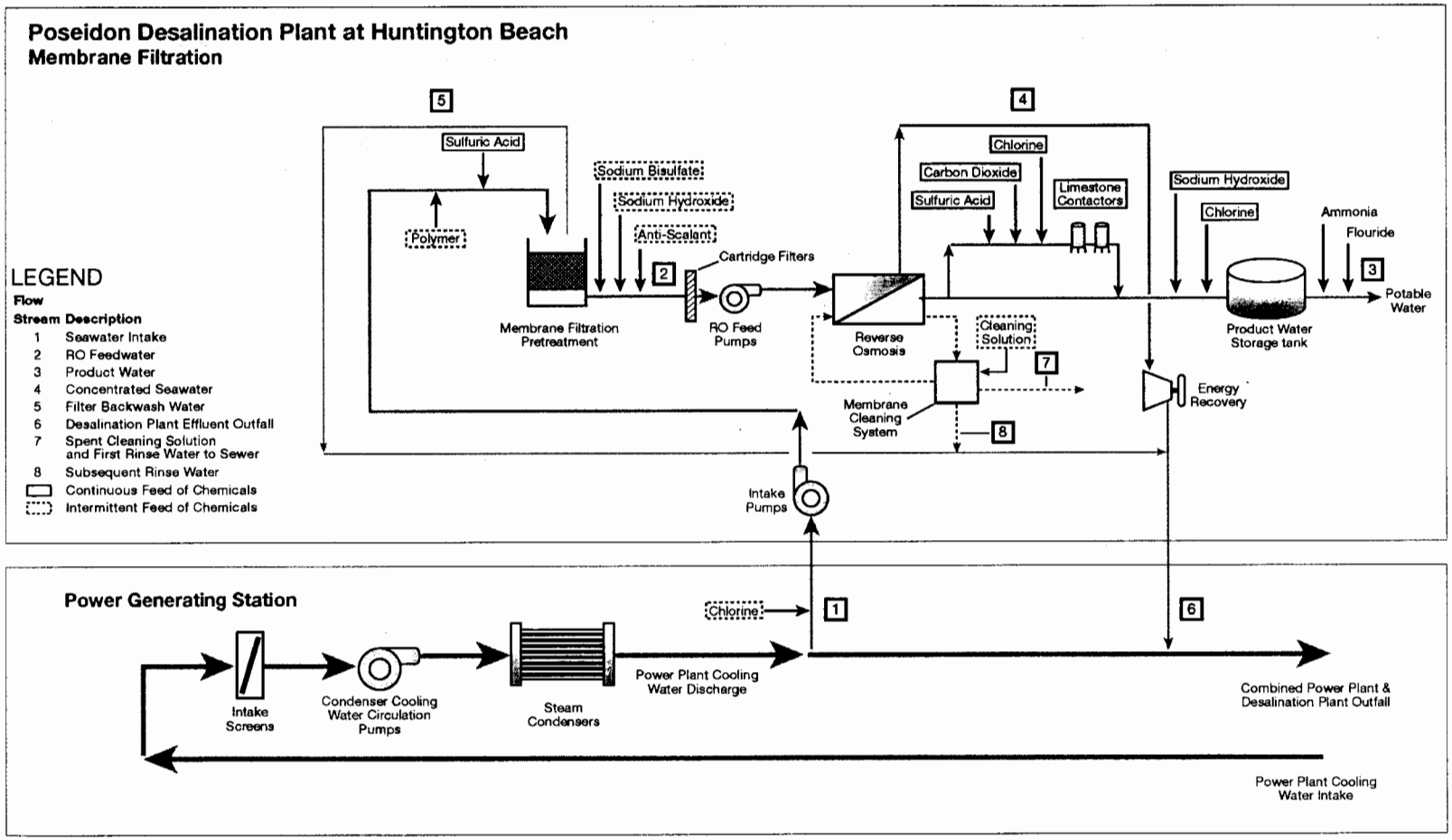
6. Modify the first paragraph on page F-34 of Attachment F- Fact Sheet, as follows:

In summary, the Regional Water Board finds that the Facility's temporary standalone operational scenario is in compliance with California Water Code Section 13142.5(b) as it employs the best site, design, technology and mitigation feasible to minimize the intake and mortality of marine life (see table F-7).~~In addition, the Regional Water Board finds that the Facility's long-term stand-alone operational scenario is in compliance with Section 13142.5(b) with regard to mitigation.~~

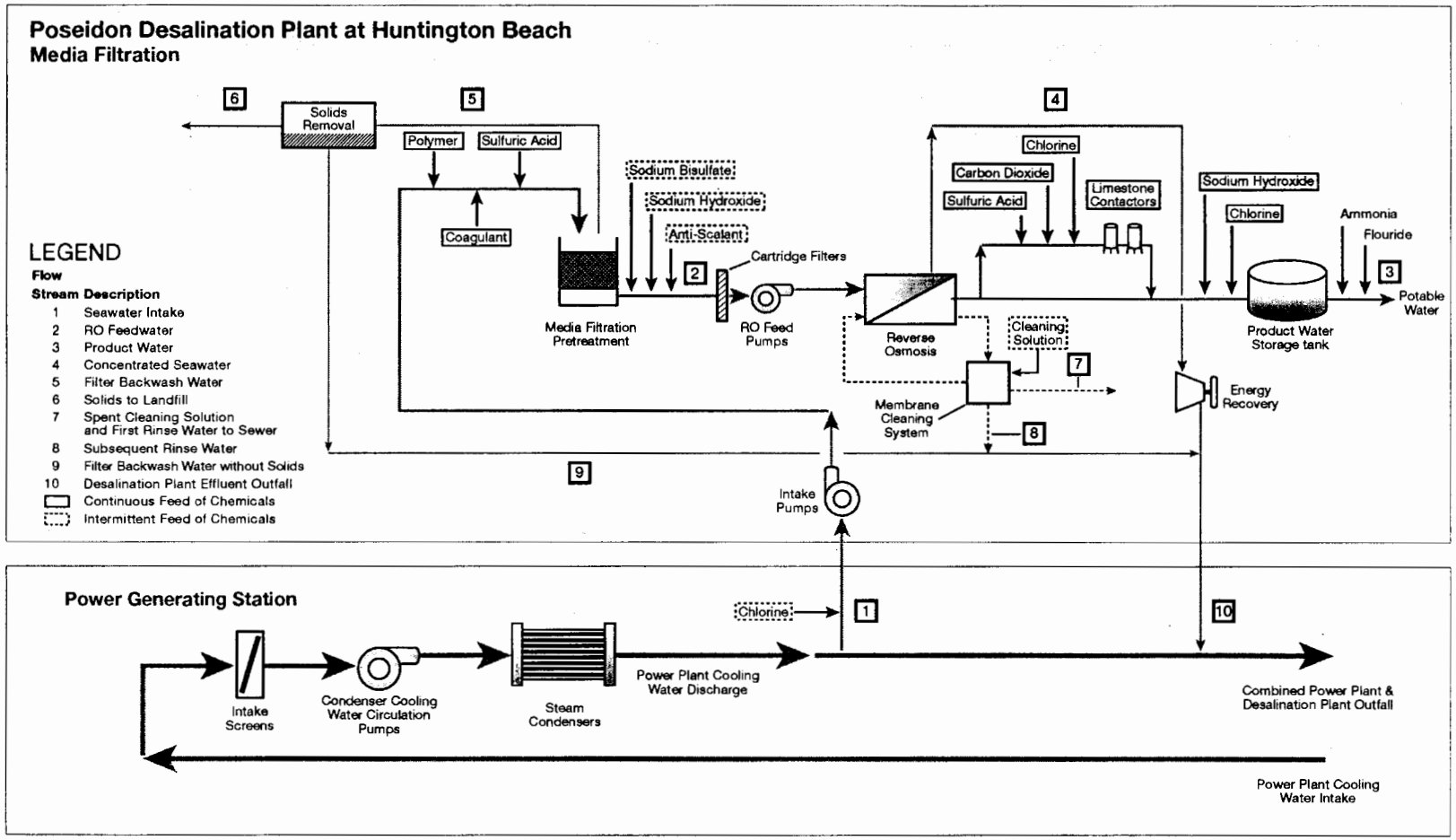
7. Add the parameter "Iron" to Attachment E – Monitoring and Reporting Program, page E-6, Table E-3 (Influent Monitoring) with a minimum sampling frequency of "Semiannual" and page E–7, Table E-4 (Effluent Monitoring), with a minimum sampling frequency of "Quarterly".

8. Replace Attachment C1, with Attachment C1A and Attachment C1B, as shown on the following two pages.

# ATTACHMENT C1A – FLOW SCHEMATIC



# ATTACHMENT C1B – FLOW SCHEMATIC



California Regional Water Quality Control Board
Santa Ana Region

December 9, 2011

**ITEM:** 10

**SUBJECT:** Renewal of Waste Discharge Requirements for Poseidon Resources (Surfside) L.L.C., Huntington Beach Desalination Facility, Order No. R8-2011-0046, NPDES No. CA8000403, Orange County

**DISCUSSION:**

See attached Fact Sheet

**RECOMMENDATIONS:**

Adopt Order No. R8-2011-0046, NPDES No. CA8000403 as presented.

**COMMENT SOLICITATION:**

Comments were solicited from the discharger and the following agencies:

U.S. Environmental Protection Agency, Permits Issuance Section (WTR-5) – Peter Kozelka
U.S. Army District, Los Angeles, Corps of Engineers, Regulatory Branch
U.S. Fish and Wildlife Service – Carlsbad
State Water Resources Control Board, Office of the Chief Counsel – David Rice
State Water Resources Control Board, Division of Water Quality – Phil Isorena
State Department of Fish and Game – Los Alamitos
California State Lands Commission – Susan Young
Orange County Water District – Nira Yamachika/Greg Woodside
Orange County Public Works - Chris Crompton
Orange County Health Care Agency - Larry Honeybourne
AES Southland L.L.C. – Steve Maghy
City of Huntington Beach, Planning Commissioner - Scott Hess
Surfrider Foundation – Joe Geever
Environment Now- Terry O'Day
Orange County Coastkeeper – Garry Brown
Orange County Coastkeeper – Ray Hiemstra
Lawyers for Clean Water C/c San Francisco Baykeeper
Eileen Murphy
Paul Cross
Randy Fuhrman

# California Regional Water Quality Control Board
## Santa Ana Region

3737 Main Street, Suite 500, Riverside, California 92501-3348
Phone (951) 782-4130 • FAX (951) 781-6288 • TDD (951) 782-3221
www.waterboards.ca.gov/santaana


Tentative

**ORDER NO. R8-2011-0046**
**NPDES NO. CA8000403**

**WASTE DISCHARGE REQUIREMENTS**
**FOR**
**POSEIDON RESOURCES (SURFSIDE) L.L.C.**
**HUNTINGTON BEACH DESALINATION FACILITY**
**ORANGE COUNTY**

The following Discharger is subject to waste discharge requirements as set forth in this Order:

**Table 1. Discharger Information**

| | |
|---|---|
| **Discharger/Operator** | **Poseidon Resources (Surfside) L.L.C.** |
| **Name of Facility** | **Huntington Beach Desalination Facility** |
| **Facility Address** | **21730 Newland Street** |
| | **Huntington Beach, CA 92646** |
| | **Orange County** |
| This discharge is classified as a **minor** discharge. | |

The discharge by the Poseidon Resources (Surfside) L.L.C. from the discharge points identified below is subject to waste discharge requirements as set forth in this Order:

**Table 2. Discharge Location**

| Discharge Point | Effluent Description | Discharge Point Latitude | Discharge Point Longitude | Receiving Water |
|---|---|---|---|---|
| 001 | RO effluent, filter backwash, RO subsequent rinse wastewater, stormwater runoff | 33° 38' 38" | 117° 58' 44" | Discharge to AES – HBGS[1] discharge pipeline to the Pacific Ocean |

[1] *AES (HBGS) – Aera Energy Services L.L.C. – Huntington Beach Generating Station*

**Table 3. Administrative Information**

| | |
|---|---|
| This Order was adopted by the Regional Water Quality Control Board on: | **December 9, 2011** |
| This Order shall become effective on: | **December 9, 2011** |
| This Order shall expire on: | **December 1, 2016** |
| The Discharger shall file a Report of Waste Discharge in accordance with title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than: | **June 4, 2016** |

IT IS HEREBY ORDERED, that this Order supersedes and rescinds Order No. R8-2006-0034 except for enforcement purposes, and, in order to meet the provisions contained in Division 7 of the California Water Code (commencing with section 13000) and regulations adopted thereunder, and the provisions of the Federal Clean Water Act and regulations and guidelines adopted thereunder, the Discharger shall comply with the requirements in this Order.

I, Kurt V. Berchtold, Executive Officer, do hereby certify that this Order No. R8-2011-0046 with all the attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Santa Ana Region, on December 9, 2011.

**Kurt V. Berchtold, Executive Officer**

## TABLE OF CONTENTS


I. Facility Information ..... 5
II. Findings ..... 5
III. Discharge Prohibitions ..... 16
IV. Effluent Limitations and Discharge Specifications ..... 16
  A. Effluent Limitations – Discharges to DP 001 ..... 16
  B. Land Discharge Specifications - N/A ..... 21
  C. Reclamation Specifications - N/A ..... 21
  D. Storm Water Discharge Specifications ..... 21
V. Receiving Water Limitations ..... 21
  A. Surface Water Limitations ..... 21
  B. Groundwater limitations - N/A ..... 24
VI. Provisions ..... 24
  A. Standard Provisions ..... 24
  B. Monitoring and Reporting Program Requirements ..... 27
  C. Special Provisions ..... 27
    1. Reopener Provisions ..... 27
    2. Special Studies, Technical Reports and Additional Monitoring Requirements - N/A ..... 28
    3. Best Management Practices and Pollution Prevention ..... 28
    4. Construction, Operation and Maintenance Specifications ..... 29
    5. Other Special Provisions - N/A ..... 30
    6. Compliance Schedules - N/A ..... 30
VII. Compliance Determination ..... 30


## LIST OF TABLES


Table 1. Discharger Information ..... 1
Table 2. Discharge Location ..... 1
Table 3. Administrative Information ..... 2
Table 4. Facility Information ..... 5
Table 5. Basin Plan Beneficial Uses ..... 12
Table 6. Ocean Plan Beneficial Uses ..... 13
Table 7. Effluent Limits for DP 001 at M-001 ..... 17

## LIST OF ATTACHMENTS

Attachment A – Definitions ..... A-1
Attachment B – Facility Location Map ..... B-1
Attachment C – Flow Schematic ..... C-1
Attachment D – Federal Standard Provisions ..... D-1
Attachment E – Monitoring and Reporting Program (MRP) ..... E-1
Attachment F – Fact Sheet ..... F-1
Attachment G – Minimum Levels ..... G-1
Attachment H – Not Used
Attachment I – Not used
Attachment J – Stormwater Pollution Prevention Plan Requirements ..... J-1
Attachment K – Stormwater Monitoring Program and Reporting Requirements ..... K-1

## I. FACILITY INFORMATION

The following Discharger is subject to waste discharge requirements as set forth in this Order:

**Table 4. Facility Information**

| | |
|---|---|
| **Discharger/Operator** | Poseidon Resources (Surfside) L.L.C. |
| **Name of Facility** | Huntington Beach Desalination Facility |
| **Facility Address** | 21730 Newland Street |
| | Huntington Beach, CA 92646 |
| | Orange County |
| **Facility Contact, Title, and Phone** | Josie McKinley, Director Project Development, (714) 596-7946 |
| **Mailing Address** | 501 W. Broadway, Suite 2020, San Diego, CA 92101 |
| **Type of Facility** | Industrial |
| **Facility Design Flow** | 56.59 MGD, 12-Month Average Flow<br>60.3 MGD Maximum Daily Flow |

## II. FINDINGS

The California Regional Water Quality Control Board, Santa Ana Region (hereinafter Regional Water Board), finds:

**A. Background.** Poseidon Resources (Surfside) L.L.C. (hereinafter Discharger) proposes to construct and operate the Huntington Beach Desalination Facility (hereinafter Facility) on a 12-acre parcel adjacent to the AES Huntington Beach Generating Station (HBGS). The Discharger has entered into a 55-year option agreement with AES, the owner and operator of the HBGS, for the desalination project site. The Discharger proposes to discharge a maximum of 60.3 million gallons per day (MGD) of wastewater (54 MGD of concentrated seawater and 6.3 MGD of filter backwash) to the Pacific Ocean.

On August 25, 2006, the Regional Water Board issued Order No. R8-2006-0034, NPDES No. CA80000403, which prescribed waste discharge requirements for discharges from the Facility. Order No. R8-2006-0034 expired on August 1, 2011. On February 2, 2010, the Discharger submitted a timely application for renewal of this permit. Therefore, pursuant to 40 CFR 122.6, Order No. R8-2006-0034, NPDES No. CA80000403, shall remain in effect until the effective date of the new permit.

Effluent limitations and mass emission limits established in this Order are at least as stringent as those established in Order No. R8-2006-0034. The permit is being modified to:

1. Allow the Discharger to utilize the HBGS intake pumps in a temporary stand-alone mode when HBGS's operations do not provide sufficient flows (i.e., approximately 126.7 MGD);

2. Establish maximum daily discharge flow limits for the Facility to allow for the temporary maximum operation of all proposed reverse osmosis units (see Attachment F, Fact Sheet, Table F-2); and

3. Establish maximum daily discharge flow limits for the Facility to account for initial start-up operations and temporary on-site maintenance operations (approximately 126.7 MGD).

For the purposes of this Order, references to the "discharger" or "permittee" in applicable federal and State laws, regulations, plans, or policy are held to be equivalent to references to the Discharger herein.

**B. Facility Description.** The Discharger proposes to produce potable water for delivery into water distribution systems within Orange County. The Discharger will receive its source water from either the HBGS's condenser cooling water discharge or directly from the HBGS's intake system. The desalination process will consist of source water screening, coagulation, filtration, pH adjustment, chlorination, de-chlorination, reverse osmosis (RO) membrane separation, and product water chlorination and chemical conditioning. The RO system will use high-rejection seawater membranes. The Facility will produce a 12-month average of 50 MGD of potable water and 50 MGD of concentrated seawater. Approximately 6.3 MGD of filter backwash will be produced and will be mixed with the concentrated seawater. RO cleaning solutions and first-rinse wastewater will be directed to a neutralization tank and then discharged to the local sewer. All subsequent rinse wastewater (up to 0.29 MGD) will be conveyed to a 200,000-gallon washwater equalization tank prior to being metered into the Facility's effluent outfall. The Discharger will utilize chlorine in the form of sodium hypochlorite to control and prevent microbial growth in the transmission pipelines and filter media. Chlorine may be injected before the influent to the filtration system. All chlorinated process water will be de-chlorinated if returned to discharge to the ocean. Chlorine will also be used to disinfect product water to meet California Department of Public Health water quality standards. The concentrated seawater with other process wastewater (on average 56.59 MGD) described above will be discharged to the ocean through the existing HBGS outfall structure. Attachment B provides a map of the Facility and surrounding area. Attachment C provides a flow schematic of the Facility.

HBGS facilities periodically engage in heat treatment as an antifouling measure. This heat treatment may occur every six to eight weeks, and may last approximately six to eight hours per occurrence. The Facility's treatment system will not operate when the HBGS is engaged in heat treatment. To make up for the periods of inactivity that are attributable to HBGS heat treatment or temporary onsite Facility maintenance, the

Facility may be operated at its maximum daily peak production capacity. The Facility's production capacity would increase the Facility's discharges during these periods, resulting in a maximum daily concentrated seawater discharge flow of 54 MGD, and a maximum daily total Facility discharge flow of 60.3 MGD (See Appendix F, Table F-2).

During initial start-up operations and temporary onsite maintenance operations, it may be necessary to temporarily return all or a portion of the filtered pretreated seawater (up to approximately 126.7 MGD) back into the HBGS discharge pipeline instead of routing the filtered seawater flow to the reverse osmosis units. Additionally, during such start-up periods or periods when it is not feasible to deliver product water to the potable water system, it may be necessary to temporarily discharge dechlorinated product water from the reverse osmosis process back into the HBGS discharge pipeline. During these temporary periods, the maximum allowable flows returned to the ocean would not exceed 126.7 MGD and the volume and salinity of the additional discharges would be identical to the volume and salinity of the intake water.

Order No. R8-2006-0011, NPDES No. CA0001163, adopted by the Regional Water Board on August 25, 2006, authorizes AES Huntington Beach (operator of the HBGS) to discharge of up 514 MGD of single-pass seawater from the HBGS. Requirements established in the Order No. R8-2006-0034 for the Discharger are based on the Facility's use of intake water from the HBGS cooling water system. Between 2006 and 2010, the HBGS's annual average seawater intake flow through the power plant ranged from 200 MGD to 268 MGD. The power plant's maximum daily intake flow reached 507 MGD in each year. On April 1, 2011, AES Huntington Beach submitted to the State Water Resources Control Board (hereinafter State Water Board) a plan for compliance with the State Water Board's "Water Quality Control Policy for the Use of Coastal and Estuarine Waters for Power Plant Cooling." Based on these policy requirements and AES's implementation plan, the HBGS cooling water system is anticipated to be in operation until at least December 31, 2020.

It is anticipated that the Facility will operate in conjunction with the HBGS (a co-located operational scenario) by using HBGS cooling water discharge as its source water. When operating in this co-location mode, the Facility's feed water intake requirements will not increase the volume or the velocity of HBGS's cooling water intake.

If HBGS were to temporarily cease operations of its once-through cooling water system (e.g., during HBGS maintenance shutdowns), or if it were to provide insufficient flows to satisfy the Facility's intake flow requirements, the Discharger would operate the HBGS's seawater intake and outfall independently in a temporary stand-alone operational mode. This temporary stand-alone mode might occur in one of two situations: (1) when HBGS is temporarily shut down; or (2) when HBGS is operating but its discharge volumes are not sufficient to meet the Facility's intake requirements. When operating in temporary stand-alone mode, the Facility's intake flows will be maintained at approximately 126.7 MGD.

If HBGS were to permanently terminate the use and operation of its once-through cooling water system and/or were to permanently stop generating electricity, the Facility would operate the seawater intake and outfall independently in a long-term stand-alone operational mode. When operating in long-term stand-alone mode, the Facility's intake flows will be maintained at approximately 126.7 MGD.

This Order establishes effluent limitations and discharge prohibitions and provisions for the co-located operational scenario and the temporary stand-alone operational scenario. The Discharger will be required to submit a separate Report of Waste Discharge to address long-term stand-alone operations in the event that HBGS permanently ceases use of the once-through cooling water system or permanently ceases electricity generating operations at the current site.

To ensure protection of receiving water beneficial uses and to limit salinity concentrations in receiving waters, Order No. R8-2006-0034 limited the Facility's total outfall discharge under the co-located operations to a maximum of 44.7 percent of the intake flow (total desalination discharge 56.59 MGD/total HBGS discharge of 126.7 MGD). Under this requirement, the Facility could achieve its production capacity whenever HBGS flows meet or exceed 126.7 MGD. If the HBGS does not direct 126.7 MGD to the Facility, the Facility will operate the intake system in a temporary stand-alone mode to maintain a minimum intake flow of approximately 126.7 MGD, thereby ensuring that the Facility's discharge remains at or less than 44.7 percent of the total intake volume.

C. **Intake Regulations.** Federal Clean Water Act (CWA) Section 316(b) implementing regulations are applicable to facilities that meet the definition of a Phase II existing facility at 40 CFR 125.91. Such facilities that withdraw cooling water from a waters of the United States; have, or are required to have, a NPDES permit; generate and transmit electric power as their primary business activity; have a total design intake capacity of 50 MGD or greater; and use at least 25 percent of the withdrawn water exclusively for cooling purposes. Pursuant to CWA 316(b) regulations, the HBGS is classified as a Phase II existing facility. However, pursuant to the definitions and applicability of the Phase I rule (40 CFR 125.8), the Phase II rule (40 CFR 125.9), and the proposed Phase III rule (Federal Register Vol. 69, No. 226, Wednesday, Nov. 24, 2004), the 316(b) regulations are not applicable to the Huntington Beach Desalination Facility. Therefore, no special conditions relating to the 316(b) implementing regulations are included in this Order.

When operating in conjunction with the power plant (co-located scenario), the Facility will not increase the volume or the velocity of HBGS's cooling water intake, nor will it increase the number of organisms impinged and/or entrained by the HBGS's cooling water intake structure. Therefore, when the Facility is operating in co-located mode, there will be no additional impacts on marine life.

The Facility's stand-alone operations are regulated under California Water Code (CWC) Section 13142.5(b), which requires new industrial facilities using seawater for processing to use the best available site, design, technology and mitigation feasible to minimize intake and mortality of marine life.

When operating in a temporary stand-alone mode, the Facility's intake flow will be approximately 126.7 MGD – a volume which is less than HBGS's currently permitted intake flow of 514 MGD. Such operations will lead to reductions in the intake volumes, flow velocities, temperature and impingement and entrainment effects which occur under the HGBS's current operations with significantly higher intake volumes (between 2006 and 2010 the HBGS' annual average intake ranged from 200 MGD to 268 MGD with a maximum daily flow of 507 MGD). In addition, HBGS has provided for marine life mitigation for more than an average annual flow of 126.7 MGD, and is mandated by the State Water Board to provide for such mitigation until it permanently ceases to use the once-through cooling water system or permanently stops generating electricity. As a result, the marine life effects of the Facility's temporary stand-alone operation would not require additional impingement and entrainment mitigation.

When the Facility is operating in temporary stand-alone mode it is utilizing the best available site, design, technology, and mitigation measures feasible to minimize the intake and mortality of all forms of marine life and is in compliance with CWC Section 13142.5(b).

If the HBGS permanently ceases operations of the once-through cooling water system and/or if the HBGS permanently stops generating electricity at the current site, within 180 days of receiving such notice, the Discharger shall submit a separate Report of Waste Discharge to the Regional Water Board which evaluates any new design and technology requirements to conform with CWC Section 13142.5(b). Additional review will be necessary, in part, because when operating in long-term stand-alone mode, the Discharger will have more discretion and flexibility with respect to the operation of the intake and outfall structure and it will be in a position to re-consider whether other design and/or technology features have been rendered feasible.

If AES Huntington Beach were to discontinue support for the marine life mitigation program, the Discharger would be required to fund AES's existing 66.8-acre tidal wetlands mitigation program, or to incorporate mandated feasible design or technology features capable of reducing or eliminating such entrainment-related effects and thereby reducing or eliminating the requirement to fund the marine life mitigation program.

The Regional Water Board finds that if the Facility were to operate in long-term stand-alone mode, by continuing the maintenance of AES's existing 66.8-acre tidal wetlands mitigation program, the Facility would be deemed to have utilized the best marine life mitigation measure feasible and would comply with the mitigation requirements under CWC Section 13142.5(b). Details regarding compliance with CWC Section 13142.5(b) are provided in the Fact Sheet, Attachment F to this Order.

D. **Legal Authorities.** This Order is issued pursuant to Section 402 of the Federal Clean Water Act (CWA) and implementing regulations adopted by the U.S. Environmental Protection Agency (USEPA) and Chapter 5.5, Division 7 of the California Water Code (Section 13370 *et seq.*). It shall serve as a NPDES permit for point source discharges from this facility to surface waters. This Order also serves as Waste Discharge Requirements (WDRs) pursuant to Article 4, Chapter 4 of the CWC (Section 13260 *et seq.*).

E. **Background and Rationale for Requirements.** The Regional Water Board developed the requirements in this Order based on information submitted as part of the application, through monitoring and reporting programs, and other available environmental information. The Fact Sheet (Attachment F), which contains background information and rationale for Order requirements, is hereby incorporated into this Order and constitutes part of the Findings for this Order. Attachments A through K are also incorporated into this Order.

F. **California Environmental Quality Act (CEQA).** Under California Water Code Section 13389, this action to adopt an NPDES permit is exempt from the provisions of the CEQA, Public Resources Code sections 21100-21177.

In compliance with the California Environmental Quality Act, a Subsequent Environmental Impact Report (SEIR) for the Facility was certified by the City of Huntington Beach on September 7, 2010, and the City adopted a CEQA Statement of Findings of Facts with a Statement of Overriding Considerations and Mitigation Monitoring and Reporting Program. Also on September 7, 2010, the City of Huntington Beach amended Conditional Use Permit No. 02-04 and on September 20, 2010, the City of Huntington Beach approved Coastal Development Permit No. 10-014 for the Facility.

As documented in the Fact Sheet (Attachment F), the Regional Water Board has reviewed the final SEIR. The final SEIR identifies no significant impacts with mitigation measures for hazards and hazardous materials or for stormwater drainage. No significant impacts were identified and no mitigation was required for any marine life- or water quality-related effects.

The Facility as currently permitted under Order No. R8-2006-0034 may operate in the absence of the power plant generating electricity but must adhere to a 44.7% minimum

dilution ratio to ensure compliance with Ocean Plan receiving water quality standards. Operating the Facility at a feed water flow rate of 152 MGD, as analyzed in the final SEIR, would provide for more dilution of the Facility's discharge than is required under the Facility's existing Order and under state and federal water quality regulations, and it could potentially cause incremental entrainment and impingement effects that can be avoided by operating the Facility at a 12-month average of 126.7 MGD.

To prevent salinity-related impacts and to ensure compliance with the Ocean Plan, this Order establishes requirements that the Facility discharges remain at or less than 44.7 percent of the total intake flow. This order also maintains the existing initial dilution factor of 7.5:1 and 1,000 foot Zone of Initial Dilution assigned to HBGS. To conform to this requirement while minimizing the potential for impingement and entrainment effects, the average annual intake flow for the Facility under temporary stand-alone operations is limited to 126.7 MGD (see Table F-2). Compliance with this average annual intake flow will ensure that the Facility's discharge is consistent with the Ocean Plan.

G. **Technology-based Effluent Limitations.** Section 301(b) of the CWA and implementing USEPA permit regulations at 40 CFR 122.44 require that permits include conditions meeting applicable technology-based requirements at a minimum, and any more stringent effluent limitations necessary to meet applicable water quality standards. The discharge authorized by this Order must meet minimum federal technology-based effluent limitations (TBELs) based on Table A of the California Ocean Plan and/or Best Professional Judgment (BPJ) in accordance with 40 CFR 125.3.

A detailed discussion of the technology-based effluent limitations in this Order is included in the Fact Sheet (Attachment F).

H. **Water Quality-based Effluent Limitations.** Section 301(b) of the CWA and 40 CFR 122.44(d) require that permits include limitations more stringent than applicable federal technology-based requirements where necessary to achieve applicable water quality standards.

40 CFR 122.44(d)(1)(i) mandates that permits include effluent limitations for all pollutants that are or may be discharged at levels that have the reasonable potential to cause or contribute to an exceedance of a water quality standard, including numeric and narrative objectives within a standard. Where numeric water quality objectives have not been established for a pollutant, water quality-based effluent limitations (WQBELs) must be established using: (1) USEPA criteria guidance under CWA Section 304(a), supplemented where necessary by other relevant information; (2) an indicator parameter for the pollutant of concern; or (3) a calculated numeric water quality criterion, such as a proposed State criterion or policy interpreting the State's narrative criterion, supplemented with other relevant information, as provided in 40 CFR 122.44(d)(1)(vi). This Order includes water quality-based effluent limitations (See Attachment F).

I. **Water Quality Control Plans.** The Regional Water Board adopted a Water Quality Control Plan for the Santa Ana Region (hereinafter Basin Plan) that became effective on January 24, 1995. The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for the Pacific Ocean. In addition, State Water Board Resolution No. 88-63 requires that, with certain exceptions, the Regional Water Board assign the municipal and domestic supply use to water bodies that do not have beneficial uses listed in the Basin Plan. Beneficial uses applicable to the Pacific Ocean are as follows:

**Table 5. Basin Plan Beneficial Uses**

| Discharge Point | Receiving Water Name | Beneficial Use(s) |
|---|---|---|
| 001[2] | Pacific Ocean Nearshore[3] Zone from the San Gabriel River to Poppy Street in Corona del Mar | Present or Potential Beneficial Use<br>a. Industrial service supply,<br>b. Navigation,<br>c. Water contact recreation,<br>d. Non-contact water recreation,<br>e. Commercial and sportfishing,<br>f. Wildlife habitat,<br>g. Rare, threatened or endangered spieces,<br>h. Spawning, reproduction, and development,<br>i. Marine habitat, and<br>j. Shellfish harvesting.<br>Excepted from Municipal and Domestic supply |
| 001[2] | Pacific Ocean Offshore Zone between the Nearshore Zone and the Limit of the State Waters | Present or Potential Beneficial Use<br>a. Industrial service supply,<br>b. Navigation,<br>c. Water contact recreation,<br>d. Non-contact water recreation,<br>e. Commercial and sportfishing,<br>f. Wildlife habitat,<br>g. Rare, threatened or endangered species,<br>h. Spawning, reproduction, and development, and<br>i. Marine habitat.<br>Excepted from Municipal and Domestic supply |

The State Water Board adopted the *Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Water and Enclosed Bays and Estuaries of California* (Thermal Plan) on May 18, 1972, and amended this plan on September 18, 1975. This plan contains temperature objectives for coastal waters. Requirements of this Order implement the Thermal Plan.

---

2 *This discharge is to AES-HBGS discharge pipeline to the Pacific Ocean.*

3 *The Nearshore Zone is defined by the Ocean Plan, Chapter II, B.1.a., as "within a zone bounded by the shoreline and a distance of 1,000 feet from the shoreline or the 30 foot depth contour, whichever is further from the shoreline."*

J. **California Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment to the Ocean Plan on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. The Ocean Plan identifies beneficial uses of ocean waters of the State to be protected as summarized below:

**Table 6. Ocean Plan Beneficial Uses**

| Discharge Point | Receiving Water | Beneficial Uses |
|---|---|---|
| 001 | Pacific Ocean | Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance (ASBS); rare and endangered species; marine habitat; fish migration, fish spawning and shellfish harvesting |

In order to protect the beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Requirements of this Order implement the Ocean Plan.

K. **Initial Dilution Factor.** In March 1980, the State Water Board investigated the initial dilution factor for power plant ocean outfalls throughout the State. The State Water Board assigned an "initial dilution" factor of 7.5:1 to AES HBGS outfall. It is appropriate to apply this dilution factor in establishing effluent limitations for discharges from this facility.

L. **Alaska Rule.** On March 30, 2000, USEPA revised its regulation that specifies when new and revised state and tribal water quality standards (WQS) become effective for CWA purposes (40 CFR 131.21; 65 Fed. Reg. 24641; (April 27, 2000).) Under the revised regulation (also known as the Alaska rule), new and revised standards submitted to USEPA after May 30, 2000 must be approved by USEPA before being used for CWA purposes. The final rule also provides that standards already in effect and submitted to USEPA by May 30, 2000, may be used for CWA purposes, whether or not approved by USEPA.

M. **Stringency of Requirements for Individual Pollutants.** This Order contains both technology-based and water quality-based effluent limitations for individual pollutants. The technology-based effluent limitations consist of restrictions on oil and grease. Restrictions on these pollutants are discussed in section IV. B. 2. of the Fact Sheet (Attachment F). The technology-based pollutant restrictions in this Order implement the minimum, applicable federal technology-based requirements. In addition, this Order

contains effluent limitations more stringent than the minimum, federal technology-based requirements that are necessary to meet water quality standards.

Water quality-based effluent limitations have been scientifically derived to implement water quality objectives that protect beneficial uses. Both the beneficial uses and the water quality objectives have been approved pursuant to federal law and are the applicable federal water quality standards. All beneficial uses and water quality objectives contained in the Basin Plan and the Ocean Plan were approved under state law and submitted to and approved by USEPA prior to May 30, 2000. Any water quality objectives and beneficial uses submitted to USEPA prior to May 30, 2000, but not approved by USEPA before that date, are nonetheless "applicable water quality standards for purposes of the CWA" pursuant to 40 CFR 131.21(c)(1).

N. **Anti-Backsliding Requirements.** Sections 402(o)(2) and 303(d)(4) of the CWA and federal regulations at 40 CFR Section 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as the effluent limitations in the previous Order.

O. **Antidegradation Policy.** 40 CFR 131.12 requires that State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution 68-16. Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Regional Water Board's Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. As discussed in detail in the Fact Sheet (Attachment F), the permitted discharge is consistent with the antidegradation provisions of 40 CFR Section 131.12 and State Water Board Resolution 68-16.

P. **Stormwater.** On April 17, 1997, the State Board adopted the General Industrial Storm Water Permit, Order No. 97-03-DWQ, NPDES No. CAS000001. This General Permit implements the Final Regulations (40 CFR 122, 123, and 124) for storm water runoff that were published on November 16, 1990 by USEPA in compliance with Section 402(p) of the Clean Water Act (CWA). This Order incorporates certain provisions of the General Industrial Storm Water permit that are pertinent to this discharge. The Regional Water Board has determined that pollution prevention is necessary to achieve water quality objectives. Consequently, this Order requires the Discharger to establish, update as necessary, and implement a pollution prevention plan and stormwater monitoring. This Order also requires the discharger to incorporate relevant provisions of a new General Industrial Storm Water Permit that will likely be adopted in early 2012. The new State Water Board Permit will contain minimum BMPs and requires monitoring for indicator parameters. This General Permit will also include Numeric Action Levels

(NALs) for these parameters. The NALs are derived from USEPA's Multi-Sector General Permit (MSGP). This new General Permit will also contain requirements that dischargers develop and implement storm water pollution prevention plans (SWPPP) that include BMPs that will achieve BAT and BCT to comply with water quality standards. Dischargers will also be required to eliminate unauthorized non-storm water discharges and to conduct monitoring, including visual and analytical storm water monitoring. This new General Permit will also require dischargers to electronically file all permit-related compliance documents in the online database smarts.waterboards.ca.gov. These documents include, but are not limited to, Notices of Intent (NOIs), SWPPPs, annual reports, Notices of Termination (NOTs), and NAL exceedance reports.

P. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 U.S.C.A. sections 1531 to 1544). This Order requires compliance with effluent limits, receiving water limits, and other requirements to protect the beneficial uses of waters of the state. The discharger is responsible for meeting all requirements of the applicable Endangered Species Act.

Q. **Intake and Outfall Vicinity**. In the vicinity of the HBGS's intake and outfall, no Areas of Special Biological Significance (ASBS), Marine Life Protection Areas (MLPA), state or federal threatened or endangered species or sensitive habitat (i.e. kelp beds) are expected to be affected by the Facility's seawater intake.

R. **Monitoring and Reporting**. 40 CFR 122.48 requires that all NPDES permits specify requirements for recording and reporting monitoring results. Sections 13267 and 13383 of the CWC authorize the Regional Water Board to require technical and monitoring reports. The Monitoring and Reporting Program establishes monitoring and reporting requirements to implement federal and State requirements. This Monitoring and Reporting Program is provided in Attachment E.

S. **Standard and Special Provisions.** Standard Provisions, which in accordance with 40 CFR Sections 122.41and 122.42, apply to all NPDES discharges and must be included in every NPDES permit, are provided in Attachment D. The Regional Water Board has also included in this Order special provisions applicable to the Discharger. A rationale for the special provisions contained in this Order is provided in the attached Fact Sheet (Attachment F).

T. **Notification of Interested Parties**. The Regional Water Board has notified the Discharger and interested agencies and persons of its intent to prescribe Waste Discharge Requirements for the discharge and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet (Attachment F) of this Order.

U. **Consideration of Public Comment.** The Regional Water Board, in a public meeting, heard and considered all comments pertaining to the discharge. Details of the Public Hearing are provided in the Fact Sheet (Attachment F) of this Order.

## III. DISCHARGE PROHIBITIONS

**A.** Discharge of wastewaters from any point other than Discharge Point 001 is prohibited.

**B.** The discharge of waste other than concentrated seawater, filter backwash, RO cleaning solutions subsequent rinse wastewater, and stormwater runoff from the Facility, except during startup and maintenance operations, is prohibited

**C.** Except during initial start-up operations and temporary onsite maintenance operations, the discharge of concentrated seawater, filter backwash water, and RO cleaning solutions subsequent rinse wastewater from the Facility to the HBGS discharge pipeline in excess of a 12-Month Average Flow of 56.59 MGD or a maximum daily flow of 60.3 MGD is prohibited. Total Facility discharge flows to the HBGS discharge pipeline, including temporary discharges of filtered pretreated water or discharges of unused dechlorinated product water in excess of a 12-Month Average Flow of 126.7 MGD, is prohibited.

**D.** The discharge of waste sludge or other solids generated as the result of Facility operations directly to the ocean, or into a waste stream that discharges to the ocean, is prohibited.

**E.** The discharge of any substances in concentrations toxic to animal or plant life in the affected receiving water is prohibited.

**F.** The discharge of any radiological, chemical, or biological warfare agent or high level radiological waste is prohibited.

## IV. EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

### A. Effluent Limitations – Discharges to DP 001

1. The Discharger shall maintain compliance with the following effluent limitations at Discharge Point 001, with compliance measured at Monitoring Location, M-001, before discharges being mixed with AES discharges as described in the attached Monitoring and Reporting Program (MRP-Attachment E).

The effluent limits are calculated by using a Dilution Factor of 7.5 and a wastewater flow of 56.59 MGD.

**Table 7. Effluent Limits for DP 001 at M-001**

| Parameter | Units | Effluent Limitations | | | | |
|---|---|---|---|---|---|---|
| | | Average Monthly | Average Weekly | Instantaneous Maximum | Daily Maximum | 6-Month Median |
| Oil and grease | mg/L | 25 | 40 | 75 | -- | -- |
| | lbs/day | 11,800 | 18,900 | -- | -- | -- |
| Total suspended solids | mg/L | 60[a] | -- | -- | -- | -- |
| | lbs/day | 28,300 | -- | -- | -- | -- |
| Settleable solids | ml/L | 1.0 | 1.5 | 3.0 | -- | -- |
| Turbidity | NTU | 75 | 100 | 225 | -- | -- |
| Arsenic | µg/L | -- | -- | 660 | 250 | 46 |
| | lbs/day | -- | -- | | 118 | 21 |
| Cadmium | µg/L | -- | -- | 85 | 34 | 8.5 |
| | lbs/day | -- | -- | | 16 | 4.0 |
| Chromium (Hexavalent) | µg/L | -- | -- | 170 | 68 | 17 |
| | lbs/day | -- | -- | | 32 | 8.0 |
| Copper | µg/L | -- | -- | 240 | 87 | 11 |
| | lbs/day | -- | -- | | 41 | 5.0 |
| Lead | µg/L | -- | -- | 170 | 68 | 17 |
| | lbs/day | -- | -- | | 32 | 8.0 |
| Mercury | µg/L | -- | -- | 3.4 | 1.36 | 0.34 |
| | lbs/day | -- | -- | | 0.64 | 0.16 |
| Nickel | µg/L | -- | -- | 420 | 170 | 43 |
| | lbs/day | -- | -- | | 80 | 20 |
| Silver | µg/L | -- | -- | 58 | 23 | 4.8 |
| | lbs/day | -- | -- | | 11 | 2.2 |
| Zinc | µg/L | -- | -- | 1600 | 620 | 110 |
| | lbs/day | -- | -- | | 290 | 52 |
| Cyanide | µg/L | -- | -- | 85 | 34 | 8.5 |
| | lbs/day | -- | -- | | 16 | 4.0 |
| Total Chlorine | µg/L | -- | -- | 510 | 68 | 17 |

**Table 7. Effluent Limits for DP 001 at M-001**

| Parameter | Units | Effluent Limitations | | | | |
|---|---|---|---|---|---|---|
| | | Average Monthly | Average Weekly | Instantaneous Maximum | Daily Maximum | 6-Month Median |
| Residual | lbs/day | -- | -- | | 32 | 8.0 |
| Chronic Toxicity[b] | TUc | -- | -- | ---- | 8.5 | ---- |
| Ammonia-Nitrogen | µg/L | -- | -- | 51,000 | 20,400 | 5,100 |
| | lbs/day | -- | -- | | 960 | 2550 |
| Phenolic Compounds (non-chlorinated)[c] | µg/L | 255 | -- | 2,600 | 1,000 | 250 |
| | lbs/day | 120 | -- | | 480 | 120 |
| Chlorinated Phenolics[d] | µg/L | 8.5 | -- | 85 | 34 | 8.5 |
| | lbs/day | 4 | -- | | 16 | 4 |

Values rounded to two significant figures. To be conservative, 6-month median, daily maximum and instantaneous maximum mass emission values are computed using seawater desalination facility flow (filter backwash, concentrated seawater and subsequent rinse wastewater) of 56.59 MGD, consistent with mass emission requirements established in Order No. R8-2006-0034.

a Table A of the Ocean Plan requires dischargers to, as a monthly average, remove 75% of suspended solids from the influent stream before discharging wastewater to the Pacific Ocean, except that the effluent limitation to be met shall not be less than 60 mg/L. Because this Facility is not a POTW, an effluent limitation of 60 mg/L is appropriate and established for the Facility's discharge.

b The chronic toxicity of the effluent shall be expressed and reported in TUc, where TUc = 100/NOEC. The No Observed Effect Concentration (NOEC) is the highest effluent concentration to which organisms are exposed in a chronic test, that causes no observable adverse effect on the test organisms (e.g., the highest concentration of toxicant to which the values for the observed responses are not statistically significantly different from the controls).

c Non-chlorinated phenolic compounds represent the sum of 2,4-dimethylphenol, 4,6-dinitro-2-methylphenol,2,4-dinitrophenol, 2-methylphenol, 4-methylphenol, 2-nitrophenol, 4-nitrophenol, and phenol.

d Chlorinated phenolic compounds represent the sum of 4-chloro-3-methylphenol, 2-chlorophenol, pentachlorophenol, 2,4,5-trichlorophenol, and 2,4,6-trichlorophenol.

2. The pH of the wastes discharged shall be at all times within the range of 6.0 to 9.0 pH units.

3. The temperature of wastes discharged shall not exceed the natural temperature of the receiving waters, as measured by the ocean intake water temperature, by more than 20°F.

4. The total daily discharge flow from the Facility, including concentrated seawater, filter backwash water and RO cleaning solutions subsequent rinse wastewater, shall not exceed the actual intake pumps daily average flow multiplied by a factor of 0.447 (whether AES or the Discharger is operating those pumps). The Discharger shall implement measures to assure that the actual intake pumps daily average flow is monitored and recorded.

5. The waste discharge must be essentially free of:
   a. Material that is floatable or will become floatable upon discharge.
   b. Settleable material or substances that may form sediments that will degrade benthic communities or other aquatic life.
   c. Substances that will accumulate to toxic levels in marine waters, sediments or biota.
   d. Substances that significantly decrease the natural light to benthic communities and other marine life.
   e. Materials that result in aesthetically undesirable discoloration of the ocean surface.

6. Toxicity Requirements

   There shall be no acute or chronic toxicity in the effluent after mixing with ambient seawater in a ratio of 1 to 7.5 nor shall the effluent cause any chronic toxicity in the receiving water. All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in human, plant, animal, or indigenous aquatic life.

   a. Definition of Chronic Toxicity

      The chronic toxicity of the effluent shall be expressed and reported in TUc, where TUc = 100/NOEC. The No Observed Effect Concentration (NOEC) is the highest effluent concentration to which organisms are exposed in a chronic test, that causes no observable adverse effect on the test organisms (e.g., the highest concentration of toxicant to which the values for the observed responses are not statistically significantly different from the controls). In addition, NOEC and IC25/EC25 values in percent effluent shall also be reported. For this discharge, chronic toxicity is defined as an exceedance of the chronic toxicity effluent limitation specified in Discharge Specification A.1.a.

   b. The Discharger shall conduct chronic toxicity monitoring of discharges, as specified in Attachment E - Monitoring and Reporting Program (M&RP).

   c. The Discharger shall develop and submit to the Regional Water Board an Initial Investigation Toxicity Reduction Evaluation (IITRE) work plan within 90 days of the effective date of this permit. This workplan shall describe the steps the Discharger intends to follow if required by Toxicity Requirement d., below. The work plan shall include at a minimum:

1) A description of the investigation and evaluation techniques that will be used to identify potential causes/sources of the exceedance, effluent variability, and/or efficiency of the treatment system in removing toxic substances. This shall include a description of an accelerated chronic toxicity testing program.

2) A description of the methods to be used for investigating and maximizing in-house treatment efficiency and good housekeeping practices.

3) A description of the evaluation process to be used to determine if implementation of a more detailed TRE/TIE is necessary.

d. The Discharger shall implement the IITRE work plan whenever the results of chronic toxicity tests of the effluent exceed:

1) A two month median value of 8.5 TUc for survival or reproduction endpoint or,

2) Any single test value of 14.5 TUc for survival endpoint.

e. The Discharger shall develop a detailed Toxicity Reduction Evaluation and Toxicity Identification Evaluation (TRE/TIE) work plan that shall describe the steps the Discharger intends to follow if the implemented IITRE fails to identify the cause of, or rectify, the toxicity.

f. The Discharger shall use as guidance, at a minimum, EPA manuals EPA/600/2-88/070 (industrial), EPA/600/4-89-001A (municipal), EPA/600/6-91/005F (Phase I), EPA/600/R-92/080 (Phase II), and EPA-600/R-92/081 (Phase III) to identify the cause(s) of toxicity. If, during the life of this Order, the aforementioned EPA manuals are revised or updated, the revised/updated manuals may also be used as guidance. The detailed TRE/TIE work plan shall include:

1) Further actions to investigate and identify the cause of toxicity;

2) Actions the Discharger will take to mitigate the impact of the discharge and to prevent the recurrence of toxicity; and

3) A schedule for these actions.

g. The Discharger shall implement the TRE/TIE work plan if the IITRE fails to identify the cause of, or rectify, the toxicity, or if in the opinion of the Executive Officer the IITRE does not adequately address an identified toxicity problem.

h. The Discharger shall assure that adequate resources are available to implement the required TRE/TIE.

### B. Land Discharge Specifications - N/A

### C. Reclamation Specifications - N/A

### D. Storm Water Discharge Specifications

1. Storm water[4] discharges shall not:

   a. Cause or contribute to a violation of any applicable water quality standards contained in the Basin Plan, or in the State or Federal regulations.

   b. Cause or threaten to cause pollution, contamination, or nuisance.

   c. Contain a hazardous substance equal to or in excess of a reportable quantity listed in 40 CFR Part 117 and/or 40 CFR Part 302.

   d. Adversely impact human health or the environment.

   e. Result in noncompliance with the lawful requirements of municipalities, counties, drainage districts, and other local agencies on storm water discharges into storm drain systems or other courses under their jurisdiction.

2. The Discharger must update and implement the Storm Water Pollution Prevention Plan for the Facility in accordance with Attachment "J" of this Order.

## V. RECEIVING WATER LIMITATIONS

### A. Surface Water Limitations

1. Receiving water limitations are based upon water quality objectives contained in the Ocean Plan. As such, they are a required part of this Order. Unless specifically excepted by this Order, ***the wastewater discharged at DP 001*** shall not cause the following in the receiving waters of the Pacific Ocean:

   a. Thermal Characteristics

      1) Temperature increases in the natural water by more than 4°F at (a) the shoreline, (b) the surface of any ocean substrate, or (c) the ocean surface beyond 1,000 feet from the discharge system. The surface temperature

---

4 *Storm water means storm water runoff and surface runoff and drainage.*

limitation shall be maintained at least 50 percent of the duration of any complete tidal cycle.

2) The maximum discharge temperature shall not exceed the natural temperature of receiving waters by more than 20°F.

3) The discharge shall occur at a sufficient distance from the areas of special biological significance to assure the maintenance of natural temperature in these areas.

4) The discharge shall occur away from the shoreline to achieve dispersion through the vertical water column.

b. Physical Characteristics

1) Floating particulates and grease and oil shall not be visible.

2) The discharge of waste shall not cause aesthetically undesirable discoloration of the ocean surface.

3) Natural light shall not be significantly reduced at any point outside the initial dilution zone as the result of the discharge of waste.

4) The rate of deposition of inert solids and the characteristics of inert solids in ocean sediments shall not be changed such that benthic communities are degraded.

c. Chemical Characteristics

1) The dissolved oxygen concentration shall not at any time be depressed more than 10 percent from that which occurs naturally, as the result of the discharge of oxygen demanding waste materials.

2) The pH shall not change at any time more than 0.2 units from that which occurs naturally.

3) The dissolved sulfide concentration of waters in and near sediments shall not significantly increase above that which is present under natural conditions.

4) The discharge shall not increase the concentration of substances set forth in Chapter II, Table B, in marine sediments to levels which would degrade indigenous biota.

5) The concentration of organic materials in marine sediments shall not increase to levels which would degrade marine life.

6) Nutrient materials shall not cause objectionable aquatic growths or degrade indigenous biota.

7) There shall be no acute or chronic toxicity in the effluent after mixing with ambient seawater in a ratio of 1 to 7.5, nor shall the effluent cause any chronic toxicity in the receiving water. All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in human, plant, animal, or indigenous aquatic life.

d. Biological Characteristics

1) Marine communities, including vertebrate, invertebrate, and plant species shall not be degraded.

2) The natural taste, odor, and color of fish, shellfish, or other marine resources used for human consumption shall not be altered.

3) The concentration of organic materials in fish, shellfish or other marine resources used for human consumption shall not bioaccumulate to levels that are harmful to human health.

e. Radioactivity

Discharge of radioactive waste, which meets the definition of "pollutant" at 40 CFR 122.2, shall not degrade marine life.

2. General Specifications

a. The Discharger shall take all reasonable steps to minimize any adverse impact to receiving waters resulting from noncompliance with any effluent limitations specified in this Order, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

b. The wastewater discharged shall not cause any visible oil, grease, scum, floating, or suspended material or foam in the receiving water, nor cause the receiving water to have an objectionable odor.

c. The wastewater discharged shall not cause aesthetically undesirable discoloration of the ocean surface.

d. The wastewater discharged shall not cause the transmittance of natural light to be significantly[5] reduced.

e. The wastewater discharged shall not cause the rate of deposition of inert solids and the characteristics of inert solids in ocean sediments to be changed such that benthic communities are degraded.

f. Pollutants not specifically mentioned and limited in this Order shall not be discharged at levels that will bioaccumulate in aquatic resources to levels which are harmful to human health.

### B. Groundwater limitations - N/A

## VI. PROVISIONS

### A. Standard Provisions

1. **Standard Provisions.** The Discharger shall comply with all *State and Federal Standard Provisions* included in Attachment D of this Order.

2. **Regional Water Board Standard Provisions.** The Discharger shall comply with the following provisions:

   a. Neither the treatment nor the discharge of waste shall create, or threaten to create, a nuisance or pollution as defined by Section 13050 of the California Water Code.

   b. This Order is not transferable to any person except after notice to and approval by the Executive Officer. The Executive Officer may require modification or revocation and reissuance of this Order to change the name of the Discharger and incorporate such other requirements as may be necessary under the Clean Water Act.

   c. The Discharger shall submit a separate Report of Waste Discharge 180 days before using source water for desalination other than seawater from the HBGS's cooling water discharge pipeline.

   d. The Discharger shall maintain a copy of this Order at the site so that it is available to site operating personnel at all times. Key operating personnel shall be familiar with its content.

---

[5] *Significant difference is defined in the Ocean Plan as a statistically significant difference in the means of two distributions of sampling results at the 95 percent confidence level.*

e. The Discharger shall comply with all of the terms, requirements and conditions of this Order. Any violation of this Order constitutes a violation of the CWC and/or may constitute a violation of the CWA and its regulations, and is grounds for enforcement action, termination of the Order, revocation and reissuance of the Order, or modification, or for denial of an application for modification, or reissuance of the Order; or a combination thereof.

f. The Discharger shall furnish, within a reasonable time, any information the Regional Water Board or EPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Order. The Discharger shall also furnish to the Regional Water Board, upon request, copies of records required to be kept by this Order.

g. The Discharger shall file with the Regional Water Board a separate Report of Waste Discharge within 180 days of receipt of notification that the HBGS is permanently ceasing operations of the once through cooling water system and/or if HBGS is permanently ceasing electricity production at the current site.

h. The Discharger shall give advance notice to the Regional Water Board as soon as possible of any planned physical alterations or additions to the permitted facility.

i. The Discharger shall take all reasonable steps to minimize or prevent any discharge that has a reasonable likelihood of adversely affecting human health or the environment.

j. The Discharger shall, at all times, properly operate and maintain all facilities and systems of treatment and control, including disposal facilities, and related appurtenances which are installed or used by the Discharger to achieve compliance with this Order. Proper operation and maintenance also includes adequate laboratory controls, appropriate quality assurance procedures, effective performance, adequate funding, adequate staffing and training, and adequate process controls. This provision requires the operation of back up or auxiliary facilities or similar systems which are installed by a Discharger only when the operation is necessary to achieve compliance with the conditions of the Order.

k. The requirements prescribed herein do not authorize the commission of any act causing injury to the property of another, nor protect the Discharger from his liabilities under federal, state, or local laws, nor guarantee the Discharger a capacity right in the receiving waters.

l. Bypass (the intentional diversion of waste streams from any portion of a treatment facility) is prohibited unless it is permitted under the terms of this Order. The Regional Water Board may take enforcement action against the Discharger for unpermitted bypass unless:

   1) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage. (Severe property damage means substantial physical damage to property, damage to the treatment facilities that causes them to

become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production);

2) There were no feasible alternatives to bypass, such as the use of auxiliary treatment facilities, retention of untreated waste, or maintenance during normal periods of equipment down time. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass that could occur during normal periods of equipment down time or preventive maintenance; and

3) The Discharger submitted a notice at least ten days in advance of the need for a bypass to the appropriate Regional Water Board. The Discharger may allow a bypass to occur that does not cause effluent limitations to be exceeded, but only if it is for essential maintenance to assure efficient operation. In such a case, the above bypass conditions are not applicable. The Discharger shall promptly notify the Regional Water Board and the EPA within 24 hours of each such bypass.

m. It shall not be a defense for the Discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Order.

n. The Discharger shall take all reasonable steps to minimize any adverse impact to receiving waters resulting from noncompliance with any requirements specified in this Order, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

o. The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this Order shall not be affected thereby.

p. Collected screenings, sludge, and other solids removed from liquid wastes shall be disposed of in a manner approved by the Regional Water Board's Executive Officer.

q. In the event of any change in control or ownership of land or waste discharge facility presently owned or controlled by the Discharger, the Discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be forwarded to the Regional Water Board.

r. Failure to comply with provisions or requirements of this Order, or violation of other applicable laws or regulations governing discharges from this facility, may subject the Discharger to administrative or civil liabilities, criminal penalties, and/or other enforcement remedies to ensure compliance. Additionally, certain violations may subject the Discharger to civil or criminal enforcement from appropriate local, state, or federal law enforcement entities.

s. In the event the Discharger does not comply or will be unable to comply for any reason, with any prohibition, or receiving water limitation of this Order, the Discharger shall notify the Regional Water Board by telephone (951) 782-4130 within 24 hours of having knowledge of such noncompliance, and shall confirm this notification in writing within five days, unless the Regional Water Board waives confirmation. The written notification shall state the nature, time, duration, and cause of noncompliance, and shall describe the measures being taken to remedy the current noncompliance and, prevent recurrence including, where applicable, a schedule of implementation. Other noncompliance requires written notification, as above, at the time of the normal monitoring report.

## B. Monitoring and Reporting Program Requirements

The Discharger shall comply with the Monitoring and Reporting Program, and future revisions thereto, in Attachment E of this Order. This monitoring and reporting program may be modified by the Executive Officer at any time during the term of this Order, and may include an increase in the number of parameters to be monitored, the frequency of the monitoring or the number and size of samples to be collected. Any increase in the number of parameters to be monitored, the frequency of the monitoring or the number and size of samples to be collected may be reduced back to the levels specified in the original monitoring and reporting program at the discretion of the Executive Officer.

## C. Special Provisions

### 1. Reopener Provisions

a. This Order may be reopened to address any changes in State or federal adopted rules, policies or regulations that would affect the quality requirements for the discharges.

b. This Order may be reopened for modification to include an effluent limitation if monitoring establishes that the discharge causes, has the reasonable potential to cause, or contributes to an excursion above an Ocean Plan Table B water quality objective.

c. This Order may be reopened to include effluent limitations for pollutants determined to be present in the discharge in concentrations that pose a reasonable potential to cause or contribute to violations of water quality objectives.

d. This Order may be reopened and modified in accordance with the requirements set forth at 40 CFR 122 and 124, to include the appropriate conditions or limits to address demonstrated effluent toxicity based on newly available information, or to implement any EPA-approved new State water quality standards applicable to effluent toxicity.

e. This Order may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Discharger for modification, revocation and reissuance, or termination of this Order or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

f. This Order will be reopened to address physical or operational alterations to the permitted facility that would affect the requirements for discharges from the facility.

**2. Special Studies, Technical Reports and Additional Monitoring Requirements - N/A**

**3. Best Management Practices and Pollution Prevention**

a. The Discharger shall implement Best Management Practices to control the discharge of pollutants in stormwater discharges associated with industrial activities.

b. Pollutant Minimization Program

Reporting protocols in the Monitoring and Reporting Program, Attachment E, Section X.B.4 describe sample results that are to be reported as Detected but Not Quantified (DNQ) or Not Detected (ND). Definitions for a reported Minimum Level (ML) and Method Detection Limit (MDL) are provided in Attachment A. These reporting protocols and definitions are used in determining the need to conduct a Pollution Minimization Program (PMP) as follows:

The Discharger shall be required to develop and conduct a PMP as further described below when there is evidence (e.g., sample results reported as DNQ when the effluent limitation is less than the MDL, sample results from analytical methods more sensitive than those methods required by this Order, presence of whole effluent toxicity, health advisories for fish consumption, results of benthic or aquatic organism tissue sampling) that a pollutant is present in the effluent above an effluent limitation and either:

1) The concentration of the pollutant is reported as DNQ and the effluent limitation is less than the reported ML; or

2) The concentration of the pollutant is reported as ND and the effluent limitation is less than the MDL.

The goal of the PMP shall be to reduce all potential sources of a pollutant through pollutant minimization (control) strategies, including pollution prevention measures as appropriate, to maintain the effluent concentration at or below the

effluent limitation. Pollution prevention measures may be particularly appropriate for persistent bioaccumulative priority pollutants where there is evidence that beneficial uses are being impacted. The Regional Water Board may consider cost-effectiveness when establishing the requirements of a PMP. The completion and implementation of a Pollution Prevention Plan, if required pursuant to CWC Section 13263.3(d), shall be considered to fulfill the PMP requirements.

The PMP shall include, but not be limited to, the following actions and submittals acceptable to the Regional Water Board:

1. An annual review and semi-annual monitoring of potential sources of the reportable pollutant(s), which may include fish tissue monitoring and other bio-uptake sampling;
2. Quarterly monitoring for the reportable pollutant(s) in the influent to the wastewater treatment system;
3. Submittal of a control strategy designed to proceed toward the goal of maintaining concentrations of the reportable pollutant(s) in the effluent at or below the effluent limitation;
4. Implementation of appropriate cost-effective control measures for the reportable pollutant(s), consistent with the control strategy; and
5. An annual status report that shall be sent to the Regional Water Board including:
   a. All PMP monitoring results for the previous year;
   b. A list of potential sources of the reportable pollutant(s);
   c. A summary of all actions undertaken pursuant to the control strategy; and
   d. A description of actions to be taken in the following year.

**4. Construction, Operation and Maintenance Specifications**

The Discharger shall develop an "Operation and Maintenance Manual (O&M Manual)". If an O&M Manual has been developed, the Discharger shall update it as necessary to conform with latest plant changes and requirements. The O&M Manual shall be readily available to operating personnel onsite. The O&M Manual shall include the following:

a. Detailed description of safe and effective operation and maintenance of treatment processes, process control instrumentation and equipment.
b. Description of laboratory and quality assurance procedures.
c. Process and equipment inspection and maintenance schedules,

d. Description of safeguards to assure that, should there be reduction, loss, or failure of electric power, the Discharger will be able to comply with the terms and conditions of this Order.
e. Description of preventive (fail-safe) and contingency (cleanup) plans for controlling accidental discharges, and for minimizing the effect of such events. These plans shall identify the possible sources (such as loading and storage areas, power outage, waste treatment unit failure, process equipment failure, tank and piping failure) of accidental discharges, untreated or partially treated waste bypass, and polluted drainage.

**5. Other Special Provisions - N/A**

**6. Compliance Schedules - N/A**

## VII. COMPLIANCE DETERMINATION

Compliance with the effluent limitations contained in Section IV. of this Order will be determined as specified below:

**A. General.**
Compliance with effluent limitations for reportable pollutants shall be determined using sample reporting protocols defined in the MRP (Attachment E) and Attachment A of this Order. For purposes of reporting and administrative enforcement by the Regional and State Water Boards, the Discharger shall be deemed out of compliance with effluent limitations if the concentration of the reportable pollutant in the monitoring sample is greater than the effluent limitation and greater than or equal to the reported reporting level (RL).

**B. Multiple Sample Data.**
When determining compliance with an AMEL or MDEL for priority pollutants and more than one sample result is available, the Discharger shall compute the arithmetic mean unless the data set contains one or more reported determinations of "Detected, but Not Quantified" (DNQ) or "Not Detected" (ND). In those cases, the Discharger shall compute the median in place of the arithmetic mean in accordance with the following procedure:

1. The data set shall be ranked from low to high, ranking the reported ND determinations lowest, DNQ determinations next, followed by quantified values (if any). The order of the individual ND or DNQ determinations is unimportant.

2. The median value of the data set shall be determined. If the data set has an odd number of data points, then the median is the middle value. If the data set has an even number of data points, then the median is the average of the two values around the middle unless one or both of the points are ND or DNQ, in which case

the median value shall be the lower of the two data points where DNQ is lower than a value and ND is lower than DNQ.

**C. Average Monthly Effluent Limitation (AMEL).**
If the average (or when applicable, the median determined by subsection B above for multiple sample data) of daily discharges over a calendar month exceeds the AMEL for a given parameter, this will represent a single violation, though the Discharger will be considered out of compliance for each day of that month for that parameter (e.g., resulting in 31 days of non-compliance in a 31-day month). If only a single sample is taken during the calendar month and the analytical result for that sample exceeds the AMEL, the Discharger will be considered out of compliance for that calendar month. The Discharger will only be considered out of compliance for days when the discharge occurs. For any one calendar month during which no sample (daily discharge) is taken, no compliance determination can be made for that calendar month.

**D. Maximum Daily Effluent Limitation (MDEL).**
If a daily discharge or when applicable, the median determined by subsection B above for multiple sample data of a daily discharge exceeds the MDEL for a given parameter, the Discharger will be considered out of compliance for that parameter for that 1 day only within the reporting period. For any 1 day during which no sample is taken, no compliance determination can be made for that day.

**E. Instantaneous Minimum Effluent Limitation.**
If the analytical result of a single grab sample is lower than the instantaneous minimum effluent limitation for a parameter, the Discharger will be considered out of compliance for that parameter for that single sample. Non-compliance for each sample will be considered separately (e.g., the results of two grab samples taken within a calendar day that both are lower than the instantaneous minimum effluent limitation would result in two instances of non-compliance with the instantaneous minimum effluent limitation).

**F. Instantaneous Maximum Effluent Limitation.**
If the analytical result of a single grab sample is higher than the instantaneous maximum effluent limitation for a parameter, the Discharger will be considered out of compliance for that parameter for that single sample. Non-compliance for each sample will be considered separately (e.g., the results of two grab samples taken within a calendar day that both exceed the instantaneous maximum effluent limitation would result in two instances of non-compliance with the instantaneous maximum effluent limitation).

**G. Six-month Median Effluent Limitation.**
If the median of daily discharges over any 180-day period exceeds the six-month median effluent concentration limitation for a given parameter, the Discharger will be considered out of compliance for each day of that 180-day period for that parameter. The next assessment of compliance will occur after the next sample is taken. If only a

single sample is taken during a given 180-day period and the analytical result for that sample exceeds the six-month median, the Discharger will be considered out of compliance for the 180-day period. For any 180-period during which no sample is taken, no compliance determination can be made for the six-month median limitation.

Similarly, compliance with the six-month median mass emissions limit shall be determined by comparing the calculated mass limit with calculated mass discharges. If mass discharges exceed the allowed mass discharges, the Discharger is not in compliance. The calculated mass discharges shall be determined by using the same equation in calculating the mass emission limit and using the allowable six-month median effluent concentration and the observed flow rate in millions of gallons per day.

## H. Mass and Concentration Limitations

Compliance with mass and concentration effluent limitations for the same parameter shall be determined separately with their respective limitations. When the concentration of a constituent in an effluent sample is determined to be "Not Detected" (ND) or "Detectable but not quantifiable" (DNQ), the corresponding mass emission rate (MER) determined from that sample concentration shall also be reported as "ND" or "DNQ".

## I. Ocean Plan Provisions for Table B Constituents

1. Sampling Reporting Protocols

   a) The Discharger shall report with each sample result the reported Minimum Level (ML) and the laboratory's current Method Detection Limit (MDL).

   b) The Discharger shall also report results of analytical determinations for the presence of chemical constituents in a sample using the following reporting protocols:

      i. Sample results greater than or equal to the reported ML must be reported "as measured" by the laboratory (i.e., the measured chemical concentration in the sample).

      ii. Sample results less than the reported ML, but greater than or equal to the laboratory's MDL, must be reported as "Detected, but Not Quantified", or DNQ. The laboratory must write the estimated chemical concentration of the sample next to DNQ as well as the words "Estimated Concentration" (may be shorted to Est. Conc.").

      iii. Sample results less than the laboratory's MDL must be reported as "Not Detected", or ND.

2. Compliance Determination

   Sufficient sampling and analysis shall be required to determine compliance with the effluent limitation.

   a) Compliance with Single-Constituent Effluent Limitations.

      The Discharger shall be deemed out of compliance with an effluent limitation or discharge specification if, based on reliable data, the concentration of the constituent in the monitoring sample is greater than the effluent limitation or discharge specification and greater than or equal to the ML.

   b) Compliance with Effluent Limitations Expressed as a Sum of Constituents.

      The Discharger shall be deemed out of compliance with an effluent limitation that applies to the sum of a group of chemicals (e.g., chlorinated phenolics) if, based on reliable data, the sum of the individual pollutant concentrations is greater than the effluent limitation. Individual pollutants of the group will be considered to have a concentration of zero if the constituent is reported as ND or DNQ.

   c) Mass Emission Rate. The mass emission rate (MER), in pounds per day, shall be obtained from the following calculation for any calendar day:

      Mass Emission Rate (lbs/day) = 8.34 x Q x C

In which Q and C are the flow rate in million gallons per day and the constituent concentration in mg/L, respectively, and 8.34 is a conversion factor (lbs/gallon of water). If a composite sample is taken, then C is the concentration measured in the composite sample and Q is the average flow rate occurring during the period over which the samples are composited.

## ATTACHMENT A – DEFINITIONS

**Acute Toxicity:**

a. Acute Toxicity (TUa)

Expressed in Toxic Units Acute (TUa)

$$TUa = \frac{100}{\text{96-hr LC } 50\%}$$

b. Lethal Concentration 50% (LC 50)

LC 50 (percent waste giving 50% survival of test organisms) shall be determined by static or continuous flow bioassay techniques using standard marine test species as specified in Appendix III. If specific identifiable substances in wastewater can be demonstrated by the discharger as being rapidly rendered harmless upon discharge to the marine environment, but not as a result of dilution, the LC 50 may be determined after the test samples are adjusted to remove the influence of those substances.

When it is not possible to measure the 96-hour LC 50 due to greater than 50 percent survival of the test species in 100 percent waste, the toxicity concentration shall be calculated by the expression:

$$TUa = \frac{\log (100 - S)}{1.7}$$

where:

S = percentage survival in 100% waste. If S > 99, TUa shall be reported as zero.

**Areas of Special Biological Significance (ASBS):** are those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All Areas of Special Biological Significance are also classified as a subset of STATE WATER QUALITY PROTECTION AREAS.

**Average Monthly Effluent Limitation (AMEL):** the highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.

**Average Weekly Effluent Limitation (AWEL):** the highest allowable average of daily discharges over a calendar week (Sunday through Saturday), calculated as the sum of all

daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.

**Chlordane** shall mean the sum of chlordane-alpha, chlordane-gamma, chlordene-alpha, chlordene-gamma, nonachlor-alpha, nonachlor-gamma, and oxychlordane.

**Chronic Toxicity:** This parameter shall be used to measure the acceptability of waters for supporting a healthy marine biota until improved methods are developed to evaluate biological response.

a. Chronic Toxicity (TUc)

Expressed as Toxic Units Chronic (TUc)

$$TUc = \frac{100}{NOEL}$$

b. No Observed Effect Level (NOEL)

The NOEL is expressed as the maximum percent effluent or receiving water that causes no observable effect on a test organism, as determined by the result of a critical life stage toxicity test listed in Appendix II.

**Daily Discharge:** Daily Discharge is defined as either: (1) the total mass of the constituent discharged over the calendar day (12:00 am through 11:59 pm) or any 24-hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g., concentration).

The daily discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day or other 24-hour period defined as a day) or by the arithmetic mean of analytical results from one or more grab samples taken over the course of the day.

For composite sampling, if 1 day is defined as a 24-hour period other than a calendar day, the analytical result for the 24-hour period will be considered as the result for the calendar day in which the 24-hour period ends.

**DDT** shall mean the sum of 4,4'DDT, 2,4'DDT, 4,4'DDE, 2,4'DDE, 4,4'DDD, and 2,4'DDD.

**Degrade.** Degradation shall be determined by comparison of the waste field and reference site(s) for characteristic species diversity, population density, contamination, growth anomalies, debility, or supplanting of normal species by undesirable plant and animal species. Degradation occurs if there are significant differences in any of three major biotic

groups, namely, demersal fish, benthic invertebrates, or attached algae. Other groups may be evaluated where benthic species are not affected, or are not the only ones affected.

**Detected, but Not Quantified (DNQ)** are those sample results less than the reported Minimum Level, but greater than or equal to the laboratory's MDL.

**Dichlorobenzenes** shall mean the sum of 1,2- and 1,3-dichlorobenzene.

**Downstream Ocean Waters** shall mean waters downstream with respect to ocean currents.

**Enclosed Bays** are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between headlands or outermost harbor works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. This definition includes but is not limited to: Humboldt Bay, Bodega Harbor, Tomales Bay, Drakes Estero, San Francisco Bay, Morro Bay, Los Angeles Harbor, Upper and Lower Newport Bay, Mission Bay, and San Diego Bay.

**Grab Sample.** A grab sample is an individual sample of a t least 100 mLs collected at a randomly selected time over a period not exceeding 15 minutes.

**HCH** shall mean the sum of the alpha, beta, gamma (lindane) and delta isomers of hexachlorocyclohexane.

**Initial Dilution** is the process which results in the rapid and irreversible turbulent mixing of wastewater with ocean water around the point of discharge.

For a submerged buoyant discharge, characteristic of most municipal and industrial wastes that are released from the submarine outfalls, the momentum of the discharge and its initial buoyancy act together to produce turbulent mixing. Initial dilution in this case is completed when the diluting wastewater ceases to rise in the water column and first begins to spread horizontally.

For shallow water submerged discharges, surface discharges, and nonbuoyant discharges, characteristic of cooling water wastes and some individual discharges, turbulent mixing results primarily from the momentum of discharge. Initial dilution, in these cases, is considered to be completed when the momentum induced velocity of the discharge ceases to produce significant mixing of the waste, or the diluting plume reaches a fixed distance from the discharge to be specified by the Regional Board, whichever results in the lower estimate for initial dilution.

**Instantaneous Maximum Effluent Limitation:** the highest allowable value for any single grab sample or aliquot (i.e., each grab sample or aliquot is independently compared to the instantaneous maximum limitation).

**Instantaneous Minimum Effluent Limitation:** the lowest allowable value for any single grab sample or aliquot (i.e., each grab sample or aliquot is independently compared to the instantaneous minimum limitation).

**Mariculture** is the culture of plants and animals in marine waters independent of any pollution source.

**Material:** (a) In common usage: (1) the substance or substances of which a thing is made or composed (2) substantial; (b) For purposes of the California Ocean Plan relating to waste disposal, dredging and the disposal of dredged material and fill, MATERIAL means matter of any kind or description which is subject to regulation as waste, or any material dredged from the navigable waters of the United States.

**Maximum Daily Effluent Limitation (MDEL):** the highest allowable daily discharge of a pollutant.

**Method Detection Limit (MDL)** is the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero, as defined in title 40 of the Code of Federal Regulatons, Part 136 Attachment B.

**Minimum Level (ML)** is the concentration at which the entire analytical system must give a recognizable signal and acceptable calibration point. The ML is the concentration in a sample that is equivalent to the concentration of the lowest calibration standard analyzed by a specific analytical procedure, assuming that all the method-specified sample weights, volumes, and processing steps have been followed.

**Natural Light:** Reduction of natural light may be determined by the Regional Water Board by measurement of light transmissivity or total irradiance, or both, according to the monitoring needs of the Regional Water Board.

**Not Detected (ND)** are those sample results less than the laboratory's MDL.

**Ocean Waters** are the territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. If a discharge outside the territorial waters of the State could affect the quality of the waters of the state, the discharge may be regulated to assure no violation of the Ocean Plan will occur in ocean waters.

**Pollutant Minimization Program (PMP)** means waste minimization and pollution prevention actions that include, but are not limited to, product substitution, waste stream recycling, alternative waste management methods, and education of the public and businesses. The goal of the PMP shall be to reduce all potential sources of Ocean Plan Table B pollutants through pollutant minimization (control) strategies, including pollution prevention measures as appropriate, to maintain the effluent concentration at or below the water quality-based effluent limitation. Pollution prevention measures may be particularly appropriate for persistent bioaccumulative priority pollutants where there is evidence that beneficial uses are being impacted. The Regional Water Board may consider cost effectiveness when establishing the requirements of a PMP. The completion and implementation of a Pollution Prevention Plan, if

required pursuant to Water Code section 13263.3(d), shall be considered to fulfill the PMP requirements.

**Practical Quantitation Level (PQL)** is the lowest concentration of a substance that can be determined within ± 20 percent of the true concentration by 75 percent of the analytical laboratories tested in a performance evaluation study. Alternatively, if performance data are not available, the PQL is the method detection limit (MDL) x 5 for carcinogens and MDL x 10 for noncarcinogens.

**Reported Minimum Level** is the ML (and its associated analytical method) chosen by the Discharger for reporting and compliance determination from the MLs included in this Order. The MLs included in this Order correspond to approved analytical methods for reporting a sample result that are selected by the Regional Water Board either from Appendix II of the Ocean Plan in accordance with section III.C.5.a. of the Ocean Plan or established in accordance with section III.C.5.b. of the Ocean Plan. The ML is based on the proper application of method-based analytical procedures for sample preparation and the absence of any matrix interferences. Other factors may be applied to the ML depending on the specific sample preparation steps employed. For example, the treatment typically applied in cases where there are matrix-effects is to dilute the sample or sample aliquot by a factor of ten. In such cases, this additional factor must be applied to the ML in the computation of the reported ML.

**Shellfish** are organisms identified by the California Department of Public Health as shellfish for public health purposes (i.e., mussels, clams and oysters).

**Significant Difference** is defined as a statistically significant difference in the means of two distributions of sampling results at the 95 percent confidence level.

**Six-month Median Effluent Limitation:** the highest allowable moving median of all daily discharges for any 180-day period.

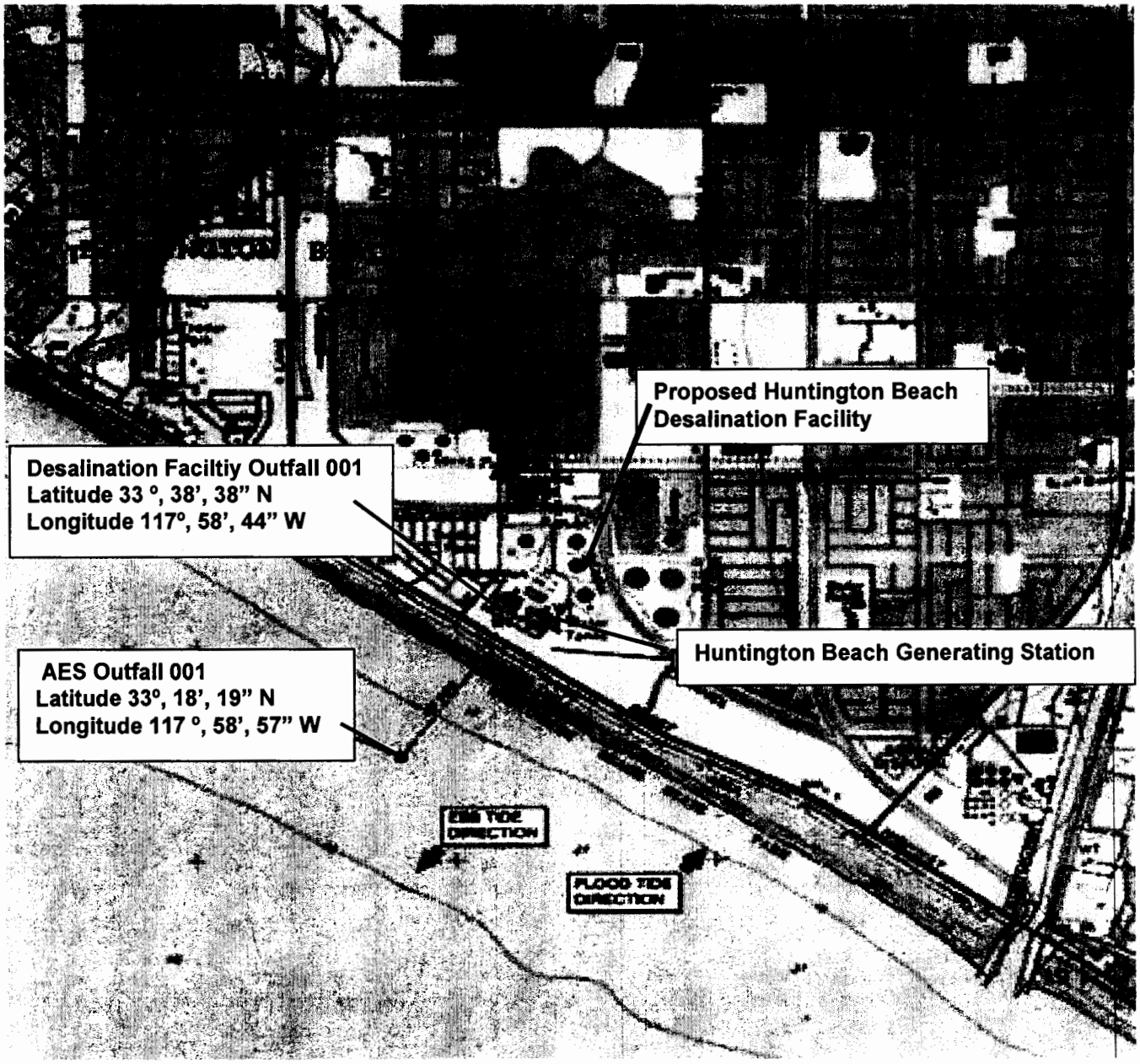
**State Water Quality Protection Areas (SWQPAs)** are non-terrestrial marine or estuarine areas designated to protect marine species or biological communities from an undesirable alteration in natural water quality. All AREAS OF SPECIAL BIOLOGICAL SIGNIFICANCE (ASBS) that were previously designated by the State Water Board in Resolution No.s 74-28, 74-32, and 75-61 are now also classified as a subset of State Water Quality Protection Areas and require special protections afforded by the Ocean Plan.

**Toxicity Reduction Evaluation (TRE)** is a study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate. (A TIE is a set of procedures to identify the specific chemical(s) responsible for toxicity. These procedures are performed in three

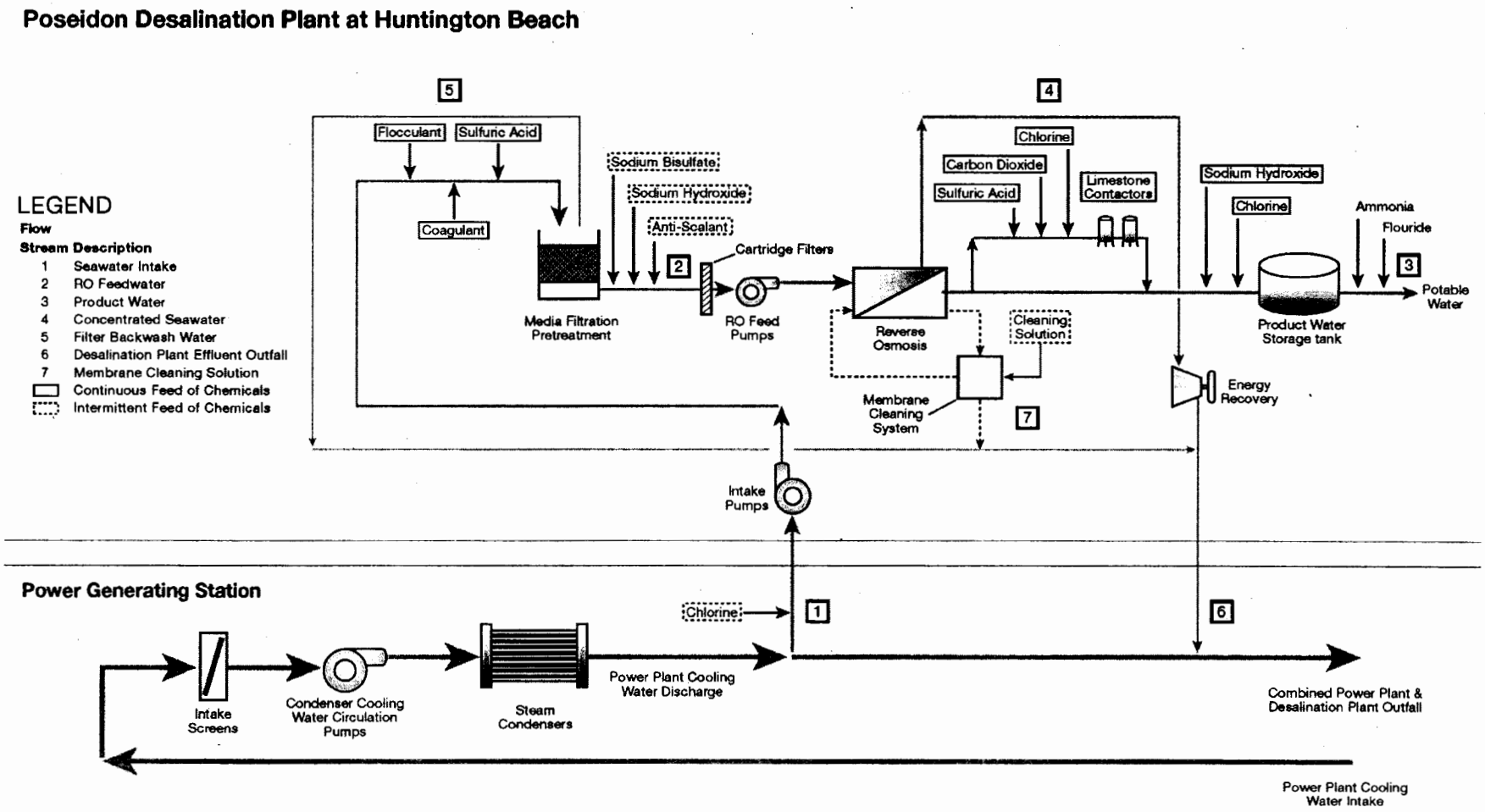
phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.)

**Waste:** As used in the Ocean Plan, waste includes a Discharger's total discharge, of whatever origin, i.e., gross, not net, discharge.

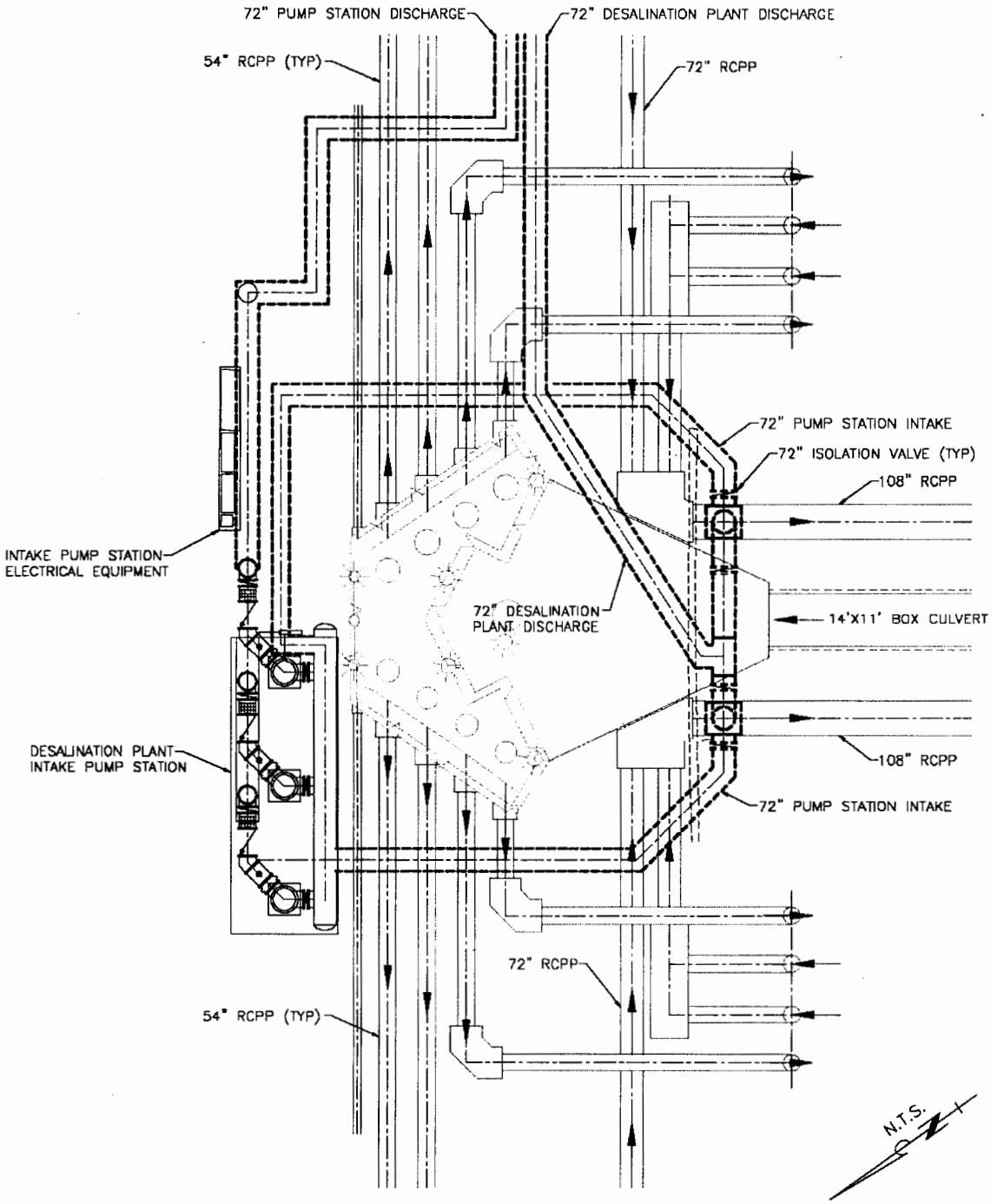
# ATTACHMENT B – VICINITY MAP



# ATTACHMENT C1 – FLOW SCHEMATIC



# ATTACHMENT C2 – INTAKE/DISCHARGE POINT




**Desalination Facility/HBGS Cooling Water Connection**

# ATTACHMENT D – FEDERAL STANDARD PROVISIONS

## I. STANDARD PROVISIONS – PERMIT COMPLIANCE

### A. Duty to Comply

1. The Discharger must comply with all of the conditions of this Order. Any noncompliance constitutes a violation of the Clean Water Act (CWA) and the California Water Code and is grounds for enforcement action, for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application. (40 C.F.R. § 122.41(a).)

2. The Discharger shall comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions, even if this Order has not been modified to incorporate the requirement. (40 C.F.R. § 122.41(a)(1).)

### B. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a Discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Order. (40 C.F.R. § 122.41(c).)

### C. Duty to Mitigate

The Discharger shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this Order that has a reasonable likelihood of adversely affecting human health or the environment. (40 C.F.R. § 122.41(d)

### D. Proper Operation and Maintenance

The Discharger shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Discharger to achieve compliance with the conditions of this Order. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems that are installed by a Discharger only when necessary to achieve compliance with the conditions of this Order. (40 C.F.R. § 122.41(e).)

## E. Property Rights

1. This Order does not convey any property rights of any sort or any exclusive privileges. (40 C.F.R. § 122.41(g).)

2. The issuance of this Order does not authorize any injury to persons or property or invasion of other private rights, or any infringement of state or local law or regulations. (40 C.F.R. § 122.5(c).)

## F. Inspection and Entry

The Discharger shall allow the Regional Water Quality Control Board, State Water Board, United States Environmental Protection Agency (USEPA), and/or their authorized representatives (including an authorized contractor acting as their representative), upon the presentation of credentials and other documents, as may be required by law, to (40 C.F.R. § 122.41(i);) Wat. Code( § 13383):

1. Enter upon the Discharger's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this Order (40 C.F.R. § 122.41(i)(1));

2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Order (40 C.F.R. § 122.41(i)(2));

3. Inspect and photograph, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order (40 C.F.R. § 122.41(i)(3));

4. Sample or monitor, at reasonable times, for the purposes of assuring Order compliance or as otherwise authorized by the CWA or the Water Code, any substances or parameters at any location. (40 C.F.R. § 122.41(i)(4).)

## G. Bypass

1. Definitions

   a. "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. (40 C.F.R. § 122.41(m)(1)(i).)

   b. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities, which causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production. (40 C.F.R. § 122.41(m)(1)(ii)

2. Bypass not exceeding limitations. The Discharger may allow any bypass to occur which does not cause exceedances of effluent limitations, but only if it is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions listed in Standard Provisions – Permit Compliance I.G.3, I.G.4, and I.G.5 below. (40 C.F.R. § 122.41(m)(2).)

3. Prohibition of bypass. Bypass is prohibited, and the Regional Water Board may take enforcement action against a Discharger for bypass, unless (40 C.F.R. § 122.41(m)(4)(i)):

   a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage (40 C.F.R. § 122.41 (m)(4)(i)(A));

   b. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass that occurred during normal periods of equipment downtime or preventive maintenance (40 C.F.R. § 122.41(m)(4)(i)(B)); and

   c. The Discharger submitted notice to the Regional Water Board as required under Standard Provision – Permit Compliance I.G.5 below. (40 C.F.R. § 122.41(m)(4)(i)(C).)

4. The Regional Water Board may approve an anticipated bypass, after considering its adverse effects, if the Regional Water Board determines that it will meet the three conditions listed in Standard Provisions – Permit Compliance I.G.3 above. (40 C.F.R. § 122.41(m)(4)(ii).)

5. Notice

   a. Anticipated bypass. If the Discharger knows in advance of the need for a bypass, it shall submit a notice, if possible at least 10 days before the date of the bypass. (40 C.F.R. § 122.41(m)(3)(i).)

   b. Unanticipated bypass. The Discharger shall submit notice of an unanticipated bypass as required in Standard Provisions - Reporting V.E below (24-hour notice). (40 C.F.R. § 122.41(m)(3)(ii).)

### H. Upset

Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Discharger. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. (40 C.F.R. § 122.41(n)(1).)

1. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of Standard Provisions – Permit Compliance I.H.2 below are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. (40 C.F.R. § 122.41(n)(2).)

2. Conditions necessary for a demonstration of upset. A Discharger who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs or other relevant evidence that (40 C.F.R. § 122.41(n)(3)):

   a. An upset occurred and that the Discharger can identify the cause(s) of the upset )(40 C.F.R. § 122.41(n)(3)(i));

   b. The permitted facility was, at the time, being properly operated (40 C.F.R. § 122.41(n)(3)(ii));

   c. The Discharger submitted notice of the upset as required in Standard Provisions – Reporting V.E.2.b below (24-hour notice) (40 C.F.R. § 122.41(n)(3)(iii)); and

   d. The Discharger complied with any remedial measures required under Standard Provisions – Permit Compliance I.C above. (40 C.F.R. § 122.41(n)(3)(iv).)

3. Burden of proof. In any enforcement proceeding, the Discharger seeking to establish the occurrence of an upset has the burden of proof. (40 C.F.R. § 122.41(n)(4).)

## II. STANDARD PROVISIONS – PERMIT ACTION

### A. General

This Order may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Discharger for modification, revocation and reissuance, or

termination, or a notification of planned changes or anticipated noncompliance does not stay any Order condition. (40 C.F.R. § 122.41(f).)

**B. Duty to Reapply**

If the Discharger wishes to continue an activity regulated by this Order after the expiration date of this Order, the Discharger must apply for and obtain a new permit. (40 C.F.R. § 122.41(b).)

**C. Transfers**

This Order is not transferable to any person except after notice to the Regional Water Board. The Regional Water Board may require modification or revocation and reissuance of the Order to change the name of the Discharger and incorporate such other requirements as may be necessary under the CWA and the Water Code. (40 C.F.R. § 122.41(l)(3);)( §122.61).)

## III. STANDARD PROVISIONS – MONITORING

**A.** Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. (40 C.F.R. § 122.41(j)(1).)

**B.** Monitoring results must be conducted according to test procedures under Part 136 or, in the case of sludge use or disposal, approved under Part 136 unless otherwise specified in Part 503 unless other test procedures have been specified in this Order. (40 C.F.R. §122.41(j)(4); § 122.44(i)(1)(iv).)

## IV. STANDARD PROVISIONS – RECORDS

**A.** Except for records of monitoring information required by this Order related to the Discharger's sewage sludge use and disposal activities, which shall be retained for a period of at least five years (or longer as required by Part 503), the Discharger shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the Regional Water Board Executive Officer at any time. (40 C.F.R. § 122.41(j)(2).)

**B. Records of monitoring information shall include:**

1. The date, exact place, and time of sampling or measurements (40 C.F.R. § 122.41(j)(3)(i));

2. The individual(s) who performed the sampling or measurements (40 C.F.R. § 122.41(j)(3)(ii));

3. The date(s) analyses were performed (40 C.F.R. § 122.41(j)(3)(iii));

4. The individual(s) who performed the analyses (40 C.F.R. § 122.41(j)(3)(iv));

5. The analytical techniques or methods used (40 C.F.R. § 122.41(j)(3)(v)); and

6. The results of such analyses. (40 C.F.R. § 122.41(j)(3)(vi).)

**C. Claims of confidentiality for the following information will be denied (40 C.F.R. § 122.7(b)):**

1. The name and address of any permit applicant or Discharger (40 C.F.R. § 122.7(b)(1)); and

2. Permit applications and attachments, permits and effluent data. (40 C.F.R. § 122.7(b)(2).)

## V. STANDARD PROVISIONS – REPORTING

### A. Duty to Provide Information

The Discharger shall furnish to the Regional Water Board, State Water Board, or USEPA within a reasonable time, any information which the Regional Water Board, State Water Board, or USEPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Order or to determine compliance with this Order. Upon request, the Discharger shall also furnish to the Regional Water Board, State Water Board, or USEPA copies of records required to be kept by this Order. (40 C.F.R. § 122.41(h); Water Code §13267.)

### B. Signatory and Certification Requirements

1. All applications, reports, or information submitted to the Regional Water Board, State Water Board, and/or USEPA shall be signed and certified in accordance with Standard Provisions – Reporting V.B.2, V.B.3, V.B.4, and V.B.5 below. (40 C.F.R. § 122.41(k).)

2. All permit applications shall be signed by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: (i) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the

regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures. (40 C.F.R. § 122.22(a)(1).)

3. All reports required by this Order and other information requested by the Regional Water Board, State Water Board, or USEPA shall be signed by a person described in Standard Provisions – Reporting V.B.2 above, or by a duly authorized representative of that person. A person is a duly authorized representative only if:

   a. The authorization is made in writing by a person described in Standard Provisions – Reporting V.B.2 above (40 C.F.R. § 122.22(b)(1));

   b. The authorization specified either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) (40 C.F.R. § 122.22(b)(2)); and

   c. The written authorization is submitted to the Regional Water Board, and State Water Board. (40 C.F.R. § 122.22(b)(3).)

4. If an authorization under Standard Provisions – Reporting V.B.3 above is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Standard Provisions – Reporting V.B.3 above must be submitted to the Regional Water Board, and State Water Board prior to or together with any reports, information, or applications, to be signed by an authorized representative. (40 C.F.R. § 122.22(c).)

5. Any person signing a document under Standard Provisions – Reporting V.B.2 or V.B.3 above shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." (40 C.F.R. § 122.22(d).)

## C. Monitoring Reports

1. Monitoring results shall be reported at the intervals specified in the Monitoring and Reporting Program (Attachment E) in this Order. (40 C.F.R. § 122.41(l)(4).)

2. Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the Regional Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. (40 C.F.R. § 122.41(l)(4)(i).)

3. If the Discharger monitors any pollutant more frequently than required by this Order using test procedures approved under Part 136 or, in the case of sludge use or disposal, approved under Part 136 unless otherwise specified in Part 503, or as specified in this Order, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Regional Water Board. (40 C.F.R. § 122.41(l)(4)(ii).)

4. Calculations for all limitations, which require averaging of measurements, shall utilize an arithmetic mean unless otherwise specified in this Order. (40 C.F.R. § 122.41(l)(4)(iii).)

## D. Compliance Schedules

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this Order, shall be submitted no later than 14 days following each schedule date. (40 C.F.R. § 122.41(l)(5).)

## E. Twenty-Four Hour Reporting

1. The Discharger shall report any noncompliance that may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the Discharger becomes aware of the circumstances. A written submission shall also be provided within five (5) days of the time the Discharger becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. (40 C.F.R. § 122.41(l)(6)(i).)

2. The following shall be included as information that must be reported within 24 hours under this paragraph (40 C.F.R. § 122.41(l)(6)(ii):

   a. Any unanticipated bypass that exceeds any effluent limitation in this Order. (40 C.F.R. § 122.41(l)(6)(ii)(A).)

   b. Any upset that exceeds any effluent limitation in this Order. (40 C.F.R. § 122.41(l)(6)(ii)(B).)

3. The Regional Water Board may waive the above-required written report under this provision on a case-by-case basis if an oral report has been received within 24 hours. (40 C.F.R. § 122.41(l)(6)(iii).)

## F. Planned Changes

The Discharger shall give notice to the Regional Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required under this provision only when (40 C.F.R. § 122.41(l)(1):

1. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in section 122.29(b) (40 C.F.R. § 122.41(l)(1)(i); or

2. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in this Order nor to notification requirements under section 122.42(a)(1) (see Additional Provisions—Notification Levels VII.A.1). (40 C.F.R. § 122.41(l)(1)(ii).)

3. The alteration or addition results in a significant change in the Discharger's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing

permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. (40 C.F.R. § 122.41(l)(1)(iii).)

**G. Anticipated Noncompliance**

The Discharger shall give advance notice to the Regional Water Board or State Water Board of any planned changes in the permitted facility or activity that may result in noncompliance with General Order requirements. (40 C.F.R. § 122.41(l)(2).)

**H. Other Noncompliance**

The Discharger shall report all instances of noncompliance not reported under Standard Provisions – Reporting V.C, V.D, and V.E above at the time monitoring reports are submitted. The reports shall contain the information listed in Standard Provision – Reporting V.E above. (40 C.F.R. § 122.41(l)(7).)

**I. Other Information**

When the Discharger becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Regional Water Board, State Water Board, or USEPA, the Discharger shall promptly submit such facts or information. (40 C.F.R. § 122.41(l)(8).)

## VI. STANDARD PROVISIONS – ENFORCEMENT

**A.** The Regional Water Board is authorized to enforce the terms of this permit under several provisions of the Water Code, including, but not limited to, sections 13385, 13386, and 13387

## VII. ADDITIONAL PROVISIONS – NOTIFICATION LEVELS

### A. Non-Municipal Facilities

Existing manufacturing, commercial, mining, and silvicultural Dischargers shall notify the Regional Water Board as soon as they know or have reason to believe (40 C.F.R. § 122.42(a)):

1. That any activity has occurred or will occur that would result in the discharge, on a routine or frequent basis, of any toxic pollutant that is not limited in this Order, if that discharge will exceed the highest of the following "notification levels" (40 C.F.R. § 122.42(a)(1)):

    a. 100 micrograms per liter (µg/L) (40 C.F.R. § 122.42(a)(1)(i));

    b. 200 µg/L for acrolein and acrylonitrile; 500 µg/L for 2,4-dinitrophenol and 2-methyl-4,6-dinitrophenol; and 1 milligram per liter (mg/L) for antimony (40 C.F.R. § 122.42(a)(1)(ii));

    c. Five (5) times the maximum concentration value reported for that pollutant in the Report of Waste Discharge (40 C.F.R. § 122.42(a)(1)(iii)); or

    d. The level established by the Regional Water Board in accordance with section 122.44(f). (40 C.F.R. § 122.42(a)(1)(iv).)

2. That any activity has occurred or will occur that would result in the discharge, on a non-routine or infrequent basis, of any toxic pollutant that is not limited in this Order, if that discharge will exceed the highest of the following "notification levels" (40 C.F.R. § 122.42(a)(2)):

    a. 500 micrograms per liter (µg/L) (40 C.F.R. § 122.42(a)(2)(i));

    b. 1 milligram per liter (mg/L) for antimony (40 C.F.R. § 122.42(a)(2)(ii));

    c. Ten (10) times the maximum concentration value reported for that pollutant in the Report of Waste Discharge (40 C.F.R. § 122.42(a)(2)(iii)); or

    d. The level established by the Regional Water Board in accordance with section 122.44(f). (40 C.F.R. § 122.42(a)(2)(iv).)

# ATTACHMENT E – MONITORING AND REPORTING PROGRAM

## Table of Contents

I. General Monitoring Provisions ..... E-2
  A. General Monitoring Provision ..... E-2
  B. Laboratory Certification ..... E-4
II. Monitoring Locations ..... E-4
III. Influent Monitoring Requirements ..... E-5
  A. Monitoring Location M-INF ..... E-5
IV. Effluent Monitoring Requirements ..... E-7
  A. Effluent Monitoring Location M-001 ..... E-7
V. Whole Effluent Toxicity Testing Requirements ..... E-10
  A. Toxicity Monitoring Requirements ..... E-10
VI. Land Discharge Monitoring Requirements - N/A ..... E-14
VII. Reclamation Monitoring Requirements - N/A ..... E-14
VIII. Receiving Water Monitoring Requirements ..... E-14
  A. Monitoring Locations of Pacific Ocean ..... E-14
IX. Other Monitoring Requirements ..... E-15
  A. Storm Water Monitoring and Reporting ..... E-15
X. Reporting Requirements ..... E-15
  A. General Monitoring and Reporting Requirements ..... E-15
  B. Self Monitoring Reports (SMRs) ..... E-15
  C. Discharge Monitoring Reports (DMRs) ..... E-18
  D. Other Reports ..... E-19

## List of Tables

Table E-1. Facility Monitoring Station Locations ..... E-4
Table E-2. Receiving Water Monitoring Station Locations ..... E-5
Table E-3. Influent Monitoring at M-INF ..... E-6
Table E-4. Effluent Monitoring at M-001 ..... E-7
Table E-5. Monitoring Periods and Reporting Schedule ..... E-16
Table E-6. Monitoring Reporting Submittal ..... E-19

## List of Figures

Figure E-1. Map of Receiving Water Monitoring Stations Locations ..... E-20

## ATTACHMENT E – MONITORING AND REPORTING PROGRAM (MRP)

The Code of Federal Regulations (40 CFR 122.48) requires that all NPDES permits specify monitoring and reporting requirements. California Water Code Sections 13267 and 13383 also authorize the Regional Water Quality Control Board to require technical and monitoring reports. This MRP establishes monitoring and reporting requirements, which implement the federal and California regulations.

## I. GENERAL MONITORING PROVISIONS

### A. General Monitoring Provision

1. All sampling and sample preservation shall be in accordance with the current edition of "Standard Methods for the Examination of Water and Wastewater" (American Public Health Association) or 40 CFR 136. (revised as of April 11, 2007) "Guidelines Establishing Test Procedures for the Analysis of Pollutants," promulgated by the United States Environmental Protection Agency (EPA).

2. All laboratory analyses shall be performed in accordance with test procedures under 40 CFR 136 (revised as of April 11, 2007) "Guidelines Establishing Test Procedures for the Analysis of Pollutants," promulgated by the United States Environmental Protection Agency (EPA), unless otherwise specified in this MRP. In addition, the Regional Water Board and/or EPA, at their discretion, may specify test methods that are more sensitive than those specified in 40 CFR 136.

3. Chemical, bacteriological, and bioassay analyses shall be conducted at a laboratory certified for such analyses by the California Department of Public Health in accordance with the provision of Water Code Section 13176, or conducted at a laboratory certified for such analyses by the EPA or at laboratories approved by the Regional Water Board's Executive Officer.

4. Whenever the Discharger monitors any pollutant more frequently than is required by this Order, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the discharge monitoring report specified by the Executive Officer.

5. For effluent and ambient receiving water monitoring:

   a. The Discharger shall submit to the Regional Water Board reports necessary to determine compliance with effluent limitations for priority pollutants in this Order and shall follow the chemical nomenclature and sequential order of constituents shown in Table B of the Ocean Plan. The Discharger shall report with each sample result:

      1) The reporting level achieved by the testing laboratory; and
      2) The laboratory's current MDL, as determined by the procedure found in 40 CFR 136 (revised as of May 14, 1999).

6. All analytical data shall be reported with identification of practical quantitation levels and with method detection limits, as determined by the procedure found in 40 CFR 136 (revised as of May 14, 1999).

7. The Discharger shall have and implement an acceptable written quality assurance (QA) plan for laboratory analyses. Duplicate chemical analyses must be conducted on a minimum of ten percent (10%) of the samples, or at least one sample per month, whichever is greater. A similar frequency shall be maintained for analyzing spiked samples. When requested by the Regional Water Board or EPA, the Discharger will participate in the NPDES discharge monitoring report QA performance study.

8. For every item of monitoring data where the requirements are not met, the monitoring report shall include a statement discussing the reasons for noncompliance, the actions undertaken or proposed that will bring the discharge into full compliance with requirements at the earliest time, and an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Regional Water Board by letter when compliance with the time schedule has been achieved.

9. The Discharger shall assure that records of all monitoring information are maintained and accessible for a period of at least five years from the date of the sample, report, or application. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge or by the request of the Regional Water Board at any time. Records of monitoring information shall include:

   a. The information listed in Attachment D - IV Standard Provisions – Records, subparagraph B. of this Order;
   b. The laboratory which performed the analyses;
   c. The date(s) analyses were performed;
   d. The individual(s) who performed the analyses;
   e. The modification(s) to analytical techniques or methods used;
   f. All sampling and analytical results, including
      (1) Units of measurement used;
      (2) Minimum reporting level for the analysis (minimum level);
      (3) Results less than the reporting level but above the method detection limit (MDL);
      (4) Data qualifiers and a description of the qualifiers;
      (5) Quality control test results (and a written copy of the laboratory quality assurance plan);
      (6) Dilution factors, if used; and
      (7) Sample matrix type.
   g. All monitoring equipment calibration and maintenance records;
   h. All original strip charts from continuous monitoring devices;
   i. All data used to complete the application for this Order; and,
   j. Copies of all reports required by this Order.
   k. Electronic data and information generated by the Supervisory Control And Data Acquisition (SCADA) System.

10. The flow measurement system shall be calibrated at least once per year or more frequently, to ensure continued accuracy.

11. Monitoring and reporting shall be in accordance with the following:

    a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

    b. The monitoring and reporting of influent, effluent, and sludge shall be done more frequently as necessary to maintain compliance with this Order and or as specified in this order.

    c. Whenever the Discharger monitors any pollutant more frequently than is required by this Order, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the discharge monitoring report specified by the Executive Officer.

    d. A "grab" sample is defined as any individual sample collected in less than 15 minutes.

    e. A composite sample is defined as a combination of no fewer than eight individual grab samples obtained over the specified sampling period. The volume of each individual grab sample shall be proportional to the discharge flow rate at the time of sampling. The compositing period shall equal the specific sampling period, or 24 hours, if no period is specified.

### B. Laboratory Certification

Laboratories analyzing monitoring samples shall be certified by the California Department of Public Health, in accordance with the provision of Water Code section 13176, and must include quality assurance/quality control data with their reports.

## II. MONITORING LOCATIONS

The Discharger shall establish the following monitoring locations to demonstrate compliance with the effluent limitations, discharge specifications, and other requirements in this Order:

**Table E-1. Facility Monitoring Station Locations**

| Discharge Point Name | Monitoring Location Name | Monitoring Location Description | Latitude and Longitude |
|---|---|---|---|
| 001 | M-INF | AES effluent intake to the desalination facility | 33° 38' 39"N, 117°58' 43"W |
| 001 | M-001 | Facility discharge to AES discharge pipeline to Pacific Ocean | 33° 38' 38"N, 117°58' 44"W |

**Table E-2. Receiving Water Monitoring Station Locations**

| Monitoring Location Name | Monitoring Location Description | Latitude & Longitude | Depth (ft) |
|---|---|---|---|
| A-1 | 10,000 feet southeast of the AES outfall tower (perpendicular to the outfall) 1,500 ft offshore | 33° 37' 30"N, 117°57' 38"W | Surface |
| A-2 | 10,000 feet southeast of the AES outfall tower (perpendicular to the outfall) 1,500 ft offshore | 33° 37' 30"N, 117°57' 38"W | Bottom |
| B-1 | 1,000 feet southeast of the AES outfall tower (perpendicular to the outfall) 1,500 ft offshore | 33° 38' 12"N, 117°58' 55"W | Surface |
| B-2 | 1,000 feet southeast of the AES outfall tower (perpendicular to the outfall) 1,500 ft offshore | 33° 38' 12"N, 117°58' 55"W | Bottom |
| C-1 | 450 feet southeast of the AES outfall tower (perpendicular to the outfall) 1,500 ft offshore | 33° 38' 18"N, 117°58' 55"W | Surface |
| C-2 | 450 feet southeast of the AES outfall tower (perpendicular to the outfall) 1,500 ft offshore | 33° 38' 18"N, 117°58' 55"W | 15 feet below Surface |
| C-3 | 450 feet southeast of the AES outfall tower (perpendicular to the outfall) 1,500 ft offshore | 33° 38' 18"N, 117°58' 55"W | Bottom |
| D-1 | 450 feet southeast of the AES outfall (perpendicular to the outfall) 100 ft offshore | 33° 38' 23"N, 117°58' 50"W | Surface |
| D-2 | 450 feet southeast of the AES outfall (perpendicular to the outfall) 100 ft offshore | 33° 38' 23"N, 117°58' 50"W | Bottom |
| E-1 | 1,000 feet northeast of the AES outfall tower (perpendicular to the outfall) 1,500 ft offshore | 33° 38' 26"N, 117°59' 07"W | Surface |
| E-2 | 1,000 feet northeast of the AES outfall tower (perpendicular to the outfall) 1,500 ft offshore | 33° 38' 26"N, 117°59' 07"W | Bottom |

## III. INFLUENT MONITORING REQUIREMENTS

### A. Monitoring Location M-INF

1. The Discharger shall sample and monitor the influent to the Facility, at the influent monitoring location[1], as follows. Except for flow, monitoring results from the AES – HBGS discharge monitoring may be used to comply with this requirement:

[1] *AES effluent intake to the desalination facility.*

**Table E-3. Influent Monitoring at M-INF**

| Parameter | Units | Sample Type | Minimum Sampling Frequency | Required Analytical Test Method |
|---|---|---|---|---|
| Flow | mgd | Recorder / Totalizer | Continuous | -- |
| Oil & Grease | mg/L | Grab | Monthly | -- |
| Total Residual Chlorine | mg/L | Grab | " | -- |
| Temperature | °F | Grab | " | See Section I.A.2 & 3, above, of this MRP |
| pH | pH units | Grab | " | " |
| Ammonia-Nitrogen | mg/L | " | Semiannually | " |
| Arsenic | µg/L | " | " | " |
| Cadmium | " | " | " | " |
| Chromium (Hexavalent) | " | " | " | " |
| Copper | " | " | " | " |
| Lead | " | " | " | " |
| Mercury | " | " | " | " |
| Nickel | " | " | " | " |
| Silver | " | " | " | " |
| Zinc | " | " | " | " |
| Cyanide | " | " | " | " |
| Phenolic Compounds (non-chlorinated) | " | " | " | See Section I.A.3. above, of this MRP |
| Chlorinated Phenolics | " | " | " | See Section I.A.2. above, of this MRP |
| HCH[2] | " | " | " | " |

2 *HCH shall mean the sum of the alpha, beta, gamma (lindane) and delta isomers of hexachlorocyclohexane.*

## IV. EFFLUENT MONITORING REQUIREMENTS

### A. Effluent Monitoring Location M-001

1. The Discharger shall monitor DP-001 at monitoring Station M-001, as follows. If more than one analytical test method is listed for a given parameter, the Discharger must select from the listed methods and corresponding Minimum Level specified in Attachment G.

**Table E-4. Effluent Monitoring at M-001**

| Parameter | Units | Sample Type | Minimum Sampling Frequency | Required Analytical Test Method and Minimum Level |
|---|---|---|---|---|
| Flow | mgd | Recorder/ Totalizer | Continuous | See Section I.A.2., above |
| Total Residual Chlorine | mg/L | Recorder | " | " |
| Temperature | °F | Recorder | Continuous (see IV.A.2., below) | " |
| pH | pH units | Grab | Weekly | " |
| Ammonia-Nitrogen | mg/L | " | " | " |
| Oil & Grease | " | " | " | " |
| Total suspended solids | " | " | " | " |
| Salinity | ppt | " | " | " |
| Arsenic | µg/L | " | Quarterly | " |
| Cadmium | " | " | " | " |
| Chromium (Hexavalent) | " | " | " | " |
| Copper | " | " | " | " |
| Lead | " | " | " | " |
| Mercury | " | " | " | " |
| Nickel | " | " | " | " |
| Silver | " | " | " | " |
| Zinc | " | " | " | " |
| Cyanide | " | " | " | " |
| Phenolic Compounds (non-chlorinated) | " | " | " | " |
| Chlorinated Phenolics | " | " | " | " |
| HCH | " | " | " | " |
| Toxicity | TUc | (See Section V, Below) | (See Section V, below) | " |
| Antimony | µg/L | Grab | Annually (See A.3., below) | " |
| Beryllium | " | " | " | " |
| Chromium (III) | " | " | " | " |
| Selenium | " | " | " | " |
| Thallium | " | " | " | " |
| 2,3,7,8-Tetrachlorodibenzo-P-Dioxin (TCDD) | " | " | " | " |
| Acrolein | " | " | " | " |
| Acrylonitrile | " | " | " | " |
| Benzene | " | " | " | " |

**Table E-4. Effluent Monitoring at M-001**

| Parameter | Units | Sample Type | Minimum Sampling Frequency | Required Analytical Test Method and Minimum Level |
|---|---|---|---|---|
| Bromoform | µg/L | Grab | Annually (See A.3., below) | See Section I.A.2., above |
| Carbon Tetrachloride | " | " | " | " |
| Chlorobenzene | " | " | " | " |
| Chlorodibromomethane | " | " | " | " |
| Chloroethane | " | " | " | " |
| 2-Chloroethyl Vinyl Ether | " | " | " | " |
| Chloroform | " | " | " | " |
| Dichlorobromomethane | " | " | " | " |
| 1,1-Dichloroethane | " | " | " | " |
| 1,2-Dichloroethane | " | " | " | " |
| 1,1-Dichloroethylene | " | " | " | " |
| 1,2-Dichloropropane | " | " | " | " |
| 1,3-Dichloropropylene | " | " | " | " |
| Ethylbenzene | " | " | " | " |
| Methyl Bromide | " | " | " | " |
| Methyl Chloride | " | " | " | " |
| Methylene Chloride | " | " | " | " |
| 1,1,2,2-Tetrachloroethane | " | " | " | " |
| Tetrachloroethylene | " | " | " | " |
| Toluene | " | " | " | " |
| 1,2-Trans-Dichloroethylene | " | " | " | " |
| 1,1,1-Trichloroethane | " | " | " | " |
| 1,1,2-Trichloroethane | " | " | " | " |
| Trichloroethylene | " | " | " | " |
| Vinyl Chloride | " | " | " | " |
| 3-Methyl-4-Chlorophenol | " | " | " | " |
| Acenaphthene | " | " | " | " |
| Acenaphthylene | " | " | " | " |
| Anthracene | " | " | " | " |
| Benzidine | " | " | " | " |
| Benzo (a) Anthracene | " | " | " | " |
| Benzo (a) Pyrene | " | " | " | " |
| Benzo (b) Fluoranthene | " | " | " | " |
| Benzo (g,h,i) Perylene | " | " | " | " |
| Benzo (k) Fluoranthene | " | " | " | " |
| Bis (2-Chloroethoxy) Methane | " | " | " | " |
| Bis (2-Chloroethyl) Ether | " | " | " | " |
| Bis (2-Chloroisopropyl) Ether | " | " | " | " |
| Bis (2-Ethylhexyl) Phthalate | " | " | " | " |
| 4-Bromophenyl Phenyl Ether | " | " | " | " |
| Butylbenzyl Phthalate | " | " | " | " |
| 2-Chloronaphthalene | " | " | " | " |
| 4-Chlorophenyl Phenyl Ether | " | " | " | " |

**Table E-4. Effluent Monitoring at M-001**

| Parameter | Units | Sample Type | Minimum Sampling Frequency | Required Analytical Test Method and Minimum Level |
|---|---|---|---|---|
| Chrysene | µg/L | Grab | Annually (See A.3., below) | See Section I.A.2., above |
| Dibenzo (a,h) Anthracene | " | " | " | " |
| 1,2-Dichlorobenzene | " | " | " | " |
| 1,3-Dichlorobenzene | " | " | " | " |
| 1,4-Dichlorobenzene | " | " | " | " |
| 3,3'-Dichlorobenzidine | " | " | " | " |
| Diethyl Phthalate | " | " | " | " |
| Dimethyl Phthalate | " | " | " | " |
| Di-n-Butyl Phthalate | " | " | " | " |
| 2,4-Dinitrotoluene | " | " | " | " |
| 2-6-Dinitrotoluene | " | " | " | " |
| Di-n-Octyl Phthalate | " | " | " | " |
| 1,2-Dipenylhydrazine | " | " | " | " |
| Fluoranthene | " | " | " | " |
| Fluorene | " | " | " | " |
| Hexachlorobenzene | " | " | " | " |
| Hexachlorobutadiene | " | " | " | " |
| Hexachlorocyclopentadien | " | " | " | " |
| Hexachloroethane | " | " | " | " |
| Indeno (1,2,3-cd) Pyrene | " | " | " | " |
| Isophorone | " | " | " | " |
| Naphthalene | " | " | " | " |
| Nitrobenzene | " | " | " | " |
| N-Nitrosodimethylamine | " | " | " | " |
| N-Nitrosodi-N-Propylamine | " | " | " | " |
| N-Nitrosodiphenylamine | " | " | " | " |
| Phenanthrene | " | " | " | " |
| Pyrene | " | " | " | " |
| 1,2,4-Trichlorobenzene | " | " | " | " |
| Aldrin | " | " | " | " |
| Chlordane | " | " | " | " |
| 4, 4' - DDT | " | " | " | " |
| 4, 4' - DDE | " | " | " | " |
| 4, 4' - DDD | " | " | " | " |
| Dieldrin | " | " | " | " |
| Alpha Endosulfan | " | " | " | " |
| Beta Endosulfan | " | " | " | " |
| Endosulfan Sulfate | " | " | " | " |
| Endrin | " | " | " | " |
| Endrin Aldehyde | " | " | " | " |
| Heptachlor | " | " | " | " |
| Heptachlor Epoxide | " | " | " | " |
| PCB 1016 | " | " | " | " |
| PCB 1221 | " | " | " | " |
| PCB 1232 | " | " | " | " |
| PCB 1242 | " | " | " | " |
| PCB 1248 | " | " | " | " |
| PCB 1254 | " | " | | " |
| PCB 1260 | " | " | " | " |

**Table E-4. Effluent Monitoring at M-001**

| Parameter | Units | Sample Type | Minimum Sampling Frequency | Required Analytical Test Method and Minimum Level |
|---|---|---|---|---|
| | | | | |
| Toxaphene | µg/L | Grab | Annually (See A.3., below) | See Section I.A.2., above |

2. Temperature in °F of the waste discharged shall be monitored and recorded continuously. Any increase or changes in temperature shall be recorded in addition to the maximum and minimum temperatures of each 24-hour day.

3. The monitoring frequency for those priority pollutants that are detected during the required annual monitoring at a concentration greater than fifty percent of the most stringent applicable receiving water objectives as specified for that pollutant in the Ocean Plan shall be accelerated to quarterly for one year.

4. At any time a parameter is detected above the maximum daily effluent limitations of the Order, the Discharger shall accelerate the monitoring frequency of that parameter to monthly. If two successive accelerated monitoring results do not indicate the presence of the specific parameter at levels above the maximum daily effluent limitations, the Discharger may return to the regular monitoring frequency. However, if two successive accelerated monitoring results show concentrations of a parameter above the effluent limitations, the Discharger shall conduct/implement a pollutant minimization program and submit a report describing the measures undertaken by the Discharger to prevent the discharge of the pollutant(s) at levels of concern.

5. When there is a discharge of filter backwash water, RO subsequent rinse waste water, and RO system concentrate, the Discharger shall take separate samples and monitor for the constituents listed in IV.A.1, above.

## V. WHOLE EFFLUENT TOXICITY TESTING REQUIREMENTS

### A. Toxicity Monitoring Requirements

#### 1. Chronic Toxicity Monitoring:

a. Test Species and Methods

The Discharger shall conduct monthly chronic toxicity tests on flow-weighted 24-hour composite effluent samples mixed with ambient seawater in a ratio of 1 to 7.5. The presence of chronic toxicity shall be estimated as specified in *Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms* (EPA/600/R-95/136, 1995). Test Organisms specified in Table III-1 of the Ocean Plan shall be used

in conducting the tests. If test organisms specified in the West Coast chronic test methods manual are not available, the presence of chronic toxicity shall be estimated as specified in *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms* (EPA 821-R-02-014, 2002).

For the first three months of each successive 27 month period, the Discharger shall conduct monthly chronic toxicity test screening with a marine vertebrate species, a marine invertebrate species, and a marine alga species. For the remaining 24 months of each 27 month period, the discharger shall conduct the monthly chronic toxicity test using only the most sensitive of the three species used in the first three months. The first screening shall be conducted at the start of plant operation. If the most sensitive test species is/are not available during the testing period, the presence of chronic toxicity shall be estimated using the second most sensitive test species from the toxicity test screening conducted for the current 24-month period. Such changes shall be noted on the discharge monitoring report (DMR). Note that a 27 month period is used so that the three month testing period rotates throughout the year over time.

**2. Quality Assurance**

a. A series of five dilutions and a control shall be tested. The series shall include the instream waste concentration (IWC), two dilutions below the IWC, and two dilutions above the IWC (e.g., 12.5, 25, 50, 75, and 100 percent effluent, where IWC = 50). The chronic IWC for this discharge is 0.55 percent effluent.

b. If test organisms are not cultured in-house, concurrent testing with reference toxicants shall be conducted. If organisms are cultured in-house, monthly testing with reference toxicants shall be conducted. Reference toxicant tests shall be conducted using the same test conditions as effluent toxicity tests (i.e., same test duration, etc.).

c. If either the reference toxicant test or the effluent test does not meet all test acceptability criteria as specified in the test methods manual, then the Discharger must re-sample and re-test within approximately 14 days.

d. Chronic effluent and reference toxicant tests must meet the upper and lower bounds on test sensitivity, as determined by calculating the Percent Minimum Significant Difference (PMSD) for each test result. Test sensitivity bounds are specified in Table 3-6 of *Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications under the National Pollutant Discharge Elimination System Program* (EPA/833-R-00-003, June 2000). There are five possible outcomes based on the PMSD result:

1) Unqualified Pass: The test's PMSD is within the bounds in Table 3-6 and there is no significant difference between the means for the control and the

IWC treatment. The regulatory authority would conclude that there is no toxicity at the IWC concentration.

2) Unqualified Fail: The test's PMSD is larger than the lower bound (but not greater than the upper bound) in Table 3-6 and there is a significant difference between the means for the control and the IWC treatment. The regulatory authority would conclude that there is toxicity at the IWC concentration.

3) Lacks Test Sensitivity: The test's PMSD exceeds the upper bound in Table 3-6 and there is no significant difference between the means for the control and the IWC treatment. The test is considered invalid. The Discharger must re-sample and re-test within approximately 14 days.

4) Lacks Test Sensitivity: The test's PMSD exceeds the upper bound in Table 3-6 and there is a significant difference between the means for the control and the IWC treatment. The test is considered valid. The regulatory authority would conclude that there is toxicity at the IWC concentration.

5) Very Small but Significant Difference: The relative difference (see Section 6.4.2 of EPA/833-R-00-003) between the means for the control and the IWC treatment is smaller than the lower bound in Table 3-6 and this difference is statistically significant. The test is acceptable. The NOEC is determined as described in Sections 6.4.2 and 6.4.3 of EPA/833-R-00-003.

e. Control and dilution water should be receiving water or lab water, as described in the test methods manual. If dilution water is different from culture water, then a second control using culture water shall also be tested.

**3. Additional (Accelerated) Toxicity Testing**

a. If toxicity (as defined) is detected, the Discharger shall increase the frequency of chronic toxicity testing to every two weeks whenever any test result exceeds 8.5 TUc. The first test under the accelerated schedule shall be conducted within two weeks of receiving notice of the test that exceeds 8.5 TUc, and every two weeks thereafter. The Discharger may resume the regular test schedule when two consecutive chronic toxicity tests result in 8.5 TUc or less, or when the results of the Initial Investigation Reduction Evaluation conducted by the Discharger have adequately addressed the identified toxicity problem.);

b. However, if implementation of the initial investigation TRE workplan indicates the source of toxicity (e.g., a temporary plant upset), then the Discharger shall conduct only the first accelerated test required above. If toxicity (as defined) is not detected in this first test, the Discharger may return to the normal sampling frequency required herein.

c. If toxicity (as defined) is not detected in the first test required above, then the Discharger may return to the normal sampling frequency required in herein.

4. **Toxicity Reduction Evaluation/Toxicity Identification Evaluation (TRE/TIE)**

   a. If toxicity (as defined) is detected in any of the accelerated monitoring, then, based on an evaluation of the test results and additional available information, the Executive Officer may determine that the Discharger shall initiate a TRE, in accordance with the Discharger's initial investigation TRE workplan and EPA/600/2-88/070 Generalized Methodology for Conducting Industrial Toxicity Reduction Evaluations (TRE's); April 1989). Moreover, the Discharger shall expeditiously develop a detailed TRE workplan which includes:

      1) Further actions to investigate/identify the cause(s) of toxicity;

      2) Actions the Discharger has taken/will take to mitigate the impact of the discharge, to correct the noncompliance, and to prevent the recurrence of toxicity;

      3) An expeditious schedule under which these actions will be implemented.

   b. As part of this TRE process, the Discharger may initiate a TIE using the test methods manuals and TIE Phase I (EPA/600/R-96/054, 1996), Phase II (EPA/600/R-92/080, 1993), and Phase III (EPA/600/R-92/081, 1993) manuals to identify the cause(s) of toxicity.

   c. If a TRE/TIE is initiated prior to completion of the accelerated testing schedule required by Toxicity Requirement, then the accelerated testing schedule may be terminated, or used as necessary in performing the TRE/TIE.

5. **Reporting**

   a. The Discharger shall submit a full report of all toxicity test results, including any toxicity testing required by Toxicity Requirements with the discharge monitoring report (DMR) for the month in which the toxicity tests are conducted. A full report shall consist of: (1) toxicity test results; (2) dates of sample collection and initiation of each toxicity test; (3) chronic toxicity effluent limitations. Toxicity test results shall be reported according to the test methods manual chapter on Report Preparation. It is suggested that the Discharger submit the data on an electronic disk in the Toxicity Standardized Electronic Reporting Form (TSERF) (*Standardized Electronic Reporting Format for Monitoring Effluent Toxicity: October 1994 Format*, State Water Resources Control Board, 1995).

      If the initial investigation TRE workplan is used to determine that additional (accelerated) toxicity testing is unnecessary, these results shall be submitted with the DMR for the month in which investigations conducted under the TRE workplan occurred.

b. Within approximately 14 days of receipt of test results exceeding an chronic toxicity effluent limitation, the Discharger shall provide written notification to the Regional Board of:

1) Findings of the TRE or other investigation to identify the cause(s) of toxicity;

2) Actions the Discharger has taken/will take, to mitigate the impact of the discharge and to prevent the recurrence of toxicity;

3) When corrective actions, including a TRE, have not been *completed*, an expeditious schedule under which corrective actions will be implemented; or

4) The reason for not taking corrective action, if no action has been taken.

## VI. LAND DISCHARGE MONITORING REQUIREMENTS - N/A

## VII. RECLAMATION MONITORING REQUIREMENTS - N/A

## VIII. RECEIVING WATER MONITORING REQUIREMENTS

### A. Monitoring Locations of Pacific Ocean

1. Receiving water monitoring in the vicinity of the outfall shall be conducted as specified below and at monitoring stations shown in Table E-2, above, and Figure E-1, Map of Receiving Water Monitoring Stations Locations on page E-20. The receiving water monitoring program may be conducted jointly with other dischargers. During monitoring events, sample stations shall be located, if possible, using a land-based microwave positioning system or a satellite positioning system such as global positioning. If an alternate navigation system is proposed, its accuracy should be compared to that of microwave and satellite based systems, and any compromises in accuracy shall be justified. The monitoring frequency shall be quarterly for the 1st and 5th year of the permit and semiannually during the 2$^{nd}$, 3$^{rd}$ and fourth year of the permit. The Discharger shall record the date and time of sampling, and a general description of observation made at the sampling location (e.g. windy, sunny, rough sea condition etc).

2. Light Transmittance Monitoring. The light transmittance shall be monitored via a Secchi disk at Monitoring Locations A-1, B-1, C-1, D-1 and E-1.

3. Water Quality Monitoring. The dissolved oxygen concentration and pH shall be monitored via grab samples at the surface at Monitoring Locations A-1, B-1, C-1, D-1 and E-1. Dissolved oxygen shall be reported as milligrams per liter (mg/L). pH shall be reported as pH Units.

4. Temperature and Salinity Monitoring. Temperature and salinity shall be monitored at all monitoring locations listed in Table 2. Temperature shall be reported in degrees Fahrenheit (°F). Salinity shall be reported in parts per thousand (ppt).

## IX. OTHER MONITORING REQUIREMENTS

### A. Storm Water Monitoring and Reporting

For storm water discharges, the Discharger shall comply with the monitoring and reporting requirements as outlined in Attachment "D".

## X. REPORTING REQUIREMENTS

### A. General Monitoring and Reporting Requirements

1. The Discharger shall comply with all Standard Provisions (Attachment D) related to monitoring, reporting, and recordkeeping.

2. By May 1 of each year, the Discharger shall submit an annual report to the Regional Water Board. The annual report shall include the following:

   a. Tabular and graphical summaries of the monitoring data obtained during the previous year;
   b. A discussion of the compliance record and the corrective actions taken or planned, which may be needed to bring the discharge into full compliance with the waste discharge requirements; and
   c. A summary of the quality assurance (QA) activities for the previous year.

3. At any time during the term of this Order when electronic submittal of monitoring reports has become the norm, the State or Regional Water Board may notify the Discharger to discontinue submittal of hard copies of reports. When such notification is given, the Discharger shall stop submitting hard copies of required monitoring reports.

### B. Self Monitoring Reports (SMRs)

1. At any time during the term of this permit, the State or Regional Water Board may notify the Discharger to electronically submit Self-Monitoring Reports (SMRs) using the State Water Board's California Integrated Water Quality System (CIWQS) Program Web site (http://www.waterboards.ca.gov/ciwqs/index.html). Until such notification is given, the Discharger shall submit hard copy SMRs. The CIWQS Web site will provide additional directions for SMR submittal in the event there will be service interruption for electronic submittal.

2. The Discharger shall report in the SMR the results for all monitoring specified in this MRP under Sections III through IX. Additionally, the Discharger shall report in the SMR the results of any special studies, acute and chronic toxicity testing, TRE/TIE, PMP, and Pollution Prevention Plan required by Special Provisions – VI.C. of this Order. The Discharger shall submit monthly, quarterly, and annual SMRs including the results of all required monitoring using USEPA-approved test methods or other test methods specified in this Order. If the Discharger monitors any pollutant more frequently than required by this Order, the results of this monitoring shall be included in the calculations and reporting of the data submitted in the SMR.

3. Monitoring periods and reporting for all required monitoring shall be completed according to the following schedule:

**Table E-5. Monitoring Periods and Reporting Schedule**

| Sampling Frequency | Monitoring Period Begins On | Monitoring Period | SMR Due Date |
|---|---|---|---|
| Continuous | The effective day of this Order | All | Submit with monthly SMR |
| Daily | The effective day of this Order | (Midnight through 11:59 PM) or any 24-hour period that reasonably represents a calendar day for purposes of sampling. | Submit with monthly SMR |
| Weekly | The effective day of this Order | Sunday through Saturday | Submit with monthly SMR |
| Monthly | First day of calendar month following permit effective date or on permit date if that date is first day of the month | 1st day of calendar month through last day of calendar month | First day of the second month following the reporting period, submit as monthly SMR |
| Quarterly[3] | Closest of January 1, April 1, July 1, or October 1 following permit effective date | January 1 through March 31, samples are collected in January;<br>April 1 through June 30; samples are collected in April;<br>July 1 through September 30; samples are collected in July;<br>October 1 through December 31; samples are collected in October | First day of the second month following the reporting period, submit with monthly SMR |
| Semi-annually | Closest of January 1 or July 1 following permit effective date | January 1 through June 30, samples are collected in January.<br>July 1 through December 31, samples are collected in July. | first day of the second month following the reporting period, submit with monthly SMR |
| Annually | The effective day of this Order | January 1 through December 31, see Table 1. | May 1 each year including report requirements in Attachments |

4. Reporting Protocols. The Discharger shall report with each sample result the applicable reported Minimum Level (ML) and the current Method Detection Limit (MDL), as determined by the procedure in Part 136.

3 *Quarterly monitoring result for certain constituents may be used to satisfy the annual monitoring for the same constituents.*

The Discharger shall report the results of analytical determinations for the presence of chemical constituents in a sample using the following reporting protocols:

a. Sample results greater than or equal to the reported ML shall be reported as measured by the laboratory (i.e., the measured chemical concentration in the sample).

b. Sample results less than the RL, but greater than or equal to the laboratory's MDL, shall be reported as "Detected, but Not Quantified," or DNQ. The estimated chemical concentration of the sample shall also be reported.

c. For the purposes of data collection, the laboratory shall write the estimated chemical concentration next to DNQ as well as the words "Estimated Concentration" (may be shortened to "Est. Conc."). The laboratory may, if such information is available, include numerical estimates of the data quality for the reported result. Numerical estimates of data quality may be percent accuracy (+ a percentage of the reported value), numerical ranges (low to high), or any other means considered appropriate by the laboratory.

d. Sample results less than the laboratory's MDL shall be reported as "Not Detected," or ND.

e. Dischargers are to instruct laboratories to establish calibration standards so that the ML value (or its equivalent if there is differential treatment of samples relative to calibration standards) is the lowest calibration standard. At no time is the Discharger to use analytical data derived from extrapolation beyond the lowest point of the calibration curve.

5. The Discharger shall submit SMRs in accordance with the following requirements:

a. The Discharger shall arrange all reported data in a tabular format. The data shall be summarized to clearly illustrate whether the facility is operating in compliance with interim and/or final effluent limitations. The Discharger is not required to duplicate the submittal of data that is entered in a tabular format within CIWQS. When electronic submittal of data is required and CIWQS does not provide for entry into a tabular format within the system, the Discharger shall electronically submit the data in a tabular format as an attachment.

b. The Discharger shall attach a cover letter to the SMR. The information contained in the cover letter shall clearly identify violations of the WDRs; discuss corrective actions taken or planned; and the proposed time schedule for corrective actions. Identified violations must include a description of the requirement that was violated and a description of the violation.

c. SMRs must be submitted to the Regional Water Board, signed and certified as required by the standard provisions (Attachment D), to the address listed below:

   Regional Water Quality Control Board
   Santa Ana Region
   3737 Main Street, Suite 500
   Riverside, CA 92501-3348

6. The Discharger shall attach a cover letter to the SMR. The information contained in the cover letter shall clearly identify violations of the WDRs; discuss corrective actions taken or planned; and the proposed time schedule for corrective actions. Identified violations must include a description of the requirement that was violated and a description of the violation.

7. By May 1 of each year, the Discharger shall submit an annual report to the Regional Water Board. The annual report shall include the following:

   a. Tabular and graphical summaries of the monitoring data obtained during the previous year;

   b. A discussion of the compliance record and the corrective actions taken or planned, which may be needed to bring the discharge into full compliance with the waste discharge requirements;

   c. A summary of the quality assurance (QA) activities for the previous year; and

   d. For priority pollutant constituents that do not have effluent limitations but are required to be monitored, the Discharger shall evaluate the monitoring data obtained during the previous year and determine whether detected constituents are at levels that would warrant reopening the permit to include effluent limitations for such constituent(s). To conduct this evaluation, the concentration of detected constituents shall be compared to the most stringent applicable receiving water objectives (freshwater or human health (consumption of organisms only) as specified for that pollutant in 40 CFR 131.384). The Discharger shall include a discussion of the corrective actions taken or planned to address values above receiving water objectives.

## C. Discharge Monitoring Reports (DMRs)

1. As described in Section X.B.1 above, at any time during the term of this permit, the State or Regional Water Board may notify the Discharger to electronically submit SMRs that will satisfy federal requirements for submittal of Discharge Monitoring Reports (DMRs). Until such notification is given, the Discharger shall submit DMRs in accordance with the requirements described below.

---

[4] *See Federal Register/ Vol. 65, No. 97 / Thursday, May 18, 2000 / Rules and Regulations.*

2. DMRs must be signed and certified as required by the Standard Provisions (Attachment D). The Discharger shall submit the original DMR and one copy of the DMR to the address listed below:

**Table E-6. Monitoring Reporting Submittal**

| Standard Mail | FedEx/UPS/ Other Private Carriers |
|---|---|
| State Water Resources Control Board<br>Division of Water Quality<br>c/o DMR Processing Center<br>PO Box 100<br>Sacramento, CA 95812-1000 | State Water Resources Control Board<br>Division of Water Quality<br>c/o DMR Processing Center<br>1001 I Street, 15th Floor<br>Sacramento, CA 95814 |

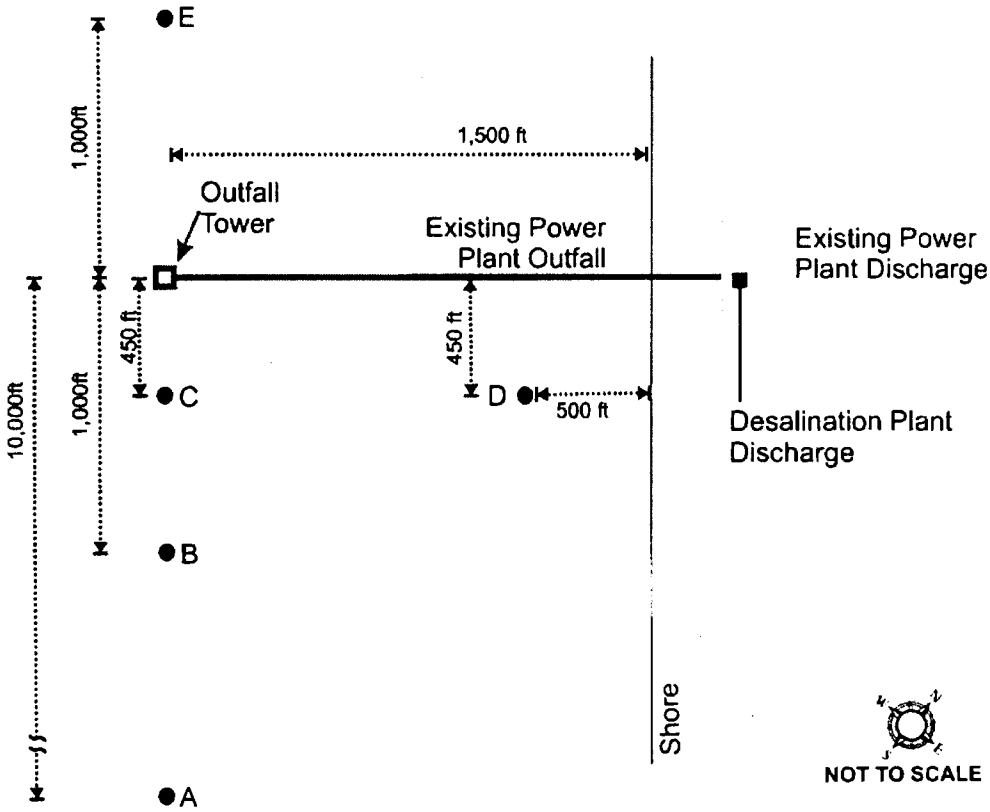
3. All discharge monitoring results must be reported on the official USEPA pre-printed DMR forms (EPA Form 3320-1). Forms that are self-generated will not be accepted unless they follow the exact same format of EPA Form 3320-1.

   Regional Administrator
   U. S. Environmental Protection Agency
   Region 9 – Attention WTR – 7
   75 Hawthorne Street
   San Francisco, CA 94105

## D. Other Reports

1. The Discharger shall report the results of any special studies, acute and chronic toxicity testing, TRE/TIE, PMP, and Pollution Prevention Plan required by Special Provisions – VI.C. of this Order. The Discharger shall submit reports with the first monthly SMR scheduled to be submitted on or immediately following the report due date in compliance with SMR reporting requirements described in subsection X.B.5 above.

## FIGURE E-1 – MAP OF RECEIVING WATER MONITORING STATIONS LOCATIONS



## ATTACHMENT F – FACT SHEET

### Table of Contents

**I. Permit Information ..... F-3**
**II. Facility Description ..... F-4**
A. Description of Wastewater Treatment or Control Systems ..... F-9
B. Discharge Points and Receiving Waters ..... F-12
C. Summary of Existing Requirements and Self Monitoring Report (SMR) Data - (Not Applicable) ..... F-12
D. Compliance Summary - (Not Applicable) ..... F-12
E. Planned Changes - (Not Applicable) ..... F-12
**III. Applicable plans, policies, and regulations ..... F-13**
A. Legal Authorities ..... F-13
B. California Environmental Quality Act (CEQA) ..... F-13
C. State and Federal Regulations, Policies, and Plans ..... F-17
1. Water Quality Control Plans ..... F-17
2. Thermal Plan ..... F-18
3. California Ocean Plan ..... F-18
4. Alaska Rule ..... F-19
5. Stringency of Requirements for Individual Pollutants ..... F-19
6. Anti-degradation Policy. ..... F-19
7. Anti-Backsliding Requirements ..... F-20
D. Impaired Water Bodies on CWA 303(d) List ..... F-20
E. Other Plans, Policies and Regulations ..... F-20
1. Clean Water Act Section 316(b) Applicability ..... F-20
2. Water Code Section 13142.5(b) Applicability and Compliance ..... F-22
**IV. Rationale for effluent limitations and discharge specifications ..... F-34**
A. Discharge Prohibitions ..... F-35
B. Technology-Based Effluent Limitations ..... F-35
1. Scope and Authority ..... F-35
2. Applicable Technology-Based Effluent Limitations ..... F-36
C. Water Quality-Based Effluent Limitations (WQBELs) ..... F-37
1. Scope and Authority ..... F-37
2. Applicable Beneficial Uses and Water Quality Criteria and Objectives ..... F-37
3. Determining the need for WQBELs ..... F-38
4. WQBEL Calculations ..... F-39
5. Discharge Flow Limitation ..... F-43
6. Whole Effluent Toxicity (WET) ..... F-43
D. Final Effluent Limitations ..... F-45
E. Interim Effluent Limitations (Not Applicable) ..... F-45
F. Land Discharge Specifications (Not Applicable) ..... F-45
G. Reclamation Specifications (Not Applicable) ..... F-45
**V. Rationale for receiving water limitations ..... F-45**
A. Surface Water ..... F-45
B. Groundwater (Not Applicable) ..... F-45

**VI. Rationale for monitoring reporting requirements ..... F-46**
A. Influent Monitoring ..... F-46
B. Effluent Monitoring ..... F-46
C. Whole Effluent Toxicity Testing ..... F-47
D. Receiving Water Monitoring ..... F-47
1. Surface Water ..... F-47
2. Groundwater (Not Applicable) ..... F-47
E. Other Monitoring Requirements (Not Applicable) ..... F-47
**VII. Rational for provisions ..... F-48**
A. Standard Provisions ..... F-48
B. Special Provisions ..... F-48
1. Reopener Provisions ..... F-48
2. Special Studies and Additional Monitoring Requirements ..... F-48
3. Best Management Practices and Pollution Prevention (Not applicable) ..... F-48
4. Construction, Operation, and Maintenance Specifications (Not Applicable) ..... F-48
5. Other Special Provisions (Not Applicable) ..... F-48
6. Compliance Schedules (Not Applicable) ..... F-48
**VIII. Public participation ..... F-48**
A. Notification of Interested Parties ..... F-49
B. Written Comments ..... F-49
C. Public Hearing ..... F-49
D. Waste Discharge Requirements Petitions ..... F-50
E. Information and Copying ..... F-50
F. Register of Interested Persons ..... F-50
G. Additional Information ..... F-50

## List of Tables

Table F-1. Facility Information ..... F-3
Table F-2. Summary of Desalination Facility Discharge Flows ..... F-7
Table F-3. Typical RO Membrane Cleaning Solution Discharge Volumes ..... F-11
Table F-4. Summary of Substantial SEIR Findings Related to Water Quality ..... F-14
Table F-5. Basin Plan Beneficial Uses ..... F-17
Table F-6. Ocean Plan Beneficial Uses ..... F-19
Table F-7. Design, Technology, and Mitigation Measures to Minimize Impacts to Marine Life ..... F-34
Table F-8. Summary of TBELs on Table A of the Ocean Plan ..... F-36
Table F-9. Ocean Plan Table B Receiving Water Standards for the Protection of Marine Aquatic Life ..... F-38
Table F-10. Pollutant Background Concentrations ..... F-40
Table F-11. Example Ocean Plan Table B Receiving Water Objectives ..... F-40
Table F-12. Summary of WQBELs on Table B of the Ocean Plan ..... F-42

## ATTACHMENT F – FACT SHEET

As described in Section II of this Order, this Fact Sheet includes the legal requirements and technical rationale that serve as the basis for the requirements of this Order.

This Order has been prepared under a standardized format to accommodate a broad range of discharge requirements for Dischargers in California. Only those sections or subsections of this Order that are specifically identified as "not applicable" have been determined not to apply to this Discharger. Sections or subsections of this Order not specifically identified as "not applicable" are fully applicable to this Discharger.

## I. PERMIT INFORMATION

The following table summarizes administrative information related to the facility.

**Table F-1. Facility Information**

| | |
|---|---|
| **WDID** | 8 303431001 |
| **Discharger/Operator** | Poseidon Resources (Surfside) LLC |
| **Name of Facility** | Huntington Beach Desalination Facility |
| **Facility Address** | 21730 Newland Street<br>Huntington Beach, CA 92646<br>Orange County |
| **Facility Contact, Title and Phone** | Josie McKinley, Director, Project Development, (714) 596-7946 |
| **Authorized Person to Sign and Submit Reports** | Peter MacLaggan, Vice President, (619) 595-7802 |
| **Mailing Address** | 501 W. Broadway, Suite 2020, San Diego, CA 92101 |
| **Billing Address** | SAME |
| **Type of Facility** | Desalination |
| **Major or Minor Facility** | Minor |
| **Threat to Water Quality** | 2 |
| **Complexity** | B |
| **Pretreatment Program** | N/A |
| **Reclamation Requirements** | N/A |
| **Facility Permitted Flow** | 56.59 MGD 12-Month Average Flow<br>60.3 (MGD) Maximum Daily Flow |
| **Facility Design Flow** | 56.59 MGD 12-Month Average Flow<br>60.3 (MGD) Maximum Daily Flow |
| **Receiving Water** | Pacific Ocean |
| **Receiving Water Type** | Ocean Water |

**A.** Poseidon Resources (Surfside) LLC (hereinafter Discharger) is the owner and operator of the Huntington Beach Desalination Facility (hereinafter Facility).

For the purposes of this Order, references to the "discharger" or "permittee" in applicable federal and State laws, regulations, plans, or policy are held to be equivalent to references to the Discharger herein.

**B.** The Facility will discharge a 12-Month Average Flow of 50 million gallons per day (MGD) of concentrated seawater, up to a total of 6.59 MGD of filter backwash and RO subsequent rinse wastewater, and up to approximately 1.67 MGD of stormwater runoff to the Pacific Ocean, a water of the United States. Discharges from the Facility are currently regulated by Order No. R8-2006-0034.

**C.** The Discharger filed a report of waste discharge and submitted an application for renewal of its Waste Discharge Requirements (WDRs) and a National Pollutant Discharge Elimination System (NPDES) permit on February 2, 2011. The application was deemed complete on March 7, 2011.

## II. FACILITY DESCRIPTION

Poseidon Resources (Surfside) LLC proposes to construct and operate the 50 MGD Huntington Beach Desalination Facility (Facility) on 12 acres located adjacent to the Applied Energy Services (AES) Huntington Beach Generating Station (HBGS). The Discharger has entered into a 55-year option agreement with AES, the owner and operator of the HBGS, for the desalination project site.

The Facility will withdraw source water from the existing AES HBGS cooling system discharge pipe and remove the salts in the water through a desalination process. On a 12-month average basis, the Facility will utilize 106.59 MGD of seawater as source water and produce a 12-month average 50 MGD of potable water. The 50 MGD of concentrated seawater plus process discharges of approximately 6.59 MGD (described below) will be returned to the HBGS discharge pipeline, combined with either the remaining HBGS cooling water system discharge or the remaining Facility intake water and discharged to the ocean. The Facility is expected to start operation in 2015.

HBGS facilities periodically engage in heat treatment as an antifouling measure. This heat treatment may occur every six to eight weeks, and may last approximately six to eight hours per occurrence. The Facility will not operate when the HBGS is engaged in heat treatment. To make up for the periods of inactivity that are attributable to HBGS heat treatment or temporary onsite Facility maintenance, the Facility may be operated at its maximum day peak production capacity. The Facility's production capacity would increase the Facility's discharges during these periods, resulting in a maximum daily concentrated seawater discharge flow of 54 MGD, and a maximum daily total Facility discharge flow of 60.3 MGD (See Table F-2). Table F-2 compares this Order's flow limits with the flow limits set forth in Order No. R8-2006-0034.

During initial start-up operations and temporary onsite maintenance operations, it may be necessary to temporarily return all or a portion of the filtered pretreated seawater (up to approximately 126.7 MGD) back into the HBGS discharge pipeline instead of routing the filtered seawater flow to the reverse osmosis units. Additionally, during such start-up periods or periods when it is not feasible to deliver product water to the regional potable water system, it may be necessary to temporarily discharge dechlorinated product water from the reverse osmosis process back into the HBGS discharge pipeline. During these temporary periods, the maximum allowable flows returned to the ocean would not exceed 126.7 MGD and the volume and salinity of the additional discharges would be identical to the volume and salinity of the intake water. As a result, no water quality changes would occur as a result of such temporary process water diversions.

The desalination process consists of the following:

1. **Intake pumps** – To prevent microbiological growth in the intake systems and filter media, the intake water will be chlorinated intermittently, as necessary.

2. **Coagulation** – To enhance the operation of the filters and to provide the required quality water to the reverse osmosis (RO) treatment units, coagulant (ferric chloride or ferric sulfate) and polymer will be added to the seawater ahead of the pretreatment filters.

3. **Media or Membrane Filtration Pretreatment** – To prepare the water for the RO treatment, a media or a membrane filtration pretreatment system will be used. The final phase of pretreatment will involve the use of cartridge filtration. The filter cartridges will be standard polypropylene wound filters enclosed in a pressure vessel. The pressure vessels will be located in the RO feed water piping between the pretreatment and RO processes.

4. **pH Adjustment and Dechlorination** – To reduce the potential for scale formation in the RO process, sulfuric acid may be added to the water after the media or membrane filtration pretreatment and before the cartridge filtration. The required dosage amount will be determined based on the bicarbonate concentration of the seawater and the Stiff Davis Index (SDI) needed in the RO concentrate. The acid also provides carbon dioxide in the RO permeate (product water), which is needed to react with the lime for product water stabilization in the permeate post-treatment step. Dechlorination using sodium bisulfite will also be done before the cartridge filtration to prevent damage to the RO membranes and to protect the RO systems.

5. **RO Treatment Systems** - The RO process will use high-rejection seawater membranes. The system will be made up of 14 process trains, each train with a design capacity of approximately 4.2 MGD. The plant will be designed to produce an average of 50 MGD of potable water using only 13 of the 14 RO trains. The 14$^{th}$ RO train will be used for standby purposes when any of the other trains requires maintenance. This arrangement provides approximately 4 percent standby capacity, which is needed to ensure continuous potable water delivery while accommodating normal membrane wear and maintenance requirements.

6. **Post-Treatment Process:** Product water from the RO process requires chemical conditioning prior to delivery to the distribution system to increase hardness and reduce its corrosion potential. Limestone and carbon dioxide will be used for post-treatment stabilization of the water. In addition, the final product water must be disinfected prior to delivery to the distribution system. Chlorine, in the form of sodium hypochlorite and ammonia, will be added as a disinfectant to meet California Department of Public Health (CDPH) water quality standards for potable water disinfection and to control biological growth in the transmission pipeline.

The HBGS generates up to 880 megawatts of electrical power (rated capacity) using four steam generators. The HBGS steam generators are cooled by a once-through seawater flow system. Seawater is drawn into the HBGS by up to eight circulating water pumps. Six of the cooling water pumps (Units 1, 2 and 4) are rated at 63.4 MGD while the remaining two pumps (Unit 3) are rated at 66.7 MGD. The Facility will receive inflow from the HBGS cooling system discharge pipe. Seawater for cooling the HBGS steam generators is withdrawn from an intake structure located approximately 1,840 feet offshore from the mean high tide line. The intake structure is located in approximately 34 feet of water, and rises approximately 16 feet from the ocean floor. A horizontal velocity cap sits atop the vertical intake structure. After passing through steam condensers, HBGS cooling water is discharged to the Pacific Ocean via an engineered outfall discharge structure. Order No. R8-2006-0011 (NPDES CA0001163) issued by the Regional Water Board to AES Huntington Beach (operator of the HBGS) authorizes the discharge of up to 514 MGD of single-pass seawater.

Requirements established in the existing Order for the Desalination Facility, Order No. R8-2006-0034, as well as this Order, are based on the Facility's use of intake water from the HBGS cooling water system. Between 2006 and 2010, the HBGS's annual average seawater intake flow through the power plant ranged from 200 MGD to 268 MGD. The power plant's maximum daily intake flow reached 507 MGD in each year. On April 1, 2011, AES Huntington Beach submitted to the State Water Board a plan for compliance with the State Water Board's "Water Quality Control Policy for the Use of Coastal and Estuarine Waters for Power Plant Cooling." Based on these policy requirements and AES's implementation plan, the HBGS cooling water system is anticipated to be in operation until at least 2020.

It is anticipated that the Facility will operate in conjunction with the HBGS (a co-located operational scenario) by using HBGS cooling water discharges as its source water. When operating in this co-location mode, the Facility's feed water intake requirements will not increase the volume or the velocity of HBGS's cooling water intake.

If HBGS were to temporarily cease operations of its once-through cooling water system (e.g., during HBGS maintenance shutdowns), or if it were to provide insufficient flows to satisfy the Facility's intake flow requirements, the Discharger would operate the HBGS's seawater intake and outfall independently in a temporary stand-alone operational mode. This temporary stand-alone mode might occur in one of two situations: (1) when HBGS is temporarily shut down; or (2) when HBGS is operating but its discharge volumes are

not sufficient to meet the Facility's intake requirements. When operating in temporary stand-alone mode, the Facility's intake flows will be maintained at approximately 126.7 MGD – an amount which is less than HBGS's currently permitted intake flow. See further discussion regarding intake regulations in section III E.

If HBGS were to permanently terminate the use and operation of its once-through cooling water system and/or permanently stop generating electricity, the Facility would operate the seawater intake and outfall independently in a long-term stand-alone operational mode. When operating in long-term stand-alone mode, the Facility's intake flows will be maintained at approximately 126.7 MGD – an amount which is less than HBGS's currently permitted intake flow. See further discussion regarding intake requirements and regulations in section III E.

This Order establishes permit effluent limitations and discharge prohibitions and provisions for the co-located operational scenario and the temporary stand-alone operation scenario. As noted in Section III.E, the Discharger would submit a separate Report of Waste Discharge to address long-term stand-alone operations in the event that HBGS permanently ceases use of the once through cooling water system or permanently ceases electricity generating operations at the current site.

To ensure protection of receiving water beneficial uses and to limit salinity concentrations in receiving waters, Order No. R8-2006-0034 limited the Facility's total outfall discharge under the co-located operations to a maximum of 44.7 percent of the intake flow (total desalination discharge 56.59 MGD/total HBGS discharge of 126.7 MGD). Under this requirement, the Facility could achieve its production capacity whenever HBGS flows meet or exceed 126.7 MGD. If the HBGS does not direct 126.7 MGD to the Facility, the Facility will operate the intake system in a temporary stand-alone mode to maintain a minimum intake flow at approximately 126.7 MGD, thereby ensuring that the Facility's discharge remains at or less than 44.7 percent of the total intake volume.

**Table F-2. Summary of Desalination Facility Discharge Flows**

| Flow Component | Order No. R8-2006-0034 (MGD) | Proposed Limits[a] | | |
|---|---|---|---|---|
| | | 12-M Average Flow[a,b] (MGD) | Maximum Day Flow[c] (MGD) | Start Up/ Maintenance[d] |
| Wastewater Flow Component | | | | |
| • Spent filter backwash flows | 6.3 | 6.3 | 6.3 | 18.7[e] |
| • Reverse osmosis concentrate seawater | 50 | 50 | 54 | 54 |

**Table F-2. Summary of Desalination Facility Discharge Flows**

| Flow Component | Order No. R8-2006-0034 (MGD) | Proposed Limits[a] | | |
|---|---|---|---|---|
| | | 12-M Average Flow[a,b] (MGD) | Maximum Day Flow[c] (MGD) | Start Up/ Maintenance[d] |
| • Reverse osmosis cleaning solutions rinse water | 0.29 | 0.29 | -- | -- |
| • Pretreated Seawater or Product Water | -- | -- | -- | 54 |
| Total Flows Discharged Back into the HBGS Discharge Pipe[f] | 56.59 | 56.59 | 60.3 | 126.7 |
| Total Minimum Intake Flows | 126.7 | 126.7 | 135.0[g] | 126.7 |
| Maximum contribution of total desalination facility discharge flow to the total outfall discharge | 44.7% | 44.7% | 44.7% | N/A |

Footnotes of the Table F-2:

a. Listed flows do not include storm water runoff from Facility's site (up to 1.67 MGD), which would be discharged to the HBGS discharge pipe and outfall.

b. Under normal operating conditions, the Facility would produce potable water at a 12-M average production rate of approximately 50 MGD.

c. The Facility will not operate when HBGS is engaged in heat treatment. Such heat treatment may occur every six to eight weeks, and may take approximately six to eight hours per occurrence. To make up for the periods of inactivity that are attributable to HBGS heat treatment or temporary onsite Facility maintenance, the Facility may be operated at its maximum day peak production capacity. The Facility's production capacity would increase the Facility's discharges during these periods, resulting in a maximum daily concentrated seawater discharge flow of 54 MGD, and a maximum daily total Facility discharge flow of 60.3 MGD. No RO cleaning solution will be discharged.

d. Projected flows may occur during start-up operations or temporary onsite maintenance operations when all or a portion of the filtered pretreated seawater is directed back into the HBGS discharge pipe. Additionally, dechlorinated product water would be temporarily discharged back into the HBGS discharge pipe during start-up periods or other times when it is not feasible to deliver product water to the regional potable water system.

e. The backwash flow includes flow to meet startup requirements associated with conditioning filters and flushing pipelines.

f. Facility wastewater would be discharged back into the HBGS cooling water discharge pipe prior to mixing with HBGS cooling water. The combined discharge effluents will flow to the Pacific Ocean via the engineered HBGS outfall discharge structure.

g. The Discharger may need to install a variable frequency drive intake pump to attain an intake flow of 135 MGD as the existing AES intake pump configurations cannot achieve this exact flow rate.

## A. Description of Wastewater Treatment or Control Systems

The Facility will generate the following waste streams that will be discharged to the AES HBGS cooling system discharge pipe and then to the AES HBGS ocean outfall:

1. Concentrated seawater resulting from the RO treatment process - Approximately one gallon of concentrated seawater will be created for every gallon of potable drinking water produced; therefore, for 50 MGD of desalination product water, approximately 50 MGD of concentrated seawater will be generated. The salinity of the concentrate will be 68,000 mg/L, twice the concentration of the incoming seawater (34,000 mg/L).

2. Spent Filter Backwash Water - The pretreatment filters will be cleaned (backwashed) to remove the intake seawater solids that accumulate in the media beds. The desalination plant will use filtered seawater for backwash. The amount of backwash water used will be between 3 to 6.3 percent (average of 4 percent) of the total intake seawater flow required for desalination. For a 50-MGD facility, operating at 50-percent recovery, the average and maximum amounts of filter backwash water will be 4.0 MGD and 6.3 MGD, respectively. The spent filter backwash water will flow from the filters to the desalination plant effluent outfall to the AES HBGS cooling system discharge pipe. The spent filter backwash water will have the same salinity as the intake ocean water (34,000 mg/L).

3. Used Membrane Cleaning Solution and Rinse Water- The accumulation of silts or scale on the RO membranes causes fouling that reduces membrane performance. The RO system membranes will be cleaned periodically to remove foulants and to extend the useful life of the RO membrane. Typical cleaning frequency of the RO membranes is twice per year. Typically, one RO train is taken off line at a time for cleaning and two RO trains are cleaned per month. In extreme conditions (for example, during very wet years or prolonged periods of strong winds when the silt content in the raw seawater may increase significantly), as many as four membrane trains may need to be cleaned in the same month.

   Membrane cleaning typically takes one day per membrane train to complete. Since one membrane train is typically cleaned at a time and each of the 13 RO membrane trains have to be cleaned two times per year, the cleaning of all membrane trains will typically take a total of 26 days per year (13 trains x 2 cleanings/train x 1 day per cleaning). Taking into consideration that there are 52 weeks per year, an average of one membrane train will be cleaned every two weeks, i.e., typically, two membrane cleanings will occur per month. In rare situations, as many as four membrane cleanings may occur per month.

   To clean the membranes, a chemical cleaning solution is circulated through the membrane train for a preset time.

   Chemicals typically used for cleaning the RO membranes include:
   - Citric Acid - (2% solution)

- Sodium Hydroxide B (0.1% solution)
- Sodium Tripolyphosphate B (2% solution)
- Sulfuric Acid B (0.1% solution)

Depending on the nature of the membrane fouling, the aforementioned cleaning chemicals may be combined in one of the following two cleaning solutions:

Cleaning Solution 1 - Low pH Cleaning Solution:

- Citric Acid - (2% solution);
- Sulfuric Acid - (0.1 % solution), to adjust pH to 4.0 for cleaning;
- Sodium Hydroxide - (0.1% solution), to adjust pH to 7.0 prior to discharge.

Cleaning Solution 2 - High pH Cleaning Solution:

- Sodium Hydroxide - (0.1 % solution);
- Sodium Dodecylbenzene Sulfonate - (0.25%);
- Sodium Hydroxide to adjust pH to 10.0 for cleaning;
- Sulfuric acid to adjust pH to 7.0 prior to discharge.

The actual cleaning solution selected for a given cleaning of a membrane train will be based on the observed operation and performance of the train once it is placed in operation.

After the cleaning solution circulation is completed, the spent cleaning solution waste is evacuated from the train to a storage tank where it may be reused or diverted for appropriate disposal. Once the spent cleaning solution is removed from the RO train, the membranes are rinsed with RO water to remove all the residual cleaning solution. The spent rinse water for membrane cleaning is stored separately in a rinse water tank prior to disposal.

The various membrane cleaning waste discharge streams are described below:

- Cleaning Solution waste is the actual spent membrane-cleaning chemical. Spent cleaning wastes will be reused or discharged to the local sewer system for further treatment at the Orange County Sanitation District's (OCSD) regional wastewater treatment facility.
- First Rinse water - is the first batch of water used to rinse the membranes after the recirculation of cleaning solution is discontinued. This rinse water contains diluted residual cleaning solution and will also be discharged to the local sewer system.
- Subsequent Rinse water is the water used to rinse the membranes after the first rinse. This rinse wastewater contains only trace amounts of cleaning solution and will be discharged with the concentrated seawater waste to the ocean.

The spent cleaning solution and first rinse water will be conveyed to a tank for retention and treatment prior to discharge to the local sewer system pursuant to an industrial pretreatment permit issued by the Orange County Sanitation District. The tank will have sufficient capacity to store cleaning solution from two simultaneous RO membrane train cleanings.

The subsequent rinse water will be conveyed to a 200,000 gallon rinse water tank for retention and treatment prior to discharge to the Facility effluent outfall to the HBGS cooling system discharge pipe. Since the volume of the subsequent rinse water generated during cleaning of one membrane train is 76,000 gallons, the rinse water tank will have sufficient capacity to store cleaning solution from two simultaneous RO membrane train cleanings. The subsequent rinse water will be pumped out of the rinse water tank to the Facility effluent outfall to the HBGS cooling system discharge pipe at a rate of 200 gpm (0.29 MGD). Because the volume of the spent subsequent rinse water per one cleaning is 76,000 gallons, it will take approximately 6.5 to 7 hours to discharge the treated spent subsequent rinse water to the Facility outfall.

Under normal operating conditions, the total volume of subsequent rinse water used for membrane cleaning will be 152,000 gallons per month. These discharges will be discrete events and will continue for a total of 13 to 14 hours per month at a rate of 200 gpm (0.29 MGD). In rare situations when the number of membrane cleanings per month may need to be increased, the total volume of the discharged treated cleaning solution to the Facility outfall will be limited to 304,000 gallons per month.

The typical volume of waste streams generated during the cleaning of one RO membrane train (independent of type of cleaning solution) is summarized in Table F-3.

**Table F-3. Typical RO Membrane Cleaning Solution Discharge Volumes**

| Type of Discharge | Gallons Per Membrane Train | Percentage of Total Volume of Discharge per-RO Train Cleaning |
|---|---|---|
| Cleaning Solution Waste | 4,000 | 4.4 |
| First Rinse Wastewater - Residual Cleaning Solution | 11,000 | 12.1 |
| Total Discharge to Sewer | 15,000 | |
| Subsequent Rinse Wastewater | 76,000 | 82.5 |
| Total Discharge to Outfall | 76,000 | |
| Total Discharge | 91,000 | 100 |

Attachment C-1 presents a schematic of water flow at the Facility. Attachment C-2 presents a schematic of the cooling water intake and discharge points.

## B. Discharge Points and Receiving Waters

The Facility will discharge exclusively at Discharge Point 001 (DP-001) located at latitude 33°38'38" and longitude 117°58'44" prior to mixing with the AES effluent discharge. The combined discharge will flow to the Pacific Ocean.

Order No. R8-2006-0034 assigned a minimum month initial dilution of 7.5 to 1 to the Facility discharge. This initial dilution ratio was based on initial dilution modeling conducted for the AES HBGS outfall in 1980 by the State Water Resources Control Board. It is appropriate as a conservative approach to apply this 7.5 to 1 initial dilution factor in establishing effluent limitations for discharges from this Facility. The Order also maintains the 1,000 foot Zone of Initial Dilution assigned to the HBGS.

Comprehensive hydrodynamic modeling of a variety of Facility discharge scenarios was recently assessed by Dr. Scott Jenkins and Joseph Waysl. In evaluating the range of potential intake flows and oceanographic conditions, Jenkins and Waysl determined that minimum initial dilution conditions occur with a combination of tranquil tide, wind, current, thermal characteristics, and minimum intake flows of 126.7 MGD. Jenkins and Waysl estimate the probability of occurrence for such minimum mixing oceanographic conditions at less than 1%. At a 1,000 foot distance from the outlet structure, the Jenkins and Waysl modeling simulated a monthly minimum dilution ratio of 10:1 under co-located (126.7 MGD warm water) conditions. A dilution of 8:1 was simulated 1,000 feet from the outlet structure under stand-alone (126.7 cold water) conditions. Thus, the continued application of the previous outfall dilution ratio of 7.5:1 is considered conservative and protective of water quality.

Additional information regarding the data collection and modeling results submitted to the Regional Water Board are contained within the Facility's file at the Regional Water Board office.

## C. Summary of Existing Requirements and Self Monitoring Report (SMR) Data - (Not Applicable)

## D. Compliance Summary - (Not Applicable)

## E. Planned Changes - (Not Applicable)

## III. APPLICABLE PLANS, POLICIES, AND REGULATIONS

The requirements contained in the proposed Order are based on the requirements and authorities described in this section.

### A. Legal Authorities

This Order is issued pursuant to Section 402 of the Federal Clean Water Act (CWA) and implementing regulations adopted by the U.S. Environmental Protection Agency (USEPA) and Chapter 5.5, Division 7 of the California Water Code (CWC) (commencing with Section 13370). It shall serve as a NPDES permit for point source discharges from this Facility to surface waters. This Order also serves as Waste Discharge Requirements (WDRs) pursuant to Article 4, Chapter 4, Division 7 of the CWC (commencing with Section 13260).

### B. California Environmental Quality Act (CEQA)

Under Water Code Section 13389, this action to adopt waste discharge requirements that will serve as a NPDES permit is exempt from the provisions of CEQA, Public Resources Code Section 21100 through 21177.

In compliance with the California Environmental Quality Act, a Subsequent Environmental Impact Report (SEIR) for the Poseidon Seawater Desalination Project at Huntington Beach was certified by the City of Huntington Beach on September 7, 2010, and the City adopted a CEQA Statement of Findings of Facts with Statement of Overriding Considerations and Mitigation Monitoring and Reporting Program. Also on September 7, 2010, the City of Huntington Beach amended Conditional Use Permit No. 02-04. On September 20, 2010, the City of Huntington Beach approved Coastal Development Permit No. 10-014.

The final SEIR identified no significant impacts with mitigation measures for hazards and hazardous materials, and stormwater drainage. No significant impacts were identified and no mitigation required for issues related to marine life and water quality.

The Facility as currently permitted under Order No. R8-2006-0034 may operate in the absence of the power plant generating electricity but must adhere to a 44.7% minimum dilution ratio to ensure compliance with Ocean Plan receiving water quality standards. Operating the Facility at a feed water flow rate of 152 MGD, as analyzed in the final SEIR, would provide for more dilution of the Facility's discharge than is required under the Facility's existing Order and under state and federal water quality regulations, and it could potentially cause incremental entrainment and impingement effects that can be avoided by operating the Facility at an annual average of 126.7 MGD.

To prevent salinity-related impacts and to ensure compliance with the Ocean Plan, this Order establishes requirements that the Facility discharge (filter backwash, concentrated seawater, plus RO membrane cleaning solutions) remain at or less than

44.7 percent of the total intake flow. The Order also maintains the existing conservative initial dilution factor of 7.5:1 and 1,000 foot Zone of Initial Dilution assigned to the HBGS. To conform to this requirement while minimizing the potential for impingement and entrainment effects, the average annual intake flow for the Facility under temporary stand-alone operations will be approximately 126.7 MGD (see Table F-2). Compliance with this average annual intake flow ensures that the Facility discharge is consistent with the Ocean Plan.

The Regional Water Board has reviewed the final SEIR for water quality related issues and mitigation measures. These issues and the Regional Water Board's analysis are summarized in Table F-4.

**Table F-4. Summary of Substantial SEIR Findings Related to Water Quality**

| Potential Issue | SEIR Finding | SEIR-Required Mitigation | Regional Water Board Analysis |
|---|---|---|---|
| Chemical release from Facility operation | No Significant Impact. Potential effects from chemical additives during the desalination process will be negligible. | None required. | Monitoring and Reporting Program will require monitoring of the effluent stream for trace contaminants and chemicals. |
| Hazards and Hazardous Materials | No Significant Impact. Hazards associated with the project will be minimized as a result of project features designed to reduce risks associated with chemical use and storage, and existing regulatory requirements for safe handling and storage of chemicals. | None required | Renewed permit requires the Discharger to develop and implement a best management practices plan consistent with the general guidance contained in the EPA *Guidance Manual for Developing Best Management Practices (BMPs)* (EPA 833-B-93-004). In particular, a risk assessment of each area identified by the Discharger shall be performed to determine the potential for hazardous or toxic waste/material discharge to surface waters. |
| Receiving Water Temperature | No significant impact. Modeling studies demonstrate that no significant effects will occur that are associated with the combined desalination facility discharge with the HBGS's discharge or the desalination facility discharge only. Due to the increase in density of the combined discharges, the HBGS thermal footprint will be reduced. | None required. | To ensure compliance with Thermal Plan requirements, the MRP of the renewed permit requires the Discharger to perform continuous receiving water temperature monitoring at the influent and effluent monitoring locations and quarterly temperature monitoring at 11 offshore water stations, as per Attachment E.<br>Under standalone operations, no significant heat will be added to the discharge. |
| Receiving Water Salinity | No Significant Impact. The Project discharge will increase salinity levels in a very small area of the Zone of Initial Dilution. Results of modeling indicate that receiving water salinity will be in compliance with California Ocean Plan requirements and will not exceed levels which would cause | None required. | To ensure protection of receiving water beneficial uses and to limit salinity concentrations in receiving waters, the renewed permit limits the Facility's discharge (filter backwash, concentrated seawater, plus RO cleaning solutions rinse water) to a maximum of 44.7 percent of the total intake flow. Under this requirement, the Facility can achieve a 50 MGD production rate and comply with |

**Table F-4. Summary of Substantial SEIR Findings Related to Water Quality**

| Potential Issue | SEIR Finding | SEIR-Required Mitigation | Regional Water Board Analysis |
|---|---|---|---|
| | significant impacts to aquatic or benthic species. | | California Ocean Plan and Clean Water Act requirements whenever intake flows meet or exceed 126.7 MGD.<br>Additionally, Receiving Water Monitoring Requirement IV.A3 of the MRP requires the Discharger to perform weekly effluent salinity monitoring at the desalination facility effluent monitoring location, and quarterly receiving water monitoring for salinity at 11 offshore water stations, as per Attachment E. |
| Entrainment & Impingement | No Significant Impact. When operating in conjunction (co-located) with HBGS, the Project will not cause additional entrainment and impingement losses. When operating independent of HBGS (temporary or long-term stand-alone), the Project would decrease the volume, velocity and the temperature of seawater relative to HBGS's uses, and no changes in the infrastructure or configuration of the intake or discharge facilities are proposed or would be required. The existing velocity cap ensures State Water Board recommended technology for avoiding impingement.<br><br>In the vicinity of the intake, there are no areas of biological significance. Marine Biological and Entrainment and Impingement studies (SEIR Appendices M and O) conclude there are no endangered or threatened species, and species with high commercial or recreational significance are very uncommon.<br><br>Impacts on marine organisms due to the potential of entrainment would not substantially reduce populations of affected species, or affect the ability of the affected species to sustain populations.<br><br>Therefore, under the desalination facility's co-located and temporary or long-term stand-alone operations, there are no | None required. | The Facility is not subject to CWA Section 316(b).<br>When operating under co-located conditions, the Facility will not increase the volume or the velocity of HBGS's cooling water intake nor will it increase the number of organisms impinged or entrained by the HBGS's cooling water intake structure. Therefore, when the Facility is operating in a co-located mode, there will be no additional impacts on marine life.<br>When operating under temporary stand-alone conditions, the Facility is utilizing the best available site, design, technology and mitigation measures feasible to avoid the intake and mortality of marine life, and thereby conforms to CWC Section 13142.5(b).<br><br>If the HBGS permanently ceases operations of the once-through cooling water system and/or if HBGS permanently stops generating electricity at the current site, within 180 days of receiving such notice, the Discharger shall submit a separate Report of Waste Discharge to the Regional Water Board. Long-term stand-alone operation of the Facility will require review to ensure compliance with California Water Code Section 13142.5(b) by employing any additional and/or better design or technology features that were not previously feasible during co-located or temporary stand-alone operations.<br><br>Based on discussion in Section III E, when operating under long-term stand-alone conditions, the Facility can comply with mitigation requirements under CWC section 13142.5(b) by maintaining HBGS's existing marine life mitigation program. |

**Table F-4. Summary of Substantial SEIR Findings Related to Water Quality**

| Potential Issue | SEIR Finding | SEIR-Required Mitigation | Regional Water Board Analysis |
|---|---|---|---|
| | significant impingement or entrainment impacts to marine organisms. | | |
| Hydrology, Drainage and Storm Water Runoff | No significant impact. 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. | Prior to issuance of permits, applicant shall prepare a hydrology and hydraulic study on storm water runoff and demonstrate compliance with NPDES permit requirements for urban runoff and storm water discharge and any regulations adopted by the City of Huntington Beach. | The Discharger will be required to conform to applicable requirements governing storm water discharges associated with construction activities through compliance with provisions of California's General Permit for Storm Water Discharges Associated with Construction Activity (Order No. 2009-0009 DWQ (CAS000002)).<br><br>In addition, the Discharger will monitor storm water discharges as per Attachment K, of the renewed permit.. The Discharger will submit annual stormwater reports. |
| Construction-related impacts on hydrology and water quality | No significant impacts | As part of its compliance with the NPDES requirements, the applicant shall prepare a Notice of Intent (NOI) to be submitted to the Santa Ana Regional Water Quality Control Board providing notification and intent to comply with the State of California general permit prior to any construction occurring.<br><br>Completion of a stormwater pollution prevention plan (SWPPP) shall be required for construction activities on site. Prior to any dewatering activities, the applicant shall obtain and comply with a general dewatering NPDES permit from the Santa Ana Regional Water Quality Control Board. | As part of its compliance with the renewed permit requirements, the Discharger shall prepare a Notice of Intent (NOI) to be submitted to the Santa Ana Regional Water Quality Control Board providing notification and intent to comply with the State of California general permit prior to any construction occurring. |
| Cumulative Effects on Biology and Water Quality | No Significant Impact. The cumulative effects on biology and water quality impacts are projected to be less than significant. | None required. | No discernible cumulative effects on marine biology and water quality are projected. The renewed MRP requires the Discharger to perform periodic receiving water quality monitoring for a variety of constituents to allow continued assessment of overall receiving water effects of the discharge (see Attachment E). |

## C. State and Federal Regulations, Policies, and Plans

1. **Water Quality Control Plans**. The Regional Water Board adopted a Water Quality Control Plan for the Santa Ana Basin (hereinafter Basin Plan) that became effective on January 24, 1995. The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for the Pacific Ocean. In addition, State Water Resources Control Board (State Water Board) Resolution No. 88-63 (Sources of Drinking Water Policy) requires that, with certain exceptions, the Regional Water Board assign the municipal and domestic water supply use to water bodies. Based on the exception criteria specified in Resolution No. 88-63, the Regional Water Board excepted the nearshore and offshore zones of the ocean from the municipal and domestic supply beneficial use.

   The Basin Plan relies primarily on the requirements of the *Water Quality Control Plan for Ocean Waters of California* (Ocean Plan) for protection of the beneficial uses of the State ocean waters. The Basin Plan specifies the beneficial uses for the nearshore and offshore zones of the Ocean that are within the jurisdiction of the Santa Ana Regional Water Board.

   Beneficial uses applicable to the Pacific Ocean are presented in Table F-5.

**Table F-5. Basin Plan Beneficial Uses**

| Discharge Point | Receiving Water Name | Beneficial Use(s) |
|---|---|---|
| 001[1] | Pacific Ocean Nearshore[2] Zone from the San Gabriel River to Poppy Street in Corona del Mar | Present or Potential Beneficial Use<br>a. Industrial service supply,<br>b. Navigation,<br>c. Water contact recreation,<br>d. Non-contact water recreation,<br>e. Commercial and sport fishing,<br>f. Wildlife habitat,<br>g. Rare, threatened or endangered species,<br>h. Spawning, reproduction, and development,<br>i. Marine habitat, and<br>j. Shellfish harvesting.<br>[Excepted from Municipal and Domestic supply] |

1 *This discharge is to AES-HBGS discharge pipeline to the Pacific Ocean.*

2 *The Nearshore Zone is defined by the Ocean Plan, Chapter II, B.1.a., as "within a zone bounded by the shoreline and a distance of 1,000 feet from the shoreline or the 30 foot depth contour, whichever is further from the shoreline".*

**Table F-5. Basin Plan Beneficial Uses**

| Discharge Point | Receiving Water Name | Beneficial Use(s) |
|---|---|---|
| 001 | Pacific Ocean Offshore Zone between the Nearshore Zone and the Limit of the State Waters | Present or Potential Beneficial Use<br>a. Industrial service supply,<br>b. Navigation,<br>c. Water contact recreation,<br>d. Non-contact water recreation,<br>e. Commercial and sport fishing,<br>f. Wildlife habitat,<br>g. Rare, threatened or endangered species, and<br>h. Spawning, reproduction, and development, and Marine habitat.<br>[Excepted from Municipal and Domestic supply] |

Requirements of this Order specifically implement the applicable Water Quality Control Plans

2. **Thermal Plan.** The State Water Board adopted a Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Water and Enclosed Bays and Estuaries of California (Thermal Plan) on May 18, 1972, and amended this plan on September 18, 1975. This plan contains temperature objectives for coastal waters.

   The Facility will not significantly affect the temperature of the intake source water, thereby, the Thermal Plan does not apply. However, due to the increase in the discharge density from the Facility when combined with the HBGS heated discharge during power production, the combined effluent will result in a significant reduction of HBGS thermal footprint. Overall, the implementation of the Facility operations is expected to result in reduced temperature effects on marine resources compared to the existing HBGS's cooling water discharge. Requirements of this Order implement the Thermal Plan.

3. **California Ocean Plan.** The State Water Board adopted the *Water Quality Control Plan for Ocean Waters of California, California Ocean Plan* (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. The Ocean Plan identifies beneficial uses of ocean waters of the State to be protected as summarized below.

**Table F-6. Ocean Plan Beneficial Uses**

| Discharge Point | Receiving Water | Beneficial Uses |
|---|---|---|
| 001 | Pacific Ocean | Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance (ASBS); rare and endangered species; marine habitat; fish spawning and shellfish harvesting. |

In order to protect the beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Requirements of this Order implement the Ocean Plan.

4. **Alaska Rule.** On March 30, 2000, USEPA revised its regulation that specifies when new and revised state and tribal water quality standards (WQS) become effective for CWA purposes (40 CFR 131.21, 65 FR 24641, (April 27, 2000).) Under the revised regulation (also known as the Alaska Rule), new and revised standards submitted to USEPA after May 30, 2000, must be approved by USEPA before being used for CWA purposes. The final rule also provides that standards already in effect and submitted to USEPA by May 30, 2000, may be used for CWA purposes, whether or not approved by USEPA.

5. **Stringency of Requirements for Individual Pollutants.** Individual pollutant restrictions consist of technology-based restrictions and water quality-based effluent limitations. Technology-based effluent limitations established in this Order implement the technology-based standards of Table A of the Ocean Plan. Water quality-based effluent limitations have been scientifically derived to implement water quality objectives that protect beneficial uses. Both the beneficial uses and the water quality objectives have been approved pursuant to federal law and are the applicable federal water quality standards. All beneficial uses and water quality objectives contained in the Basin Plan and the Ocean Plan were approved under state law and submitted to and approved by USEPA prior to May 30, 2000. Any water quality objectives and beneficial uses submitted to USEPA prior to May 30, 2000, but not approved by USEPA before that date, are nonetheless "applicable water quality standards for purposes of the CWA" pursuant to 40 CFR 131.21(c)(1). Collectively, this Order's restrictions on individual pollutants are not more stringent than required to implement the technology-based requirements of the CWA and the applicable water quality standards for purposes of the CWA.

6. **Anti-degradation Policy.** Section 131.12 requires that state water quality control standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution 68-16. Resolution 68-16 incorporates the federal antidegradation policy where the federal policy applies under the federal law. Resolution 68-16

requires that existing water quality is maintained unless degradation is justified based on specific findings.

Investigations were conducted by the Discharger to evaluate compliance with antidegradation requirements (Poseidon Seawater Desalination Facility at Huntington Beach, Antidegradation Policy Analysis, 2006). The results of these investigations indicate that there would be a slight increase in salinity concentrations as the result of discharges from the Facility but that this change would be spatially localized and confined to the mixing zone. Further, the discharges would not cause or contribute to adverse impacts on the beneficial uses of the receiving waters. Mass emission and concentration limits established in this Order are at least as stringent as those established in the previous order, and would not result in a lowering of water quality. Therefore, discharges from the Facility are consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution 68-16.

7. **Anti-Backsliding Requirements.** Sections 402(o)(2) and 303(d)(4) of the CWA and federal regulations at title 40, Code of Federal Regulations[3] section 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require that effluent limitations in a reissued permit must be as stringent as those in the previous permit, with some exceptions in which limitations may be relaxed. Effluent limitations in this Order are at least as stringent as those established in the previous Order.

## D. Impaired Water Bodies on CWA 303(d) List

California's 2006 list of impaired water bodies is prepared by the State Board pursuant to Section 303(d) of the CWA. These waters are not expected to meet applicable water quality standards after implementation of technology-based effluent limitations for point sources. The Huntington Beach State Park is included in the 303d list for enterococci, indicator bacteria, and PCBs (Polychlorinated biphenyls). The nearshore and offshore zones of Huntington Beach State Park are the immediately affected receiving waters of discharges from the Facility.

## E. Other Plans, Policies and Regulations

### 1. Clean Water Act Section 316(b) Applicability

Current CWA Section 316(b) implementing regulations are applicable to facilities that meet the definition of a Phase II existing facility at 40 CFR 125.91. Such facilities withdraw cooling water from a water of the United States; have, or are required to have, a NPDES permit; generate and transmit electric power as their

[3] *All further statutory references are to Title 40 of the Code of Federal Regulations unless otherwise indicated.*

primary business activity; have a total design intake capacity of 50 MGD or greater; and use at least 25 percent of the withdrawn water exclusively for cooling purposes. Pursuant to CWA 316(b) regulations, the HBGS is classified as a Phase II existing facility. However, pursuant to the definitions and applicability of the Phase I rule (40 CFR 125.8), the Phase II rule (40 CFR 125.9), and the proposed Phase III rule (Federal Register Vol. 69, No. 226, Wednesday, Nov. 24, 2004), the 316(b) regulations are not applicable to the Facility. Therefore, no special conditions relating to the 316(b) implementing regulations are included in this Order.

On May 4, 2010, the State Water Resources Control Board (SWRCB) adopted a Water Quality Control Policy for the use of Coastal and Estuarine Waters for Power Plant Cooling ("OTC Policy") that establishes technology-based standards to implement the federal Clean Water Act section 316(b). Section 316(b) applies specifically to cooling water intake structures used by power plants. Section 316(b) does not apply to seawater desalination facilities, including this Facility[4].

The Substitute Environmental Document (SED) for the OTC Policy adopted by the SWRCB recognizes that seawater desalination facilities and power plants that use once-through cooling technology have different operational characteristics (e.g., water intake volumes and velocities and discharge temperature and salinity). The SED also notes that power plants are different from seawater desalination facilities in terms of the Best Technology Available (BTA) for the minimization of environmental effects, as the use of seawater is secondary to the primary purpose of power production whereas it is the primary purpose of desalinated water production. The SWRCB excluded seawater desalination plants from the OTC Policy and the Policy has no direct application to the permitting of the Huntington Beach Desalination Facility. The AES Huntington Beach Generating Station must be in compliance with the State Board policy as early as December 31, 2020[5].

When operating in conjunction with the power plant (co-located scenario), the Facility will not increase the volume or the velocity of HBGS's cooling water intake, nor will it increase the number of organisms impinged and/or entrained by the HBGS's cooling water intake structure. Therefore, when the Facility is operating in co-located mode, there will be no additional impacts on marine life.

---

4 *On May 4, 2010, State Water Resources Control Board adopted a Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling; Final Substitute Environmental Document, page 57.*

5 *May 4, 2010 State Water Resources Control Board Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling; Final Substitute Environmental Document, page 79.*

2. **Water Code Section 13142.5(b) Applicability and Compliance**

Water Code Section 13142.5(b) requires new industrial facilities using seawater for processing to use the best available site, design, technology, and mitigation feasible to minimize the intake and mortality of all forms of marine life.

The Regional Water Board recognizes that future HBGS flows may not follow historical trends. For this reason, the Regional Water Board requires the Discharger to ensure that the requirements of Section 13142.5(b) of the Water Code are complied with when the Facility's intake requirements exceed the volume of water being discharged by the HBGS. This analysis addresses each of the following provisions of Water Code Section 13142.5(b) for temporary stand-alone Facility operations:

a. Determines the best available **SITE** feasible to minimize Facility related effects to marine life;

1). The Facility will be located adjacent to HBGS and will use HBGS's existing intake and discharge infrastructure, which draws cooling water from the Pacific Ocean and discharges into the Pacific Ocean.

2). The Impingement and Entrainment studies at HBGS demonstrate estimated levels of proportional mortality that are much less than the estimates from other coastal power plants in California. This is attributed to the location of the Facility along a fairly homogeneous stretch of coastline dominated by sandy habitat that provides less diverse habitat for fishes than rocky coastal or estuarine areas where some of the other facilities are located. In the vicinity of the HBGS's intake and outfall, there are no Areas of Special Biological Significance (ASBS), no Marine Life Protection Areas (MLPA) and no state or federal threatened or endangered species that are expected to be affected by the Facility's seawater intake or discharge.

3). The Discharger has defined fundamental project objectives for the Facility including: (1) to use proven technology to affordably provide a local and reliable source of water not subject to the variations of drought or political or legal constraints; (2) to reduce local dependence on imported water; and (3) to meet the Facility's planned contribution of desalinated water as a component of satisfying regional water supply planning goals.

4). Co-locating the Facility with HBGS allows the Facility to use the existing HBGS intake and discharge infrastructure. Using HBGS's existing intake and discharge infrastructure allows the Facility to minimize the intake and mortality of marine life by reducing the amount of source water required to be withdrawn directly from the Pacific Ocean for its purposes by using water discharged by HBGS.

5). The HBGS's intake pipe is a 14-foot diameter conduit that is capable of transporting more than four times the volume of water required by the Facility. The use of the existing pipe allows for lower intake velocities when used by the Facility, which will result in less impingement effects.

6). By co-locating with the HBGS, the Facility will use the waste stream discharged by the HBGS as its first source of water. The discharge of the HBGS wastewater to the Pacific Ocean is subject to Regional Water Board Order No. R8-2006-0011 (NPDES CA00001163), issued to AES Huntington Beach L.L.C. The Discharger's beneficial reuse of HBGS's discharge water recycles, conserves, and reuses water recycling expressly, which is encouraged by the State of California (see e.g., Water Code Section 461). This beneficial reuse also reduces the amount of HBGS wastewater discharged under R8-2006-0011.

7). Using the HBGS's existing intake and discharge infrastructure also eliminates the need for new construction of major intake and discharge facilities and avoids corresponding environmental impacts and economic costs.

8). In addition to the HBGS site, the Discharger considered sites within the City of Huntington Beach that were deemed by the City to be infeasible. Three alternative sites in Orange County were also considered that could accommodate the proposed desalination project. These sites included: the mouth of San Juan Creek (within the City of Dana Point), San Onofre (within San Diego County), and along the coast of the City of San Clemente. These alternative sites in Orange County are deemed infeasible for the following reasons:

(a) San Juan Creek – requires the construction of a new ocean intake/outfall that would cause avoidable ocean water quality, coastal resource and marine life impacts; sensitive surrounding land uses that could cause incompatibility issues (i.e., noise and aesthetics).

(b) San Onofre – requires co-location in proximity to existing nuclear power plant facilities; presents engineering and land acquisition issues.

(c) San Clemente – requires the construction of a new ocean intake/outfall that would cause avoidable ocean water quality coastal resource and marine life impacts; sensitive surrounding land uses that could cause incompatibility issues (i.e., noise and aesthetics).

9). The Facility's certified Subsequent Environmental Impact Report (SEIR) found there were no other feasible and environmentally-superior sites.

10). Providing water at a competitive cost represents another fundamental objective of the Project. Alternative sites would require the construction of a new form of seawater intake system. The construction of a new seawater

intake system of any type including beach wells or a seafloor infiltration gallery (see City of Huntington Beach 2010 SEIR Findings, and 2011 Water Global Consulting Evaluation of Alternative Desalination Plant Subsurface Technologies) would be cost prohibitive and increase the cost of production of the water well above the cost of imported supplies.

11). Pursuant to Water Code Section 13142.5(b), the Regional Water Board finds that there are no better alternative and feasible sites available for the Facility and that the HBGS site is the best available site feasible to minimize intake and mortality to marine life during operations of the Facility.

b. Determines the best available **DESIGN** feasible to minimize Facility related effects to marine life;

1). The primary design feature of the Facility is the direct connection of the desalination plant to the HBGS's cooling water system pipelines after the intake water is screened. This design feature allows the Facility to use the power plant screened water as both source water for the seawater desalination plant and as a blending water to reduce the salinity of the desalination facility concentrate prior to discharging to the ocean. Under temporary stand-alone operations, the Discharger has little control over the intake structure.

2). The Facility's use of an existing offshore deep water intake is a design feature that minimizes entrainment and impingement effects due to the location of the plant's offshore intake along a fairly homogeneous stretch of coastline dominated by sandy habitat that provides mush less habitat for fishes than nearshore rocky coastal or estuarine areas[6].

3). When operating in a temporary stand-alone mode, the volume and velocity of the Facility's flows through the inlet (bar racks) and fine screens will be less than HBGS's permitted flows at these locations.

4). Under temporary stand-alone operations, the Discharger has little control over the intake structure. Under these conditions, the existing intake meets the best available design criteria. Pursuant to Water Code Section 13142.5(b), the direct connection of the desalination plant to the HBGS's cooling water system pipelines represents the best available design feasible to minimize intake and mortality to marine life from the Facility's temporary stand-alone operations. Because different and/or better designs may be feasible in the future under long-term stand-alone operations, the Regional Water Board will reevaluate the Facility's compliance with Water Code section 13142.5(b), best design available requirement, under those conditions.

---

[6] *Entrainment and Impingement Effects from Operation of the Huntington Beach Desalination Facility in Stand-alone Mode, Tenera Environmental, February 2011,*

c. Determines the best available **TECHNOLOGY** feasible to minimize Facility related effects to marine life;

1). Because the Facility will be co-located with the HBGS, technological modifications to the existing intake channel to minimize the intake and mortality of marine life must be compatible with the operations of both HBGS and the Facility. In addition, the Amendment of Lease PRC 1980.1 [State Lands Commission lease with AES Huntington Beach L.L.C. I (HBGS operator)] to authorize the Facility's use of the intake and outfall provides that entrainment and impingement minimization measures cannot interfere with, or interrupt ongoing power plant operations.

2). The HBGS's seawater intake structure extends approximately 1,800 feet offshore and consists of a vertical riser with a horizontal velocity cap supported approximately 5 feet above the opening to the cooling water conduit. The velocity cap is one technology recommended by the State Water Board for minimizing impingement effects in order to comply with the Water Quality Control Policy for the use of Coastal and Estuarine Waters for Power Plant Cooling[7]. Studies on the effectiveness of the HBGS's velocity cap have shown impingement reductions as high as 90%[8]. No physical changes to the intake structure are proposed or required, and the velocity cap would remain in place during the Facility's temporary stand-alone operations.

3). The Facilities use of the HBGS' existing intake structure as a stand-alone operation at a reduced flow rate of 126.7 MGD and the elimination of heat treatment will result in a 92% reduction in fish impingement compared to the HBGS' impingement losses[9].

4). Located in the ocean, the velocity cap currently has large mammal exclusion bars which are vertical bars spaced approximately 12 inches on center. New additional fiberglass rods have been installed by the HBGS, reducing the opening to less than 9.

5). A number of alternative seawater intake technologies were analyzed and investigated. This analysis included the following intake alternatives: (1) subsurface intake (vertical, horizontal and slant beach wells and seafloor infiltration galleries); (2) modifications to the existing HBGS's intake system; and (3) installation of variable frequency drives (VFDs) on seawater intake pumps.

---

7 *Water Quality Control Policy For The Use Of Coastal And Estuarine Waters For Power Plant Cooling, Final Substitute Environmental Document (SED pg. 100)*

8 *Id.*

9 2011 *Arcadis Evaluation of Alternative Intake Technologies for the Reduction of Impingement and Entrainment Mortality*

**Subsurface Intake Alternatives**

6). The Facility's certified SEIR and 2011 Water Global Consulting Evaluation of Alternative Desalination Plant Subsurface Technologies, includes a site-specific technical analysis of the feasibility of the use of alternative subsurface intakes (e.g., beach wells and seafloor infiltration gallery) for the Facility. Based on this analysis, the Regional Water Board finds that the alternative intakes that were evaluated are technologically infeasible and/or environmentally inferior for the following reasons:

a) The Talbert Aquifer transmissivity and storativity characteristics limit the individual capacity of intake wells to 2.2 to 5 MGD and constrain the use of subsurface intakes for extraction of the source water volume required for the Facility.

b) Beach wells (i.e., vertical, horizontal and slant) require service roads, collector pipelines to move the water to the desalination facilities and power supplies. The construction and operation of these facilities would produce significant aesthetic and coastal resources impacts, while limiting public access to the beachfront and increasing the Facility's seawater intake energy consumption.

c) The construction and operation of beach wells would permanently disrupt the Huntington State Beach and limit public access over several miles:
   (1) Vertical wells – 72 wells each with 2.2 MGD capacity require 2.0 miles of beachfront to collect and transport the source water to the Facility.
   (2) Horizontal wells – 32 intake wells each with 5 MGD capacity require 2.3 miles of beachfront to collect and transport the source water to the Facility.
   (3) Slant wells – 30 intake wells each with 4.3 MGD capacity require 4.0 miles of beachfront to collect and transport the source water to the Facility.

d) A seafloor infiltration gallery sized for the Facility would impact approximately 64 acres of benthic habitat and beachfront.
   (1) Seafloor filtration bed 1.25 miles in length and 200 ft wide and 6 feet deep and would disturb approximately 30 acres of seafloor.
   (2) An additional 30 acres of seafloor would also need to be excavated to a depth of 6 feet to lay the 33 connector pipes from the shore through the surf zone to the filter bed.
   (3) The 33 collector pipelines would be connected to 33 wells located on the beach and would need to be connected to an electrical supply and service roads for regular maintenance.
   (4) The wells would pump the seawater to the desalination facility via a newly constructed pipeline (one mile long, ranging from 24 to 72 inches in diameter). Each of the 33 wells would require approximately

2,800 square feet of beachfront property, for a combined loss of over 2.1 acres of beachfront property and related impact to public access. The collection pipeline would require an easement over 1.5 additional acres of shoreline.

e) Infiltration galleries result in significantly larger environmental impacts as compared to vertical, horizontal and slant wells because of the significantly larger soil excavation volume that is associated with the construction of infiltration galleries and the destruction of the benthic flora and fauna over the entire intake footprint.

f) Energy demands associated with conveyance of source seawater from the infiltration gallery to the Facility are comparable to those of the other subsurface intakes and are approximately 2 times greater than what is required to collect intake water from the HBGS's existing seawater intake system.

g) The potential long-term adverse environmental impacts associated with the dewatering of the adjacent Talbert, Brookhurst, and Magnolia Marshes due to the operation of subsurface intake wells. Long-term dewatering could result in irreversible damage to the marshes and negate years of restoration measures.

h) Poor water quality of the aquifer, in terms of lack of oxygen, and elevated ammonia, iron, manganese, and bacterial contamination.

i) Possible interception of contaminated groundwater from nearby Ascon Landfill, which could introduce carcinogenic hydrocarbons into the source water for the Facility.

j) Possible interception of injection water from Talbert Barrier by the intake which may impair the function of this barrier to protect against seawater intrusion to the groundwater basin and may direct reclaimed water into the intake.

k) Potential subsidence of public roads and structures from potential drawdown of the groundwater table.

l) Impairment to the aesthetics of the coastal shore by any above ground structures and roads.

The alternative subsurface intake systems were determined not to be the environmentally preferred alternatives. Taking into account economic, environmental and technological factors, the Regional Water Board finds that the alternative subsurface intakes are not feasible.

**Modifications to the Existing Intake System**

7). A number of modifications to the existing intake system technologies were analyzed and investigated. The 2011 Arcadis Evaluation of Alternative Intake Technologies for the Reduction of Impingement and Entrainment Mortality analysis compared screening technologies including: (a) Fish nets, light, acoustic and air bubble barriers upstream of the existing intake; (b) New screening technologies (e.g. wedge wire screens) to replace the existing velocity cap and mammal exclusion bars; and (c) fine mesh vertical traveling screens.

a) Barriers - Based upon the Comprehensive Demonstration Study for the HBGS, light, sound, air bubbles and other behavioral barrier technologies have been proven to be species-and site-specific and are most effective on Alosids, which are not impinged at HBGS. Due to the site and species specific results for behavioral barrier effectiveness in reducing impingement and the lack of positive results with those species that are impinged at HBGS, behavioral barriers are not considered a viable option for the Facility.

b) Screening technologies to replace existing velocity cap - To achieve a reduction in impingement and entrainment mortality based on the species collected at HBGS, it would be necessary to replace the existing velocity cap with cylindrical wedgewire screens with a 0.5 mm slot width. An installation of 0.5 mm slot cylindrical wedgewire screens at a large offshore seawater intake has never been constructed in the United States and while several site-specific pilot studies are underway along the California coast, no conclusive results have been produced to date. No operational experience exists on which to base a high probability of success. For these reasons, offshore fine slot wedgewire screens are not considered to be a feasible alternative for this site.

c) Fine vertical traveling screens - Replacing the existing 3/8 inch (9.5 mm) mesh intake screens with fine mesh modified Ristroph screens and a fish return system at the HBGS would impact the current operation of the HBGS and is therefore infeasible. Once HBDF begins stand-alone operation, the use of fine mesh modified Ristroph screens and a fish return system could prove technologically feasible; however, would only provide a very small incremental reduction in impingement mortality and the survival of the eggs and larvae that are prevented from being entrained is anticipated to be very low. Therefore, the use of fine mesh screens will provide very little benefit for the nearly $10 million in construction costs. When considering economics and environmental benefits, fine mesh modified Ristroph screens are not at this point in time a feasible technology for minimizing impingement and entrainment effects from the operation of the HBDF.

Implementation of the alternatives associated with the modification of the existing HBGS' intake and screening facilities were infeasible because they are unproven on such a large scale in ocean water conditions or would interfere with, or interrupt, power plant scheduled operations. HBGS' intake screening alternatives are not capable of being accomplished in a successful manner within a reasonable period of time.

Taking into account economic, environmental and technological factors, the Regional Water Board finds that the modifications to the existing intake system are not feasible.

**Installation of Variable Frequency Drive (VFD) on Facility Seawater Intake Pump Station**

8). The Regional Water Board finds that the installation of VFDs on the Facility intake pump station is a feasible impingement, entrainment and flow reduction technology measure for the site-specific conditions of the Facility. The Facility intake pump station will be equipped with a VFD system to closely control the volume of the collected seawater. As water demand decreases during certain periods of the day and the year, the VFD system will reduce the intake pump motor speed and decrease intake pump flow to the minimum level needed for water production. The installation of a VFD system at the intake pump station could reduce the total intake flow of the desalination plant compared to constant speed design, resulting in the proportional decrease in entrainment associated with desalination plant operations. In addition, by reducing the intake flow and velocity, the Facility will further minimize any potential for impingement. Under these circumstances, the Discharger has identified the installation of VFDs as the best technology feasible to minimize the intake and mortality of marine life at this time.

9). Pursuant to Water Code Section 13142.5(b), the Regional Water Board finds that the proposed technology for the Facility is the best available technology feasible to minimize intake and mortality to marine life under temporary stand-alone operations. Because different and/or better technologies may be feasible in the future under long-term stand-alone operations, the Regional Board will reevaluate the Facility's compliance with the best technology available requirements of Water Code section 13142.5(b) under those conditions.

d. Determines the best available **MITIGATION** measures feasible to minimize Facility related effects to marine life.

1). **Facility Temporary Stand-Alone operation.** In May 2001, the CEC granted an emergency certification for the retooling and restarting of HBGS Units 3 and 4, which had been retired in 1995. As part of that emergency process, the

CEC conditions of approval included a requirement that AES pay for a study to determine the actual impingement and entrainment losses resulting from the operation of the HBGS once-through cooling water system. This study (the "AES Huntington Beach L.L.C. Generating Station Entrainment and Impingement Study") was completed in April 2005. Data from this study were used to evaluate impingement and entrainment effects of the Huntington Beach Seawater Desalination Project at Huntington Beach.

Working together with the California Department of Fish and Game, the California Coastal Commission, the Santa Ana RWQCB, and National Marine Fisheries Service, the California Energy Commission determined that impacts to marine species resulting from the operation of HBGS Units 3 and 4 (seasonally adjusted annual flow rate of 253.4 MGD) would be mitigated by AES's funding of the purchase, restoration, and maintenance of 66.8 acres of tidal wetlands. The restoration of the tidal wetlands was completed in 2009 and maintenance is ongoing.

In 2010, the CEC granted AES a 10-year license extension for HBGS units 3 and 4, an extension that was conditioned upon the continued funding for the maintenance of the 66.8-acre restored tidal wetlands to ensure there are no unmitigated marine life-related effects due to entrainment at HBGS units 3 and 4.

Pursuant to the State Water Board's 2010 "Water Quality Control Policy For The Use Of Coastal And Estuarine Waters for Power Plant Cooling," HBGS must implement measures to mitigate the interim impingement and entrainment impacts resulting from the cooling water intake structure until HBGS decommissions its cooling water system. This requirement ensures through the continued maintenance of the HBGS' wetlands mitigation program, or any potential alternative HBGS mitigation program, that during temporary stand-alone operations, sufficient impingement and entrainment mitigation has already been implemented by HBGS for the Facility's operation.

When operating in temporary stand-alone mode, the Facility's intake flow will be approximately 126.7 MGD – a volume which is less than HBGS's currently permitted intake flow of 514 MGD. The Facility's reduced intake flow rate will reduce the existing permitted intake volume, velocity, temperature and number of organisms impinged and entrained from the ocean waters. HBGS has provided for marine life mitigation for more than a 12-M average flow of 126.7 MGD, and it will continue to provide for such mitigation until it permanently ceases to use the once-through cooling water system or permanently stops generating electricity. As a result, the marine life effects of the Facility's temporary stand-alone operation would not require additional marine life mitigation.

The Regional Water Board finds that when the Facility is operating in a temporary stand-alone mode, all marine life related effects are mitigated. The Regional Water Board further finds that, while operating in temporary stand-alone mode, the Facility is in compliance with California Water Code Section 13142.5(b) and meets the requirements of best available mitigation to minimize the intake and mortality of marine life.

If AES were to stop supporting the marine life mitigation program to offset all entrainment-related effects on marine life, the Discharger would be required to fund AES's existing 66.8-acre tidal wetlands mitigation program under the direction of the Huntington Beach Wetlands Conservancy, or to incorporate mandated feasible design or technology features capable of reducing or eliminating such entrainment-related effects and thereby reducing or eliminating the requirement to fund the marine life mitigation program.

2). **Long-Term Stand-Alone Operations.** If HBGS permanently ceases operations of its once-through cooling water system and/or if it were to permanently stop generating electricity at the current site, the Discharger would independently operate the seawater intake and outfall for the Facility. The amount of the Facility's intake flow would be less than the currently permitted HBGS intake flow (i.e., 514 MGD), which would reduce the existing intake volume, velocity, temperature and impingement and entrainment-related effects. In order to ensure R8-2011-0046 requirements, the Facility's average annual seawater intake flow rate will be 126.7 MGD.

On October 29, 2010, the California State Lands Commission approved a lease amendment authorizing the Discharger's use of HBGS's existing offshore seawater intake and discharge facilities. If the HBGS's cooling water system were permanently decommissioned, the Lease Amendment requires the Discharger to maintain AES's existing marine life mitigation program. By funding the existing marine life mitigation program, the Discharger would compensate for any marine life-related effects that might be associated with the Facility's long-term stand-alone operations.

If the HBGS permanently ceases operations of the once-through cooling water system and/or if HBGS permanently stops generating electricity at the current site, within 180 days of receiving such notice, the Discharger shall submit a separate Report of Waste Discharge to the Regional Water Board which evaluates any new design and technology requirements to conform with California Water Code Section 13142.5(b). Additional review will be necessary, in part, because when operating in long-term stand-alone mode, the Discharger will have more discretion and flexibility with respect to the operation of the intake structure and outfall and it will be in a position to re-consider whether other design and/or technology features have been rendered feasible.

If AES were to discontinue support for the marine life mitigation program, the Discharger would be required to fund AES's existing 66.8-acre tidal wetlands mitigation program or to incorporate mandated feasible design or technology features capable of reducing or eliminating such entrainment-related effects, thereby reducing or eliminating the requirement to fund the marine life mitigation program.

The Regional Water Board finds that the Facility's long-term stand-alone operational scenario is in compliance with the mitigation requirements of Section 13142.5(b).

a) Impingement

(1) The proposed operation of the HBGS seawater intake system under long-term stand-alone mode would result in an estimated average daily impingement of 11 fishes weighing 0.26 kg (0.59 lb). The estimated average daily impingement rate for shellfish would be approximately 6 individuals weighing 0.09 kg (0.198 lb)[10].

(2) Impingement would not result in substantial reductions in fish or shellfish populations under long-term stand-alone operating conditions. It is not anticipated that the small amount of impingement losses would have any effect on the ability of impinged species to sustain their populations. The intake structure is not within or near an Area of Special Biological Significance (ASBS). No threatened or endangered species or kelp beds exist within the vicinity of the HBGS outfall.

(3) For long-term stand-alone operations, the total daily impingement of approximately 0.78 lbs per day (estimated impingement of fishes plus estimated impingement of shellfish) is a fraction (less than 25%) of the daily diet of one brown pelican.

(4) The Facility's use of the HBGS's existing intake structure as a stand-alone operation at a reduced flow rate of 126.7 MGD and the elimination of heat treatment will result in a 92% reduction in fish impingement compared to the HBGS's impingement losses[11].

---

10 *Entrainment and Impingement Effects from the Operation of the Huntington Beach Desalination Facility in Stand-alone Mode; Tenera Environmental, February 2011.*

11 2011 *Arcadis Evaluation of Alternative Intake Technologies for the Reduction of Impingement and Entrainment Mortality*

b) Entrainment

(1) The Facility's entrainment was projected using the Empirical Transport Model ("ETM"), which is a widely used model to estimate mortality rates resulting from water intake systems. Potential entrainment was assessed by comparing the numbers of larvae entrained with the numbers of larvae at risk of entrainment in the source waters to obtain an estimate of the proportional mortality caused by entrainment.

(2) Proportional Mortality (Pm) represents the percentage of the population of a marine species in a given water body that will be drawn in and entrained by a water intake system. The Pm ratio is calculated by dividing (a) the number of larvae that are entrained in a water intake system by (b) the number of larvae in the same water body that are subject to entrainment (i.e., entrainable).

(3) Based on a fairly constant pumping rate with an 12-month average of 126.7 MGD, larval entrainment losses due to the long-term stand-alone operation of the Facility are projected to affect only a small fraction of the larvae (0.02–0.28%) of the source water populations of approximately 115,000,000,000 (billion) larvae.

(4) The entrainment effects associated with the Facility's stand-alone operations and fixed average annual intake flow rate of approximately 126.7 MGD would be less than the entrainment effects that are currently associated with the HBGS's Units 3 and 4 seasonally adjusted (pumping rate of up to 253. 4 MGD) larval entrainment losses.

(5) The most abundant taxon of larval fish entrained (33%) was CIQ gobies, which is comprised of three species of small, bottom-dwelling fish that are found in bays and lagoons. Nearby adult populations are concentrated in localized habitats, such as Alamitos Bay, Anaheim Bay, and Talbert Marsh, and their larvae are dispersed in these environs and transported out into coastal waters by tidal flushing and prevailing currents. These larvae would experience high rates of natural mortality at the intake location because the intake is located in an area that does not provide a suitable habitat to sustain resident adult populations, and there is a low likelihood that larvae that have been flushed into the area of the intake would be able to return to the shallow bay habitats that meet the species' life history requirements.

(6) No state or federal threatened or endangered species are expected to be impacted by the proposed Facility. The intake structure is not within or near an Area of Special Biological Significance (ASBS).

In summary, the Regional Water Board finds that the Facility's temporary stand-alone operational scenario is in compliance with California Water Code Section 13142.5(b) as it employs the best site, design, technology and mitigation feasible to minimize the intake and mortality of marine life (see table F-7). In addition, the Regional Water Board finds that the Facility's long-term stand-alone operational scenario is in compliance with Section 13142.5(b) with regard to mitigation.

**Table F-7. Design, Technology, and Mitigation Measures to Minimize Impacts to Marine Life**

| Category | | Operational Scenario | Feature | Result |
|---|---|---|---|---|
| 1. Site | 1.1 | Temporary Stand-Alone | Proposed location at Huntington Beach Generating Station (HBGS) | Best available site for the project, no feasible and less environmentally damaging alternative locations. |
| | 1.2 | Temporary Stand-Alone | Proposed location at Huntington Beach Generating Station (HBGS) | No Areas of Special Biological Significance (ASBS), no Marine Life Protection Areas (MLPA) and no state or federal threatened or endangered species in the vicinity of the HBGS's intake and outfall. |
| 2. Design | 2.1 | Temporary Stand-Alone | Connection to HBGS Discharge Pipeline | Screened water to reduce entrainment of marine organisms |
| | 2.2 | Temporary Stand-Alone | Reduction in inlet screen velocity | Reduction of impingement of marine organisms |
| | 2.3 | Temporary Stand-Alone | Connection to HBGS Discharge Pipeline | Deep water, offshore intake |
| | 2.4 | Temporary Stand-Alone | Reduction in fine screen velocity | Reduction of impingement of marine organisms |
| 3.Technology | 3.1 | Temporary Stand-Alone | Intake velocity cap | Reduction of impingement of marine organisms |
| | 3.2 | Temporary Stand-Alone | Installation of VFD on Facility intake pumps | Reduce the total intake flow for the desalination facility to no more than that needed at any given time, thereby minimizing the entrainment of marine organisms. |
| 4. Mitigation | 4.1 | Temporary and Long-Term Stand-Alone | Maintenance of existing 66.8 acres of wetlands mitigation for operation of 126.7 MGD intake | Compensates for unavoidable entrainment and impingement impacts and enhances the coastal environment. |

## IV. RATIONALE FOR EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

The CWA requires point source discharges to control the amount of conventional, non-conventional, and toxic pollutants that are discharged into the waters of the United States. The control of pollutants discharged is established through effluent limitations and other requirements in NPDES permits. There are two principal bases for effluent limitations in the Code of Federal Regulations: section 122.44(a) requires that permits include applicable technology-based limitations and standards; and section 122.44(d) requires that permits include water quality-based effluent limitations to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water.

Where numeric water quality objectives have not been established, three options exist to protect water quality: 1) 40 CFR Section 122.44(d) specifies that WQBELs may be established using USEPA criteria guidance under CWA section 304(a); 2) proposed State criteria or a State policy interpreting narrative criteria supplemented with other relevant information may be used; or 3) an indicator parameter may be established.

## A. Discharge Prohibitions

Discharge Prohibitions in this Board Order are based on the Federal Clean Water Act, Basin Plan, State Water Resources Control Board's plans and policies, California Ocean Plan, and U.S. Environmental Protection Agency guidance and regulations.

## B. Technology-Based Effluent Limitations

### 1. Scope and Authority

Section 301(b) of the CWA and implementing USEPA permit regulations at section 122.44, title 40 of the Code of Federal Regulations, require that permits include conditions meeting applicable technology-based requirements at a minimum, and any more stringent effluent limitations necessary to meet applicable water quality standards. The discharge authorized by this Order must meet minimum federal technology-based effluent limitations (TBELs) based on Table A of the California Ocean Plan and/or Best Professional Judgment (BPJ) in accordance with Part 125, section 125.3.

The CWA requires that technology-based effluent limitations be established based on several levels of controls:

a. Best practicable treatment control technology (BPT) represents the average of the best performance by plants within an industrial category or subcategory. BPT standards apply to toxic, conventional, and nonconventional pollutants.

b. Best available technology economically achievable (BAT) represents the best existing performance of treatment technologies that are economically achievable within an industrial point source category. BAT standards apply to toxic and nonconventional pollutants.

c. Best conventional pollutant control technology (BCT) represents the control from existing industrial point sources of conventional pollutants including BOD, TSS, fecal coliform, pH, and oil and grease. The BCT standard is established after considering the "cost reasonableness" of the relationship between the cost of attaining a reduction in effluent discharge and the benefits that would result, and also the cost effectiveness of additional industrial treatment beyond BPT.

d. New source performance standards (NSPS) represent the best available demonstrated control technology standards. The intent of NSPS guidelines is to

set limitations that represent state-of-the-art treatment technology for new sources.

The CWA requires USEPA to develop effluent limitations, guidelines and standards (ELGs) representing application of BPT, BAT, BCT, and NSPS. Section 402(a)(1) of the CWA and section 125.3 of the Code of Federal Regulations authorize the use of best professional judgment (BPJ) to derive technology-based effluent limitations on a case-by-case basis where ELGs are not available for certain industrial categories and/or pollutants of concern. Where BPJ is used, the permit writer must consider specific factors outlined in section 125.3.

2. **Applicable Technology-Based Effluent Limitations**

Table A of the Ocean Plan establishes technology-based effluent limitations for POTWs and industrial discharges for which effluent limitation guidelines have not been established (including the discharge of concentrated seawater from the desalination facility). Order No. R8-2011-0046 established numeric effluent limitations based on Table A of the Ocean Plan at Discharge Point 001.

Table A of the Ocean Plan requires dischargers to, as a monthly average, remove 75 percent of suspended solids from the influent stream before discharging wastewater to the Pacific Ocean, except that the effluent limitation to be met shall not be less than 60 mg/L. Because the seawater desalination facility is not a POTW, an effluent limitation of 60 mg/L is more appropriate and has been established for the desalination facility discharge. The technology-based effluent limitations from the Ocean Plan are summarized below in Table F-8.

**Table F-8. Summary of TBELs on Table A of the Ocean Plan**

| Parameter | Units | Effluent Limitations | | | |
|---|---|---|---|---|---|
| | | Monthly Average | Weekly Average | Instantaneous Minimum | Instantaneous Maximum |
| Oil & grease | mg/l | 25 | 40 | -- | 75 |
| | lbs/day | 11,800 | 18,900 | -- | |
| Total Suspended Solids | mg/l | 60[a] | -- | -- | -- |
| | lbs/day | 28,300 | -- | -- | -- |
| Settleable solids | ml/l | 1.0 | 1.5 | -- | 3.0 |
| Turbidity | NTU | 75 | 100 | -- | 225 |
| pH | pH units | -- | -- | 6.0 | 9.0 |

[a] Table A of the Ocean Plan requires dischargers to, as a monthly average, remove 75% of suspended solids from the influent stream before discharging wastewater to the Pacific Ocean, except that the effluent limitation to be met shall not be less than 60 mg/L. Because this Facility is not a POTW, an effluent limitation of 60 mg/L is appropriate and established for the Facility's discharge.

## C. Water Quality-Based Effluent Limitations (WQBELs)

### 1. Scope and Authority

Section 301(b) of the CWA and section 122.44(d) require that permits include limitations more stringent than applicable federal technology-based requirements where necessary to achieve applicable water quality standards.

Section 122.44(d)(1)(i) mandates that permits include effluent limitations for all pollutants that are or may be discharged at levels that have the reasonable potential to cause or contribute to an exceedance of a water quality standard, including numeric and narrative objectives within a standard. Where reasonable potential has been established for a pollutant, but there is no numeric criterion or objective for the pollutant, water quality-based effluent limitations (WQBELs) must be established using: (1) USEPA criteria guidance under CWA section 304(a), supplemented where necessary by other relevant information; (2) an indicator parameter for the pollutant of concern; or (3) a calculated numeric water quality criterion, such as a proposed state criterion or policy interpreting the state's narrative criterion, supplemented with other relevant information, as provided in section 122.44(d)(1)(vi).

The process for determining reasonable potential and calculating WQBELs when necessary is intended to protect the designated uses of the receiving water as specified in the Basin Plan, and achieve applicable water quality objectives and criteria that are contained in other state plans and policies, or any applicable water quality criteria contained in the Ocean Plan.

### 2. Applicable Beneficial Uses and Water Quality Criteria and Objectives

Applicable beneficial uses designated within the Basin Plan and Ocean Plan are listed in Tables F-5 and F-6 within Section III.C., above.

The following water quality objectives listed below from Table B, Page 7 of the California Ocean Plan are established for the protection of marine aquatic life. The Ocean Plan also establishes receiving water standards for acute and chronic toxicity to protect marine aquatic life. Additionally, the Ocean Plan establishes water quality objectives for the protection of human health for 20 non-carcinogenic and 42 carcinogenic compounds.

**Table F-9. Ocean Plan Table B Receiving Water Standards for the Protection of Marine Aquatic Life**

| OBJECTIVES FOR THE PROTECTION OF AQUATIC LIFE | | | | |
|---|---|---|---|---|
| **Parameters** | **Limiting Concentrations** | | | |
| | **Units of Measurement** | **6-Month Median** | **Daily Maximum** | **Instantaneous maximum** |
| Arsenic | µg/L | 8 | 32 | 80 |
| Cadmium | µg/L | 1 | 4 | 10 |
| Chromium (Hexavalent) | µg/L | 2 | 8 | 20 |
| Copper | µg/L | 3 | 12 | 30 |
| Lead | µg/L | 2 | 8 | 20 |
| Mercury | µg/L | 0.04 | 0.16 | 0.4 |
| Nickel | µg/L | 5 | 20 | 50 |
| Selenium | µg/L | 15 | 60 | 150 |
| Silver | µg/L | 0.7 | 2.8 | 7 |
| Zinc | µg/L | 20 | 80 | 200 |
| Cyanide | µg/L | 1 | 4 | 10 |
| Total Residual Chlorine | µg/L | 2 | 8 | 60 |
| Ammonia (Expressed as Nitrogen) | µg/L | 600 | 2400 | 600 |
| Chronic Toxicity | TUc | N/A | 1 | N/A |
| Phenolic Compounds (non-chlorinated) | µg/L | 30 | 120 | 300 |
| Chlorinated Phenolics | µg/L | 1 | 4 | 10 |

### 3. Determining the need for WQBELs

Order No. R8-2006-0034 contained effluent limitations based on implementing Ocean Plan Table B receiving water standards for non-conventional and toxic pollutants. The Facility is not operational, and no effluent data are presently available. Pilot plant effluent data developed using HBGS effluent were presented within the Discharger's Report of Waste Discharge. The pilot plant data indicate that no measurable concentrations of Table B compounds will be present in the discharge. The seawater desalination operations result in returning influent seawater

constituents back to the ocean. The Discharger adds no measurable quantities of Table B toxic compounds to the ocean, and does not result in an increase in mass emissions of toxic constituents to the ocean over and above compounds that are within the HBGS cooling water effluent. For these reasons, effluent limitations are established in this Order for those constituents which are regulated by effluent limitations established within the AES HBGS NPDES permit. Effluent limits are established based on the water quality objectives listed in Table B, page 7 of the California Ocean Plan.

4. **WQBEL Calculations**

a. **Concentration Calculation**

Table B of the Ocean Plan includes water quality objectives for the protection of marine aquatic life and these objectives are used to establish effluent limits for discharges from this Facility.

The Ocean Plan takes into account the "minimum probable initial dilution" in determining effluent limitations for toxic pollutants. Initial dilution is the process that results in the rapid and irreversible turbulent mixing of wastewater with ocean water around the point of discharge. For the purposes of the Ocean Plan, minimum initial dilution is the lowest average initial dilution within any single month of the year. Dilution estimates must be based on observed waste flow characteristics, observed receiving water density structure, and the assumption that no currents of sufficient strength to influence the initial dilution process flow across the discharge structure. In March 1980, the State Board investigated the initial dilution factor for the power plant ocean outfalls throughout the State. The State Board assigned an "initial dilution" factor of 7.5:1 to AES (Huntington Beach generating station outfall). Since the Discharger is utilizing AES cooling water discharges and is discharging to the same outfall utilized by AES HBGS, it is a conservative approach to apply this dilution factor in establishing effluent limitations for discharges from this Facility.

To establish effluent limits for discharges from this Facility, a minimum probable initial dilution of 7.5 to 1 is used.

The following equation from Section III.C.4.a. of the Ocean Plan was used to calculate all concentration-based, effluent limitations (except for instantaneous maximum total residual chlorine).

$$Ce = Co + Dm\ (Co - Cs)$$

Where:
Ce = the effluent concentration limit, µg/L
Co = the concentration (water quality objective) to be met at the completion of initial dilution, µg/L
Cs = background seawater concentration, µg/L

Dm = minimum probable initial dilution expressed as parts seawater per part wastewater.

Background seawater concentration for all Table B parameters was assumed to be zero (Cs = 0), except for the following five parameters (see Table C, Page 14 of Ocean Plan)

**Table F-10. Pollutant Background Concentrations**

| Constituent | Background Seawater Concentration, Cs (µg/L) |
|---|---|
| Arsenic | 3 |
| Copper | 2 |
| Mercury | 0.0005 |
| Silver | 0.16 |
| Zinc | 8 |

Examples:

The following water quality objectives taken from Table B of ocean plan for copper, lead and total chlorine residual were used to establish effluent limits:

**Table F-11. Example Ocean Plan Table B Receiving Water Objectives**

| Pollutant (Co) | 6-Month Median | Daily Maximum | Instantaneous Maximum |
|---|---|---|---|
| Copper (µg/L)[1)] | 3 | 12 | 30 |
| Lead (µg/L)[2)] | 2 | 8 | 20 |
| Total Chlorine Residual (µg/L) | 2 | 8 | 60 |

1) Copper is an example of an Ocean Plan Table B parameter that contains a background seawater concentration (see Table F-10 above).
2) Lead is an example of an Ocean Plan Table B parameter for which it is assumed that the background seawater concentration is zero.

Using the equation, Ce = Co + Dm (Co – Cs), effluent limitations are calculated:

- *Copper*
  Ce = 3 + 7.5 (3 – 2) = 11 µg/L (6-Month Median)
  Ce = 12 + 7.5 (12 – 2) = 87 µg/L (Daily Maximum)
  Ce = 30 + 7.5 (30 – 2) = 240 µg/L (Instantaneous Maximum)

- *Lead*
  Ce = 2 + 7.5 (2 – 0) = 17 µg/L (6-Month Median)
  Ce = 8 + 7.5 (8 – 0) = 68 µg/L (Daily Maximum)
  Ce = 20 + 7.5 (20 – 0) = 170 µg/L (Instantaneous Maximum)

- *Total Residual Chlorine*
  Since chlorination will be conducted on an as-needed basis, which cannot be more explicitly defined, it is appropriate to adopt a conservative approach and assume that chlorination is continuous rather than intermittent. Intermittent is defined as discharges not lasting for more than two hours per day.

  Ce = 2 + 7.5 (2 – 0) = 17 µg/L (6-Month Median)
  Ce = 8 + 7.5 (8 – 0) = 68 µg/L (Daily Maximum)
  Ce = 60 + 7.5 (60 – 0) = 510 µg/L (Instantaneous Maximum)

b. **Mass-based Effluent Limitations**

Mass-based effluent limitations are established using Equation 3 listed in Section III, age 15, of the Ocean Plan.

Mass lbs/day = 0.00834 x effluent limitation (µg/L) Ce x Flow rate (MGD) Q

where: Mass = mass limitation for a pollutant (lbs/day)
Effluent limitation, Ce = concentration limit for a pollutant (µg/L)
Flow rate = discharge flow rate (MGD)

For example, in the case of copper, the 6-month median mass limit is:

0.00834 x 11 µg/L x 56.59 MGD = 5 lbs/day

c. **Summary of Water Quality-based Effluent Limitations Discharge Point 001**: The discharge of wastes shall maintain compliance with the following effluent limitations at Discharge Point 001, with compliance measured at Monitoring Location[12] as described in the attached Monitoring & Reporting Program (Attachment E).

These limits are derived from Table B (Page 7) of the California Ocean Plan using the assigned dilution factor of 7.5 and using equation (1) on Page 13 of the California Ocean Plan. The mass loading (lbs/day) is computed using 56.59 MGD of wastewater discharge, consistent with mass emission requirements established in Order No. R8-2006-0034. Mass emission rate limits are derived using Equation 3 on Page 15 of the California Ocean Plan.

[12] *Before RO effluent mixes with AES discharges*

**Table F-12. Summary of WQBELs on Table B of the Ocean Plan**

| Parameter | Units | 6-Month Median | Daily Maximum | Instantaneous Maximum |
|---|---|---|---|---|
| Arsenic | µg/L | 46 | 250 | 660 |
| | lbs/day | 22 | 118 | --- |
| Cadmium | µg/L | 8.5 | 34 | 85 |
| | lbs/day | 4 | 16 | --- |
| Chromium (Hexavalent) | µg/L | 17 | 68 | 170 |
| | lbs/day | 8 | 32 | --- |
| Copper | µg/L | 11 | 87 | 240 |
| | lbs/day | 5 | 41 | --- |
| Lead | µg/L | 17 | 68 | 170 |
| | lbs/day | 8 | 32 | --- |
| Mercury | µg/L | 0.34 | 1.36 | 3.4 |
| | lbs/day | 0.16 | 0.64 | --- |
| Nickel | µg/L | 43 | 170 | 420 |
| | lbs/day | 20 | 80 | --- |
| Silver | µg/L | 4.8 | 23 | 58 |
| | lbs/day | 2 | 11 | --- |
| Zinc | µg/L | 110 | 620 | 1600 |
| | lbs/day | 52 | 290 | --- |
| Cyanide | µg/L | 8.5 | 34 | 85 |
| | lbs/day | 4 | 16 | --- |
| Total Chlorine Residual | µg/L | 17 | 68 | 510 |
| | lbs/day | 8 | 32 | --- |
| Ammonia-Nitrogen | µg/L | 5,100 | 20,400 | 51,000 |
| | lbs/day | 2,400 | 9,600 | --- |
| Chronic Toxicity[1] (See IV.C.4.e) | TUc | ---- | 8.5 | ---- |
| Phenolic Compounds[2] (non-chlorinated) | µg/L | 250 | 1,000 | 2,550 |
| | lbs/day | 120 | 480 | --- |
| Chlorinated Phenolics[3] | µg/L | 8.5 | 34 | 85 |
| | lbs/day | 4 | 16 | --- |

Values rounded to two significant figures. To be conservative, 6-month median, daily maximum and instantaneous maximum mass emission values are computed using the monthly average seawater desalination facility flow (filter backwash, concentrated seawater and rinse water) of 56.59 MGD, consistent with mass emission requirements established in Order No. R8-2006-0034.

1) The chronic toxicity of the effluent shall be expressed and reported in TUc, where TUc = 100/NOEC. The No Observed Effect Concentration (NOEC) is the highest effluent concentration to which organisms are exposed in a chronic test, that causes no observable adverse effect on the test organisms (e.g., the highest concentration of toxicant to which the values for the observed responses are not statistically significantly different from the controls).
2) Non-chlorinated phenolic compounds represent the sum of 2,4-dimethylphenol, 4,6-dinitro-2-methylphenol,2,4-dinitrophenol, 2-methylphenol, 4-methylphenol, 2-nitrophenol, 4-nitrophenol, and phenol.

3) Chlorinated phenolic compounds represent the sum of 4-chloro-3-methylphenol, 2-chlorophenol, pentachlorophenol, 2,4,5-trichlorophenol, and 2,4,6-trichlorophenol.

## 5. Discharge Flow Limitation

The Order includes a requirement that the AES HBGS and/or the Facility maintain an intake minimum flow of 126.7 MGD, or reduce desalination production to ensure that the desalination discharge does not comprise more than 44.7 percent of the intake flow. The multiplier factor of 0.447 is based on 56.59 MGD divided by 126.7 MGD. The 56.59 MGD flow includes a maximum of 50 MGD of concentrated seawater, 6.3 MGD of backwash water (salinity same as seawater), and 0.29 MGD of RO concentrate solution rinse water.

If the Facility discharges less than 56.59 MGD, it may reduce the intake flow but at all times must meet the flow ratio requirement of 0.447 as described above.

## 6. Whole Effluent Toxicity (WET)

Ocean Plan 2005 addresses chronic and acute toxicity requirements based on minimum initial dilutions factors.

Here is the Section III.C.4.c of the Ocean Plan 2005:

"Toxicity Testing Requirements based on the Minimum Initial Dilution Factor for Ocean Waste Discharges:

(1) Dischargers shall conduct acute toxicity testing if the minimum initial dilution of the effluent is greater than 1,000:1 at the edge of the mixing zone.
(2) Dischargers shall conduct either acute or chronic toxicity testing if the minimum initial dilution ranges from 350: 1 to 1,000: 1 depending on the specific discharge conditions. The RWQCB shall make this determination.
(3) Dischargers shall conduct chronic toxicity testing for ocean waste discharges with minimum initial dilution factors ranging from 100: 1 to 350: 1. The RWQCBs may require that acute toxicity testing be conducted in addition to chronic as necessary for the protection of beneficial uses of ocean waters,
(4) Dischargers shall conduct chronic toxicity testing if the minimum initial dilution of the effluent falls below 100: 1 at the edge of the mixing zone."

As described in Section II.B above, a minimum month 7.5 to 1 initial dilution ratio is assigned to the discharge. Based on this 7.5 to 1 initial dilution ratio, chronic toxicity monitoring of the discharge is warranted per Section III.C.4.c.(4) of the Ocean Plan, and the above-listed Ocean Plan requirements III.C.4.c.(1)-(3) are not applicable to the discharge.

The Ocean Plan establishes a daily maximum receiving water toxicity objective (to be achieved upon completion of initial dilution) of 1.0 TUc (chronic toxicity units).

Calculations for Chronic Toxicity:

The equation is:

Ce = Co + Dm (Co – Cs), effluent limitation is calculated as
Ce = 1 + 7.5 (1 - 0) = 8.5 TUc (Daily Maximum)

Where:
Ce = the effluent concentration limit, µg/L
Co = the concentration (water quality objective) to be met at the completion of initial dilution, µg/L
Cs = background seawater concentration, µg/L
Dm = minimum probable initial dilution expressed as parts seawater per part wastewater.

No acute toxicity requirement or monitoring is warranted per Section III.C.4 of the Ocean Plan. Additional factors considered by the Regional Water Board in not establishing acute toxicity monitoring or acute toxicity effluent requirements include:

- The discharge returns constituents that occur in natural seawater back to the ocean and does not increase mass emissions of toxic compounds.
- Effluent data submitted by the discharger based on pilot plant testing indicate that the discharge will comply with all Ocean Plan Table B standards for toxic constituents.
- The Ocean Plan does not establish any numerical discharge concentrations standards for salinity. Exposure to the estimated salinity concentrations should have no observable effects on marine life or habitat.
- This permit implements a requirement that the discharge not comprise more than 44.7 percent of the total intake flow in order to prevent adverse salinity-related effects and to ensure conformance with Ocean Plan narrative and numerical toxicity objectives.
- The area within Zone of Initial Dilution with elevated salinity is small.
- Under minimum oceanographic mixing conditions with a probability of occurrence of less than 1 percent, hydrodynamic modeling conducted by Dr. Scott Jenkins and Joseph Waysl indicated a dilution ratio of 10:1 under co-located operations (126.7 mgd heated discharge flow), and a 8:1 initial dilution under stand-alone operations (126.7 mgd cold discharge flow) at 1000 foot distance from the outlet structure. The 7.5:1 minimum month initial dilution

value implemented within this permit is more conservative and more protective than initial dilutions projected by Jenkins and Wasyl under minimum oceanographic mixing conditions. As a result, initial dilutions will typically be in excess of the minimum month dilution assigned herein.

- The Zone of Initial Dilution where there will be slightly elevated salinity levels does not include Areas of Special Biological Significance (ASBS), Marine Life Protection Areas (MLPA), state or federal threatened or endangered species or sensitive habitat (e.g. kelp beds).

### D. Final Effluent Limitations

**Final Effluent Limitations.** Tables F-8 and F-12 summarize effluent limitations established on discharge point DP 001 by this Order. Mass emission limitations have been derived based on a flow of 56.59 MGD (50 MGD concentrated seawater, 6.3 MGD filtration backwash, and 0.29 MGD rinse water).

### E. Interim Effluent Limitations (Not Applicable)

### F. Land Discharge Specifications (Not Applicable)

### G. Reclamation Specifications (Not Applicable)

## V. RATIONALE FOR RECEIVING WATER LIMITATIONS

### A. Surface Water

Receiving water limitations are based on water quality objectives contained in the Ocean Plan. As such, they are a required part in this Order.

The proposed mass effluent limits in IV.C., above are based on an average monthly wastewater flow of 56.59 million gallons of total desalination facility effluent to the ocean. Order No. R8-2006-0034 and this Order limit the Facility's total outfall discharge to a maximum of 44.7 percent of the intake flow (see Table F-2) and assign a minimum month initial dilution of 7.5 to 1.

### B. Groundwater (Not Applicable)

## VI. RATIONALE FOR MONITORING REPORTING REQUIREMENTS

Section 122.48 requires all NPDES permits to specify requirements for recording and reporting monitoring results. Water Code sections 13267 and 13383 authorize the Regional Water Board to require technical and monitoring reports. The Monitoring and Reporting Program (MRP), Attachment E of this Order, establishes monitoring and reporting requirements to implement federal and state requirements. The following provides the rationale for the monitoring and reporting requirements contained in the MRP for this Facility.

### A. Influent Monitoring

The Discharger is required to conduct quarterly influent monitoring for the first year and annual monitoring for every year thereafter. This is to establish a baseline water quality of the intake water. This intake water is also monitored by AES HBGS as required by the NPDES permit issued to AES for discharges of once through cooling water. When available, the Discharger may use the AES effluent monitoring data to comply with the influent monitoring requirement of this Order.

### B. Effluent Monitoring

The Discharger is required to conduct monitoring of the permitted discharges in order to evaluate compliance with permit conditions. Monitoring requirements are set forth in the monitoring and reporting program (Attachment E). This provision requires compliance with the monitoring and reporting program, and is based on sections 122.44(i), 122.62, 122.63 and 124.5. The self-monitoring program (SMP) is a standard requirement in all NPDES permits (including this proposed Order) issued by the Regional Water Board.

In addition to containing definitions of terms, the SMP specifies general sampling/analytical protocols and the requirements for reporting of spills, violations, and routine monitoring data in accordance with NPDES regulations, the California Water Code, and Regional Water Board's policies. The monitoring and reporting program also contains a sampling program specific to the Discharger's treatment facility. It defines the sampling stations, monitoring frequency, pollutants to be monitored, and additional reporting requirements. Pollutants to be monitored include all pollutants for which effluent limitations are specified.

Although the Discharger will be discharging wastewater at one discharge point into the ocean outfall of AES, due to intermittent discharges of in-plant waste streams (RO treatment wastewater, filter backwash wastewater, RO flush wastewater), monitoring of these waste streams will be necessary to assure that discharges will meet water quality standards. The Discharger is required to conduct monitoring for certain constituents when in-plant waste streams (RO treatment wastewater, filter backwash wastewater, RO flush wastewater) are discharged.

## C. Whole Effluent Toxicity Testing

Whole effluent toxicity (WET) testing protects the receiving water quality from the aggregate toxic effect of a mixture of pollutants in the effluent. WET tests measure the degree of response of exposed aquatic test organisms to an effluent. The WET approach allows for protection of the narrative "no toxics in toxic amounts" criterion while implementing numeric criteria for toxicity. There are two types of WET tests: acute and chronic. An acute toxicity test is conducted over a shorter time period and measures mortality. A chronic toxicity test is conducted over a longer period of time and may measure mortality, reproduction, and growth.

The Basin Plan specifies a narrative objective for toxicity, requiring that all waters be maintained free of toxic substances in concentrations that are lethal to or produce other detrimental response on aquatic organisms. Detrimental response includes but is not limited to decreased growth rate, decreased reproductive success of resident or indicator species, and/or significant alterations in population, community ecology, or receiving water biota.

Per Section IV.C.4.e above, this Order requires the Discharger to conduct chronic toxicity testing of the effluent on a monthly basis. Consistent with the requirements of the prior Order, this Order also requires the Discharger to conduct an Initial Investigation Toxicity Reduction Evaluation (IITRE) program when either the two-month median of toxicity test results exceeds 8.5 TUc or any single test exceeds 14.5 TUc for survival endpoint. Based on the results of this investigation program and at the discretion of the Executive Officer, a more rigorous Toxicity Reduction Evaluation/Toxicity Identification Evaluation (TRE/TIE) may be required.

## D. Receiving Water Monitoring

### 1. Surface Water

The receiving water monitoring program shall consist of biological surveys of the area surrounding the discharge, and shall include studies of the physical-chemical and biological characteristics of the receiving water that may be impacted by the discharge.

### 2. Groundwater (Not Applicable)

## E. Other Monitoring Requirements (Not Applicable)

## VII. RATIONAL FOR PROVISIONS

### A. Standard Provisions

Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR Section 122.41, and additional conditions applicable to specified categories of permits in accordance with section 122.42, are provided in Attachment D to the Order.

Section 122.41(a)(1) and (b) through (n) establish conditions that apply to all State-issued NPDES permits. These conditions must be incorporated into the permits either expressly or by reference. If incorporated by reference, a specific citation to the regulations must be included in the Order. Section 123.25(a)(12) allows the state to omit or modify conditions to impose more stringent requirements. In accordance with Section 123.25, this Order omits federal conditions that address enforcement authority specified in sections 122.41(j)(5) and (k)(2) because the enforcement authority under the Water Code is more stringent. In lieu of these conditions, this Order incorporates by reference Water Code section 13387(e).

### B. Special Provisions

#### 1. Reopener Provisions

This provision is based on 40 CFR Part 123. The Regional Water Board may reopen the permit to modify permit conditions and requirements. Causes for modifications include the promulgation of new regulations, or adoption of new regulations by the State Board or Regional Water Board, including revisions to the Basin Plan and Ocean Plan.

#### 2. Special Studies and Additional Monitoring Requirements (Not Applicable)

#### 3. Best Management Practices and Pollution Prevention (Not Applicable)

#### 4. Construction, Operation, and Maintenance Specifications (Not Applicable)

#### 5. Other Special Provisions (Not Applicable)

#### 6. Compliance Schedules (Not Applicable)

## VIII. PUBLIC PARTICIPATION

The California Regional Water Quality Control Board, Santa Ana Region (Regional Water Board) is considering the issuance of waste discharge requirements (WDRs) that will serve as a National Pollutant Discharge Elimination System (NPDES) permit for the Poseidon Resources (Surfside) L.L.C.'s Poseidon Seawater Desalination Facility at Huntington Beach. As a step in the WDR adoption process, the Regional Water Board staff has

developed tentative WDRs. The Regional Water Board encourages public participation in the WDR adoption process.

### A. Notification of Interested Parties

The Regional Water Board has notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for the discharge and has provided them with an opportunity to submit their written comments and recommendations. Notification was provided through the posting of the Notice of Public Hearing at the City Hall, Banning Library, Central Library, and HBGS and publication of the Notice in local newspapers; and the posting of the Notice and tentative Order on the Regional Water Board website: http://www.waterboards.ca.gov/santaana/board_decisions/tentative_orders/index.shtml on October 25, 2011.

### B. Written Comments

The staff determinations are tentative. Interested persons are invited to submit written comments concerning these tentative WDRs. Comments should be submitted either in person or by mail to the Executive Office of the Regional Water Board at the address above on the cover page of this Order.

To be fully responded to by staff and considered by the Regional Water Board, written comments should be received at the Regional Water Board offices by 5:00 p.m. on November 18, 2011.

### C. Public Hearing

The Regional Water Board will hold a public hearing on the tentative WDRs during its regular Board meeting on the following date and time and at the following location:

| | |
|---|---|
| Date: | December 9, 2011 |
| Time: | 9:00 a.m. |
| Location: | City of Loma Linda Council Chambers<br>25541 Barton Road<br>Loma Linda, CA 92354 |

Interested persons are invited to attend. At the public hearing, the Regional Water Board will hear testimony, if any, pertinent to the discharge, WDRs, and permit. Oral testimony will be heard; however, for accuracy of the record, important testimony should be in writing.

Please be aware that dates and venues may change. Our web address http://www.waterboards.ca.gov/santaana/board_info/agendas/ where you can access the current agenda for changes in dates and locations.

## D. Waste Discharge Requirements Petitions

Any aggrieved person may petition the State Water Resources Control Board to review the decision of the Regional Water Board regarding the final WDRs. The petition must be submitted within 30 days of the Regional Water Board's action to the following address:

State Water Resources Control Board
Office of Chief Counsel
P.O. Box 100, 1001 I Street
Sacramento, CA 95812-0100

## E. Information and Copying

The Report of Waste Discharge, related documents, tentative effluent limitations and special provisions, comments received, and other information are on file and may be inspected at the address above at any time between 9:00 a.m. and 3:00 p.m. Monday through Friday. Copying of documents may be arranged through the Regional Water Board by calling (951) 320-2008.

## F. Register of Interested Persons

Any person interested in being placed on the mailing list for information regarding the WDRs and NPDES permit should contact the Regional Water Board, reference this Facility, and provide a name, address, and phone number.

## G. Additional Information

Requests for additional information or questions regarding this Order should be directed to Jane Qiu at (951) 320-2008.

## ATTACHMENT G– MINIMUM LEVELS, IN PPB (μG/L)

The Minimum* Levels identified in this appendix represent the lowest concentration of a pollutant that can be quantitatively measured in a sample given the current state of performance in analytical chemistry methods in California. These Minimum* Levels were derived from data provided by state-certified analytical laboratories in 1997 and 1998 for pollutants regulated by the California Ocean Plan and shall be used until new values are adopted by the SWRCB. There are four major chemical groupings: volatile chemicals, semi-volatile chemicals, inorganics, pesticides & PCB's. "No Data" is indicated by "--".

### TABLE II-1
### MINIMUM* LEVELS – VOLATILE CHEMICALS

| | | Minimum* Level (ug/L) | |
|---|---|---|---|
| **Volatile Chemicals** | **CAS Number** | **GC Method [a]** | **GCMS Method [b]** |
| Acrolein | 107028 | 2. | 5 |
| Acrylonitrile | 107131 | 2. | 2 |
| Benzene | 71432 | 0.5 | 2 |
| Bromoform | 75252 | 0.5 | 2 |
| Carbon Tetrachloride | 56235 | 0.5 | 2 |
| Chlorobenzene | 108907 | 0.5 | 2 |
| Chlorodibromomethane | 124481 | 0.5 | 2 |
| Chloroform | 67663 | 0.5 | 2 |
| 1,2-Dichlorobenzene (volatile) | 95501 | 0.5 | 2 |
| 1,3-Dichlorobenzene (volatile) | 541731 | 0.5 | 2 |
| 1,4-Dichlorobenzene (volatile) | 106467 | 0.5 | 2 |
| Dichlorobromomethane | 75274 | 0.5 | 2 |
| 1,1-Dichloroethane | 75343 | 0.5 | 1 |
| 1,2-Dichloroethane | 107062 | 0.5 | 2 |
| 1,1-Dichloroethylene | 75354 | 0.5 | 2 |
| Dichloromethane | 75092 | 0.5 | 2 |
| 1,3-Dichloropropene (volatile) | 542756 | 0.5 | 2 |
| Ethyl benzene | 100414 | 0.5 | 2 |
| Methyl Bromide | 74839 | 1. | 2 |
| Methyl Chloride | 74873 | 0.5 | 2 |
| 1,1,2,2-Tetrachloroethane | 79345 | 0.5 | 2 |
| Tetrachloroethylene | 127184 | 0.5 | 2 |
| Toluene | 108883 | 0.5 | 2 |
| 1,1,1-Trichloroethane | 71556 | 0.5 | 2 |
| 1,1,2-Trichloroethane | 79005 | 0.5 | 2 |
| Trichloroethylene | 79016 | 0.5 | 2 |
| Vinyl Chloride | 75014 | 0.5 | 2 |

**Table II-1 Notes**

a) GC Method = Gas Chromatography
b) GCMS Method = Gas Chromatography / Mass Spectrometry
* To determine the lowest standard concentration in an instrument calibration curve for these techniques, use the given ML (see Chapter III, "Use of Minimum* Levels").

## TABLE II-2
## MINIMUM* LEVELS – SEMI VOLATILE CHEMICALS

| | | Minimum* Level (ug/L) | | | |
|---|---|---|---|---|---|
| **Semi-Volatile Chemicals** | **CAS Number** | **GC Method [a,*]** | **GCMS Method [b,*]** | **HPLC Method [c,*]** | **COLOR Method [d]** |
| Acenapthylene | 208968 | -- | 10 | 0.2 | -- |
| Anthracene | 120127 | -- | 10 | 2 | -- |
| Benzidine | 92875 | -- | 5 | -- | -- |
| Benzo(a)anthracene | 56553 | -- | 10 | 2 | -- |
| Benzo(a)pyrene | 50328 | -- | 10 | 2 | -- |
| Benzo(b)fluoranthene | 205992 | -- | 10 | 10 | -- |
| Benzo(g,h,i)perylene | 191242 | -- | 5 | 0.1 | -- |
| Benzo(k)floranthene | 207089 | -- | 10 | 2 | -- |
| Bis 2-(1-Chloroethoxy) methane | 111911 | -- | 5 | -- | -- |
| Bis(2-Chloroethyl)ether | 111444 | 10 | 1 | -- | -- |
| Bis(2-Chloroisopropyl)ether | 39638329 | 10 | 2 | -- | -- |
| Bis(2-Ethylhexyl) phthalate | 117817 | 10 | 5 | -- | -- |
| 2-Chlorophenol | 95578 | 2 | 5 | -- | -- |
| Chrysene | 218019 | -- | 10 | 5 | -- |
| Di-n-butyl phthalate | 84742 | -- | 10 | -- | -- |
| Dibenzo(a,h)anthracene | 53703 | -- | 10 | 0.1 | -- |
| 1,2-Dichlorobenzene (semivolatile) | 95504 | 2 | 2 | -- | -- |
| 1,3-Dichlorobenzene (semivolatile) | 541731 | 2 | 1 | -- | -- |
| 1,4-Dichlorobenzene (semivolatile) | 106467 | 2 | 1 | -- | -- |
| 3,3-Dichlorobenzidine | 91941 | -- | 5 | -- | -- |
| 2,4-Dichlorophenol | 120832 | 1 | 5 | -- | -- |
| 1,3-Dichloropropene | 542756 | -- | 5 | -- | |
| Diethyl phthalate | 84662 | 10 | 2 | -- | -- |
| Dimethyl phthalate | 131113 | 10 | 2 | -- | -- |
| 2,4-Dimethylphenol | 105679 | 1 | 2 | -- | -- |
| 2,4-Dinitrophenol | 51285 | 5 | 5 | -- | -- |
| 2,4-Dinitrotoluene | 121142 | 10 | 5 | -- | -- |
| 1,2-Diphenylhydrazine | 122667 | -- | 1 | -- | -- |
| Fluoranthene | 206440 | 10 | 1 | 0.05 | -- |
| Fluorene | 86737 | -- | 10 | 0.1 | -- |
| Hexachlorobenzene | 118741 | 5 | 1 | -- | -- |
| Hexachlorobutadiene | 87683 | 5 | 1 | -- | -- |
| Hexachlorocyclopentadiene | 77474 | 5 | 5 | -- | -- |

| Semi-Volatile Chemicals | CAS Number | GC Method [a,*] | GCMS Method [b,*] | HPLC Method [c,*] | COLOR Method [d] |
|---|---|---|---|---|---|
| Hexachloroethane | 67721 | 5 | 1 | -- | -- |
| Indeno(1,2,3-cd)pyrene | 193395 | -- | 10 | 0.05 | -- |
| Isophorone | 78591 | 10 | 1 | -- | -- |
| 2-methyl-4,6-dinitrophenol | 534521 | 10 | 5 | -- | -- |
| 3-methyl-4-chlorophenol | 59507 | 5 | 1 | -- | -- |
| N-nitrosodi-n-propylamine | 621647 | 10 | 5 | -- | -- |
| N-nitrosodimethylamine | 62759 | 10 | 5 | -- | -- |
| N-nitrosodiphenylamine | 86306 | 10 | 1 | -- | -- |
| Nitrobenzene | 98953 | 10 | 1 | -- | -- |
| 2-Nitrophenol | 88755 | -- | 10 | -- | -- |
| 4-Nitrophenol | 100027 | 5 | 10 | -- | -- |
| Pentachlorophenol | 87865 | 1 | 5 | -- | -- |
| Phenanthrene | 85018 | -- | 5 | 0.05 | -- |
| Phenol | 108952 | 1 | 1 | -- | 50 |
| Pyrene | 129000 | -- | 10 | 0.05 | -- |
| 2,4,6-Trichlorophenol | 88062 | 10 | 10 | -- | -- |

**Table II-2 Notes:**

a) GC Method = Gas Chromatography
b) GCMS Method = Gas Chromatography / Mass Spectrometry
c) HPLC Method = High Pressure Liquid Chromatography
d) COLOR Method= Colorimetric

* To determine the lowest standard concentration in an instrument calibration curve for this technique, multiply the given ML by 1000 (see Chapter III, "Use of Minimum* Levels").

| Inorganic Substances | CAS Number | COLOR Method[a] | DCP Method[b] | FAA Method[c] | GFAA Method[d] | HYDRIDE Method[e] | ICP Method[f] | ICPMS Method[g] | SPGFAA Method[h] | CVAA Method[i] |
|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 7440360 | -- | 1000. | 10. | 5. | 0.5 | 50. | 0.5 | 5. | -- |
| Arsenic | 7440382 | 20. | 1000. | -- | 2. | 1. | 10. | 2. | 2. | -- |
| Beryllium | 7440417 | -- | 1000. | 20. | 0.5 | -- | 2. | 0.5 | 1. | -- |
| Cadmium | 7440439 | -- | 1000. | 10. | 0.5 | -- | 10. | 0.2 | 0.5 | -- |
| Chromium (total) | -- | -- | 1000. | 50. | 2. | -- | 10. | 0.5 | 1. | -- |
| Chromium (VI) | 18540299 | 10. | -- | 5. | -- | -- | -- | -- | -- | -- |
| Copper | 7440508 | -- | 1000. | 20. | 5. | -- | 10. | 0.5 | 2. | -- |
| Cyanide | 57125 | 5. | -- | -- | -- | -- | -- | -- | -- | -- |
| Lead | 7439921 | -- | 10000. | 20. | 5. | -- | 5. | 0.5 | 2. | -- |
| Mercury | 7439976 | -- | -- | -- | -- | -- | -- | 0.5 | -- | 0.2 |
| Nickel | 7440020 | -- | 1000. | 50. | 5. | -- | 20. | 1. | 5. | -- |
| Selenium | 7782492 | -- | 1000. | -- | 5. | 1. | 10. | 2. | 5. | -- |
| Silver | 7440224 | -- | 1000. | 10. | 1. | -- | 10. | 0.2 | 2. | -- |
| Thallium | 7440280 | -- | 1000. | 10. | 2. | -- | 10. | 1. | 5. | -- |
| Zinc | 7440666 | -- | 1000. | 20. | -- | -- | 20. | 1. | 10. | -- |

**Table II-3 Notes**

a) COLOR Method = Colorimetric
b) DCP Method = Direct Current Plasma
c) FAA Method = Flame Atomic Absorption
d) GFAA Method = Graphite Furnace Atomic Absorption
e) HYDRIDE Method = Gaseous Hydride Atomic Absorption
f) ICP Method = Inductively Coupled Plasma
g) ICPMS Method = Inductively Coupled Plasma / Mass Spectrometry
h) SPGFAA Method = Stabilized Platform Graphite Furnace Atomic Absorption (i.e., US EPA 200.9)
i) CVAA Method = Cold Vapor Atomic Absorption

* To determine the lowest standard concentration in an instrument calibration curve for these techniques, use the given ML (see Chapter III, "Use of Minimum* Levels").

**TABLE II-4**
**MINIMUM* LEVELS – PESTICIDES AND PCBs**

| Pesticides – PCB's | CAS Number | Minimum* Level (ug/L) GC Method[a,*] |
|---|---|---|
| Aldrin | 309002 | 0.005 |
| Chlordane | 57749 | 0.1 |
| 4,4'-DDD | 72548 | 0.05 |
| 4,4'-DDE | 72559 | 0.05 |
| 4,4'-DDT | 50293 | 0.01 |
| Dieldrin | 60571 | 0.01 |
| a-Endosulfan | 959988 | 0.02 |
| b-Endosulfan | 33213659 | 0.01 |
| Endosulfan Sulfate | 1031078 | 0.05 |
| Endrin | 72208 | 0.01 |
| Heptachlor | 76448 | 0.01 |
| Heptachlor Epoxide | 1024573 | 0.01 |
| a-Hexachlorocyclohexane | 319846 | 0.01 |
| b-Hexachlorocyclohexane | 319857 | 0.005 |
| d-Hexachlorocyclohexane | 319868 | 0.005 |
| g-Hexachlorocyclohexane (Lindane) | 58899 | 0.02 |
| PCB 1016 | -- | 0.5 |
| PCB 1221 | -- | 0.5 |
| PCB 1232 | -- | 0.5 |
| PCB 1242 | -- | 0.5 |
| PCB 1248 | -- | 0.5 |
| PCB 1254 | -- | 0.5 |
| PCB 1260 | -- | 0.5 |
| Toxaphene | 8001352 | 0.5 |

**Table II-4 Notes**

a) GC Method = Gas Chromatography

* To determine the lowest standard concentration in an instrument calibration curve for this technique, multiply the given ML by 100 (see Chapter III, "Use of Minimum* Levels").

# ATTACHMENT J - STORM WATER POLLUTION PREVENTION PLAN REQUIREMENTS

1. *Implementation Schedule*

The storm water pollution prevention plan (SWPPP) shall be prepared and/or updated and implemented in a timely manner, but in no case later than 90 days before start of operation.

2. *Objectives*

The SWPPP has two major objectives: (a) to identify and evaluate sources of pollutants associated with industrial activities that may affect the quality of storm water discharges and authorized non-storm water discharges from the facility; and (b) to identify and implement site-specific best management practices (BMPs) to reduce or prevent pollutants associated with industrial activities in storm water discharges and authorized non-storm water discharges. BMPs may include a variety of pollution prevention measures or other low-cost pollution control measures. They are generally categorized as non-structural BMPs (activity schedules, prohibitions of practices, maintenance procedures, and other low-cost measures) and as structural BMPs (treatment measures, run-off controls, over-head coverage). To achieve these objectives, dischargers should consider the five phase process for SWPPP development and implementation as shown in Table A, below.

The SWPPP requirements are designed to be sufficiently flexible to meet the various needs of the facility. SWPPP requirements that are not applicable to the facility should not be included in the SWPPP.

A facility's SWPPP is a written document that shall contain a compliance activity schedule, a description of industrial activities and pollutant sources, descriptions of BMPs, drawings, maps, and relevant copies or references of parts of other plans. The SWPPP shall be revised whenever appropriate and shall be readily available for review by facility employees or Regional Water Board inspectors.

3. *Planning and Organization*

   a. *Pollution Prevention Team*

   The SWPPP shall identify a specific individual or individuals and their positions within the facility organization as members of a storm water pollution prevention team responsible for developing the SWPPP, assisting the facility manager in SWPPP implementation and revision, and conducting all monitoring program activities required in the Stormwater monitoring program of Order No. R8-2011-0046. The SWPPP shall clearly identify the storm water pollution prevention related responsibilities, duties, and activities of each team member.

   b. *Review Other Requirements and Existing Facility Plans*

The SWPPP may incorporate or reference the appropriate elements of other regulatory requirements. The discharger shall review all local, state, and federal requirements that impact, complement, or are consistent with the requirements of Order No. R8-2011-0046. The discharger shall identify any existing facility plans that contain storm water pollutant control measures or relate to the requirements of Order No. R8-2011-0046. As examples, dischargers whose facilities are subject to Federal Spill Prevention Control and Countermeasures' requirements should already have instituted a plan to control spills of certain hazardous materials. Similarly, the discharger whose facilities are subject to air quality related permits and regulations may already have evaluated industrial activities that generate dust or particulates.

4. *Site Map*

The SWPPP shall include a site map. The site map shall be provided on an 8-1/2 x 11 inch or larger sheet and include notes, legends, and other data as appropriate to ensure that the site map is clear and understandable. If necessary, the discharger may provide the required information on multiple site maps. The following information shall be included on the site map:

a. The facility boundaries; the outline of all storm water drainage areas within the facility boundaries; portions of the drainage area impacted by run-on from surrounding areas; and direction of flow of each drainage area, on-site surface water bodies, and areas of soil erosion. The map shall also identify nearby water bodies (such as rivers, lakes, ponds) and municipal storm drain inlets where the facility's storm water discharges and authorized non-storm water discharges may be received.

b. The location of the storm water collection and conveyance system, associated points of discharge, and direction of flow. Include any structural control measures that affect storm water discharges, authorized non-storm water discharges, and run-on. Examples of structural control measures are catch basins, berms, detention ponds, secondary containment, oil/water separators, diversion barriers, etc.

c. An outline of all impervious areas of the facility, including paved areas, buildings, covered storage areas, or other roofed structures.

d. Locations where materials are directly exposed to precipitation and the locations where significant spills or leaks identified in Section 6.a.(4)., below, have occurred.

e. Areas of industrial activity. This shall include the locations of all storage areas and storage tanks, shipping and receiving areas, fueling areas, vehicle and equipment storage/maintenance areas, material handling and processing areas, waste treatment and disposal areas, dust or particulate generating areas, cleaning and rinsing areas, and other areas of industrial activity which are potential pollutant sources.

5. *List of Significant Materials*

The SWPPP shall include a list of significant materials handled and stored at the site. For each material on the list, describe the locations where the material is being stored, received, shipped, and handled, as well as the typical quantities and frequency. Materials shall include raw materials, intermediate products, final or finished products, recycled materials, and waste or disposed materials.

6. *Description of Potential Pollutant Sources*

a. The SWPPP shall include a narrative description of the facility's industrial activities, as identified in Section 4.e., above, associated potential pollutant sources, and potential pollutants that could be discharged in storm water discharges or authorized non-storm water discharges. At a minimum, the following items related to a facility's industrial activities shall be considered:

(1) Industrial Processes

Describe each industrial process, the type, characteristics, and quantity of significant materials used in or resulting from the process, and a description of the processes (manufacturing or treatment), cleaning, rinsing, recycling, disposal, or other activities related to the process. Where applicable, areas protected by containment structures and the corresponding containment capacity shall be described.

(2) Material Handling and Storage Areas

Describe each handling and storage area, type, characteristics, and quantity of significant materials handled or stored, description of the shipping, receiving, and loading procedures, and the spill or leak prevention and response procedures. Where applicable, areas protected by containment structures and the corresponding containment capacity shall be described.

(3) Dust and Particulate Generating Activities

Describe all industrial activities that generate dust or particulates that may be deposited within the facility's boundaries and identify their discharge locations; the characteristics of dust and particulate pollutants; the approximate quantity of dust and particulate pollutants that may be deposited within the facility boundaries; and a description of the primary areas of the facility where dust and particulate pollutants would settle.

(4) Significant Spills and Leaks

Describe materials that have spilled or leaked in significant quantities in storm water discharges or non-storm water discharges. Include toxic chemicals (listed in 40 Code of Federal Regulations [CFR] Part 302) that have been discharged to storm water as reported on U.S. Environmental Protection Agency (U.S. EPA) Form R, and oil and

hazardous substances in excess of reportable quantities (see 40 CFR, Parts 110, 117, and 302).

The description shall include the type, characteristics, and approximate quantity of the material spilled or leaked, the cleanup or remedial actions that have occurred or are planned, the approximate remaining quantity of materials that may be exposed to storm water or non-storm water discharges, and the preventative measures taken to ensure spills or leaks do not reoccur. Such list shall be updated as appropriate during the term of Order No. R8-2001100XX.

(5) Non-Storm Water Discharges

The discharger shall investigate the facility to identify all non-storm water discharges and their sources. As part of this investigation, all drains (inlets and outlets) shall be evaluated to identify whether they connect to the storm drain system.

All non-storm water discharges shall be described. This shall include the source, quantity, frequency, and characteristics of the non-storm water discharges and associated drainage area.

Non-storm water discharges that contain significant quantities of pollutants or that do not meet the conditions of Order No. R8-2001100XX are prohibited. (Examples of prohibited non-storm water discharges are contact and non-contact cooling water, boiler blowdown, rinse water, wash water, etc.). The SWPPP must include BMPs to prevent or reduce contact of non-storm water discharges with significant materials or equipment.

(6) Soil Erosion

Describe the facility locations where soil erosion may occur as a result of industrial activity, storm water discharges associated with industrial activity, or authorized non-storm water discharges.

b. The SWPPP shall include a summary of all areas of industrial activities, potential pollutant sources, and potential pollutants. This information should be summarized similar to Table B, below. The last column of Table B, "Control Practices", should be completed in accordance with Section 8., below.

7. *Assessment of Potential Pollutant Sources*

a. The SWPPP shall include a narrative assessment of all industrial activities and potential pollutant sources as described in Section 6., above, to determine:

(1) Which areas of the facility are likely sources of pollutants in storm water discharges and authorized non-storm water discharges, and

(2) Which pollutants are likely to be present in storm water discharges and authorized non-storm water discharges. The discharger shall consider and evaluate various factors when performing this assessment such as current storm water BMPs;

quantities of significant materials handled, produced, stored, or disposed of; likelihood of exposure to storm water or authorized non-storm water discharges; history of spill or leaks; and run-on from outside sources.

b. The discharger shall summarize the areas of the facility that are likely sources of pollutants and the corresponding pollutants that are likely to be present in storm water discharges and authorized non-storm water discharges.

The discharger is required to develop and implement additional BMPs as appropriate and necessary to prevent or reduce pollutants associated with each pollutant source. The BMPs will be narratively described in Section 8., below.

8. *Storm Water Best Management Practices*

The SWPPP shall include a narrative description of the storm water BMPs to be implemented at the facility for each potential pollutant and its source identified in the site assessment phase (Sections 6. and 7., above). The BMPs shall be developed and implemented to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges. Each pollutant and its source may require one or more BMPs. Some BMPs may be implemented for multiple pollutants and their sources, while other BMPs will be implemented for a very specific pollutant and its source.

The description of the BMPs shall identify the BMPs as (1) existing BMPs, (2) existing BMPs to be revised and implemented, or (3) new BMPs to be implemented. The description shall also include a discussion on the effectiveness of each BMP to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges. The SWPPP shall provide a summary of all BMPs implemented for each pollutant source. This information should be summarized similar to Table B.

The discharger shall consider the following BMPs for implementation at the facility:

a. Non-Structural BMPs: Non-structural BMPs generally consist of processes, prohibitions, procedures, schedule of activities, etc., that prevent pollutants associated with industrial activity from contacting with storm water discharges and authorized non-storm water discharges. They are considered low technology, cost-effective measures. The discharger should consider all possible non-structural BMPs options before considering additional structural BMPs (see Section 8.b., below). Below is a list of non-structural BMPs that should be considered:

(1) Good Housekeeping: Good housekeeping generally consist of practical procedures to maintain a clean and orderly facility.

(2) Preventive Maintenance: Preventive maintenance includes the regular inspection and maintenance of structural storm water controls (catch basins, oil/water separators, etc.) as well as other facility equipment and systems.

(3) Spill Response: This includes spill clean-up procedures and necessary clean-up equipment based upon the quantities and locations of significant materials that may spill or leak.

(4) Material Handling and Storage: This includes all procedures to minimize the potential for spills and leaks and to minimize exposure of significant materials to storm water and authorized non-storm water discharges.

(5) Employee Training: This includes training of personnel who are responsible for (a) implementing activities identified in the SWPPP, (b) conducting inspections, sampling, and visual observations, and (c) managing storm water. Training should address topics such as spill response, good housekeeping, and material handling procedures, and actions necessary to implement all BMPs identified in the SWPPP. The SWPPP shall identify periodic dates for such training. Records shall be maintained of all training sessions held.

(6) Waste Handling/Recycling: This includes the procedures or processes to handle, store, or dispose of waste materials or recyclable materials.

(7) Record Keeping and Internal Reporting: This includes the procedures to ensure that all records of inspections, spills, maintenance activities, corrective actions, visual observations, etc., are developed, retained, and provided, as necessary, to the appropriate facility personnel.

(8) Erosion Control and Site Stabilization: This includes a description of all sediment and erosion control activities. This may include the planting and maintenance of vegetation, diversion of run-on and runoff, placement of sandbags, silt screens, or other sediment control devices, etc.

(9) Inspections: This includes, in addition to the preventative maintenance inspections identified above, an inspection schedule of all potential pollutant sources. Tracking and follow-up procedures shall be described to ensure adequate corrective actions are taken and SWPPPs are made.

(10) Quality Assurance: This includes the procedures to ensure that all elements of the SWPPP and Monitoring Program are adequately conducted.

b. Structural BMPs: Where non-structural BMPs as identified in Section 8.a., above, are not effective, structural BMPs shall be considered. Structural BMPs generally consist of structural devices that reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges. Below is a list of structural BMPs that should be considered:

(1) Overhead Coverage: This includes structures that provide horizontal coverage of materials, chemicals, and pollutant sources from contact with storm water and authorized non-storm water discharges.

(2) Retention Ponds: This includes basins, ponds, surface impoundments, bermed areas, etc., that do not allow storm water to discharge from the facility.

(3) Control Devices: This includes berms or other devices that channel or route run-on and runoff away from pollutant sources.

(4) Secondary Containment Structures: This generally includes containment structures around storage tanks and other areas for the purpose of collecting any leaks or spills.

(5) Treatment: This includes inlet controls, infiltration devices, oil/water separators, detention ponds, vegetative swales, etc., that reduce the pollutants in storm water discharges and authorized non-storm water discharges.

9. *Annual Comprehensive Site Compliance Evaluation*

The discharger shall conduct one comprehensive site compliance evaluation in each reporting period (July 1-June 30). Evaluations shall be conducted within 8-16 months of each other. The SWPPP shall be revised, as appropriate, and the revisions implemented within 90 days of the evaluation. Evaluations shall include the following:

a. A review of all visual observation records, inspection records, and sampling and analysis results.

b. A visual inspection of all potential pollutant sources for evidence of, or the potential for, pollutants entering the drainage system.

c. A review and evaluation of all BMPs (both structural and non-structural) to determine whether the BMPs are adequate, properly implemented and maintained, or whether additional BMPs are needed. A visual inspection of equipment needed to implement the SWPPP, such as spill response equipment, shall be included.

d. An evaluation report that includes, (1) identification of personnel performing the evaluation, (2) the date(s) of the evaluation, (3) necessary SWPPP revisions, (4) schedule, as required in Section 10.e, below, for implementing SWPPP revisions, (5) any incidents of non-compliance and the corrective actions taken, and (6) a certification that the discharger is in compliance with Order No. R8-2011-0046. If the above certification cannot be provided, explain in the evaluation report why the discharger is not in compliance with this order. The evaluation report shall be submitted as part of the annual report, retained for at least five years, and signed and certified.

10. *SWPPP General Requirements*

a. The SWPPP shall be retained on site and made available upon request by a representative of the Regional Water Board and/or local storm water management agency (local agency) which receives the storm water discharges.

b. The Regional Water Board and/or local agency may notify the discharger when the SWPPP does not meet one or more of the minimum requirements of this section. As requested by the Regional Water Board and/or local agency, the discharger shall submit a SWPPP revision and implementation schedule that meets the minimum requirements of this section to the Regional Water Board and/or local agency that requested the SWPPP revisions. Within 14 days after implementing the required

SWPPP revisions, the discharger shall provide written certification to the Regional Water Board and/or local agency that the revisions have been implemented.

c. The SWPPP shall be revised, as appropriate, and implemented prior to changes in industrial activities which (1) may significantly increase the quantities of pollutants in storm water discharge, (2) cause a new area of industrial activity at the facility to be exposed to storm water, or (3) begin an industrial activity which would introduce a new pollutant source at the facility.

d. The SWPPP shall be revised and implemented in a timely manner, but in no case more than 90 days after a discharger determines that the SWPPP is in violation of any requirement(s) of Order No. R8-2011-0046.

e. When any part of the SWPPP is infeasible to implement by the deadlines specified in Order No. R8-2011-0046, due to proposed significant structural changes, the discharger shall submit a report to the Regional Water Board prior to the applicable deadline that (1) describes the portion of the SWPPP that is infeasible to implement by the deadline, (2) provides justification for a time extension, (3) provides a schedule for completing and implementing that portion of the SWPPP, and (4) describes the BMPs that will be implemented in the interim period to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges. Such reports are subject to Regional Water Board approval and/or modifications. The discharger shall provide written notification to the Regional Water Board within 14 days after the SWPPP revisions are implemented.

f. The SWPPP shall be provided, upon request, to the Regional Water Board. The SWPPP is considered a report that shall be available to the public by the Regional Water Board under Section 308(b) of the Clean Water Act.

## TABLE A

## FIVE PHASES FOR DEVELOPING AND IMPLEMENTING INDUSTRIAL STORM WATER POLLUTION PREVENTION PLANS

**PLANNING AND ORGANIZATION**
*Form pollution prevention team
*Review other plans

↓

**ASSESSMENT PHASE**
*Develop a site map
*Identify potential pollutant sources
*Inventory of materials and chemicals
*List significant spills and leaks
*Identify non-storm water discharges
*Assess pollutant risks

↓

**BEST MANAGEMENT PRACTICES IDENTIFICATION PHASE**
*Non-structural BMPs
*Structural BMPs
*Select activity and site-specific BMPs

↓

**IMPLEMENTATION PHASE**
*Train employees
*Implement BMPs
*Conduct record keeping and reporting

↓

**EVALUATION / MONITORING**
*Conduct annual site evaluation
*Review monitoring information
*Evaluate BMPs
*Review and revise SWPPP

**TABLE B**

**EXAMPLE**

**ASSESSMENT OF POTENTIAL POLLUTION SOURCES AND CORRESPONDING BEST MANAGEMENT PRACTICES SUMMARY**

| AREA | ACTIVITY | POLLUTANT SOURCE | POLLUTANT | **BEST MANAGEMENT PRACTICES** |
|---|---|---|---|---|
| Vehicle & equipment fueling | Fueling | Spills and leaks during delivery | Fuel oil | - Use spill and overflow protection<br>- Minimize run-on of storm water into the fueling area<br>- Cover fueling area<br>- Use dry cleanup methods rather than hosing down area<br>- Implement proper spill prevention control program<br>- Implement adequate preventative maintenance program to prevent tank and line leaks<br>- Inspect fueling areas regularly to detect problems before they occur<br>- Train employees on proper fueling, cleanup, and spill response techniques. |
| | | Spills caused by topping off fuel oil | Fuel oil | |
| | | Hosing or washing down fuel area | Fuel oil | |
| | | Leaking storage tanks | Fuel oil | |
| | | Rainfall running off fueling areas, and rainfall running onto and off fueling area | Fuel oil | |

# ATTACHMENT K - STORMWATER MONITORING PROGRAM AND REPORTING REQUIREMENTS

1. *Implementation Schedule*

The discharger shall continue to implement their existing Stormwater monitoring program and implement any necessary revisions to their Stormwater monitoring program in a timely manner, but in no case later than 90 days before start up of operation. The discharger may use the monitoring results conducted in accordance with their existing Stormwater monitoring program to satisfy the pollutant/parameter reduction requirements in Section 5.c., below, and Sampling and Analysis Exemptions and Reduction Certifications in Section 10, below.

2. *Objectives*

The objectives of the monitoring program are to:

a. Ensure that storm water discharges are in compliance with waste discharge requirements specified in Order No. R8-2011-0046.

b. Ensure practices at the facility to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges are evaluated and revised to meet changing conditions.

c. Aid in the implementation and revision of the SWPPP required by Attachment "J" Stormwater Pollution Prevention Plan of Order No. R8-2011-0046.

d. Measure the effectiveness of best management practices (BMPs) to prevent or reduce pollutants in storm water discharges and authorized non-storm water discharges. Much of the information necessary to develop the monitoring program, such as discharge locations, drainage areas, pollutant sources, etc., should be found in the Storm Water Pollution Prevention Plan (SWPPP). The facility's monitoring program shall be a written, site-specific document that shall be revised whenever appropriate and be readily available for review by employees or Regional Water Board inspectors.

3. *Non-Storm Water Discharge Visual Observations*

a. The discharger shall visually observe all drainage areas within their facility for the presence of unauthorized non-storm water discharges;

b. The discharger shall visually observe the facility's authorized non-storm water discharges and their sources;

c. The visual observations required above shall occur quarterly, during daylight hours, on days with no storm water discharges, and during scheduled facility operating hours[1]. Quarterly visual observations shall be conducted in each of the following periods: January-March, April-June, July-September, and October-December. The discharger shall conduct quarterly visual observations within 6-18 weeks of each other.

d. Visual observations shall document the presence of any discolorations, stains, odors, floating materials, etc., as well as the source of any discharge. Records shall be maintained of the visual observation dates, locations observed, observations, and response taken to eliminate unauthorized non-storm water discharges and to reduce or prevent pollutants from contacting non-storm water discharges. The SWPPP shall be revised, as necessary, and implemented in accordance with Attachment "J" Stormwater Pollution Prevention Plan of Order No. R8-2011-0046.

4. *Storm Water Discharge Visual Observations*

a. With the exception of those facilities described in Section 4.d., below, the discharger shall visually observe storm water discharges from one storm event per month during the wet season (October 1-May 30). These visual observations shall occur during the first hour of discharge and at all discharge locations. Visual observations of stored or contained storm water shall occur at the time of release.

b. Visual observations are only required of storm water discharges that occur during daylight hours that are preceded by at least three (3) working days[2] without storm water discharges and that occur during scheduled facility operating hours.

c. Visual observations shall document the presence of any floating and suspended material, oil and grease, discolorations, turbidity, odor, and source of any pollutants. Records shall be maintained of observation dates, locations observed, observations, and response taken to reduce or prevent pollutants in storm water discharges. The SWPPP shall be revised, as necessary, and implemented in accordance with Attachment "J" Stormwater Pollution Prevention Plan of Order No. R8-2011-0046.

d. The discharger with storm water containment facilities shall conduct monthly inspections of their containment areas to detect leaks and ensure maintenance of adequate freeboard. Records shall be maintained of the inspection dates, observations, and any response taken to eliminate leaks and to maintain adequate freeboard.

---

1 "Scheduled facility operating hours" are the time periods when the facility is staffed to conduct any function related to industrial activity, but excluding time periods where only routine maintenance, emergency response, security, and/or janitorial services are performed.

2 Three (3) working days may be separated by non-working days such as weekends and holidays provided that no storm water discharges occur during the three (3) working days and the non-working days.

5. *Sampling and Analysis*

a. The discharger shall collect storm water samples during the first hour of discharge from (1) the first storm event of the wet season, and (2) at least one other storm event in the wet season. All storm water discharge locations shall be sampled. Sampling of stored or contained storm water shall occur at the time the stored or contained storm water is released. The discharger that does not collect samples from the first storm event of the wet season are still required to collect samples from two other storm events of the wet season and shall explain in the "Annual Stormwater Report" (see Section 12, below) why the first storm event was not sampled.

b. Sample collection is only required of storm water discharges that occur during scheduled facility operating hours and that are preceded by at least (3) three working days without storm water discharge.

c. The samples shall be analyzed for:

(1) Total suspended solids (TSS) pH, specific conductance, and total organic carbon (TOC). Oil and grease (O&G) may be substituted for TOC;

(2) Toxic chemicals and other pollutants that are likely to be present in storm water discharges in significant quantities. If these pollutants are not detected in significant quantities after two consecutive sampling events, the discharger may eliminate the pollutant from future sample analysis until the pollutant is likely to be present again;

(3) The discharger is not required to analyze a parameter when either of the two following conditions are met: (a) the parameter has not been detected in significant quantities from the last two consecutive sampling events, or (b) the parameter is not likely to be present in storm water discharges and authorized non-storm water discharges in significant quantities based upon the discharger's evaluation of the facilities industrial activities, potential pollutant sources, and SWPPP; and

(4) Other parameters as required by the Regional Water Board.

6. *Sample Storm Water Discharge Locations*

a. The discharger shall visually observe and collect samples of storm water discharges from all drainage areas that represent the quality and quantity of the facility's storm water discharges from the storm event.

b. If the facility's storm water discharges are commingled with run-on from surrounding areas, the discharger should identify other visual observation and sample collection locations that have not been commingled by run-on and that

represent the quality and quantity of the facility's storm water discharges from the storm event.

c. If visual observation and sample collection locations are difficult to observe or sample (e.g., sheet flow, submerged outfalls), the discharger shall identify and collect samples from other locations that represent the quality and quantity of the facility's storm water discharges from the storm event.

d. The discharger that determines that the industrial activities and BMPs within two or more drainage areas are substantially identical may either (1) collect samples from a reduced number of substantially identical drainage areas, or (2) collect samples from each substantially identical drainage area and analyze a combined sample from each substantially identical drainage area. The discharger must document such a determination in the annual Stormwater report.

7. Visual Observation and Sample Collection Exceptions

The discharger is required to be prepared to collect samples and conduct visual observations at the beginning of the wet season (October 1) and throughout the wet season until the minimum requirements of Sections 4. and 5., above, are completed with the following exceptions:

a. The discharger is not required to collect a sample and conduct visual observations in accordance with Section 4 and Section 5, above, due to dangerous weather conditions, such as flooding, electrical storm, etc., when storm water discharges begin after scheduled facility operating hours or when storm water discharges are not preceded by three working days without discharge. Visual observations are only required during daylight hours. The discharger that does not collect the required samples or visual observations during a wet season due to these exceptions shall include an explanation in the "Annual Stormwater Report" why the sampling or visual observations could not be conducted.

b. The discharger may conduct visual observations and sample collection more than one hour after discharge begins if the discharger determines that the objectives of this section will be better satisfied. The discharger shall include an explanation in the "Annual Stormwater Report" why the visual observations and sample collection should be conducted after the first hour of discharge.

8. *Alternative Monitoring Procedures*

The discharger may propose an alternative monitoring program that meets Section 2, above, monitoring program objectives for approval by the Regional Water Board's Executive Officer. The discharger shall continue to comply with the monitoring requirements of this section and may not implement an alternative monitoring plan until the alternative monitoring plan is approved by the Regional Water Board's Executive Officer. Alternative monitoring plans are subject to modification by the Regional Water Board's Executive Officer.

9. *Monitoring Methods*

a. The discharger shall explain how the facility's monitoring program will satisfy the monitoring program objectives of Section 2., above. This shall include:

(1) Rationale and description of the visual observation methods, location, and frequency;

(2) Rationale and description of the sampling methods, location, and frequency; and

(3) Identification of the analytical methods and corresponding method detection limits used to detect pollutants in storm water discharges. This shall include justification that the method detection limits are adequate to satisfy the objectives of the monitoring program.

b. All sampling and sample preservation shall be in accordance with the current edition of "Standard Methods for the Examination of Water and Wastewater" (American Public Health Association). All monitoring instruments and equipment (including the discharger's own field instruments for measuring pH and Electro-conductivity) shall be calibrated and maintained in accordance with manufacturers' specifications to ensure accurate measurements. All laboratory analyses must be conducted according to test procedures under 40 CFR Part 136, unless other test procedures have been specified in Order No. R8-2011-0046 or by the Regional Water Board's Executive Officer. All metals shall be reported as total recoverable metals or unless otherwise specified in Order No. R8-2011-0046. With the exception of analysis conducted by the discharger, all laboratory analyses shall be conducted at a laboratory certified for such analyses by the State Department of Health Services. The discharger may conduct their own sample analyses if the discharger has sufficient capability (qualified employees, laboratory equipment, etc.) to adequately perform the test procedures.

10. *Sampling and Analysis Exemptions and Reductions*

A discharger who qualifies for sampling and analysis exemptions, as described below in Section 10.a.(1) or who qualifies for reduced sampling and analysis, as described below in Section 10.b., must submit the appropriate certifications and required documentation to the Regional Water Board prior to the wet season (October 1) and certify as part of the annual Stormwater report submittal. A discharger that qualifies for either the Regional Water Board or local agency certification programs, as described below in Section 10.a.(2) and (3), shall submit certification and documentation in accordance with the requirements of those programs. The discharger who provides certification(s) in accordance with this section are still required to comply with all other monitoring program and reporting requirements. The discharger shall prepare and submit their certification(s) using forms and instructions provided by the State Water Board, Regional Water Board, or local agency or shall submit their information on a form that contains equivalent information. The discharger whose facility no longer meets the certification conditions must notify the Regional Water Board's Executive Officer (and local agency) within 30 days and

immediately comply with Section 5., Sampling and Analysis requirements. Should a Regional Water Board (or local agency) determine that a certification does not meet the conditions set forth below, the discharger must immediately comply with the Section 5., Sampling and Analysis requirements.

a. Sampling and Analysis Exemptions

A discharger is not required to collect and analyze samples in accordance with Section 5., above, if the discharger meets all of the conditions of one of the following certification programs:

(1) No Exposure Certification (NEC)

This exemption is designed primarily for those facilities where all industrial activities are conducted inside buildings and where all materials stored and handled are not exposed to storm water. To qualify for this exemption, the discharger must certify that their facilities meet all of the following conditions:

(a) All prohibited non-storm water discharges have been eliminated or otherwise permitted.

(b) All authorized non-storm water discharges have been identified and addressed in the SWPPP.

(c) All areas of past exposure have been inspected and cleaned, as appropriate.

(d) All significant materials related to industrial activity (including waste materials) are not exposed to storm water or authorized non-storm water discharges.

(e) All industrial activities and industrial equipment are not exposed to storm water or authorized non-storm water discharges.

(f) There is no exposure of storm water to significant materials associated with industrial activity through other direct or indirect pathways such as from industrial activities that generate dust and particulates.

(g) There is periodic re-evaluation of the facility to ensure conditions (a), (b), (d), (e), and (f) above are continuously met. At a minimum, re-evaluation shall be conducted once a year.

(2) Regional Water Board Certification Programs

The Regional Water Board may grant an exemption to the Section 5. Sampling and Analysis requirements if it determines a discharger has met the conditions set forth in a Regional Water Board certification program. Regional Water Board certification programs may include conditions to (a) exempt the discharger whose facilities infrequently discharge storm water to waters of the United States, and (b) exempt the discharger that demonstrate compliance with the terms and conditions of Order No. R8-2011-0046.

(3) Local Agency Certifications

A local agency may develop a local agency certification program. Such programs must be approved by the Regional Water Board. An approved local agency program may either grant an exemption from Section 5. Sampling and Analysis requirements or reduce the frequency of sampling if it determines that a discharger has demonstrated compliance with the terms and conditions of the Industrial Activities Storm Water General Permit Order No. 97-03-DWQ which was adopted by the State Water Resources Control Board on April 17, 1997.

b. Sampling and Analysis Reduction

(1) A discharger may reduce the number of sampling events required to be sampled for the remaining term of Order No. R8-2011-0046 if the discharger provides certification that the following conditions have been met:

(a) The discharger has collected and analyzed samples from a minimum of six storm events from all required drainage areas;

(b) All prohibited non-storm water discharges have been eliminated or otherwise permitted;

(c) The discharger demonstrates compliance with the terms and conditions of the Order No. R8-2011-0046 for the previous two years (i.e., completed Annual Stormwater Reports, performed visual observations, implemented appropriate BMPs, etc.);

(d) The discharger demonstrates that the facility's storm water discharges and authorized non-storm water discharges do not contain significant quantities of pollutants; and

(e) Conditions (b), (c), and (d) above are expected to remain in effect for a minimum of one year after filing the certification.

*11. Records*

Records of all storm water monitoring information and copies of all reports (including the Annual Stormwater Reports) required by Order No. R8-2011-0046 shall be retained for a period of at least five years. These records shall include:

a. The date, place, and time of site inspections, sampling, visual observations, and/or measurements;

b. The individual(s) who performed the site inspections, sampling, visual observations, and or measurements;

c. Flow measurements or estimates;

d. The date and approximate time of analyses;

e. The individual(s) who performed the analyses;

f. Analytical results, method detection limits, and the analytical techniques or methods used;

g. Quality assurance/quality control records and results;

h. Non-storm water discharge inspections and visual observations and storm water discharge visual observation records (see Sections 3. and 4., above);

i. Visual observation and sample collection exception records (see Section 5.a, 6.d, 7, and 10.b.(2), above;

j. All calibration and maintenance records of on-site instruments used;

k. All Sampling and Analysis Exemption and Reduction certifications and supporting documentation (see Section 10);

l. The records of any corrective actions and follow-up activities that resulted from the visual observations.

*12. Annual Report*

The discharger shall submit an Annual Stormwater Report by July 1 of each year to the Executive Officer of the Regional Water Board and to the local agency (if requested). The report shall include a summary of visual observations and sampling results, an evaluation of the visual observation and sampling and analysis results, laboratory reports, the Annual Comprehensive Site Compliance Evaluation Report required in Section 9. of Attachment "J" of Order No. R8-2011-0046, an explanation of why a facility did not implement any activities required by Order No. R8-2011-0046 (if not already included in the Evaluation Report), and records specified in Section 11., above. The method detection limit of each analytical parameter shall be included. Analytical results that are less than the method detection limit shall be reported as "less than the method detection limit". The discharger shall prepare and submit their Annual Stormwater Reports using the annual report forms provided by the State Water Board or Regional Water Board or shall submit their information on a form that contains equivalent information.

*13. Watershed Monitoring Option*

Regional Water Boards may approve proposals to substitute watershed monitoring for some or all of the requirements of this section if the Regional Water Board finds that the watershed monitoring will provide substantially similar monitoring information in evaluating discharger compliance with the requirements of Order No. R8-2011-0046.

# COMMENT LETTERS

South Orange County Regional Chamber of Commerce

24031 El Toro Road, Suite 300
Laguna Hills, CA 92653
Ph: 949.600.5470
Fax: 949.600.5474
www.socchambers.com

November 10, 2011

Ms. Carole H. Beswick
Chair
Santa Ana Regional Water Quality Control Board
3737 Main Street, Suite 500
Riverside, CA 92501-3348

**Re: Huntington Beach Seawater Desalination Project – APPROVE National Pollutant Discharge Elimination System (NPDES) Permit Order No. R8-2011-0046 (NPDES CA8000403)**

Dear Chair Beswick:

As the Chairman of the largest chamber of commerce in South Orange County, I can tell you how important water resources are to our business community. For this reason I urge your board to act decisively on December 9, 2011 to approve the permit application for the Huntington Beach Seawater Desalination Project (National Pollutant Discharge Elimination System (NPDES) Permit Order No. R8-2011-0046 (NPDES CA8000403)).

Poseidon Resources, the company developing the desalination facility, is seeking no changes in the effluent limitations or the mass emission limits established in Order No. R8-2006-0034, which was issued by the Regional Board in 2006. The permit application before you today will provide for operational certainty by allowing the desalination project to operate independent of the power plant's use of its cooling water system. This operational certainty is critical to the project's water reliability benefits.

This project will provide Orange County with a local, drought-proof water supply that will protect us during shortages in other water supplies.

Additionally, this privately-financed development will provide more than 2,000 jobs at a time when unemployment is in double-figures and will also provide millions of dollars in reliable local tax revenue for decades to come.

The Huntington Beach Seawater Desalination Facility is a project that is broadly supported and needed both in Huntington Beach and throughout Orange County. Poseidon Resources has taken the responsible approach of undergoing the environmental analysis of operating as a "stand-alone" facility, and your staff's

support for the permit is an indication that sufficient environmental protections are in place.

The scientific analysis clearly shows that with no threatened, endangered or commercially valuable species located offshore of Huntington Beach and with a reduction in the water intake by 75 percent or more from what is being drawn in today, this project has no significant environmental impact. To that end, the Huntington Beach City Council certified the Final Subsequent Environmental Impact Report (FSEIR) and the State Lands Commission unanimously approved the lease.

I encourage you and your fellow board members approve the permit when you meet in December and allow this project to move forward.

Sincerely,

John Whitman
Chairman
South Orange County Regional Chamber of Commerce

cc: Board Member Linda Ackerman
Board Member Fred Ameri
Board Member Richard A. Freschi
Board Member Mark Murai
Board Member William Ruh
Mr. Kurt Berchtold, Executive Officer
Mr. Gary Stewart, Senior Engineer

ORANGE COUNTY
BUSINESS COUNCIL

2 Park Plaza, Suite 100 | Irvine, California 92614-5904
phone: 949.794.2242 | fax: 949.476.0443 | www.ocbc.org

November 10, 2011

Ms. Carole H. Beswick
Chair
Santa Ana Regional Water Quality Control Board
3737 Main Street, Suite 500
Riverside, CA 92501-3348

Re: Huntington Beach Seawater Desalination Project – APPROVE National Pollutant Discharge Elimination System (NPDES) Permit Order No. R8-~~2006~~ 2011-0046 (NPDES CA8000403)

Dear Chair Beswick:

The Orange County Business Council is a longtime supporter of infrastructure projects that will improve California and enhance our business climate and economy. As such, OCBC supports Poseidon Resources in its efforts to obtain National Pollutant Discharge Elimination System (NPDES) Permit Order No. R8-2006-0046 (NPDES CA8000403), which was first approved by your board in August 2006.

The current permit issued by the Regional Board ensures this project is fully compliant with all water quality regulations and Poseidon is seeking no changes in the effluent limitations or mass emission limits established in Order No. R8-2006-0034. The amended renewal of the permit before you will allow for the project to operate independent of the power plant's use of its cooling water system. This operational flexibility is necessary to ensure a reliable water supply.

Water is too often taken for granted and is, in fact, a crucial infrastructure element that is considered by businesses interested in moving to or expanding in Orange County. Today more than 50 percent of Orange County's water supply comes from imported sources. When you combine Southern California's arid climate with the environmental and agricultural constraints that further limit the reliability of our imported water supply, a local, drought-proof, high-quality water supply is essential to attracting and retaining businesses in Orange County.

The Huntington Beach Seawater Desalination facility is a perfect example of how public-private partnerships can work and move our state forward. I encourage the Santa Ana Regional Water Quality Control Board to approve the permit application request at its December 9, 2011 meeting.

Sincerely,

Lucy Dunn
President and CEO

cc: Board Member Linda Ackerman
Board Member Fred Ameri
Board Member Richard A. Freschi
Board Member Mark Murai
Board Member William Ruh
Mr. Kurt Berchtold, Executive Officer
Mr. Gary Stewart, Senior Engineer

OCTax.org
OCTAX
Orange County Taxpayers Association

25 Orchard Suite 200, Lake Forest, CA 92630
phone (949) 768-8131 • fax (949) 768-1601 • www.octax.org

Ms. Carole H. Beswick
Chair
Santa Ana Regional Water Quality Control Board
3737 Main Street, Suite 500
Riverside, CA 92501-3348

October 27, 2011

**Re: Huntington Beach Seawater Desalination Project – APPROVE Renewal of National Pollutant Discharge Elimination System (NPDES) Permit Order No. R8-2011-0046 (NPDES CA8000403)**

Dear Chair Beswick:

A recent National Resources Defense Council report said, "...virtually all of California faces the prospect of serious water shortages." The Orange County Taxpayers Association (OCTax) wants Orange County to prepare for that prospect, and be celebrated for its foresight rather than cursed for its ignorance in ignoring the problem.

Others debate the minimal environmental effects of the proposed desalination facility. But the fact of the matter is that the desalination project fully complies with all state and federal environmental laws and regulations, which is why the Regional Board first approved it in 2006.

While the insignificant environmental effects of the project are clear, OCTax respectfully invites your attention to the project's tax benefits.

The facility will pay $1.8 million per year in property tax, which will support schools, municipal services, special districts, libraries and environmental protections. It will pay $500,000 per year in sales tax and $50,000 per year in utility tax.

The builder will spend $350 million for construction, creating 2,000 high-wage taxpaying jobs and 275 indirect jobs. Once in operation, it will create 18 full-time jobs and 322 indirect jobs.

It will be a reliable source of 50 million gallons per day of potable water. It will hedge against economic consequences of drought or other possible disruption to our water supply.

It will be operated for the benefit of the public by the taxpaying private sector, not by a tax-exempt public agency. Private investors accept most of the risk and pay the bills.

OCTax first testified in support of this project in 2003. Taxpayers and citizens need it now more than we needed then. Please vote to renew the permit at your public hearing on December 9, 2011.

OCTax.org
OCTAX
Orange County Taxpayers Association

25 Orchard Suite 200, Lake Forest, CA 92630
phone (949) 768-8131 • fax (949) 768-1601 • www.octax.org

Sincerely,

Reed L Royalty

President
Orange County Taxpayers Association

cc: Board Member Linda Ackerman
Board Member Fred Ameri
Board Member Richard A. Freschi
Board Member Mark Murai
Board Member William Ruh
Mr. Kurt Berchtold, Executive Officer
Mr. Gary Stewart, Senior Engineer

ASSOCIATION OF CALIFORNIA CITIES
ORANGE COUNTY

600 South Main Street, #940, Orange, CA 92868 | P: 714.953.1300 | F: 714.953.1302 | www.ACCOC.org

October 25, 2011

Ms. Carole H. Beswick
Chair
Santa Ana Regional Water Quality Control Board
3737 Main Street, Suite 500
Riverside, CA 92501-3348

**Re: Huntington Beach Seawater Desalination Project – APPROVE Renewal of National Pollutant Discharge Elimination System (NPDES) Permit Order No. R8-2006-0034 (NPDES CA8000403)**

Dear Chair Beswick:

The proposed seawater desalination facility in Orange County is a project that will provide water to replace the increasingly constrained access to imported water and be a significant benefit to the entire region.

More than a dozen cities throughout Orange County have passed resolutions supporting the completion of this important water infrastructure project. The ability for Orange County to become more self-reliant in terms of water resources is invaluable. Municipalities recognize the need for a new, reliable, drought-proof, high-quality water supply and the support for this project has been overwhelming.

The development of a seawater desalination facility at no risk to the taxpayer isn't just popular… it is overwhelmingly popular with cities and their mayors and council members, as evidenced by the fact that of all of the cities that have considered a resolution of support for the project, more than 90 percent of the elected officials voted affirmatively.

Additionally, the project has unanimous bi-partisan support from Orange County's entire state legislative delegation – Republicans and Democrats alike. Water is not a partisan issue. I encourage you and your fellow board members renew the permit your body approved in August 2006 and allow this project to move forward.

Sincerely,

Robert Ming
President
Association of California Cities – Orange County

MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

*Street Address:*
18700 Ward Street
Fountain Valley, California 92708

*Mailing Address:*
P.O. Box 20895
Fountain Valley, CA 92728-0895

(714) 963-3058
Fax: (714) 964-9389
www.mwdoc.com

Joan C. Finnegan
*President*

Jeffery M. Thomas
*Vice President*

Brett R. Barbre
*Director*

Wayne A. Clark
*Director*

Larry D. Dick
*Director*

Susan Hinman
*Director*

Ed Royce, Sr.
*Director*

Kevin P. Hunt, P.E.
*General Manager*

**MEMBER AGENCIES**

City of Brea
City of Buena Park
East Orange County Water District
El Toro Water District
Emerald Bay Service District
City of Fountain Valley
City of Garden Grove
Golden State Water Co.
City of Huntington Beach
Irvine Ranch Water District
Laguna Beach County Water District
City of La Habra
City of La Palma
Mesa Consolidated Water District
Moulton Niguel Water District
City of Newport Beach
City of Orange
Orange County Water District
City of San Clemente
City of San Juan Capistrano
Santa Margarita Water District
City of Seal Beach
Serrano Water District
South Coast Water District
Trabuco Canyon Water District
City of Tustin
City of Westminster
Yorba Linda Water District

October 31, 2011

Ms. Carole H. Beswick
Chair
Santa Ana Regional Water Quality Control Board
3737 Main Street, Suite 500
Riverside, CA 92501-3348

**Re: Huntington Beach Seawater Desalination Facility – APPROVE National Pollutant Discharge Elimination System (NPDES) Permit Order No. R8-2011-0046 (NPDES CA8000403)**

Dear Chair Beswick:

On behalf of the Orange County Seawater Desalination Working Group ("Working Group"), I am writing to respectfully ask the Santa Ana Regional Water Quality Control Board to approve the National Pollutant Discharge Elimination System (NPDES) Permit Order No. R8-2011-0046 (NPDES CA8000403) for the Huntington Beach Desalination Facility at your December 9, 2011 Board meeting.

The current permit issued by the Regional Board ensures this project is fully compliant with all water quality regulations. Poseidon is seeking no changes in the effluent limitations or mass emissions limits established in its permit. We believe the project is in compliance with applicable state law by incorporating the best available site, design technology and mitigation measures feasible to avoid the intake and mortality of marine life.

The Working Group is comprised of approximately twenty one Orange County public water agencies, retail water purveyors and municipalities including: the Municipal Water District of Orange County (MWDOC); Orange County Water District (OCWD); the Water Districts of Mesa Consolidated, El Toro, Irvine Ranch, Laguna Beach County, Moulton Niguel, Santa Margarita, South Coast and Trabuco Canyon; the Golden State Water Company; and, the cities of Newport Beach, Fullerton, Orange, Santa Ana, Fountain Valley, Garden Grove, Anaheim, Seal Beach and Westminster.

For the past several years we have worked with Poseidon Resources on the contractual terms and institutional arrangements necessary to supply a new source of drinking water throughout Orange County. While each member of the Working Group has its own unique interest in the project, we all share the common goal of diversifying supply and reducing demand for imported water. The collective demand from our agencies equals the Project's maximum 56,000 acre feet annual capacity.

Orange County is a leader in water conservation, recycling and groundwater replenishment. Still, Orange County must import 50% of its water from the Colorado River and the State Water Project in order to meet ratepayer demands.

MWDOC's Urban Water Management Plan identifies seawater desalination as a critical component of its plan to diversify the County's water supply and reduce demand on imported water. The Huntington Beach Desalination Project will produce 56,000 acre feet per year of local drinking water. enough to supply 300,000 Orange County residents. This local, drought-proof water supply reduces the county's dependence on imported water supplies.

We commend the Santa Ana Regional Water Quality Control Board for its previous approval of the discharge permit in August 2006, and we respectfully request that the Commission approve the permit as requested to allow this critical water infrastructure facility to move forward.

Sincerely,

Kevin P. Hunt

Kevin P. Hunt, P.E.
General Manager

cc:
Board Member Linda Ackerman
Board Member Fred Ameri
Board Member Richard A. Freschi
Board Member Mark Murai
Board Member William Ruh
Mr. Kurt Berchtold, Executive Officer
Mr. Gary Stewart, Senior Engineer

**Dallas Weaver**
**8152 Evelyn Circle**
**Huntington Beach, CA 92646**

Ms. Carole H. Beswick
Chair
Santa Ana Regional Water Quality Control Board
3737 Main Street, Suite 500
Riverside, CA 92501-3348

November 4, 2011

Dear Chairman Beswick and Regional Board Members:

Having attended several meetings and discussions on the stability and reliability of our water supply in the face of a natural disaster or a political/legal shutdown of the Delta Water extraction, it is clear that a major earthquake or some judicial decision could shut down a major component of our water supply. If an earthquake on the San Andres fault damaged the pumps over the mountains, the U.S. no longer has the forging capacity to replace the pumps in a reasonable amount of time. Lead times could be in the several-year time scale – meanwhile we would have no water from central Calif.

A similar earthquake in the Bay Area could shut the system down for a year or more. All landscaping, pools, fountains, auto-washes would have to go, along with flushing toilets more than once a day. This is a huge and unacceptable risk when you have most of your water traveling across one of the most active earthquake faults in the world.

I have also conducted research into the impingement and entrainment issue associated with the AES Generating Station and the input water supply for the desalination unit and find the "concerns" about the impact of this water supply on our marine ecology to be insignificant relative to natural processes impacting the marine ecology. For example, those who worry about fish eggs, zooplankton and phytoplankton being removed with the water must ask themselves what happens to the organisms in the waves breaking along the beach. The famous Surf City surf sees to it that the water gets filtered into the sand; all the organisms in the water are killed in vastly larger numbers than what we are talking about with the power plant, but their reproduction rates vastly exceed even this natural kill rate in our marine ecology. The impact on our marine ecology of this water removal is literally like the impact of spitting in the ocean, insignificant by all measures.

Poseidon Resources has a plan in place to get a desalination plant up and running here in Orange County within a couple of years of getting approval from the regulatory agencies.

The fact that the permit process for this project has taken about a decade is a sorry example of why our economy can't create jobs for the less than college educated (18% unemployment) in our society. Our present permit system creates lots of employment for highly educated professionals (a group with less than 2% unemployment) who suck massive amount of wealth out of potential projects before anything actually gets built by the less educated, and more despertely unemployed plebians.

Soon, you will be considering approval of their Amended Permit application. I hope you will approve this so that our county can start benefiting from the desalination plant as soon as possible.

I live near the proposed location and will be glad when the useless oil tanks presently occupying the site are gone and replaced by a vibrant, productive and necessary facility.

Sincerely,

Dallas Weaver

Dallas Weaver, PhD, P.E.

cc: Board Member Linda Ackerman
Board Member Fred Ameri
Board Member Richard A. Freschi
Board Member Mark Murai
Board Member William Ruh
Mr. Kurt Berchtold, Executive Officer
Mr. Gary Stewart, Senior Engineer

***Cindy Cross***
***6612 Jardines Drive***
***Huntington Beach, CA 92647***

Ms. Carole H. Beswick
Chair
Santa Ana Regional Water Quality Control Board
3737 Main Street, Suite 500
Riverside, CA 92501-3348

November 1, 2011

Dear Chairwoman Beswick and Regional Board,

**SUBJECT: Please approve Poseidon's Amended Permit**

I was there when Poseidon got their Draft Recirculated EIR approved by the City Council – after more than six hours of public testimony.

I was there when Poseidon donated water for troops returning to Camp Pendleton from overseas.

I was there when Poseidon became a major sponsor of the Duck-A-Thon, helping to raise money for healthcare services offered by the Community Care Health Centers.

I hope I don't have to be there when the Amended Permit is considered by the Regional Board this year. I hope you'll just approve it because the project deserves to be built.

It's my further hope that other private businesses in Huntington Beach and greater Orange County will take leadership within their communities as seriously as Poseidon Resources has.

Finally, I hope that the development of this desalination facility will have a ripple effect within the world and further the cause of providing drinking water to those on our planet who need it.

Respectfully submitted,

Cindy Cross

cc: Board Member Linda Ackerman
Board Member Fred Ameri
Board Member Richard A. Freschi
Board Member Mark Murai
Board Member William Ruh
Mr. Kurt Berchtold, Executive Officer
Mr. Gary Stewart, Senior Engineer

Chairwoman Carole H. Beswick
Santa Ana Regional Water Quality Control Board
3737 Main Street, Suite 500
Riverside, CA 92501-3348

November 10, 2011

Dear Chairwoman Beswick:

I am a long-time resident of southeast Huntington Beach, where the proposed desalinization plant will be built, and I strongly favor the project. In my discussions with other residents who have learned the facts regarding the building and operation of the facility, I find overwhelming support for it. I have only encountered a small group of citizens who oppose the project, and, almost without exception, their opposition is based on emotion or lack of knowledge of the facts.

Theirs is the minority position in my area and certainly the minority position within the entire city. To illustrate the fact that the majority of the city supports the building of the plant, the vocal minority had to go outside Huntington Beach to find at least half of their leadership.

I am strongly convinced that my area will benefit from the improvements and beautification aspects of the plan, the city as a whole will benefit from the jobs, revenue, and property tax/fees the project will create, and Orange County will benefit from the resultant ready, high-quality water supply.

I ask that you ignore the scare tactics of the naysayers and consider only the facts relevant to this project. If you do, I am confident you will move forward with the approval of the permit for the Poseidon Water Treatment facility.

Sincerely,

George Cross
19842 Isthmus Lane
Huntington Beach, CA 92646
(714) 962-7132

cc: Board Member Linda Ackerman
Board Member Fred Ameri
Board Member Richard A. Freschi
Board Member Mark Murai
Board Member William Ruh
Mr. Kurt Berchtold, Executive Officer
Mr. Gary Stewart, Senior Engineer

# John Prusa

**16657 Arbor Circle**
**Huntington Beach, CA 92647**
**P/F: 714-842-9004**


---

Chairwoman Carole H. Beswick
Santa Ana Regional Water Quality Control Board
3737 Main Street, Suite 500
Riverside, CA 92501-3348

November 19, 2011

Dear Chairwoman Carole H. Beswick:

What would happen to the residents and businesses in Huntington Beach and Orange County if we have a severe water shortage and there is not enough clean, fresh water? The prospect of this happening is a real possibility, and I, as a Huntington Beach resident, don't want to find out about the consequences if it did occur.

Therefore, I would like to see that additional water sources be made available so that we can safeguard against future shortages. I believe that the desalination plant proposed by Poseidon Resources is a good source for Huntington Beach and the rest of Orange County.

As part of the original EIR process, thorough research was conducted to ensure that the water produced by the Huntington Beach Desalination facility would be healthful, the plan is cost effective, there are no negative aesthetic effects and it is an overall environmentally sound solution. Furthermore, the 2010 approval of the Subsequent Environmental document by the Huntington Beach City Council means that Poseidon will have access to as much seawater as needed to produce an abundant supply of tap water for Orange County.

San Diego County has already obtained State approval for a desalination plant and the process has been effectively used in the U.S. and more than 120 countries around the world. The Huntington Beach business community, including the Chamber of Commerce, of which I am a member, has endorsed the Huntington Beach project.

The time is now for the Huntington Beach Desalination Plant. I ask that the Santa Ana Regional Water Quality Control Board approve the Amended Permit application and do something good for our economy and the overall well-being of Huntington Beach residents and businesses by swiftly providing their approval for this long awaited and worthwhile project!

Sincerely,

John Prusa

cc: Board Member Linda Ackerman
Board Member Fred Ameri
Board Member Richard A. Freschi
Board Member Mark Murai
Board Member William Ruh
Mr. Kurt Berchtold, Executive Officer
Mr. Gary Stewart, Senior Engineer

**Bill Cuppy**
**301 Main Street, Suite #112**
**Huntington Beach, CA 92648**

Ms. Carole H. Beswick
Chair
Santa Ana Regional Water Quality Control Board
3737 Main Street, Suite 500
Riverside, CA 92501-3348

October 30, 2011

Dear Chairwoman Beswick and Regional Water Quality Control Board, Santa Ana Region:

Desalinated water is becoming a reality in Southern California. I was thrilled to learn that Poseidon's Carlsbad desalination plant has received final approval. As an Orange County resident, however, the project's approval reminded me that the final permits for the Huntington Beach Poseidon plant have still not been issued. I am writing today to ask that you expedite this process to bring the water to Orange County! I know that you will be considering Poseidon's project soon. I hope you will approve it.

Desalinated water will bring us reliable, clean drinking water. It will be drought-proof. In this day and age, with proven technology, local support, unreliable precipitation and other water supplies, why wait?

Sincerely,

Bill Cuppy
billc4re@earthlink.net

cc:
Board Member Linda Ackerman
Board Member Fred Ameri
Board Member Richard A. Freschi
Board Member Mark Murai
Board Member William Ruh
Mr. Kurt Berchtold, Executive Officer
Mr. Gary Stewart, Senior Engineer

FROM: DOUG FLEISCHLI
TO: CHAIRWOMAN CAROLE H. BESWICK, RWQCB/SANTA ANA REG
DATE: NOVEMBER 7, 2011
SUBJECT: PLEASE APPROVE THE AMENDED PERMIT FOR THE POSEIDON DESALINATION PLANT

I am a surfer and have long enjoyed the waves in Huntington. I also have a background in water management and storm water issues, and I fully support the proposed Poseidon desalination plant.

I ask that you approve their application for an Amended Permit, which will be under consideration soon. It will allow the desal plant to operate independently from the AES Generating Station and provide water supplies to the county.

Please do not allow the shortsighted, selfish motives or political agendas of a few to overrule the benefits to the many.

Help protect the future of Orange County and our region by saying YES to Poseidon.

Sincerely,

Doug Fleischli

cc: Board Member Linda Ackerman
Board Member Fred Ameri
Board Member Richard A. Freschi
Board Member Mark Murai
Board Member William Ruh
Mr. Kurt Berchtold, Executive Officer
Mr. Gary Stewart, Senior Engineer

Doug Fleischli | 27611 Bocina | Mission Viejo, CA 92692

Dale L. Dunn
17302 Almelo Lane
Huntington Beach, CA 92649

November 17, 2011

Dear Commission,

I have lived in Huntington Beach for 44 years. I'm fully in favor of the desalination facility that Poseidon is proposing, including the Amended Permit that allows for direct extraction of ocean water in the case of the elimination of once-through cooling. The reasons are simple. It isn't going to harm our ocean water quality, it will provide extremely high-quality water supplies to our county and city, and it will result in an economic boon for our city.

I trust the scientific community, not the unsubstantiated claims of the opponents. Scientist after scientist says that taking water molecules out of ocean water and mixing the ocean salt with the rest of the ocean water doesn't harm the environment.

Poseidon isn't asking for any waivers or variances. This area is zoned properly for a desalination facility, product water will exceed state drinking water quality standards, and the project should be approved.

If we don't need the water today, we'll need it tomorrow. These projects take a long time to get through the entitlement, permitting and building process.

Please approve this project.

Sincerely,

Dale L. Dunn
714-846-4982

**Carol Speaker**
**207 6th Street**
**Huntington Beach, CA 92648**

Ms. Carole H. Beswick
Chair
Santa Ana Regional Water Quality Control Board
3737 Main Street, Suite 500
Riverside, CA 92501-3348

November 4, 2011

Dear Chair Beswick,

I am writing to express my support for the Poseidon desalination plant.

They have been generous community partners with the Duck-A-Thon, which raises money for the Community Clinic, providing sponsorships for the past six-plus years.

I have learned about their Amended Permit application and believe that it will have insignificant environmental and water quality impacts.

The project itself will benefit our city and our county. These benefits will be significant and long lasting.

I hope the Board will approve the permit for the Poseidon project.

Sincerely,

Carol Speaker

Carol Speaker

cc: Board Member Linda Ackerman
Board Member Fred Ameri
Board Member Richard A. Freschi
Board Member Mark Murai
Board Member William Ruh
Mr. Kurt Berchtold, Executive Officer
Mr. Gary Stewart, Senior Engineer

**Fred Speaker**
**207 6th Street**
**Huntington Beach, CA 92648**

Ms. Carole H. Beswick
Chair
Santa Ana Regional Water Quality Control Board
3737 Main Street, Suite 500
Riverside, CA 92501-3348

November 4, 2011

Dear Ms. Beswick,

I support the Poseidon desalination plant.

I believe the project will benefit our city and our county. These benefits will be significant and long lasting.

An additional, alternative water supply will be invaluable as our area continues to grow. Huntington Beach is becoming, more and more, a major tourist destination and we need water for our visitors. Our businesses and our residents rely on a steady supply of safe, clean water. The Huntington Beach desalination plant will provide that.

I strongly urge you to approve the Amended Permit for the Poseidon project.

Sincerely,

Fred Speaker

cc: Board Member Linda Ackerman
Board Member Fred Ameri
Board Member Richard A. Freschi
Board Member Mark Murai
Board Member William Ruh
Mr. Kurt Berchtold, Executive Officer
Mr. Gary Stewart, Senior Engineer

To: Executive Office of the Regional Water Board
California Regional Water Quality Control Board
Santa Ana Region 3737 Main Street, Suite 500
Riverside, CA 92501-3348

Date: October 18, 2011

CRWQCB - REGION 8
GDS 11/22
QJQ
NOV 21 2011

RE; WASTE DISCHARGE REQUIREMENTS
(National Pollutant Discharge Elimination System Permit)
Order No. R8-2011-0046, NPDES No. CA8000403

Dear Board Members;

Thank you for this opportunity to comment on the above referenced document. The Board Members and staff should be commended for the thorough documentation and presentation for public review of the Waste Discharge Requirements for such a large scale (50MGD) seawater desalination plant. We would be remiss in our responsibilities as concerned citizens if we did not take the time and make the effort to respond to some of these very complex issues;

Pg.8 Par.1 states;
"If HBGS were to permanently terminate the use and operation of its once-through cooling water system and/or were to permanently stop generating electricity, the Facility would operate the seawater intake and outfall independently in a long-term stand-alone operational mode. When operating in long-term stand-alone mode, the Facility's intake flows will be maintained at approximately 126.7 MGD."

**COMMENT**
It is not clear in either the language of the permit or the SEIR what the incremental environmental impact would be on the energy demand or water quality when the desalination plant is when operating in the reduced flow stand-alone mode. Is it accurate to assume that at least a part of the HBGS energy budget load would then be assumed by the desalination plant and the concentration of seawater contaminants in the waste discharge would be significantly increased?

Pg.9 Par.2 states;
"When operating in a temporary stand-alone mode, the Facility's intake flow will be Approximately 126.7 MGD- a volume which is less than HBGS's currently permitted intake flow of 514 MGD. Such operations will lead to reductions in the intake volumes, flow velocities, temperature and impingement and entrainment effects which occur under the HGBS's current operations"

**COMMENT**
Is it true that when the plant is operating in the stand-alone mode at the reduced flow rate the concentration of contaminants contained in the discharge would be significantly greater than the seawater intake and would lead to further degradation of an already impaired water body?

Also, is it true that at the reduced intake flow rate of 126.7 MGD the flow velocity at the seawater intake will be less than the 0.5 feet per second (fps) required for protection of marine life?

Pg.9 Par.4 states;
"If the HBGS permanently ceases operations of the once-through cooling water system and/or if the HBGS permanently stops generating electricity at the current site, within 180 days of receiving such notice, the Discharger shall submit a separate Report of Waste Discharge to the Regional Water Board"

**COMMENT**
Under these conditions the desalination plant discharger is the permittee and is responsible for the operation and compliance to the waste discharge permit requirements in this order. Since the discharge no longer serves as an OTC purpose for a power plant generating station but is an integral part of a new stand-alone desalination plant, should there be a requirement for a new complete and comprehensive EIR instead of the "Report of Waste Discharge" as stated above?

Pg.10 Par. 6 states;
"No significant impacts were identified and no mitigation was required for any marine life- or water quality-related effects."

And
Attach. F-13 Par. 4 states;
"No significant impacts were identified and no mitigation required for issues related to marine life and water quality.

And
Pg.11 Par.2 states;
"Compliance with this average annual intake flow will ensure that the Facility's discharge is consistent with the Ocean Plan."

**COMMENT**
The statements above appear to be predicated on the standard for review for CEQA.
The California Ocean plan (COP) contains a more stringent definition of the term "significant" and there are several contaminants-of-concern that are discharged by the desalination plant into an already impaired 303d water body at concentrations that are "significant", i.e. arsenic, copper, mercury, silver, zinc, PCBs and indicator bacteria.

As stated in Attach A Par.A-5; (from the COP);

**Significant Difference** "is defined as a statistically significant difference in the means of two distributions of sampling results at the 95 percent confidence level."

Is it accurate to state that when determining compliance to the waste discharge requirements The COP standard for significance as defined above being the most stringent, should prevail?

Pg.14, Par.3 states;
**0. Antidegradation Policy.** " 40 CFR 131.12 requires that State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution 68-16. Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Regional Water Board's Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. As discussed in detail in the Fact Sheet (Attachment F), the permitted discharge is consistent with the antidegradation policy provisions of 40 CFR Section 131 .12 and State Water Board Resolution 68-16."

However, Attach. F-20 Par.3 states;
**D. Impaired Water Bodies on CWA 303(d) List**
"California's 2006 list of impaired water bodies is prepared by the State Board pursuant to Section 303(d) of the CWA. These waters are not expected to meet applicable water quality standards after implementation of technology-based effluent limitations for point sources. The Huntington Beach State Park is included in the 303d list for enterococci, indicator bacteria, and PCBs (Polychlorinated biphenyls). The nearshore and offshore zones of Huntington Beach State Park are the immediately affected receiving waters of discharges from the Facility."

**COMMENT**
The source water for the proposed desalination plant are the waters offshore of Huntington Beach State Park. To date the source of these contaminants (enterococci, indicator bacteria And PCBs) are unknown, and TMDLs (total maximum daily loads) have yet to be determined. At low flow rates the concentration of these, as well as the other contaminants-of-concern included in Table B of the COP are doubled in the discharge of the effluent from the stand-alone desalination plant and then discharged into the near shore surf zone. This could pose a serious health hazard to recreational surfers and swimmers at the State Park.

Has the water board conducted an antidegredation analysis and determined that continued discharge of increased concentration of these contaminants-of-concern at low flow rates is consistent with the Antidegredation Policy?

Pg. F-43 Par. 1 states;
**Discharge Flow Limitation**
"The Order includes a requirement that the AES HBGS and/or the Facility maintain an intake minimum flow of 126.7 MGD, or reduce desalination production to ensure that the desalination discharge does not comprise more than 44.7 percent of the intake flow. The multiplier factor of 0.447 is based on 56.59 MGD divided by 126.7 MGD. The 56.59 MGD flow includes a maximum of 50 MGD of concentrated seawater, 6.3 MGD of backwash water (salinity same as seawater), and 0.29 MGD of RO concentrate solution rinse water."\

**COMMENT**
Although not specifically stated in the Waste Discharge Requirements does the above Discharge Flow Limitation implies a mandated salinity concentration limit at the point of discharge of 49.9 ppt?

Does the COP salinity concentration limit of 37.4ppt at the 1000 ft. distance from the plant outflow still apply? (not more than 10% above nominal).

I greatly appreciate your attention to these comments and questions and look forward to a timely and informative response.

Please feel free to contact me if these comments and questions require additional clarity.

Informational references are available on request.

Sincerely,

Don Schulz (562)430-2260
Member, Environmental Stakeholder Coalition.
Surfdad@hotmail.com

# California Legislature

November 21, 2011

Carole H. Beswick
Chair
Santa Ana Regional Water Quality Control Board
3737 Main Street, Suite 500
Riverside, CA 92501-3348

***Re: Huntington Beach Seawater Desalination Facility – APPROVE National Pollutant Discharge Elimination System (NPDES) Permit Order No. R8-2011-0046 (NPDES CA8000403)***

Dear Chair Beswick:

We are collectively writing you to urge your approval of the National Pollutant Discharge Elimination System (NPDES) Permit Order No. R8-2011-0046 (NPDES CA 8000403) for the Huntington Beach Seawater Desalination Project at your upcoming Board Meeting. Your approval will move this critical water infrastructure project one step closer to construction.

In 2006, your board first approved the permit for the project. This new amended permit will allow the Huntington Beach desalination Project to operate as a "stand-alone" facility, which was studied and approved by the City of Huntington Beach and by the California State Lands Commission last year.

The Municipal Water District of Orange County's (MWDOC) Urban Water Management Plan identifies seawater desalination, and specifically the Huntington Beach project, as a critical component of its plan to diversify the County's water supply and reduce demand on imported water. The Huntington Beach desalination Project has undergone 10 years of planning and scientific study and it has been determined that there will be no significant unmitigatable impacts from the construction and operation of the project.

The Project will not only provide Orange County with a new, drought-proof water supply, it will also create over 2,000 jobs during the 36-month construction period while providing over $350 million in local economic stimulus. All of the water will be appropriated for public use through long-term water purchase agreements with public water agencies. These water purchase agreements provide important ratepayer protections by guaranteeing the quantity, quality, reliability and price of the water.

The Huntington Beach Desalination Project is a critically needed and environmentally-responsible solution to the County's water supply needs. We urge your immediate approval.

Sincerely,

State Senator Robert Huff
29th District

State Senator Mimi Walters
33rd District

State Senator Lou Correa
34th District

State Senator Tom Harman
35th District

State Senator Mark Wyland
38th District

State Assemblyman Tony Mendoza
56th District

State Assemblyman Curt Hagman
60th District

State Assemblyman Jim Silva
67th District

State Assemblyman Allan Mansoor
68th District

State Assemblyman Jose Solorio
69th District

State Assemblyman Don Wagner
**70th District**

State Assemblyman Jeff Miller
71st District

**State Assemblyman Chris Norby**
**72nd District**

State Assemblywoman Diane Harkey
73rd District

cc:

Board Member Linda Ackerman
Board Member Fred Ameri
Board Member Richard A. Freschi
Board Member Mark Murai
Board Member William Ruh
Mr. Kurt Berchtold, Executive Officer
Mr. Gary Stewart, Senior Engineer

Attached is a copy of a comment letter received via email in support of this permit. The Following people submitted this same letter:

1. Daniel Barro, Huntington Beach
2. Christine Brissey, Huntington Beach
3. Sherri Butterfield, Mission Viejo
4. Robert Lee, San Clement
5. Cliff Stone
6. Thomas E. Burrows, Huntington Beach
7. Danny Rothstein, Huntington Beach
8. Yvonne Rothstein, Huntington Beach
9. Ray C. Emmons, Huntington Beach
10. Dan Hytrek, Huntington Beach
11. Howard Spielman, Huntington Beach
12. Jean Keller, Huntington Beach
13. Fred Jackson, Orange
14. Thomas Budds, Huntington Beach
15. Tyler Banks, Huntington Beach
16. Michael Tasker, Huntington Beach
17. Nathaniel D. Pendleton, Huntington Beach
18. Diane Salgado Sandoval, Huntington Beach
19. Evelyn Ha, Garden Grove
20. Mike Little, Huntington Beach
21. Donna Little, Huntington Beach
22. Phyllis Nichols, Huntington Beach
23. Allan Leader, Huntington Beach
24. Bruce West, Huntington Beach
25. Mike Carter, Huntington Beach
26. Al Guidotti, Huntington Beach
27. William Lochrie, Fullerton
28. Samantha Fitzgerald, Irvine
29. Donna A. Sandoval, Huntington Beach
30. Dr. James Woods, Huntington Beach
31. Kathleen Davis, Huntington Beach
32. Mrs. Lois Paul, Huntington Beach
33. Daniel Barro, Huntington Beach

**Felipa Carrillo - A comment from Daniel Barro**

---

**From:** <ranchero59@p3slh164.shr.phx3.secureserver.net>
**To:** <fcarrillo@waterboards.ca.gov>
**Date:** 10/26/2011 11:15 AM
**Subject:** A comment from Daniel Barro

---

Dear Chair Beswick:

Orange County needs a locally-controlled, reliable, drought-proof water supply and the Huntington Beach Seawater Desalination Facility fits the bill. This project will reduce our dependency on imported water and protect Orange County in case of emergency or drought.

Poseidon Resources has spent over a decade working on the environmental regulatory review process and the science clearly shows that desalinating seawater has no significant impact on the marine life or coastal habitat. Additionally, this project would create thousands of good-paying jobs for Orange County at a time when our state unemployment is more than 12 percent.

Conservation, Recycling and Imported water are all important components to our water supply, but desalination must be part of that equation. A reliable water supply is crucial to the economic growth of our region.

In August 2006, your board approved the original permit for this project and now we're asking you to approve this amended application.

Orange County needs the water and jobs. Please vote yes.

Sincerely,

Daniel Barro
Huntington Beach

cc:

Board Member William Ruh
Board Member Fred Ameri
Board Member Richard A. Freschi
Board Member Mark Murai
Board Member Linda Ackerman
Mr. Kurt Berchtold, Executive Officer

# COMMENT LETTERS
# (Part 2)

**CHARLA KABANA**
**2124 MAIN STREET, SUTIE 140**
**HUNTINGTON BEACH, CA 92648**

November 22, 2011

Ms. Carole H. Beswick
Chair
Santa Ana Regional Water Quality Control Board
3737 Main Street, Suite 500
Riverside, CA 92501-3348

Dear Carole Beswick and Regional Board Members:

Orange County residents like me support new, innovative solutions to improve water reliability. We also support projects that provide high-quality water to our communities. That's why I'm writing today to ask for an expedited permit granting for the pending desalination project in Huntington Beach, California.

There is already an approved seawater desalination project in Carlsbad. It's now time for Orange County to also receive a drought-proof, high-quality water supply for our residents and businesses.

I'm a strong advocate for enhancing the county's investment in infrastructure. I also support the added economic benefits of the project, such as new jobs. For these reasons and more, a swift approval of the project will allow Orange County residents to start reaping the many benefits of this project.

Thank you in advance for helping Orange County secure its water future.

Best regards,

Charla Kabana

Charla Kabana

cc: Board Member Linda Ackerman
Board Member Fred Ameri
Board Member Richard A. Freschi
Board Member Mark Murai
Board Member William Ruh
Mr. Kurt Berchtold, Executive Officer
Mr. Gary Stewart, Senior Engineer

Charkab@earthlink.net
(714) 969-7100

Maureen Sloan
18301 Roberta Circle
Huntington Beach, CA 92646

November 21 2011

Ms. Carole H. Beswick
Chair
Santa Ana Regional Water Quality Control Board
3737 Main Street, Suite 500
Riverside, CA 92501-3348

Dear Chair Carole Beswick:

I live in Huntington Beach, Calif. I am concerned about the future availability of clean, safe drinking water for my family and community.

With annual rain fall in Orange County consistently below average, and continual population increases in California, the issue of having enough water to supply the OC residents in the future is troubling. With a vast ocean at our fingertips, Poseidon Resources Group, an experienced innovator in water infrastructure projects, has been working with local and State agencies to develop a seawater desalination plant that will convert ocean water into pure drinking water. I support their plan and proposed facility in Huntington Beach.

Poseidon's desalination project will provide very good, safe water - 50 million gallons/day of it - to Orange County, which is 8% of the water the county needs, by using ocean water that is already available. On-site storage will also provide a guaranteed safe, reliable drinking water supply to Huntington Beach in times of emergency, reducing risks of water shortages, and dependence on imported water.

I hope you can see the urgency and importance of approving Poseidon's permit.

Sincerely,
*Maureen Sloan*
714.375.5908

cc: Board Member Linda Ackerman
Board Member Fred Ameri
Board Member Richard A. Freschi
Board Member Mark Murai
Board Member William Ruh
Mr. Kurt Berchtold, Executive Officer
Mr. Gary Stewart, Senior Engineer

**Margie Bunten**
**380 5th Street**
**Huntington Beach, CA 92648**
**mbunten@gwc.cccd.edu**
**714-960-4861**

23 Nov 2011

Ms. Carole H. Beswick
Chair
Santa Ana Regional Water Quality Control Board
3737 Main Street, Suite 500
Riverside, CA 92501-3348

Dear Ms. Beswick:

I have raised my family here in Huntington Beach. As a mother and volunteer, I have many concerns for my family's welfare and the wellbeing of other families and children. If the Regional Board approves the permit for Poseidon Seawater Desalination project, I will have one less worry for our community's future.

Year after year, we experience less than optimum local rainfall. Good water is becoming scarcer. It's just a matter of time before we will need to find alternative water sources in Orange County. I believe that ocean desalinization is a good method to ensure a local drought-proof water supply. I am also impressed by the quality of this water – clean, pure, tested for purity.

As you can imagine, the Huntington Beach coastline and environment are important to me. I love the beach and sea life. I feel very lucky to live near the ocean in beautiful Southern California.

I believe this plan will also boost our economy by providing high-paying jobs and millions in local tax revenue. This money can be put towards our schools, parks, police and fire department or other community improvements.

Many, many hundreds of Huntington residents support this project. I hope you can approve it soon. The future of families and children in Orange County depend on it!

Sincerely,

Maggie Burton

cc: Board Member Linda Ackerman
Board Member Fred Ameri
Board Member Richard A. Freschi
Board Member Mark Murai
Board Member William Ruh
Mr. Kurt Berchtold, Executive Officer
Mr. Gary Stewart, Senior Engineer

Donna L. Gray
3782 Humboldt Drive
Huntington Beach, CA 92647

November 23, 2011

Ms. Carole H. Beswick
Chair
Santa Ana Regional Water Quality Control Board
3737 Main Street, Suite 500
Riverside, CA 92501-3348

Dear Reg. Board and Chair Beswick:

The Huntington Beach desalination plant, which will bring a new source of water to Orange County residents utilizing the same technology as the approved Carlsbad project, is asking you for an amended permit.

I urge you to grant this permit at Poseidon's hearing.

Surveys of Huntington Beach and Orange County voters have shown that there is a considerable amount of support for desalination in general and the Huntington Beach facility in particular.

Best regards,

Donna L Gray

cc: Board Member Linda Ackerman
Board Member Fred Ameri
Board Member Richard A. Freschi
Board Member Mark Murai
Board Member William Ruh
Mr. Kurt Berchtold, Executive Officer
Mr. Gary Stewart, Senior Engineer

*Donna L. Cross*
*19842 Isthmus Lane*
*Huntington Beach, CA 92646*
*(714) 962-7132*

November 23, 2011

Ms. Carole H. Beswick
Chair
Santa Ana Regional Water Quality Control Board
3737 Main Street, Suite 500
Riverside, CA 92501-3348

Dear Chair Beswick:

I am a resident of Orange County who believes that it is imperative that the Regional Board move forward with granting a permit for the Huntington Beach desalination project. The project's developer has been working to obtain the necessary permits for more than ten years, and it seems that the time is now to move forward.

As you know, approximately half of Orange County's water is imported. In South County, all of the water is imported. Unlike north Orange County, South County receives no groundwater. With a looming water crisis inevitable in the future, obtaining new sources of water for our residents is the responsible thing to do. Desalination is the future, and the time is now.

I hope that you will pursue moving this project forward as soon as possible. Thank you.

Sincerely,

Donna L. Cross

cc: Board Member Linda Ackerman
Board Member Fred Ameri
Board Member Richard A. Freschi
Board Member Mark Murai
Board Member William Ruh
Mr. Kurt Berchtold, Executive Officer
Mr. Gary Stewart, Senior Engineer

**Pamela Alagata**
**P.O. Box 1447**
**Huntington Beach, CA 92647**

**November 22, 2011**

Ms. Carole H. Beswick
Chair
Santa Ana Regional Water Quality Control Board
3737 Main Street, Suite 500
Riverside, CA 92501-3348

Dear Ms. Beswick, Chairwoman:

Desalination will be an important part of California's long-term water supply solution.

I have read that the reverse osmosis technology that will be used in the proposed Huntington Beach desalination project is already used in Orange County to prepare wastewater for refilling underground aquifers.

Importantly, desalination of ocean water provides new sources of water that won't be affected by fights over water rights or problems in the Delta. Desalinated water is also drought-proof.

Please expedite the necessary permits to bring desalination to Orange County. We need new sources of water for Orange County, and we need them now.

Sincerely,

**Pamela Alagata**
**714-654-9219**
**hbpld@yahoo.com**

cc: Board Member Linda Ackerman
Board Member Fred Ameri
Board Member Richard A. Freschi
Board Member Mark Murai
Board Member William Ruh
Mr. Kurt Berchtold, Executive Officer
Mr. Gary Stewart, Senior Engineer

Mary Sue Bowden
16972 Agate Circle
Huntington Beach, CA 92649
714 345-0484

11/22/2011

Ms. Carole H. Beswick
Chair
Santa Ana Regional Water Quality Control Board
3737 Main Street, Suite 500
Riverside, CA 92501-3348

Chair Beswick and Board:

We are in a time of environmental crisis, particularly in the area of drinking water supplies. Finding new sources is critical. That's why I am urging the RWQCB to permit the Huntington Beach desalination project as soon as possible

Living near the coast, Orange County has an exciting new prospect in desalinated water. The process of researching, planning and studying this prospect has been long, but the research has found that the project will benefit our community.

It's exciting that Orange County is on the brink of being at the forefront of receiving a new, reliable source of water. Moving forward with the project will bring our residents that much closer to another source of water, a source that we desperately need. I look forward to the day we can turn on our taps and feel secure in having a drought-proof, safe, clean and environmentally sound source of water for Orange County.

Sincerely,

Mary Sue Bowden

Mary Sue Bowden

cc: Board Member Linda Ackerman
Board Member Fred Ameri
Board Member Richard A. Freschi
Board Member Mark Murai
Board Member William Ruh
Mr. Kurt Berchtold, Executive Officer
Mr. Gary Stewart, Senior Engineer

**Kara Rudin**
**624 Ashland Drive**
**Huntington Beach CA 92648**
**(714) 594-5234** **KARA@RUDINLAW.COM**

21 Nov 2011

Ms. Carole H. Beswick
Chair
Santa Ana Regional Water Quality Control Board
3737 Main Street, Suite 500
Riverside, CA 92501-3348

Dear Chair Beswick:

Orange County has been thirsting for an economically and environmentally responsible solution to our diminishing water supply. Fortunately, we found a great one when the City of Huntington Beach approved the construction of an innovative $250 million Seawater Desalination Plant. Unfortunately, we still seek the approval to move ahead with this forward-thinking project.

The Huntington Beach desalination plant is supported by local residents as well as numerous civic leaders, organizations, businesses and elected officials. Water infrastructure industry leader Poseidon Resources is going to take all of the risk associated with building and operating this plant and local residents and businesses will reap many substantial rewards.

The plant will use an environmentally safe process to produce 50 million gallons of fresh drinking water per day. This water will meet and exceed all state water quality standards. It will be built at no cost to tax payers, generate hundreds of jobs and bring millions in revenue to the city of Huntington Beach. The project's location next to an existing AES Generating Station will reduce environmental impacts, lessen construction costs and enable the water to be priced more affordably. The desalination facility is not expected to increase water bills for Huntington Beach residents and the water produced is expected to be priced at rates that will be competitive with other new sources of high quality drinking water. Furthermore, because of the facility's ideal location, the water should be the lowest priced desalinated seawater on the California Coast.

**Kara Rudin**
**624 Ashland Drive**
**Huntington Beach CA 92648**
**(714) 594-5234** **KARA@RUDINLAW.COM**

We need your prompt approval to quench Orange County's thirst for a reliable alternative water source. Please make the Huntington Beach Seawater Desalination Plant a not-too-distant reality.
Sincerely,

cc: Board Member Linda Ackerman
Board Member Fred Ameri
Board Member Richard A. Freschi
Board Member Mark Murai
Board Member William Ruh
Mr. Kurt Berchtold, Executive Officer
Mr. Gary Stewart, Senior Engineer

**Terry Rose**
**212 E. Utica Ave.**
**Huntington Beach, CA 92648**
**terry@giftsfromadistance.com**
**(714) 271-9305**

11-21-11

Ms. Carole H. Beswick
Chair
Santa Ana Regional Water Quality Control Board
3737 Main Street, Suite 500
Riverside, CA 92501-3348

Dear Regional Board/Chair Beswick:

It's time to wake up and smell the coffee (while we still have enough water to make some)! The diminishing water sources from Northern California and the Colorado River are clear evidence that Orange County needs a pure, reliable and drought proof water supply to sustain our growing communities in the not-too-distant future.

Hundreds of countries around the globe are already successfully using desalination to enhance water supply. Plenty of research has proven that desalination plants similar to the proposed Poseidon facility in Huntington Beach, are effective, sustainable and fiscally responsible.

The Poseidon Seawater Desalination facility promises to provide 50 million gallons per day of drinking water to Orange County. It will not harm the environment or be unsightly, and will be built at no cost to taxpayers. The plant and this plan are supported by hundreds of local Huntington Beach residents and are endorsed by Republican and Democratic legislators as well as the HB Chamber of Commerce, the OC Taxpayers Association, the Orange County Business Council and local environmental leaders.

Please approve the permit requested by Poseidon so they can implement this responsible solution to protect our community's water supply now!

Sincerely,

Terry Rose

**Terry Rose**

cc: Board Member Linda Ackerman
Board Member Fred Ameri

Board Member Richard A. Freschi
Board Member Mark Murai
Board Member William Ruh
Mr. Kurt Berchtold, Executive Officer
Mr. Gary Stewart, Senior Engineer

**Chuck Roberts**
**12704 George Reyburn Road**
**Garden Grove, CA 92845**

Ms. Carole H. Beswick
Chair
Santa Ana Regional Water Quality Control Board
3737 Main Street, Suite 500
Riverside, CA 92501-3348

November 28, 2011

Dear Chair Beswick:

I have lived in West Garden Grove most of my life, and I have rarely felt compelled to write a letter to many regulatory agencies.

However, I feel the Poseidon desalination plant is one of the most important projects under consideration in Orange County.

This desalination plant will provide insurance for what most intelligent people understand will be a very real problem in the near future: the lack of an adequate drinking water supply in California.

I hope you will take our county's needs into consideration when you review the amended permit application. Please don't hold the rest of us hostage to a few unhappy residents and their outside supporters who fear anything new or don't want this "in their backyards."

PLEASE VOTE TO APPROVE THE POSEIDON PROJECT'S PERMIT.

Sincerely,

Chuck Roberts

Chuck Roberts

cc: Board Member Linda Ackerman
Board Member Fred Ameri

Board Member Richard A. Freschi
Board Member Mark Murai
Board Member William Ruh
Mr. Kurt Berchtold, Executive Officer
Mr. Gary Stewart, Senior Engineer

*Pat Davis*
*7172 Ridge Glen Drive, #209*
*Huntington Beach, CA 92648*
*(714) 274-3753*
*pdavis27@socal.rr.com*

November 28, 2011

Ms. Carole H. Beswick
Chair
Santa Ana Regional Water Quality Control Board
3737 Main Street, Suite 500
Riverside, CA 92501-3348

Dear Chairwoman Beswick:

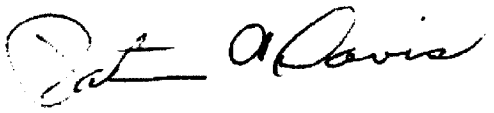
Bringing millions of dollars in revenue to Orange County, there's never been a more important time to move forward with the Huntington Beach desalination project.

According to the project's Web site, the proposed construction of the desalination plant will bring more than 600 new jobs to Orange County. Once it's complete, 18 full-time jobs will be created along with more than 300 related jobs.

In addition, it won't cost Orange County residents any money. There will be no cost to the city, county or taxpayers. Instead, all costs will be borne by Poseidon. All benefits will be provided to the city and the county—at no risk to the city or the county. If the facility ever ceases to operate, a bond will be available to restore the site to its original condition if desired by the land owner and the city.

In these times of economic uncertainty, one thing seems clear: This project will only provide Orange County with economic benefits. Please consider the current economic climate and move forward with granting the necessary permits to make this project – which will provide much-needed, high-quality water – a reality.

Sincerely,



cc: Board Member Linda Ackerman
Board Member Fred Ameri
Board Member Richard A. Freschi
Board Member Mark Murai
Board Member William Ruh
Mr. Kurt Berchtold, Executive Officer
Mr. Gary Stewart, Senior Engineer

Robert W. Harrison
9332 Greenwich Drive
Huntington Beach, CA 92646-3526
(714) 504-0291

Ms. Carole H. Beswick
Chair
Santa Ana Regional Water Quality Control Board
3737 Main Street, Suite 500
Riverside, CA 92501-3348

December 2, 2011

Dear Chair Beswick,

As a retired engineer and member of the boards of directors of the Bolsa Chica Conservancy and ISA (International Society of Automation) Technical Society, I'm fully in favor of the desalination facility that Poseidon is proposing. I hope that the RWQCB will approve the amended permit for the proposed desalination facility in Huntington Beach. I have lived in southeast Huntington Beach for 40 years, and I believe that the project will benefit the city and the entire region with the water supplies that will be created.

The opponents are the people who oppose every improvement in our city, and many of them do not even live here. Their assertions that the plant will harm the environment are based on falsehoods.

Poseidon Resources is asking to build a project that meets all the requirements of the Department of Health Services, the Coastal Act, and the city's own zoning codes.

I respectfully request that you approve the permit for this project when it comes before you for consideration.

Sincerely,

Robert W. Harrison, PE
ISA Fellow

cc: Board Member Linda Ackerman
Board Member Fred Ameri
Board Member Richard A. Freschi
Board Member Mark Murai
Board Member William Ruh
Mr. Kurt Berchtold, Executive Officer
Mr. Gary Stewart, Senior Engineer

**Don MacAllister**

1121 Park St., Huntington Beach, CA 92648 (714) 960-2892

Ms. Carole H. Beswick
Chair
Santa Ana Regional Water Quality Control Board
3737 Main Street, Suite 500
Riverside, CA 92501-3348

November 29, 2011

Dear Chairman Beswick,

I have studied the local water issues and have spent time learning about the proposed desalination facility in Huntington Beach. I support Poseidon's proposed project, including the Amended Permit, which you will soon be considering. I hope you will vote to approve their permit and allow this company to provide our area with precious, and much-needed, water resources.

Desalination is needed to provide for our water needs. Municipal Water District of Orange County (our member agency at Metropolitan Water District) has been planning for a long time on desalination as one of the "Next steps for Orange County" per their Planning and Operations Committee Report of May 2004.

The need for desalination projects is further emphasized by the Integrated Resource Plan (IRP) Update from July 2004. Water supplies for Orange County during one of the latest update periods of Fiscal Year 2002 fell short of MWDOC's goal of 300,000 acre-feet by 50,000 acre-feet, an unfulfilled need of 16%. The IRP states, "Meeting the targets will require the region to produce 159,000 acre-feet of additional local project and/or seawater desalination supply by 2010 and 249,000 acre-feet by 2020."

The Orange County Water District, our area's groundwater management agency, has been a pioneer in the development of desalination technology. Their 70-million-gallons-per-day wastewater recycling project, the Groundwater Replenishment System, will utilize the same types of reverse osmosis filters as are planned for the Huntington Beach desalination facility.

Desalination has been talked about for decades, has been researched for years, and has been tested thoroughly, and is a viable part of the picture to satisfy our community's water needs. It is also proven to provide VERY high quality product water that will go a long way toward improving water quality in our area.

The time has come to realize the dream. Please support the desalination project for Huntington Beach.

Yours,

Don MacAllister
Former Mayor, Huntington Beach

cc: Board Member Linda Ackerman
Board Member Fred Ameri
Board Member Richard A. Freschi
Board Member Mark Murai
Board Member William Ruh
Mr. Kurt Berchtold, Executive Officer
Mr. Gary Stewart, Senior Engineer

CALCOAST

# *California Coastal Coalition*
**1133 Second Street Suite G**
**Encinitas, CA 92024**

BOARD OF DIRECTORS:

Chair: Supvr. Pam Slater-Price
3rd District, San Diego County

Vice Chair: Hon. Ann Kulchin
City of Carlsbad

Supervisor Patricia Bates
5th District Orange County

Supervisor Don Knabe
4th Dist. LA County

Councilmember Brian Brennan
City of Ventura

Councilmember Ted Ehring
City of Pismo Beach

AMBAG
BEACON
SANDAG
SCAG
County of Los Angeles
County of Orange
County of San Diego
County of Santa Barbara
County of Ventura
Orange County Sanitation Dist.
City of Carlsbad
City of Carpinteria
City of Capitola
City of Coronado
City of Dana Point
City of Del Mar
City of Encinitas
City of Half Moon Bay
City of Hermosa Beach
City of Huntington Beach
City of Imperial Beach
City of Laguna Beach
City of Long Beach
City of Los Angeles
City of Malibu
City of Manhattan Beach
City of Monterey
City of Morro Bay
City of Newport Beach
City of Oceanside
City of Pacific Grove
City of Pismo Beach
City of Port Hueneme
City of Redondo Beach
City of Rancho Palos Verde

**STEVEN ACETI, J.D.**
***Executive Director***

**760.944.3564 tel**
**760.944.7852 fax**
**steveaceti@calcoast.org**

December 1, 2011

Santa Ana Regional Water Quality Control Board
3737 Main Street, Suite 500
Riverside, CA 92501-3348

**Re: Huntington Beach Seawater Desalination Project – APPROVE National Pollutant Discharge Elimination System (NPDES) Permit Order No. R8-2006-0046 (NPDES CA8000403)**

Dear Chair Beswick and Board Members

On behalf of California Coastal Coalition's (CalCoast) board of directors and our local government members, I would like to urge your approval of National Pollutant Discharge Elimination System (NPDES) Permit Order No. R8-2006-0046 (NPDES CA8000403) for the Huntington Beach Desalination Project.

CalCoast is a non-profit advocacy group comprised of 35 coastal cities, five counties, the San Diego Association of Governments, the Southern California Association of Governments, and numerous business associations and allied groups. CalCoast is committed to restoring California's coast through sand replenishment, increasing the flow of natural sediment, wetlands recovery and improved water quality.

Poseidon Resources, the company developing the desalination facility, has informed CalCoast that it is not seeking any changes in the effluent limitations or the mass emission limits established in Order No. R8-2006-0034, which was issued to the facility by the Regional Board in 2006. Poseidon Resources has assured us that the permit prepared by your staff ensures that the potential future stand-alone operation of the desalination facility is fully compliant with California Water Code Section 13142.4(b), which ensures the facility will utilize the best available site, design, technology and mitigation measures feasible to avoid the intake and mortality of marine life.

We have given extensive consideration to the role of seawater desalination in the state of California and believe Poseidon's Huntington Beach project is appropriately sited and includes the necessary design, technology and mitigation for one to conclude it represents an appropriate use of coastal property and public trust resources.

Sincerely,

Steve Aceti, Executive Director
California Coastal Coalition

City of San Clemente

City of Sand City

City of San Diego

City of San Francisco

City of Santa Barbara

City of Santa Cruz

City of Santa Monica

City of Seal Beach

City of Solana Beach
City of Ventura

***CalCoast is an advocacy organization comprised of coastal communities and interest groups***

**www.calcoast.org**

*David E. Hamilton*
*5401 Kenilworth Drive*
*Huntington Beach, CA 92649*
*Phone: (714) 840-8901*
*E-mail: de.hamilton@verizon.net*

CRWQCB - REGION 8
MAS
GDS 11/29
NOV 28 2011

November 22, 2011

**Regional Water Quality Control Board**
Santa Ana Region
3737 Main Street, Suite 500
Riverside, CA 92501-3348

**Re: Order No. R8-2011-0046, NPDES No. CA80000403**
**Poseidon Desalination Project in Huntington Beach**

Dear Editors,

The RWQCB should not grant an NPDES permit to Poseidon Resources (Surfside) L.L.C. to operate its proposed Huntington Beach Desalination Facility. The cumulative uncertainties and risks of this project on coastal water quality are not balanced by potential benefits to California, the Santa Ana region, or the residents.

First, the environmental effects of dumping **7,000 tons of salt concentrates per day*** produced by the Poseidon facility back into Huntington Beach's coastal waters can only be guessed at. The only assurance of such guesswork is that coastal water quality will not improve as a result. In fact, the Poseidon EIR states on page 18 of the Executive Summary: "**OCEAN WATER QUALITY:** *The proposed project may adversely impact ocean water quality in the vicinity of the HBGS outfall.* ***Significance: Less than significant.***" The Board should be amazed that anyone could possibly claim that dumping 7,000 tons per day of anything into our coastal waters would be "Less than significant"! That's not 7,000 tons of brine being referenced. It's the actual 14,000,000 pounds (!) of light and heavy metal salts which gets dissolved into a brine mixture for transport and disposal in our near coastal waters every day. That's nearly 5 tons per minute of every minute of every hour of every day for the operational life of the proposed facility.

At a time when our civic leaders and responsible agencies should be making all possible decisions to improve the quality of our coastal waters, the Board is to decide on an issue that, according to the requestor's own documents, "...may adversely impact ocean water quality...".

Furthermore, there are uncertainties about the adverse effects on ocean wildlife via the HBGS/Poseidon intakes; impacts of brine odors on residential air quality; and, the constant noise produced by pressurizing, pumping, and moving around 200,000 tons of water per day (for comparison: the maximum take-off weight of a Boeing 747-300 is 400 tons). Combine those with the uncertainty about the technology to produce the proposed quantity of potable water, especially considering the debacle of Poseidon's Tampa, Florida effort. Then, there's the economic uncertainty of whether it's wise to build reliance on private, profitized sources for what is an essential for life. Finally, there's the uncertainty of the long-term viability of Poseidon Resources as a company, particularly considering that, as of October 31, 2011, according to the Municipal Water District of Orange County (MWDOC), Poseidon Resources has no agreement with any public agency to acquire the water the facility produces.

OPPOSE

Please note, in other parts of the world, just a 1°C increase in coastal water temperatures has destroyed thousands of square miles of the world's coral reefs. A 3% increase in coastal water acidity has claimed additional thousands of square miles of coral reef and marine habitat. Poseidon facility's dumping of salt by-product will increase water salinity in Huntington Beach's surf zone between 5% and 20% depending on depth, water temperature, and proximity to the discharge point. This increased salinity will exist continuously for the projected 30-year life of the desalting plant. During the typical mid-summer, long-shore currents can carry Poseidon's meta- and hyper-saline effluent plume onshore toward protected State Beaches.

How will the increase in salinity affect the coastal waters? Depends on which biologists the Board believes—Poseidon's paid biologists *or* the self-financed marine biologists of environmental organizations and academia. One thing is assured: The health of local coastal water will be adversely affected to *some* degree! Can the Board take the chance that the local coastal waters will *not* be adversely impacted?

The uncertainties accumulate geometrically to the point that the only—and it bears repeating—ONLY assurance Poseidon can give is "...may adversely impact ocean water quality...". The Poseidon Desalination Project in Huntington Beach should not be granted an NPDES permit.

Regards,

David Hamilton
Huntington Beach Resident

* According to NOAA, ocean water contains approximately 3.5% by weight of salts. The Poseidon plant is designed to produce 50 million gallons per day of desalinated water. That's 200,000 tons of water per day. 3.5% of 200,000 tons/day equals 7,000 tons of salts per day!

ORANGE COUNTY COASTKEEPER®

SURFRIDER FOUNDATION

November 21, 2011

*Via Electronic Mail:* jqiu@waterboards.ca.gov

Regional Water Quality Control Board – Santa Ana Region
3737 Main Street, Suite 500
Riverside, CA 92501-3348

**RE: Waste Discharge Requirements for Poseidon Resources Huntington Beach Desalination Facility; Order No. R8-2011-0046; NPDES No. CA 8000403**

Dear Chair Beswick and Board Members:

Orange County Coastkeeper (Coastkeeper) and the Surfrider Foundation (Surfrider) write on behalf of our collective membership to express our reservations with the Waste Discharge Requirements for Poseidon Resources (Surfside) L.L.C. Huntington Beach Desalination Facility Orange County, Order No. R8-2011-0046, NPDES No. CA8000403 (Tentative Order).

Coastkeeper and Surfrider assert Poseidon Resources' (Poseidon) renewal of Order No. R8-2006-0034, NPDES No. CA80000403, which remains in effect until the approval by the Regional Water Quality Control Board, Santa Ana Region (Regional Board) of Order No. R8-2011-0046, NPDES No. CA80000403, is in part premature and should include conditions on the operation of the facility until the state adopts a uniform policy on the development of ocean desalination facilities. At this time, our organizations are concerned that Poseidon is moving forward with an application for a NPDES permit for an ocean desalination project in the midst of efforts by the California Ocean Protection Council (OPC) and the State Water Resources Control Board (State Board) to develop policies and regulations guiding the development of these facilities and the approval of this Tentative Order would result in the development of an non-compliant facility that would require expensive retrofits to comply with the results of the OPC and State Board's process.

The State Board invested scarce public resources into implementing Clean Water Act Section 316(b)'s mandate requiring "the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact."[1] The environmental impact necessitating the adoption of the once through cooling policy (OTC Policy)[2] was the withdrawal of billions of gallons of source water daily killing millions of fish, larvae, eggs, seals, sea lions, turtles and other creatures due to the species intake into the cooling system (entrainment) or becoming exposed to high pressure against the systems intake screens (impingement).[3] The expressed purpose of the OTC Policy was to phase out this harmful technology, minimize entrainment and impingement, and consequently eliminate the adverse impacts on marine ecosystems.

---

[1] Federal Water (CWA) 316(b).
[2] See: STATEWIDE WATER QUALITY CONTROL POLICY ON THE USE OF COASTAL AND ESTUARINE WATERS FOR POWER PLANT COOLING
[3] California Water Boards, *Once Through Cooling Policy Protects Marine Life and Insures Electric Grid Reliability – Fact* Sheet, 1.

Poseidon's application for a renewal of their existing NPDES permit allowing for the continued use of the Huntington Beach Generating Station's (HBGS) existing intake infrastructure would be in direct conflict with the intent of the OTC Policy adopted less than two years ago, as well as violate some of the expressed provisions in that Policy. Currently, HBGS is scheduled to phase out their once through cooling intake system and re-power their facility with high efficiency generators with closed-cycle cooling by December 31, 2020. In the interim, HBGS is prohibited from withdrawing seawater unless it is necessary for generating electricity and other emergency purposes.

The Regional Board's approval of this Tentative Order, as currently worded, would conflict with the State's sound public policy designed to dramatically reduce the intake and mortality of marine life from harmful cooling water intake systems by merely shifting the harm from power plant cooling water intakes to new facilities for ocean water desalination that are not fully compliant with the strictest interpretation of Water Code section 13142.5(b). Without employing the best site, design, technology and mitigation feasible to minimize the intake and mortality of marine life, new ocean desalination facilities can cause substantially more harm than existing power plant cooling water intakes, due to the increase in intake volume required for a continuous desalination process compared to the intermittent use by a "peaker" power generator used only when demand requires operation. In short, without some conditions placed in the Order to mitigate the intake and mortality of marine life, the continual use of the HBGS intake system by Poseidon increases the harm caused by an antiquated technology scheduled to be phased out of operation within the next decade.

Further, the proposed "short-term stand alone operation" of the Facility will violate the expressed conditions in the OTC Policy to discontinue withdrawing seawater at HBGS during times when the power plant is not generating electricity.[4]

Finally, withdrawing an additional 26.7 million gallons a day (MGD) of seawater to dilute the brine before it is discharged creates an additional intake and mortality of marine life that could be avoided by the use of superior technology – in clear violation of the mandates of the Water Code.

Coastkeeper and Surfrider limit our comments on the Tentative Order to issues with the Fact Sheet relating to incomplete and/or irrelevant analysis, misinterpretation of Water Code section 13142.5 and the California Ocean Plan -- and concerns regarding the daily discharge of large volumes of additional iron near the Huntington Beach shoreline.

For the reasons above, and those explained in more detail below, we respectfully request the conditions in the permit include:

- A prohibition on withdrawing seawater in volumes greater than what is needed for the Facility "feed water" simply to dilute the brine before it is discharged;
- Mitigating the interim impacts of the Facility seawater withdrawals by limiting the volume of the "feed water" to no more than what the power plant is discharging on any given day;
- A clear and unambiguous Re-Opener providing for a *de novo* review of the Facility for complete compliance with the Water Code section 13142.5(b) once either: a) the generator permanently ceases withdrawing seawater in volumes necessary for the currently designed capacity of the Facility, or; b) when the power plant discontinues using the site for electrical generation, or; c) once the State Board completes the adoption of a statewide policy and/or guidance document for the development of seawater desalination facilities according to the Water Code section 13142.5(b); and

[4] See: STATEWIDE WATER QUALITY CONTROL POLICY ON THE USE OF COASTAL AND ESTUARINE WATERS FOR POWER PLANT COOLING, "Immediate and Interim Requirements," Section 2. C(2).

- A comprehensive review and analysis of permit conditions relating to additional iron discharge off the Huntington Beach shoreline.

Thank you for your consideration of these comments. We look forward to working with the Regional Water Quality Control Board to ensure protection of our precious coast and ocean.

Sincerely,

Joe Geever
Surfrider Foundation
Water Programs Manager
jgeever@surfrider.org
(949) 636-8426

Ray Heimstra
Associate Director
Orange County Coastkeeper
ray@coastkeeper.org
(714) 850-1965

**Specific Comments on Tentative Order Fact Sheet (Attachment F)**

I. General Comments

It is important to consider that although the OTC Policy was limited in application to coastal and estuarine waters for power plant cooling, the California Water Code (Water Code) does not distinguish between withdrawals of seawater for "power plants" and withdrawals for "other industrial installations."[5] As written, the Water Code establishes the policy of the state, with respect to water quality in coastal marine environments is that "for each new or expanded coastal powerplant *or other industrial installation* using seawater for cooling, heating, or *industrial processing*, the best available site, design, technology, and mitigation measures feasible shall be used to minimize the intake and mortality of all forms of marine life"(*emphasis added*).[6] Poseidon proposes the development a seawater desalination facility withdrawing approximately 126.7 MGD of seawater, with approximately 100 MGD "feed water" for processing into potable water, and an additional approximate 26.7 MGD devoted to mixing the brine before discharging it to the ocean. This aggregate 126.7 MGD withdrawal of seawater is proposed to utilize an antiquated intake system that is scheduled to be phased out and therefore not otherwise operational due to its proven harmful impact, primarily the intake and mortality of marine life.

In consideration of the Water Code and the recently adopted OTC Policy, the Regional Board should adopt a Tentative Order limiting the use of the existing OTC infrastructure by Poseidon to the actual seawater volume available from the HBGS's discharge as "source water" for the proposed desalination facility's "temporary stand alone operation." Further, the Facility's withdrawal of seawater for "in-plant dilution" of harmful brine discharges should also be limited to what is available from the actual discharge from HBGS in combination with the "feed water." Given the stated prohibitions on altering the existing intake system articulated in the Fact Sheet at Page F-25, section c (1), for the short-term, that is the best mitigation feasible for minimizing the intake and mortality of marine life, and is at least as protective of marine life as the letter and intent of the protections recently adopted in the OTC Policy.

Once the HBGS has permanently discontinued withdrawals of seawater in volumes sufficient to supply the facility "feed water" or discontinues electrical generation, we agree with the recommendation that the facility be re-evaluated for strict compliance with Water Code section 13142.5(b) as a "stand alone facility." We only have two recommended alterations to this provision: first, the conditions for re-evaluating compliance with the Water Code should include the adoption of a statewide Policy on Ocean Desalination that is currently under development by the State Water Resources Control Board, and second the provision for re-evaluating the facility under permanent "stand alone operation" should be clearly articulated in an enforceable "re-opener" condition of approval.

The rationale for ensuring the permit under consideration is at least as protective of marine ecosystems as the OTC Policy, as well as a condition in the permit prohibiting withdrawal of seawater in greater volumes than what HBGS withdraws[7] is supported by the USEPA's response to comments during the Clean Water Act section 316(b)Phase II rulemaking process where the agency directly addressed the issue of co-located desalination facilities. In their response to comments USEPA concluded that: "[t]he Phase II regulations apply only to facilities that generate and transmit

[5] Water Code 13142.5(b)

[6] Id.

[7] The Tentative Order refers to this operation of the facility as the "co-located operation"

or sell power, and therefore do not apply to desalination facilities *unless they share an intake with a power plant*" (*emphasis added*). USEPA went on to explain that in situations where "desalination plants share intakes with power plants...the 316(b) regulations would apply to the intake flow attributed to a desalination plant if the intake flow exceeds whatever regulatory threshold is established in the Phase I, II, or II regulations, *but the power plant would be the permitted entity*"[8] (*emphasis added*).

USEPA's approach implements sound public policy by recognizing the parasitic relationship desalination facilities have with coastal power plant intake systems. Co-located desalination facilities with higher water intake demands than the existing power plant must be required to minimize the intake and mortality of marine life. Again, given that the Fact Sheet itself appears to imply that modifications to the existing cooling water structure to minimize the intake and mortality of marine life cannot be accomplished without interruption of the power plant operations, and are consequently prohibited. Therefore, until improvements to the now outlawed intake structure and/or other sites, designs or technologies become available, limiting the production capacity to the volume of water discharged by HBGS is a preferred mitigation measure to reliance on an existing "after the fact" restoration project that has subsequently been prohibited by the federal courts.

**In conclusion, allowance of the so-called "temporary stand alone operation", and the additional withdrawal of up to 126.7 MGD above what the power plant is discharging would undermine the benefits to our marine environment recently adopted in the OTC Policy. Further, much of the analysis in the Fact Sheet, and the notion that there is a need for a "temporary stand alone" operation of the facility, assumes a need for full production in the near term. However, in fact there are no water purchase agreements or long-term commitments to addition of the product water to any agency supply portfolio in a specified time period. With this in mind, full production capacity is not imminent in the near future. Therefore, the Permit can, and should, include a limit on production commensurate with the volume of water discharged by the HBGS.**

II. <u>The Regional Board must revise the "stand alone" source water intake section of the Tentative Order to accurately reflect actual source water infrastructure conditions and demand.</u>

Attachment F of the Tentative Order relating to "Stand Alone" source water intake requirements requires significant modifications to reflect the changing realities present and anticipated to occur at the existing HBGS. As previously stated, the existing cooling water intake system utilized by HBGS is scheduled to be phased out due to generator upgrades by December 31, 2020. Therefore, the Tentative Order should make clear that seawater withdrawals for both "temporary" and "long-term" "stand alone operation",of the facility would be "new" withdrawals regulated by strict enforcement of the Water Code. These withdrawals should be classified by the Regional Board as a departure from the existing permit authority granted to operate the HBGS facility in terms of additional water withdrawn above what the power plant withdraws for the generation of electricity ("temporary stand alone operation") and once HBGS eliminates or reduces their withdrawal of seawater on a permanent basis to comply with the new OTC policy ("long-term stand alone operation"). In brief, we recommend that every step must be taken to minimize the intake and mortality of marine life.

For example, pages F4 to F5 of the analysis includes provisions for operation of the facility "...when it is not feasible to deliver water to the regional potable water system...." The text goes on to suggest "it may be necessary to temporarily discharge dechlorinated product water from the reverse osmosis

[8] *See* Comment ID: 316bEFR.026.003 at 528
(available at http://www.epa.gov/waterscience/316b/phase2/ comments/author-ph2.pdf)

process back into the HBGS discharge pipeline." Further, the report states: "During these temporary periods, the maximum allowable flows returned to the ocean would not exceed 126.7 MGD…." **Please clarify if these conditions in the permit would be applicable during "temporary stand alone" and/or "permanent stand alone" operations. If these conditions would be applicable during stand alone procedures, please explain why shutting down the Facility when the delivery of the product water is infeasible is not considered as a mitigation method to minimize the intake and mortality of marine life. A provision to discontinue operation of the facility when it is not delivering the product water would be consistent with, if not mandated by, the Water Code's mandate to minimize the intake and mortality of marine life.**

In addition, on page F7, the report states that, "[b]etween 2006 and 2010, the HBGS's annual average intake flow through the power plant ranged from 200 MGD to 268 MGD." It is our understanding that much of that flow was for operation of Units 3 and 4, and that these units are currently being sold and scheduled for retirement **The report should make clear how much intake volume was the result of operating Units 3 and 4 during the time between 2006 and 2010 and how much intake volume would be reduced after their retirement.**

The report also fails to identify how much of the cumulative flows or annual average of daily flows was unrelated to actual power generation (which is now prohibited by the "Immediate and Interim Requirements" in the OTC Policy[9]). Furthermore, the report does not identify the number of days or duration of times when the volume of intake was significantly less than this annual average. **Please revise Attachment F to include information that would more accurately reflect a reasonably foreseeable number of days when the cooling water discharge would not meet or exceed 126.7 MGD and consequently demand "temporary stand alone operation."**

Further, the comments on the Subsequent Environmental Impact Report ("SEIR") on page F-15 do not adequately interpret the relevant laws. California Water Code section 13142.5(b) regulates both cooling water intakes and other industrial withdrawals of seawater. While the Clean Water Act is specific to cooling water intakes, the Water Code does not distinguish between the numerous potential seawater withdrawals – inclusive of cooling water intakes. Therefore, federal case law on cooling water intakes is relevant to interpreting section 13142.5(b). Please see our comments below on Section III (E).

Finally, there is no reasonable distinction between water withdrawn for "temporary stand alone operations" and "long term stand alone operations" as both are "new" withdrawals of seawater and should be regulated similarly under the permit. **We recommend a clarification in the Order stating that "temporary operation" of the facility may not withdraw seawater in volumes that exceed the discharge of cooling water from the HBGS. This would make a conditional permit for the operation of the facility that is consistent with the mandates of the Water Code.**

**Further, we recommend deletion of the finding on "entrainment and impingement" that: "Based on discussion in Section III E, when operating under long-term stand alone conditions, the Facility can comply with mitigation requirements under CWC section 13142.5(b) by maintaining HBGS's existing marine life mitigation program." First, this conclusory statement is premature if it is the intent of the Board to re-open the permit for full consideration when the power plant permanently ceases to withdraw seawater in volumes**

---

[9] See: STATEWIDE WATER QUALITY CONTROL POLICY ON THE USE OF COASTAL AND ESTUARINE WATERS FOR POWER PLANT COOLING, "Immediate and Interim Requirements", Section 2. C(2).

**necessary for the facility as it's currently planned. Second, as discussed in our comments below on Attachment F, section III E, "after the fact" restoration is not allowed under a strict interpretation of Water Code section 13142.5(b) and relevant case law. Finally, as discussed in our comments below regarding "Stand Alone Discharge", the additional withdrawal of seawater for in-plant dilution is contrary to both the Water Code section 13142.5(b) and the Ocean Plan.**

**Section III E (Clean Water Act and Water Code section 13142.5(b) analysis)**

On page F-20, the report states that Clean Water Act, "Section 316(b) does not apply to seawater desalination facilities, including this Facility. However, it is important to note that while the recently adopted State Water Board OTC Policy may not have "direct application" to the facility, case law on interpretation of the Clean Water Act section 316(b) is relevant when interpreting Water Code section 13142.5(b). This is significant because much, if not all, of the mitigation of the intake and mortality of marine life associated with the temporary or long term "stand alone operation" of the facility relies on "after the fact restoration." In two decisions by the Federal Second Circuit Court of Appeals (referred to as the "*Riverkeeper, Inc v. EPA* cases"), the court decided that:

> Restoration measures correct for the adverse environmental impacts of impingement and entrainment; they do not minimize those impacts in the first place.
>
> Restoration measures resemble the pre-1972 approach to water pollution, which regulated point sources based on their effect on the surrounding water and allowed sources to discharge pollutants provided the discharge did not cause water quality to dip below an acceptable level. See *CPC Int'l, Inc. v. Train*, 515 F.2d 1032, 1034-35 (8th Cir.1975). Similarly, restoration measures would allow a facility, at least in theory, to impinge and entrain unlimited numbers of organisms provided that other steps maintained acceptable water quality, here measured by wildlife levels as opposed to pollutant concentration. But "[i]t was ... dissatisfaction with water quality standards as a method of pollution control that led to the proposal that they be replaced or supplemented with `effluent limitations.'" [citation omitted] A plaintiff attempting to prove a violation of the Clean Water Act faced "a virtually unbridgeable causal gap," [citation omitted] for "the burden of proving that a particular polluter had caused the water quality to dip below the standards was all but impossible to satisfy,"[citation omitted]. Allowing compliance through restoration measures would involve exactly the same hurdles. As the EPA itself recognized in the preamble to the Rule,
>
>> [B]ecause of the complexity of biological studies, it is very difficult to assess the cause and effect of cooling water intake structures onecosystems or on important species within an ecosystem.... [U]nlike in the laboratory, where conditions are controlled, a multitude of confounding factors make biological studies very difficult to perform and make causation, in particular, difficult to determine.[10]

This rationale is instructive to interpreting Water Code section 13142.5(b) for several reasons. First, the Water Code does not distinguish between seawater withdrawals for cooling water and other industrial withdrawals. Second, while it is true the OTC Policy made some distinctions between the use of seawater for these different purposes, <u>the State Water Board did not explicitly distinguish the prohibition of "after the fact restoration" that was included in the OTC Policy.</u> Third, while there is a mention of "mitigation" in the Water Code section 13142.5(b), the term is followed by the operative language to "minimize the intake and mortality of marine life." "After the fact restoration" efforts, even if they were successful, would not mitigate the "intake and mortality" of marine life. By

[10] *Riverkeeper, Inc. v. U.S. E.P.A.*, 384 F.3d 174, 189-190 (2d Cir. 2004).

definition "after the fact" restoration efforts are to "replace" the marine life after its "intake and mortality" – and the Water Code clearly mandates minimizing the intake in the first place.

**Therefore, we strongly recommend eliminating any reliance on the restoration of wetlands imposed on HBGS as a condition of their California Energy Commission permit as "mitigation" for ongoing withdrawals of seawater for either the power plant or the proposed desalination Facility. In short, these "after the fact" restoration efforts have been prohibited since that condition was placed on the HBGS permit.**

## A. SITE ANALYSIS

Coastkeeper and Surfrider are concerned that the Site Analysis section of the Tentative Order is not placing the necessary emphasis on the requirement that the proposed site be the "best available" location feasible to "minimize the intake and mortality of all forms of marine life."[11] The Regional Board is not charged with reviewing the most convenient sites, rather reviewing those sites that "minimize the intake and mortality of marine life."

Section 2(a)(2) of the Tentative Order suggests the proposed location is the best available based upon "proportional mortality" rates of marine life populations near HBGS. Here, proportional mortality is the proportion of observed deaths from entrapment or impingement in a defined population divided by the proportion of deaths expected from this condition in a standard population.[12] The Tentative Order relies upon "other power plants in California,"[13] when the Regional Board should have analyzed the proportional mortality based upon the use of the HBGS intake system on a discrete local population and assemblage of marine life. Section 2(a)(2) reads that the "estimated levels of proportional mortality are much less than the estimates from other coastal power plants in California." This, according to the Tentative Order, is attributed to the homogeneity of the coastline as compared to rocky coastlines or estuarine areas elsewhere along the California coast. Comparing the proportional mortality of this proven harmful device in an area without the equivalent diversity as rocky coastlines or estuarine areas skews the results and will improperly lead to a conclusion that it will not have the level of harmful impact on local marine life. It is important at this point to note that the Water Code mandates minimizing the intake and mortality of marine life without any required showing of "significance", distinguishing this law from others like the California Environmental Quality Act.

The site analysis section of the Tentative Order similarly misleads the reader in Sections 2(a)(4-9) by assuming the plant would operate as a "co-located" facility. The rationale provided in these subsections concluding this is the best available site feasible to minimize the intake and mortality of marine life presupposes receipt of HBGS wastewater discharge as an available intake source to the desalination facility. For example, Section 2(a)(4) argues co-locating the proposed desalination facility with the existing HBGS minimizes intake and mortality because it uses "existing HBGS intake and discharge infrastructure" and reduces the amount of source water required for desalination purposes "by using water discharged by HBGS." The OTC Policy and the HBGS implementation plan to comply with that Policy will eliminate the withdrawal of seawater in volumes necessary for the design capacity of this Facility. Therefore, the infrastructure described in this section, absent any modifications to minimize the intake and mortality of marine life,, and the reliance on that

---

[11] Fact Sheet, page F-22

[12] U.S. Dept. of Health & Human Svc., Environmental Health & Toxicology, National Library of Medicine – National Institute of Health, http://sis.nlm.nih.gov/enviro/iupacglossary/glossaryp.html (Last accessed Nov. 22, 2011).

[13] Fact Sheet, Section 2(a)(2), F-22

infrastructure in an analysis determining whether this location satisfies the mandates of the Water Code undermines the intent of the State Board in adopting the OTC Policy.

Finally, Section 2(a)(5) of the Tentative Order argues the use of an existing pipe will result in lower intake velocity and therefore lower impingement effects. The rationale provided in the subsection relies on the fact the pipe is "capable of transporting more than four times the volume of water required by the Facility." The section fails to reference any study estimating any numerical reduction in the intake and mortality of marine life, nor any reduction in "proportional mortality" rates. In fact, there is no mention of any reduction of marine life mortality from entrainment of organisms. **We recommend further documentation to substantiate this statement before the Regional Board relies upon it prior to concluding whether the site is the best available for minimizing the intake and mortality of marine life.**

## B. DESIGN ANALYSIS

We maintain similar concerns over the design analysis as we did over the project in general. **A thorough analysis of the "design" of the facility should include reducing the production capacity and/or other alternatives to make the best intake "technologies" feasible and available for the proposed facility. As we have said, the site, design, technology and mitigation measures should be considered as integrated parts to minimize the intake and mortality of marine life.**

The analysis of the facility design should also include alternative discharge technologies that meet the mandates of Water Code section 13142.5(b) to minimize the intake and mortality of marine life. As proposed, the design feature of withdrawing additional seawater for "in-plant" dilution would increase the intake volume by approximately 25%, thereby **increasing** entrainment of marine life.

**Alternative brine discharge technologies have been successfully employed on seawater desalination facilities elsewhere[14], and should be analyzed as an option here for eliminating the necessity of withdrawing additional seawater for so-called "in-plant dilution."**

Section 2(b)(1) of the Fact Sheet implies that the current HBGS seawater withdrawal employs the best technology available for minimizing the intake and mortality of marine life. This contradicts the findings and resulting adoption of the State Board's OTC Policy[15]. Therefore, the continued use of this intake technology for "temporary stand-alone operation" of the facility would undermine the "Immediate and Interim Requirements" to discontinue the withdrawal of seawater during times when HBGS is not generating electricity in order to minimize the intake and mortality of marine life. Further, as stated above, withdrawing additional seawater for "in-plant dilution" during the "temporary stand alone operations" violates the clear mandates of the Water Code section 13142.5(b) to use the best design to minimize the intake and mortality of marine life. Finally, the Fact Sheet appears to assume that "temporary stand alone operation" is necessary without any substantiating evidence. **We recommend deleting this sub-section of the Fact Sheet. We also recommend a condition on the permit prohibiting "temporary stand alone operation" of the facility at times when the HBGS is not discharging enough water for full design production capacity, and limiting the production of the facility to what is actually discharged from the HBGS for the facility's "source water."**

---

[14] See Attachment A: "Perth, Australia: Two-year Feedback on Operation and Environmental Impact"
[15] See: STATEWIDE WATER QUALITY CONTROL POLICY ON THE USE OF COASTAL AND ESTUARINE WATERS FOR POWER PLANT COOLING

Section 2(b)(2) of the Fact Sheet directly contradicts the findings of the OTC Policy by asserting the use of the existing offshore intake system minimizes entrainment and impingement effects. The State Board possessed reports on the intake and mortality of marine life from the existing HBGS intake system during the development of the OTC Policy, yet the State Board concluded the existing intake failed to employ the best technology available to minimize the intake and mortality of marine life. As with the proportional mortality discussion in our critique of the site analysis, comparing other areas of the coast with different habitats and fish assemblages is irrelevant when analyzing the proposed facility's compliance with the Water Code section 13142.5(b). **We recommend deleting this sub-section of the Fact Sheet as it is irrelevant to the analysis of the design and operation of the facility in either "temporary stand alone operation" or "long term stand alone operation." We also recommend replacing this sub-section with an analysis of the intake and mortality of marine life in terms of the proportion of the population and assemblage of species residing in the affected area, as well as the species and life stages of the species that may transit the area through their own mobility or be transported through the affected area in the ocean current.**

Sub-section 2(b)(3) is an irrelevant comparison between the volume and velocity of flows for cooling the HBGS and what would be required in a "temporary stand alone operation." As noted above, the withdrawal of seawater for "temporary stand alone operation" and for "long term stand alone operation" of the facility are "new" withdrawals of seawater under Water Code section 13142.5(b) and must be analyzed and enforced independent of the current cooling water intake. **We recommend deleting this sub-section.**

Section 2(b)(4) defends the design of the project by arguing the existing intake infrastructure meets best available design criteria even though the technology has been proven to significantly harm marine life to a degree necessitating a more thorough Water Code Section 13142.5(b) analysis. The Tentative Order first states, that "[u]nder stand alone operations, the Discharger has little control over the intake structure."[16] The statement ignores the fact that Poseidon, as the Discharger, has complete control over the design of the facility, and consequently controls the production capacity during "temporary stand alone operation." The incorporation of an intake system that reduces marine life intake and mortality, such as subsurface intake, would closely resemble a design matching the Water Code Section 13142.5(b) criteria.

Elsewhere in Section 2(b)(4) the Regional Board claims it will "reevaluate the Facility's compliance with Water Code section 13142.5(b)" if the future yields "different and/or better" feasible designs for long-term stand-alone operations. The State Board is currently developing a "Policy on Ocean Desalination" that will address the design of desalination facilities and the use of once through cooling technology as an intake system for operation by a facility operator. **Coastkeeper and Surfrider recommend the Regional Board include a clear and concise "reopener" in this permit that allows for a full *de novo* review and modification of this NPDES permit once that Policy is adopted by the State Board, and provide a timeline and guidance for Poseidon's compliance with the policy.**

**In addition, we recommend the Regional Board take a holistic review of alternatives that include amending the "design" production capacity and subsurface intake mechanisms to better enable the use of the best "technology" available for minimizing the intake and mortality of marine life.**

**We also recommend a thorough analysis of alternative discharge technologies that would eliminate the need for increased intake volume for in-plant dilution, thereby minimizing, if**

[16] Section 2(b)(4)

**not eliminating, the intake and mortality of marine life through use of the best design and technology for brine dilution.**[17]

## C. TECHNOLOGY ANALYSIS

Coastkeeper and Surfrider want to repeat that the analysis of the best technology available should not be confined by the "design" of the facility's production capacity, nor by its "site." Rather, the site, design and technology must be considered as a whole – not discrete parts. It is the proposed continuation of antiquated technology that concerns our organizations most in Water Code Section 13142.5(b)'s analysis.

Our concerns were especially heightened when we failed to read any analysis of operating the facility at production capacities that are properly limited to the volumes of cooling water discharged from uninterrupted operation of HBGS. Section 2(c)(1) states the "facility's use of the intake and outfall provides that entrainment and impingement minimization measures cannot interfere with, or interrupt ongoing power plant operations." To be consistent with the OTC Policy, and in particular, the prohibition of withdrawing seawater when the HBGS is not generating electricity, "temporary stand alone operation" should be prohibited. In fact, the prohibitions on employing entrainment and impingement minimization measures for this new withdrawal of seawater strengthen our assertion seeking limited production capacity from the facility under the current operation of HBGS. **Therefore, we strongly recommend that the Tentative Order be amended to support a condition in the permit that "temporary stand alone operation" is prohibited and production capacity from the proposed facility is limited by the "source water" available from HBGS's discharge volumes.**

Additionally, Section 2(c)(2) and(4) briefly describes the benefits of the horizontal velocity cap and mammal exclusion bars and the subsequent reduction in impingement rates. However, these descriptions merely addresses half of the harmful intake equation. A reduction in impingement numbers due to the velocity cap and the exclusion bars ignore the loss of marine life due to entrainment. Nothing in these sections refer to or recommend technological modifications to reduce high entrainment numbers. **Again, we recommend that without any attempt by the Discharger to minimize the intake and mortality of marine life from entrainment during the proposed "temporary stand alone operations", the withdrawal of seawater in volumes above that used for the generation of electricity should be prohibited.**

Section 2(c)(3) of the Fact Sheet compares the reduction of impingement from the proposed "temporary stand alone operation" of desalination facility to impingement occurring from the operation of the HBGS facility. The implication is the Poseidon facility is an environmental improvement over the existing intake from HBGS. However, the section does not state that the withdrawal of seawater over and above the volumes necessary for the generation of electricity at HBGS is a "new" intake and governed by the Water Code section 13142.5(b). Therefore, it is irrelevant to compare the intake and mortality from impingement caused by the operation of HBGS to the new withdrawal of seawater for "temporary stand alone operation." In fact, the proposed desalination facility could continue impingement decades after the cooling water intake system will be prohibited from use. The fact is, the continued use of the existing intake structure after the power plant discontinues it's current "once through cooling" practice will be an entirely new withdrawal of seawater, and entirely new cause of the intake and mortality of marine life. **We recommend this sub-paragraph either be deleted, or modified to better explain how the "new" intake of seawater will affect the cumulative intake and mortality of marine life from the addition of "temporary stand alone operation" at this site.**

---

[17] See e.g.,: Attachment A: "Perth, Australia: Two-year Feedback on Operation and Environmental Impact"

1. ANALYSIS of ALTERNATIVE INTAKES

The analyses of "Subsurface Intakes Alternatives" are inadequate. First, there is no mention of the potential benefits of minimizing the intake and mortality of marine life from these alternatives. For example, the Fact Sheet, at 6(d) lists numerous adverse impacts of a "seafloor infiltration gallery," but fails to point out that these impacts are mostly temporary in that they result from placement of the galleries. Further, section 6(d)(4) of the Fact Sheet states there will be, "...a combined loss of 2,800 square feet of beachfront property, for a combined loss of over 2.1 acres of beachfront property and related impact to public access." The analysis fails to recognize that much of this necessary infrastructure could be constructed below surface and have little to no long-term impacts on beachfront property or coastal access. Finally, section 6(f) considers the energy demand of such a proposed alternative. Again, this has little relation with the minimization of marine life mortality, nor the technological feasibility of this alternative intake system. These conclusions about loss of beachfront property, coastal access and energy demands are repeated in the analysis of several different types of "beach wells."

Second, the opening paragraph of this section of the Fact Sheet concludes that these alternatives are "technologically infeasible." However, the analysis only indicates certain short–term technological challenges to the construction, but nothing in the analysis suggests that "subsurface intakes" are technologically infeasible. It is important to note that in the definition of "Not Feasible" in the recently adopted OTC Policy, the State Water Board concluded that: "Cost is not a factor to be considered when determining feasibility under Track 1."[18] It is reasonably predictable that the prohibition of cost considerations will be adopted in the Policy on Ocean Desalination currently under development by the State Water Resources Control Board.

Third, much of the analysis is speculative. For example, the Fact Sheet uses terms such as "the potential" long term effects of dewatering local marshes[19], "possible interception" of contaminated groundwater[20], "possible interception" of injection water for the seawater barrier[21], "potential subsidence" of roads and structures[22]. These statements are not only speculative and inappropriate, but once again they have no relevance to the mandate to minimize the intake and mortality of marine life.

Finally, there is no analysis of how some of the issues raised in this section could be mitigated by reducing the designed production capacity of the facility. As stated above, Water Code section 13142.5(b) should be read in a way to harmonize all the potential sites, designs, technology and mitigation to minimize the intake and mortality of marine life. The design capacity of the facility, and the analysis based on that assumed design, appears to preclude strict enforcement of Water Code section 13142.5(b).

**We strongly recommend a more thorough analysis of a Facility with a "design" production capacity that is consistent with an intake technology that results in the "best" minimization of the intake and mortality of marine life. Further, we strongly recommend re-consideration of the site of the Facility given that the existing open ocean intake for the HBGS cooling water has already been determined as inadequate for meeting the mandates to minimize the**

---

[18] STATEWIDE WATER QUALITY CONTROL POLICY ON THE USE OF COASTAL AND ESTUARINE WATERS FOR POWER PLANT COOLING, "Definition of Terms", Section 5.
[19] See Fact Sheet, 6 (g).
[20] Id at 6 (i)
[21] Id at 6 (j)
[22] Id at 6 (k)

**intake and mortality of marine life. While this determination was based on enforcement of the Clean Water Act, it is important to note that had this analysis been applied to a "new" power plant's proposed cooling water system, the Water Code section 13142.5(b) would have also prohibited open ocean intakes. So, given that the Water Code makes no distinction between seawater withdrawals for "cooling" from seawater withdrawals for other "industrial purposes", the same standards for minimizing the intake and mortality of marine life are applicable to this proposed Facility. Consequently, the analysis and conclusions in the Fact Sheet are inadequate and mostly irrelevant to consideration of enforcing the mandates of Water Code section 13142.5(b).**

2. MODIFICATIONS to the EXISTING INTAKE SYSTEM

We assume this analysis is both for modifications to the existing intake system for both the "short-term stand alone operations" and "long term stand alone operations."

In regards to short-term "stand alone" operations, this analysis only provides more reasons to limit the production of the facility to what can be accomplished from the volume of water discharged from HBGS. The Fact Sheet documents that modifications to the existing infrastructure to better minimize the intake and mortality of marine life are effectively prohibited until the power plant discontinues use of the intake structure.[23] As noted above, withdrawal of seawater in excess of what is discharged by HBGS would be a "new" withdrawal of seawater for industrial purposes, and trigger immediate enforcement of the mandates in Water Code section 13142.5(b). **Therefore, compliance with the Water Codes mandate to utilize the <u>best</u> "mitigation" measures feasible would require limiting the "temporary" operation of the Facility by prohibiting the withdrawal of seawater in excess of what is available from the HBGS discharge.**

In regards to long-term "stand alone" operations, this analysis is premature and irrelevant. Several coastal power plants are proposing the use of screening technologies for volumes of seawater withdrawals in excess of the 100 mgd needed for this facility. It is, as yet, unclear if those technologies will succeed at minimizing the intake and mortality of marine life within the parameters of the OTC Policy. Nonetheless, the consideration of alternative technologies, designs, sites and mitigation for long-term "stand alone" operation is a question that is not before the Board in granting this permit. If the Board is to reconsider interpretation and enforcement of Water Code section 13142.5(b) once HBGS permanently ceases withdrawal of seawater in volumes sufficient for operation of the proposed facility at this design capacity, and/or the State Water Board adopts a Policy on Ocean Desalination – that would be the time for consideration of modifications to the existing intake system. We think it is appropriate that the Discharger be put on notice that all of the conditions in this permit are temporary. **We strongly recommend a clear "Re-Opener" provision in this temporary permit explicitly stating that all possible revisions to the design, site and technology of the facility to minimize the intake and mortality of marine life will be considered when the permit is re-opened for a *de novo* review.**

## VARIABLE FREQUENCY DRIVES

We think this analysis is irrelevant and this technology does not fully enforce the mandates of the Water Code. Variable frequency drives are common technology in the design of seawater desalination facilities. Their use allows the Facility to regulate the volume of water withdrawn to meet different source water demands during different production volumes.

We agree that these variable frequency drives are effective at ensuring the Facility is not withdrawing

[23] See Fact Sheet, page F-25, section c. (1)

more seawater than necessary. We disagree that this technology, in and of itself, is the best approach for minimizing the intake and mortality of marine life for the so-called "temporary stand-alone operation" of the Facility. **Consequently, once again, we strongly recommend that full enforcement of the Water Code requires mitigating the intake and mortality of marine life by limiting the source water intake for the Facility to what is available from the HBGS discharge on any given day. Variable Frequency Drives are a technology that only marginally minimizes the withdrawal of seawater and are therefore not, in and of themselves, fully compliant with the mandates of the Water Code.**

## D. MITIGATION ANALYSIS

It is important to note at the outset that recent case law prohibits the use of "restoration measures" in lieu of the best technology available for minimizing entrainment and impingement of marine life under the Clean Water Act.[24] The Second Circuit Court of Appeals first decided this issue in *Riverkeeper I*, which dealt with the proposed USEPA regulation of seawater intakes for "new" facilities withdrawing more than 50 MGD for cooling purposes. Because Riverkeeper I dealt with the regulation of new facilities, this decision is particularly instructive to interpreting the Water Code Section 13142.5(b) mandate of the use of the best site, design, technology and mitigation feasible to minimize the intake and mortality of marine life. While specifically identifying these mandates for cooling purposes at "new" facilities, the Water Code goes beyond the regulation of seawater intakes in the Clean Water Act and includes seawater withdrawals for all industrial purposes. Importantly, the Water Code does not distinguish between the mandates for minimizing the intake and mortality of marine life from cooling water withdrawals and other industrial purposes.

Therefore, new withdrawal of seawater for cooling would be regulated by the Water Code as well as the Clean Water Act. Consequently, the prohibition of "restoration measures" articulated in *Riverkeeper I* must be consistent with the interpretation of "mitigation" in the Water Code. And given there is no distinction in the Water Code between withdrawal of seawater for cooling purposes and any other "industrial use", it stands to reason that the prohibition of "after the fact" restoration efforts are prohibited as mitigation for seawater desalination facilities, including this proposed Facility.

Further, the plain language in the Water Code would, in and of itself, prohibit "after the fact" restoration measures. The mandate to use the "best site, design, technology and mitigation feasible" is clearly meant to "minimize the *intake* and mortality of marine life." By definition, after-the-fact restoration efforts do nothing to mitigate the intake and mortality of marine life.

This has been further articulated in the State Board's "OTC Policy." Restoration in lieu of using the best technology for reducing marine life mortality is only allowed on a temporary basis until the power plant operator meets compliance with the technology-based mandates of the Policy.

Nonetheless, the Fact Sheet heavily relies on decisions by other California regulatory agencies to permit the withdrawal of seawater for cooling the HBGS Units 3 & 4, and the imposition of restoration measures in those permits. Those permits and condition of restoration measures would be prohibited under today's law. Transfer of that condition on existing permits to this new facility would be equally prohibited by the law.

---

[24] *See* Riverkeeper, Inc. v. U.S. EPA, 358 F.3d 174 (2d Cir. 2004) ["Riverkeeper I"]; Riverkeeper, Inc. v. U.S. EPA, 475 F.3d 83 (2d Cir. 2007) ["Riverkeeper II"], *rev'd on other grounds sub nom.* Entergy Corp. v. Riverkeeper, Inc., 129 S. Ct. 1498 (2009).

Further, the Fact Sheet includes predictions of the potential entrainment and impingement of marine life in "stand alone operation" and concludes these impacts are not significant. Unlike an analysis in an Environmental Impact Report under the mandates of CEQA, the Water Code has no similar "significance threshold" nor does the term "mitigation" have the same meaning under CEQA and the Water Code. The Water Code clearly mandates "the best" measures for minimizing the intake and mortality of marine life. This cannot be interpreted to allow "second best" mitigation that would reduce the impacts to level described in CEQA as "not significant."

In conclusion, a strict interpretation of the language in the Water Code section 13142.5(b) mandates that mitigation measure minimize the "intake and mortality" of marine life in the first place. "After the fact" restoration measures are prohibited in that, by definition, they do nothing to minimize the intake and mortality of marine life. Further, decisions by the federal courts in *Riverkeeper I* and *Riverkeeper II* invalidate the conditions of approval in the California Energy Commission permit requiring restoration of wetlands in lieu of mandating the best technology available for minimizing entrainment and impingement. The allowance of "after the fact" restoration measures would be prohibited if that permit were to be issued under current law, and transferring credit for those restoration measures in a permit issued for a new facility is equally prohibited under today's laws.

**We strongly recommend this section of the Fact Sheet be re-written, and the permit accurately reflect that "after the fact" restoration is not allowable as mitigation under today's law. It is of no consequence or importance whether those restoration measures were permitted under past law, they are not legal today.**

**Finally, we re-assert that the "best mitigation feasible" for the "temporary stand alone operation" of the facility is to limit the volume of "feed water" for the Facility to the volume that is actually being discharged from the HBGS cooling water system on a daily basis. Further, we strongly recommend the Regional Board defer any consideration of "best mitigation feasible" for the "permanent stand alone operation" until the permit is 'Re-opened" and there is a full de novo review of compliance with the Water Code section 13142.5(b).**

III. The Regional Board must revise the Discharge Requirement of the Tentative Order in order to comply with the Water Code and the Ocean Plan.

Throughout the Tentative Order, there appears to be a pre-determined assumption that the best design of the facility to meet the mandates of both the Ocean Plan and the Water Code section 12134.5(b) is to increase the intake volume by approximately 26.7 MGD for what could be described as "in-plant dilution" – that is, dilution prior to discharge of the brine. This is plainly inconsistent with the mandates of the Water Code section 13142.5(b), as well as the dilution requirements in the Ocean Plan.

The Ocean Plan states:

> The mixing zone for the acute* toxicity objective shall be ten percent (10%) of the distance **from the edge of the outfall structure** to the edge of the chronic mixing zone (zone of initial dilution)[25].

[25] See: Ocean Plan, Section III. C(4)(b), page 14 (emphasis added)

The Water Code section 13142.5(b) states:

> In addition to any other policies established pursuant to this division, the policies of the state with respect to water quality as it relates to the coastal marine environment are that:
> (b) For each new or expanded coastal powerplant or other industrial installation using seawater for cooling, heating, or industrial processing, the best available site, design, technology, and mitigation measures feasible shall be used to minimize the intake and mortality of all forms of marine life.

The Fact Sheet analyzes compliance with the 7.5 to 1 "dilution ratio" assuming an additional intake volume of approximately 26.7 MGD over and above what is required for "source water" intake.[26] This additional water withdrawal during "temporary stand alone" as well as "long term stand alone" operations is not the best technology for minimizing the intake and mortality of marine life in accordance with the Water Code section 13142.5(b), nor is it consistent with the language in the Ocean Plan for the area of dilution.

First, as explained above, there are superior brine dilution technologies that could eliminate the need for withdrawing additional seawater.[27] Yet the Tentative Permit fails to consider these superior alternatives, much less analyze them for compliance with the mandate in the Water Code to employ the best technology available for minimizing the intake and mortality of marine life.

Also, the Ocean Plan clearly states that the zone of initial dilution (ZID) is bounded by the "edge of the outfall structure" and the outer boundaries of the ZID. A strict read of this language would preclude so-called "in-plant dilution". Given that the Tentative Order has determined that the 7.5:1 "dilution ratio" for the dissipation of heat being discharged from the HBGS is appropriate for the discharge of the brine waste from the proposed Facility, we assume the rule would be generally applicable to all ocean discharges. It is incomprehensible, and contrary to sound public policy, to allow for the withdrawal of seawater strictly for the purpose of "in-plant dilution."

For example, one can only imagine how a wastewater treatment facility would operate if they were allowed to withdraw seawater for "in-plant" dilution of their waste stream. In the extreme case, under the allowance for "in-plant" dilution, the wastewater facility could conceivably withdraw enough seawater to dilute the effluent to the point where it no longer violates their discharge requirements. His would allow the facility to avoid the use of any technology to treat the effluent in the first place. While this analogy is not perfect, the results are similar to what is being proposed in this Tentative Permit. That is, the Discharger is not required to employ any technology to ensure adequate dilution of the brine waste discharge within the ZID, they are instead being allowed to add to the intake and mortality of marine life by withdrawing additional seawater to simply dilute the brine and other waste materials prior to discharge.

In conclusion, the analysis of the brine discharge is inadequate in that it does not adequately analyze the best technology available for minimizing the intake and mortality of marine life in accordance with the Water Code. Further, the analysis does not fully consider, analyze, or justify the proposed use of "in-plant" dilution and it's compliance with the Ocean Plan language regulating the boundaries of the discharge.

**Please explain why preferable dilution technologies, such as "pressurized spray brine" or any other alternative, were not considered and analyzed as a superior alternative to**

---

[26] See Fact Sheet, page F12

[27] See e.g.,: Attachment A: "Perth, Australia: Two-year Feedback on Operation and Environmental Impact"

**simultaneously meet the dilution standards, meet the clear language of the Ocean Plan to do so in a "mixing zone" starting at the "edge of the outfall structure" , as well as minimizing the intake and mortality of marine life from the additional seawater withdrawal volume for "in-plant dilution", as mandated in the Water Code.**

**We strongly recommend that the Final Oder include a clear prohibition on the withdrawal of 26.7 MGD of seawater, or any withdrawal of seawater, for dilution of the brine and other waste being discharged from the Facility. Instead, the Final Order should include a provision either mandating the use of the best technology available for diluting the brine in the ZID without the necessity for withdrawing additional seawater, and/or a reduction in the production capacity so that the volume of brine waste discharge will dilute within the ZID without the necessity of an additional withdrawal of seawater. These provisions in the Final Order are necessary to ensure full compliance with Water Code section 13142.5(b), as well as the strictest interpretation of the Ocean Plan.**

**Finally, the Final Order should include a condition mandating "real time monitoring" and requirements to reduce the production capacity or shut down the Facility if the water quality standards are not being met. Examples of this monitoring technology, and examples of when a similar seawater desalination plant was required to reduce its production capacity to meet water quality standards in Australia can be found in Attachment A to this letter.**

## Specific Comments on Iron Loading from Poseidon's Discharge

I. The Regional Board must contemplate the direct and indirect consequences of increasing iron levels off Huntington Beach before approving this Tentative Order.

Coastkeeper and Surfrider are alarmed at high levels of additional iron discharge off Huntington Beach's shoreline and Poseidon's brief and dismissive analysis of the potential consequences of contributing nearly a ton of additional iron through the existing discharge pipe. Oceanic iron loading has been identified with numerous and mixed environmental consequences which have not been adequately analyzed in relation to the approval of the proposed Poseidon discharge. Some of the negative environmental consequences identified through rigorous scientific studies conducted over nearly two decades can be analyzed through the regulatory constraints placed upon Poseidon in this Tentative Order.

A. Poseidon's waste iron discharge will contribute to nutrient loading resulting in objectionable aquatic growth and the degradation of indigenous biota in violation of their NPDES Permit.

The Tentative Order prohibits Poseidon from discharging nutrient materials which cause objectionable aquatic growth or degrade indigenous biota.[28] According to the approved DSEIR, Poseidon will discharge at least 1,831 pounds of iron from DP 001 per day at a concentration fifteen times greater than the normal seawater concentration of 0.30 mg/L. [29] Elevated levels of iron are a consequence of reverse osmosis pre-treatment methods using iron sulfate or iron chloride as a chelating agent that coagulates organic solutes and dissolved materials and also precipitates a fraction of the trace elements. [30]

As Poseidon's DSEIR states, "iron is an important ocean nutrient (essential for the growth of phytoplankton) and is likely to be biologically assimilated by primary producer organisms (mainly phytoplankton) in the discharge plume."[31] By increasing the availability of nutrients, thereby stimulating the growth of phytoplankton, there is the potential that stressed fish stocks may actually improve. However, there is the equally likely scenario that the discharge will produce a similar increase in the bacteria that feed on phytoplankton. Phytoplankton growth from iron discharges, according to the Woods Hole Oceanographic Institution (WHOI), may "just as equally favor less-useful pathways in the food web, making more jellyfish or algae, especially harmful algal blooms that could have impacts on fish, birds, and even marine mammals up the food chain.[32]"

The term harmful algae blooms (HABs) is scientific shorthand used to describe a variety of algae blooms of microscopic and macroscopic marine algae which produce toxic effects on humans or other organisms, physical impairment to fish and shellfish, discoloration and/or nuisance conditions from severe odors, or severe impacts on marine ecosystems due to oxygen depletion or overgrown habitat.[33] HABs generally begin when heavy winter rains flush nutrients from the land into the ocean and wind blows warm surface water away, resulting in cold nutrient-rich upwelling, dormant phytoplankton then hatch into swimming cells once the water warms concluding with phytoplankton

---

[28] Section V(A)(1)(c)
[29] Appendix N, U-6
[30] Appendix N, U-1
[31] Appendix N, U-2
[32] Hugh Powell, Woods Hole Oceanographic Institution, *What are the Possible Side Effects?*, http://www.whoi.edu/oceanus/viewArticle.do?id=35668, (January 8, 2008).
[33] NOAA, *Harmful Algal Blooms in Coastal Waters: Options for Prevention, Control and Mitigation*, Decision Analysis Series No. 10, 3 (Feb. 1997).

feeding on nutrients and multiplying.[34] Phytoplankton expand exponentially, with a single cell producing up to 8,000 offspring in a single week.[35] After the phytoplankton production hits its zenith the organic materials sink and the decomposition of materials reduces the availability of oxygen, producing anoxic conditions and causing significant marine die-offs. In addition, several off the phytoplankton offspring produce toxins that are stored in their bodies and bioaccumulate in species that feed on the algae and have sickened people humans who consume affected shellfish.

Since 1993, scientific experiments into intentional open ocean iron discharge (referred to as "iron fertilization") proves algae can be stimulated to grow rapidly with the addition of a sufficient input of iron. According to an article in the *Proceedings of the National Academy of Sciences*, these artificially generated algae blooms "produced diatoms in the genus Pseudo-nitschia, which produce a neurotoxin called domoic acid."[36] Domoic acid causes seizures in higher vertebrates, such as marine mammals.[37] A scientific team from the University of California, Santa Barbara, concluded the "addition of iron from natural or artificial sources can stimulate the rapid growth of this harmful algae."[38]

Mary Silver, the lead author of the UCSB study, described how the neurotoxin producing Pseudo-nitschia usually has little effect, but that "the species is incredibly responsive to iron, often becoming dominant in algal blooms that result from iron fertilization."[39] "Any iron input," she continued, "might cause a bloom of cells that make the toxin....which will get into the food chain, as it does in the coastal zone."[40]

Consistent flows of high iron concentrations of nearly a ton a day in perpetuity from the proposed desalination facility could contribute to increased HABs and low-oxygen events off Huntington Beach. Scientific experiments conducted in international ocean waters testing iron fertilization since 1993, twelve in total, have produced plankton blooms similar to those associated with HABs.[41] The impact of these tests and the contribution of significant amounts of additional iron into ocean waters has led at least one scientist to conclude that they "do not, and likely will not, have the capability to say how this may impact marine food chains."[42]

Coastkeeper and Surfrider acknowledge the experiments conduced testing iron fertilization concern oceanic conditions and their conversion into coastal conditions may not translate into the same results. However, Poseidon acknowledges the daily contribution of a nearly a ton of iron off the Huntington Beach shoreline will at least have a direct impact on the rapid production of phytoplankton. Increased phytoplankton production off the California coast also produces various types of algae, including Pseudo-nitzschia, the domoic acid producing diatom commonly linked with HABs. Our chief concern regarding the discharge of additional iron off the coast is the unknown impact this significant nutrient contribution will have on the marine ecosystem in and around the discharge pipe.

---

[34] Id.
[35] Id.
[36] Id.
[37] *See* Section V.A.1.d.1 ("wastewater discharged at DP 001 shall not cause: marine communities, including vertebrate, invertebrate, and plant species [to be] degraded").
[38] U. of Cal., Santa Barbara, *Iron Stimulates blooms of toxin-producing algae in open ocean, study finds*, November 8, 2010.
[39] Id.
[40] Id.
[41] Powell, *supra* n. 33
[42] Id.

B. The Regional Board must consider the aesthetically undesirable impact iron discharge could have on the ocean surface.

The Tentative Order prohibits discharged wastewater from causing "aesthetically undesirable discoloration of the ocean surface."[43] Iron discharged from desalination plants has recently caused discoloration of surface water in plants using reverse osmosis systems. The Ashkelon desalination facility in Israel caused significant concerns within the Ministry of Environmental Protection (Ministry) following the discharge of "red water" from the discharge pipes leaving the facility.[44] The red water discharge occurs nearly every hour for approximately ten to twenty minutes and can be seen from a distance of 1 kilometer from the outfall depending on weather conditions.[45] The Ashkelon facility discharges approximately 450 tons per year as opposed to Poseidon's proposed discharge of approximately 365 tons per year.[46]

The Ministry became seriously concerned with the red discharge after discovering the influence of the iron discharge on the receiving water and the lack of research on the impact of the effect of such iron discharges to the marine environment. As a precaution, the Ministry intended to seek assurances that the Ministry of Finance would require substantial reductions in iron discharges before contracting for additional desalination facilities in Israel.

The Israeli Ministry encouraged policy makers to follow the precautionary principle concerning the adoption of desalination facilities along the coastline in recognition of the sparse scientific information available on the marine and coastal impacts these facilities may cause.[47] The precautionary principle, as used by the Ministry, states that "when an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically."[48] The Ministry concluded that in accordance with the precautionary principle, ferric should be removed from desalination discharge, "not only for the discoloration and aesthetic matter, but also for the preventing of a potential risk for the marine environment due to high loads and accumulation with time."[49] Coastkeeper and Surfrider strongly encourage the Regional Board to consider the Israeli example of Ashkelon and order a continued monitoring of the discharge to account for potential ecosystem changes and harmful sediment concentrations originating from the proposed increase in iron concentrations leaving DP 001.

C. The Regional Board must consider the accumulation of iron in sediments in and around the desalination plant's discharge point.

The Tentative Order requires the waste discharge to be free of "settleable material or substances that may form sediments that may form sediments that will degrade benthic communities or other aquatic life."[50] Appendix N of Poseidon's DEIR acknowledges discharged iron from DP 001 will "readily bind with the others elements in seawater and sediment."[51] Coastkeeper and Surfrider have reasonable cause for concern over the accumulation of iron in sediments in and around DP 001

---

[43] Section V.A.2; *See also* Section V.A.1.c.3

[44] *Ashkelon desalination plant leaches iron into sea*, Globes Israel Business News, July 27 2008 (last accessed Nov. 18, 2011) http://www.globes.co.il/serveen/globes/docview.asp?did=1000365853

[45] Iris Safari & Alon Zask, Environmental Regulations for discharging Desalination Brine to the Sea and its Possible Impacts, Ministry of Environmental Protection, http://www.ildesal.org.il/pdf/130.pdf, 5-6

[46] Id. at 5.

[47] Id. at 6.

[48] Id. at 1.

[49] Id. at 6.

[50] Id.

[51] Appendix N, U-2

originating from a daily discharge of at least 1,831 pounds of iron that is known to bind with sediments. The Regional Board must responsibly consider the acknowledged discharge of iron from the desalination facility and determine whether it can reconcile those facts with the restrictions placed upon the discharge in the Tentative Order. Without additional information provided by Poseidon, we do not believe the Regional Board can responsibly conclude the discharge complies with the conditions of the Tentative Order.

Coastkeeper and Surfrider are concerned that Poseidon's waste discharge of at least 1,831 pounds of iron per day may contribute to more frequent HABs leading to hypoxic zones off the Huntington Beach coast as well as the accumulation of iron in sediments in the discharge zone. The Regional Board should strongly consider the impact of this acknowledged discharge from the proposed desalination plant and how the discharge can be reconciled with Sections V(A)(1)(c), IV(A)(5)(a) and (b)'s prohibitions on sediment degradation and aquatic growth inducing nutrient discharge before adopting the renewal of Tentative Order No. R8-2006-0034, NPDES No. CA80000403.

# Perth, Australia: Two-year Feed Back on Operation and Environmental Impact

**Authors:** *Steve Christie, Véronique Bonnélye*

**Presenter:** *Steve Christie*
Senior Engineer, Desalination - Perth Seawater Desalination Plant - Water Corporation - Australia

**Abstract**

Seawater desalination development in Australia is strongly influenced by environmental protection and sustainability. The Perth Seawater Desalination Plant (PSDP), as the first large seawater desalination project based on reverse osmosis in this part of the world, had to demonstrate its sustainability with regard to energy and environmental impact. Both subjects were treated with care during the bid preparation as well as during the plant design and construction phases. This paper outlines how the operational environmental concerns have been addressed, and is supported by more than two years of operational data.

The PSDP with a production of 143 700 cubic meters per day (45GL/yr) is able to produce 17% of the total potable water demand for the Perth Integrated Water Supply System (IWSS). The plant forms a key part of the Water Corporation's strategy of "security through diversity" taking into account Perth's growing population and the limitation of the supplies.

The main areas of environmental concern faced at the PSDP consist of dilution of the brine discharge, toxicity of the brine, a perceived threat to dissolved oxygen levels in Cockburn Sound, waste products, and energy consumption.

## I. INTRODUCTION

Australia has been subjected to repetitive drought in the last decade, impacting the drinking water supply reliability mainly in the southern part of the country. In this context, seawater desalination appears to be a key alternative resource as part of the whole water management scheme. The Perth Seawater Desalination Plant (PSDP) project commenced construction in May 2005 and was a fast track project [1]. The plant is located to the south of Perth, the capital and largest city of the Australian state of Western Australia. With a Mediterranean climate (850 mm average rain fall), and a population of 1.6 million inhabitants, Perth is experiencing rapid growth and is expected to nearly double in population to 2.9 million by 2060 [2].

The PSDP with a production of 143 700 cubic meters per day (45GL/yr) is able to produce 17% of the total potable water demand for the Perth Integrated Water Supply System (IWSS). The plant forms a key part of the Water Corporation's strategy of "security through diversity" taking into account Perth's growing population and the limitation of current dam and groundwater supplies.

Seawater desalination development in Australia is strongly related to environmental impact reflection as well as sustainability. The PSDP as the first large seawater desalination project based on reverse osmosis in this part of the world, had to demonstrate its sustainability with regard to energy and environmental impact. Both subjects were treated with care during the bid preparation as well as during the plant design and construction phases. Sustainability remains a key focus area of the plant into operations.

The main areas of environmental concern faced at the PSDP and its sustainability focus consist of:

- Dilution of the brine discharge at the edge of the 'mixing zone' – 50m in all directions of the diffuser,
- Toxicity of the brine and its effect on the surrounding ecosystem,
- A perceived threat to dissolved oxygen levels in Cockburn Sound by the environmental regulator and the Cockburn Sound Management Council (who monitor the environmental 'health' of Cockburn Sound),
- Other waste products such as sludge from the dual media backwash water, and
- Energy consumption.

These items will be addressed below in more detail.

## II. ENVIRONMENTAL APPROVALS

Considerable time and effort is required to obtain environmental approvals in Australia for large construction projects, sometimes taking upwards of 2 years. The Water Corporation re-activated the project in April 2004 (after being on hold), when some early hydrodynamic modelling work was also undertaken to support the application. A project timeline is listed below, which shows that even though environmental approval was given in July 2004, the environmental operating licence was not issued until less than one month before operations began:

- 2002 The Water Corporation begins to investigate desalination plants as a realistic source of water (Initially looking at a 30GL/yr plant),

- 2003 Project put on hold due to increasing rainfalls 2001-2003,
- April 2004 Project Re-Activated (and increased to 45GL/yr) due to low rainfall after being on hold since 2003,
- July 2004 Government Announcement,
- July 2004 Environmental Approval (Section 46 approval) by the Environmental Protection Authority,
- September 2004 Contract awarded for Project Definition Phase (Tender),
- February 2005 Tenders submitted,
- May 2005 Contract awarded to Multiplex Degremont Joint Venture (MDJV), construction begins,
- August 2006 Pre-commissioning begins,
- October 2006 Environmental Licence issued by the Department of Environment and Conservation,
- November 2006 First Water,
- April 2007 Practical Completion awarded.

The environmental operating licence has since been amended 3 times but only for minor operational changes to make the licence more practicable. The main monitoring requirements have remained the same.

## III. BRINE MANAGEMENT

### 3.1 Brine dilution

Brine discharge to the environment was raised as a main constraint for the development of seawater desalination. It was perceived by some areas of the public and environmental bodies that the high salt content of the brine could impact the sensitive ecosystem of Cockburn Sound. The issue was evaluated at different levels during the project development, plant construction and into operation.

The PSDP is restricted in operations by its operational environmental licence, issued by the Department of Environment and Conservation (DEC). The licence prescribes that the PSDP's brine discharge will meet a dilution factor of 45, at a distance 50m in all directions of the diffuser (the edge of the defined mixing zone). Where:

$$\text{Dilution Factor} = (SB - SS) / (SD - SS)$$

SB (psu) = Salinity of the seawater concentrate being discharged
SD (psu) = Salinity at 50m from the diffuser (average of the brine plume – see explanation of the average below)
SS (psu) = Salinity of the seawater (at inlet)

The seawater salinity at the edge of the mixing zone is measured as close as practicable to 0.5m intervals in the bottom 5m of the water column. The pycnocline due to the diffuser discharge is identified and only those depths below the pycnocline are averaged to determine the diffuser performance. Salinity is measured for at least 3 minutes at each depth then time averaged prior to the determination of the pycnocline depth and any depth averaging. A Seabird CTD instrument is used for all measurements. It

was a requirement of the Environmental Operating Licence to carry out salinity monitoring 12 times over the first year to get an appropriate spread over the seasons, then once every 2 years thereafter. The dilution factors being achieved range from 50 up to 120 at the edge of the mixing zone, depending on which direction the current is flowing, well in excess of the prescribed limitations in the environmental licence which requires a dilution of 45 times [4]. The PSDP also has the option to re-circulate seawater into the brine stream. This can be done during periods of reduced PSDP capacity in order to increase dilution, and ensure sufficient volume and velocity of the discharge in order for the diffusion to work.

The diffuser design was optimized using computer fluid dynamic models based on Roberts Equation, which allowed for the optimization of diameter and angle of discharge. During the design phase, studies were performed at the University of New South Wales using hydraulic calculation code as well as physical 1:15 scale modelling for the confirmation of the design of the outfall (Plume thickness and height, impact, ultimate dilution (<1.2 ppt at 50m objective)). The final design consists of a 1.6m diameter pipe running 500m offshore under the seabed. The terminal diffuser consists of 40 ports along the final 200 m, at about 0.5m from the seabed surface at a 60 degree angle. Later ELCOM (Estuary, Lake and Coastal Ocean Monitoring) computer modelling undertaken by the University of Western Australia (UWA) verified the model using seasonal data collected from real time monitoring sites (such as current data, salinity and temperature). This modelling was also run under a number of "worst case scenarios", the results of this modelling is discussed in Section 3.3. Figure 1 shows the diffuser location compared to the shoreline and intake. The intake is located 200m offshore in 10m depth of water (intake screens are at mid-depth (5m).

Figure 1: PSDP Diffusers, Intake and shoreline

The performance of the diffuser system was also validated at full scale by the University of Western Australia [3] using salinity measurements around the discharge points as well as hydraulic tests using a rhodamine dye tracer shown in Figure 2 and Figure 3. The experiments consisted of high-resolution profiling of temperature, conductivity, pH, dissolved oxygen, and turbidity under calm conditions over several days in December 2006 and April 2007. The time periods were chosen in an attempt to simulate calm conditions (i.e. a worst case scenario).

Figure 2 and 3: Rhodamine Dye tracer test

The PSDP's discharge is not affected by surrounding industry. There is a large warmer plume to the North of the PSDP which is discharged from the neighbouring power station, and although picked up in more extensive salinity and temperature sampling, it does not affect the PSDP's immediate mixing zone.

### 3.2 Brine toxicity

Toxicity tests were also performed to quantify the impact of the brine discharge on the most sensitive species present in Cockburn Sound [5]. Whole Effluent Toxicity (WET) testing was carried out at commissioning and after 12 months of operation. This was a ministerial condition as set by the Environmental Protection Authority (EPA). A selection of species was subject to long term contact (time frames below) with different concentration of brine and monitored to identify the dilution required for minimal environmental impact.

The toxicity of the brine samples was assessed using the following tests which are all NATA accredited (NATA - National Association of Testing Authorities is Australia's national laboratory accreditation authority):
- 72 hour macroalgal germination assay using the brown kelp *Ecklonia radiata*,
- 48 hour mussel larval development using *Mytilis edulis*,
- 72 hour algal growth test using the unicellular algae *Isochrysis galbana*,
- 28 Day copepod reproduction test using the copepod *Gladioferens imparipes*,
- 7 day larval fish growth test using the marine fish pink snapper, *Pagrus auratus*.

All toxicity tests were undertaken at Geotechnical Services (Geotech) Ecotoxicology Laboratory at Fremantle using filtered seawater obtained from Cockburn Sound as the dilution water, and brine from the PSDP. The brine sample represents typical brine discharge during normal operations, hence did not include any CIP chemicals (Note that lime sludge along with the dual media filter backwash water is sent through a de-sludging system before being discharged with the brine plume so would have been included in the PSDP discharge. This is discussed further in Section 3).

Table 1 summarizes the outcome, expressed as the degrees of dilution necessary to protect the most susceptible species at varying levels.

| Protection Level with 50% confidence | Protection Value % Brine | Dilution Factor |
|---|---|---|
| 99 | 6.64 | 15.1 |
| 95 | 8.15 | 12.3 |
| 90 | 9.23 | 10.8 |
| 80 | 10.93 | 9.2 |

Table 1: Dilution Factor required for different protection levels

Results show dilution rates much lower than those selected during the design phase of the project (45 times dilution), which was also verified by the dilution testing. Hence the PSDP is meeting all of its environmental commitments.

The actual diffusers themselves, after a year of operation, are heavily populated by marine growth, mussels and surrounded by feeding fish, Figure 4.

Figure 4: Marine growth around diffuser

### 3.3 Environmental Survey

Cockburn Sound is a sensitive area as it is characterized by relatively closed access and a variable off shore current. Cockburn Sound is formed by the presence of Garden Island to the west which is joined onto the mainland at the south by a mostly rock groyne bridge (shown later in Figure 6). Only a small opening in the bridge allows minimal mixing with the ocean at the South, most mixing comes from the North. Hence Cockburn Sound consists of a 10m shelf at the front of the PSDP, moving into a 20m basin at its deepest part, and enclosed by Garden Island further west: the bathymetry data show a deep basin, which is naturally subjected to oxygen drop during low current/wind periods.

During the PSDP's environmental approvals phase, the DEC was concerned that the brine, being denser than seawater, would sink to the deeper basin of Cockburn Sound causing a hypoxic layer and cause

dissolved oxygen (DO) levels to drop at the seabed floor. The hypothesis is represented in Figure 5 below. Under extreme hypoxic conditions fish kills can occur which was the DEC's main concern.

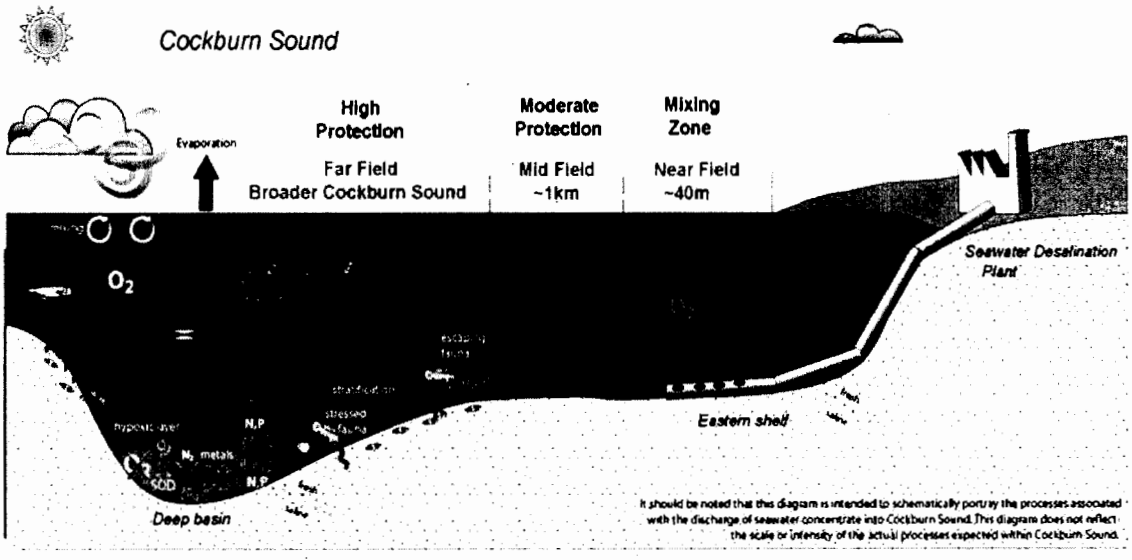



Figure 5: Hypothesis – Brine would sink to the deep basin

The concern had been expressed that under certain meteorological conditions, the brine, despite the mixing from the diffusers, would form a higher density plume which could flow over a seabed ridge into the deep basin of Cockburn Sound.

The PSDP is therefore required to monitor DO levels (a requirement of the environmental operating licence) in the deeper basin of Cockburn Sound (at 0.5m from the seabed floor), and is required to "shutdown" to 1/6$^{th}$ capacity when these levels fall to certain prescribed levels. This has occurred twice during 2008 (over 15 days in April and 12 days in May). The Water Corporation has 3 Real Time Monitoring Stations (RTMS) in the deeper basin of Cockburn sound, taking half hourly measurements of dissolved oxygen, temperature and salinity, and transmitting this data back to head office. A map of Cockburn Sound showing the location of the PSDP, Garden Island and the 3 RTMS is shown in Figure 6. The RTMS are located at the 'North', 'Central' and 'South' locations. Stirling Channel runs in a North-South location directly in front of the PSDP.

Since the environmental licence was prescribed, UWA's rhodamine dye test has proven that the PSDP's brine discharge is mixing well on the shelf at the front of the PSDP, and cannot even be traced in the deeper basin of Cockburn Sound [6]. Figure 7 shows UWA's ELCOM model highlighting the density of the PSDP's brine plume. The plume can be traced on the 10m shelf and entering into the basin through Stirling Channel getting smaller in size and becoming less dense. The plume, at the end of Stirling Channel is shown to be completely mixed with the surrounding seawater, hence can not even be traced in the deeper basin of the Sound. The plume is shown as red (at the PSDP outlet) at its strongest, then becoming more and more dilute as it transgresses across the 10m shelf of the Sound. As it exits into the 20m basin, the tracer can no longer be tracked.

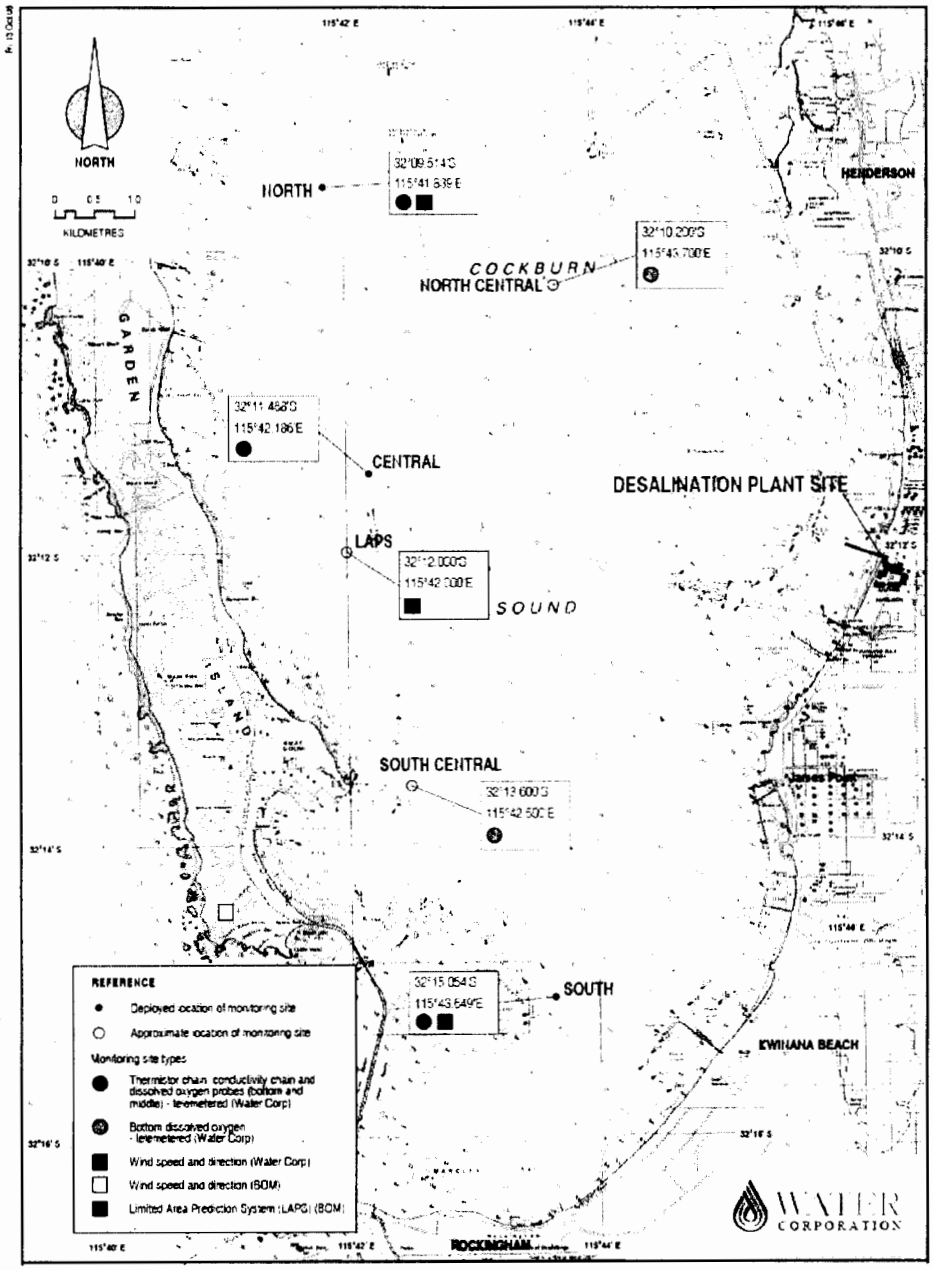



Figure 6: Map of Cockburn Sound showing the 3 Real Time Monitoring Stations at 'North', 'Central' and 'South' locations.

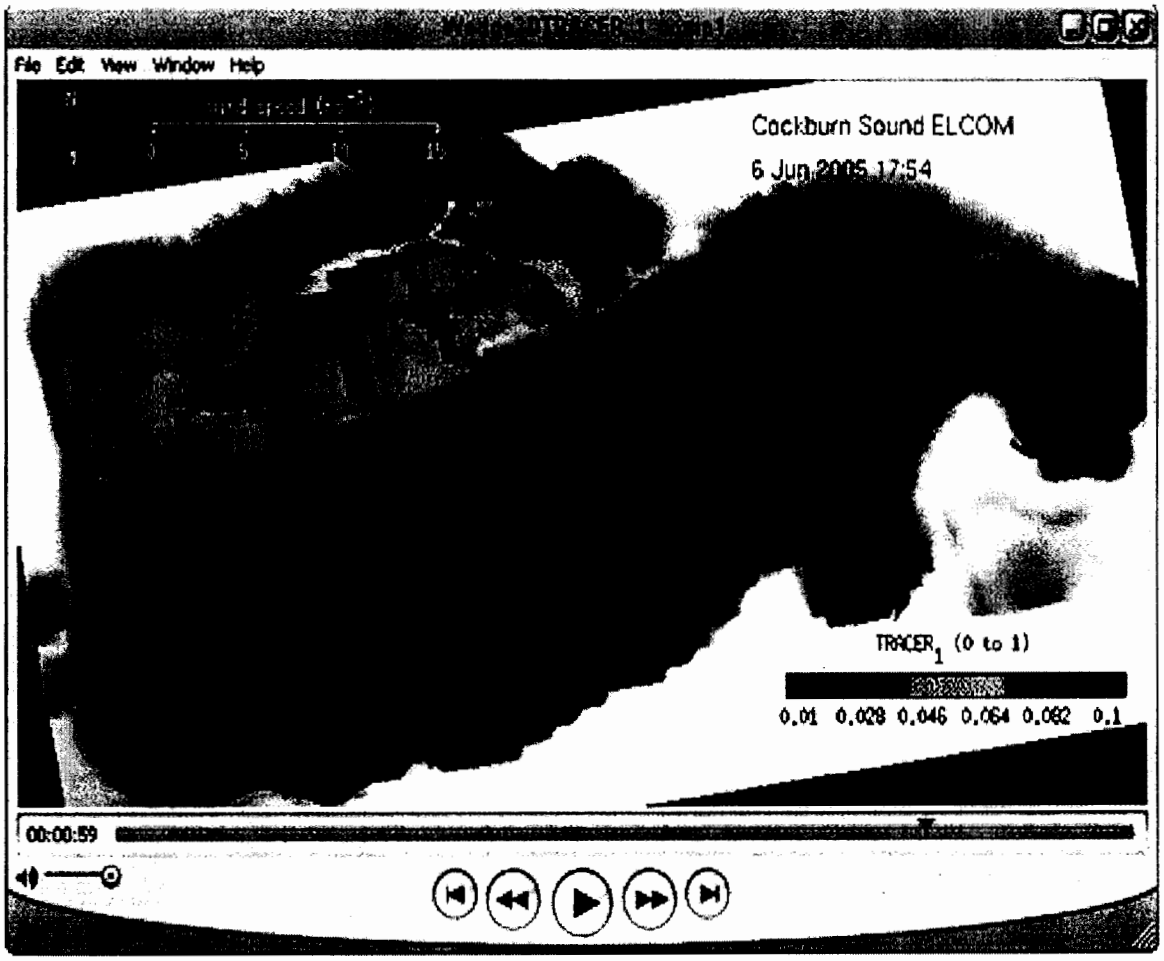



Figure 7: Field results of the Rhodamine Dye tracer test conducted by the Centre for Water Research at the University of Western Australia

If the brine plume is completely mixed at the end of the Channel, and cannot be traced in the deeper basin of Cockburn Sound (as shown in Figure 7), the PSDP can not be having any measurable effect on dissolved oxygen levels in the deeper basin of Cockburn Sound [7]. Despite this, the DEC is hesitant to remove any of the dissolved oxygen plant "shutdown" conditions, perhaps due to public perception rather than science.

The PSDP was "shutdown" to 1/6$^{th}$ capacity twice in 2008 due to dissolved oxygen levels at the seabed floor dropping below those required under the environmental operating licence. The two periods in April and May 2008 occurred during autumn, most likely caused by the fact that Cockburn Sound stratifies naturally particularly when long periods of calm whether can occur [8]. Cockburn Sound is generally a well mixed environment. The main cause of mixing is wind; however tides also have an effect. During autumn a number of consecutive days can occur with very little wind mixing causing Cockburn Sound to stratify and dissolved oxygen levels at the seabed floor to fall.

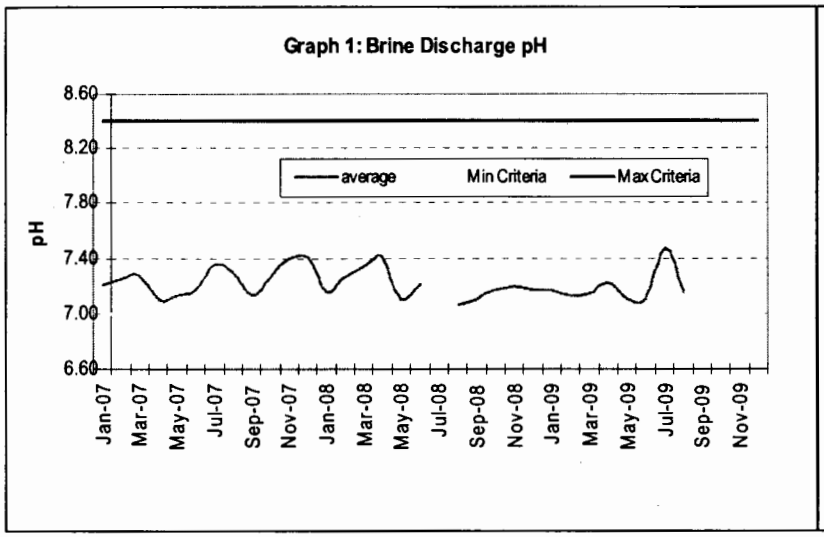
Seabird SBE43 dissolved oxygen sensors are used on the RTMS to measure the dissolved oxygen levels at 0.5m from the seabed floor. They are connected to the buoy via an umbilical cord, from where the data is transmitted to the Water Corporation head office via mobile phone technology. Bio-fouling is a major problem in ensuring accurate DO readings. Figure 8 shows a typical DO sensor during deployment.

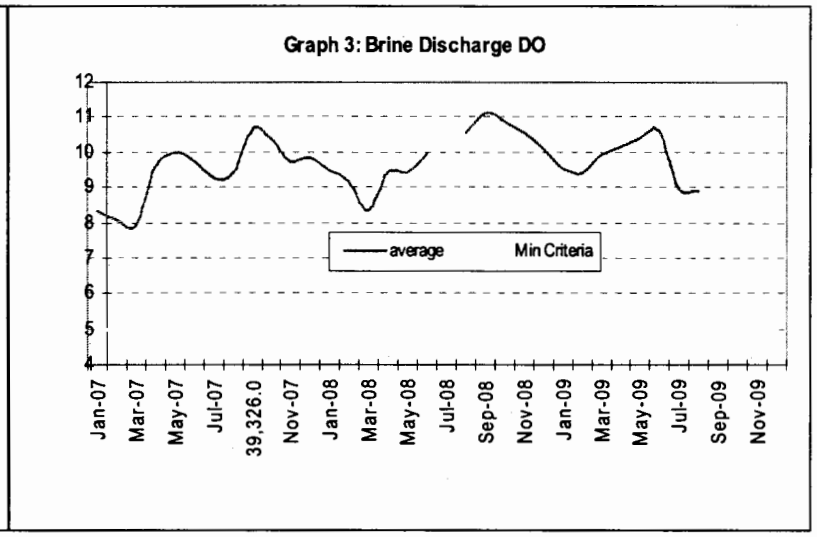
Figure 8: Typical bio-fouling on DO sensor after deployment for a couple of months.

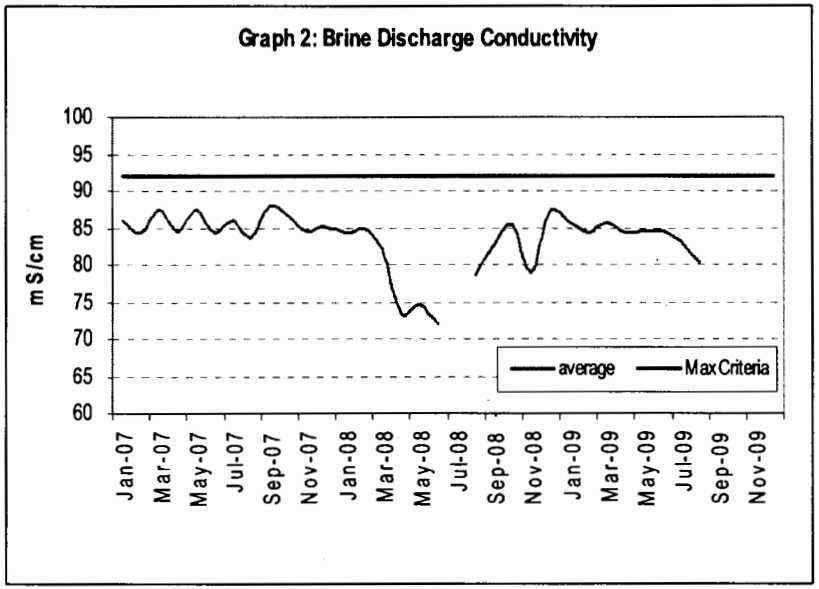
As a result, a number of actions have been implemented in order to decrease the effects of bio-fouling including using an anti-fouling agent, using copper pipe at the entrance to the probe and using blacked out plastic piping and cases to reduce sunlight around sensitive areas. Even still, fortnightly insitu calibration of the DO probes occurs as part of the programs quality assurance. Regular maintenance on the buoys and sensors ensure their reliability.

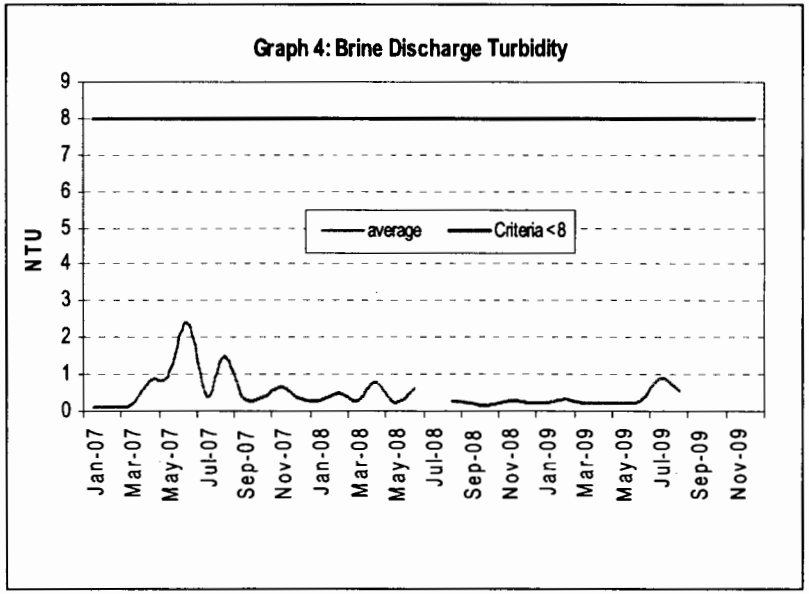
### 3.4 On-line Brine Discharge Monitoring

24 hour real time on-line monitoring of the brine discharge is also a requirement of the PSDP's Water Quality Management Plan, approved by the DEC. The discharge limits were prescribed in accordance with the Cockburn Sound Environmental Quality Criteria taking into consideration the dilution effect of the diffusers. Graph's 1 – 4 show the trends of pH, Conductivity, Dissolved Oxygen and Turbidity from more than 2 years of operations. Note the dilution effect on conductivity of re-circulating seawater through the brine discharge in April/May 2008 when the PSDP had to reduce production to $1/6^{th}$ capacity due to DO levels. All results have been compliant in part due to the steady state nature of the desalination process.


Graph 1: Brine Discharge pH
pH
8.60
8.20
7.80
7.40
7.00
6.60
average
Min Criteria
Max Criteria
Jan-07
Mar-07
May-07
Jul-07
Sep-07
Nov-07
Jan-08
Mar-08
May-08
Jul-08
Sep-08
Nov-08
Jan-09
Mar-09
May-09
Jul-09
Sep-09
Nov-09


Graph 3: Brine Discharge DO
12
11
10
9
8
7
6
5
4
average
Min Criteria
Jan-07
Mar-07
May-07
Jul-07
39,326.0
Nov-07
Jan-08
Mar-08
May-08
Jul-08
Sep-08
Nov-08
Jan-09
Mar-09
May-09
Jul-09
Sep-09
Nov-09


Graph 2: Brine Discharge Conductivity
m S/cm
100
95
90
85
80
75
70
65
60
average
Max Criteria
Jan-07
Mar-07
May-07
Jul-07
Sep-07
Nov-07
Jan-08
Mar-08
May-08
Jul-08
Sep-08
Nov-08
Jan-09
Mar-09
May-09
Jul-09
Sep-09
Nov-09


Graph 4: Brine Discharge Turbidity
NTU
9
8
7
6
5
4
3
2
1
0
average
Criteria <8
Jan-07
Mar-07
May-07
Jul-07
Sep-07
Nov-07
Jan-08
Mar-08
May-08
Jul-08
Sep-08
Nov-08
Jan-09
Mar-09
May-09
Jul-09
Sep-09
Nov-09

## IV. OTHER MARINE MONITORING

In addition to the Rhodamine dye testing, dissolved oxygen monitoring and brine monitoring, an extensive Macrofauna community, sediment habitat and water quality study was undertaken. These studies were undertaken by consultants Oceanica – Marine and Estuarine Specialists. Two Macrobenthic surveys were undertaken, one in March 2006 before PSDP start up and one in March 2008 as part of the PSDP's Ministerial Conditions. The March 2006 baseline survey covered 77 sites to determine the spatial pattern in benthic macrofauna communities (grab sampling) and benthic habitat and epibenthic fauna (towed video) in the deep waters of Cockburn Sound. The repeat survey used the same methods as the 2006 survey to sample 41 of the 77 sites sampled in 2006, plus 5 new sites, in order to gain a view of some areas impacted by the PSDP, and other areas not impacted by the PSDP. The results showed that there has been a marked shift in sediment characteristics and benthic macrofaunal communities throughout the deep basin of Cockburn Sound between 2006 and 2008, however the changes are due to a regional effect, not the result of the operation of the PSDP [9]. The shift in characteristics was generally more pronounced in the northern basin than the central and southern basin. There was also no significant difference between the west or 'control' sites and the 'potential impact' sites, hence it can be deduced that a regional effect is the cause. The results highlight a requirement for a greater understanding of factors contributing to the temporal variation in the benthic communities of Cockburn Sound, however as the changes are shown to be regional (not due to the PSDP), future surveys should be conducted by the greater community, not solely the PSDP.

The water quality sampling program began in February 2005 more than one year before PSDP operations and concluded in May 2008, some two years after operations began. The monitoring program consisted of 8 water quality sites and 6 transect sites which were sampled twice per season. Overall a total of 28 water quality samples were carried out. The findings of the monitoring program support the findings of the modelling studies carried out during the development phase of the PSDP [10]. In particular the salinity impact was only evident on the eastern shelf of the Sound which was slightly higher than the ambient salinity of the receiving waters (up to 1ppt at the seabed floor), however all readings were well within the range of natural salinity variation (variable by up to 4ppt seasonally). All other parameters showed no observable effect following commissioning of the PSDP (except for TDS, which is closely linked to salinity).

## V. OTHER WASTE PRODUCT MANAGEMENT

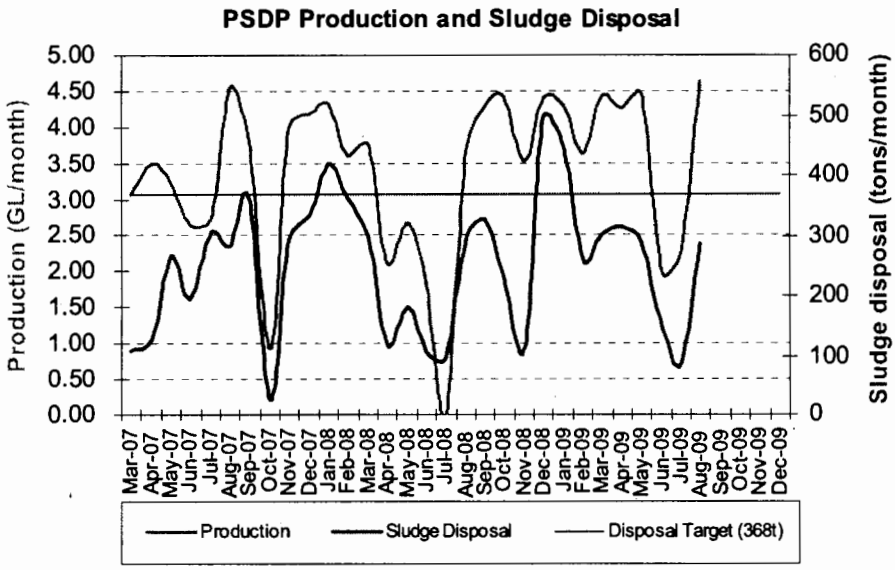
The desalination plant is equipped with a conventional pre-treatment system including screening, coagulation using ferric sulphate (with pH correction using sulphuric acid), filtration on dual media filters and safety filtration through cartridge filters [11]. The coagulation – filtration step removes suspended solids, particles and part of the organics naturally present in the seawater, that are then concentrated in the backwash water.

A clarification and sludge dewatering system was implemented on the PSDP to clarify the pre-treatment reject before discharge. This reduces the turbidity impact on the environment which could have had a significant negative effect on photosynthesis.

The backwash water from the Dual Media Filters (DMF's), the first filtration used at PSDP as the seawater enters the site, is settled out using a Densadeg – a settling tank consisting of lamellas and clear water channels at the top to allow the clear water to exit to the outfall tank. The sludge (taken from the

bottom of the tank) is then sent to a centrifuge to spin the solids out. The clear water is returned to the brine outfall tank; however the solids are removed from site to a landfill facility. Figure's 9 and 10 show the clear water channels of the settling tank and typical sludge removed. The PSDP's maximum target sludge removal is 368tons/month. The dewatered sludge consists of 20% solids. It is collected and mixed with mineral or organic waste and disposed to landfill at 40% solids. It was decided to install the sludge treatment facility in order to achieve minimal turbidity of the brine discharge, and to prevent any visible impact of the effluent in the surrounding waters. To date, no other use has been found for the sludge other than landfill due to the high saline content. Monthly sludge disposal can be seen in Graph 5 below. Lower sludge levels are noted during calm whether periods such as March – June. The PSDP attempts to minimize waste streams through process optimization.

Figure's 9 and 10: 'Densadeg' – settlement tank and typical sludge after being put through a centrifuge




Graph 5: Monthly Production and Sludge Disposal

An additional benefit of de-sludging is that very little suspended solids are returned to Cockburn Sound, thus the brine plume is a clear water and will not discolour any of the surrounding white sands. This was also a major factor in the decision to install the de-sludging system during construction.

## VI. ENERGY

Desalination is an energy consuming process. In terms of energy management, and in keeping with the sustainability strategy, the Water Corporation decided to purchase "green energy" to power the desalination plant. The Corporation has signed an agreement which led to the development of the Emu Downs Wind Farm located 30 km east of Cervantes in Western Australia's Midwest region. This wind farm [12], which includes 48 wind turbines 1.8 MW unitary capacity has a maximal power production of 83 MW supplying 272 GWh/year into the grid, more than three times the maximum consumption of the desalination plant. All of the energy required to power the PSDP is purchased from the Emu Downs Wind Farm.

A high efficiency energy recovery system was also selected on the first reverse osmosis pass to reduce the plants energy consumption. Energy Recovery Inc - ERI PX 220 installed on the 12 first pass racks exceeds the energy recovery efficiency expected. The 16 PX 220 installed per rack have an efficiency exceeding 96%. The plant energy consumption remains below the design value of 4.1 kWh/m$^3$, and is operated between 3.2 and 3.8 kWh/m$^3$ (including intake and transfer into the distribution system) on this rather cold seawater ranging from 15 degrees in winter to 25 degrees in summer, and salinity of between 36 – 39g/L. Operational feed back of ERI equipment is positive after two years of operation.

## VII. CONCLUSION

In conclusion, desalination has an important role in Australia, as a new source of water, with a constant and reliable availability compared to natural resources. Reverse osmosis appears as a sustainable technology as its possible impacts on the environment can be managed. The PSDP was the first large scale reverse osmosis desalination plant built in Australia, which has now spurned other plants being built in Queensland (operational Dec 2008), Sydney, Melbourne and Adelaide. As the PSDP was at the forefront of large scale desalination plants in Australia, it has lead the way in gaining environmental approvals, and is a leading model for sustainable desalination.

The unprecedented marine monitoring programme has included computer modelling for diffuser design and validation, rhodamine dye tracer tests, extensive far field dissolved oxygen tests, a water quality monitoring programme, diffuser performance monitoring programme, WET testing and Macrobenthic surveys. All studies have proven that the PSDP is having negligible impact on the surrounding environment. Impacts on seawater habitat are limited by a validated diffuser design and treatment of suspended solids.

The power consumption of RO plants is decreasing due to increasing technological gains in plant design, membrane design and energy recovery. RO plants can also easily be powered (offset) by renewable energies. Energy recovery systems such as that used at the PSDP (ERI) are now extremely efficient at recovering energy from the brine waste water (greater than 96% efficiency). Sourcing power from renewable energy (albeit offset) is an important sustainability principal employed by the PSDP, which is also now being applied by other large scale Australian desalination plants.

## VIII. REFERENCES


1- M.A. Sanz, N. Winsor, G. Crisp, V. Bonnélye, Perth Reverse osmosis Project: Potable Water from Sea and Wind, , IDA World congress on Desalination and Water Reuse, Maspalomas, 2007.

2 - Water Corporation "Water Forever – Directions for our water future, draft plan" ISBN 1740434951 Feb 2009, http://www.thinking50.com.au/

3- P. Okely, J.P. Antenucci, J. Imberger, C.L. Marti, "Field investigations into the impact of the Perth Seawater Desalination Plant discharge on Cockburn Sound", Centre for Water Research, University of Western Australia, June 2007, WP2150PO, http://www.watercorporation.com.au/D/desalination_environment.cfm

4- D. Luketina, S. Christie, Marine Impact – Proving the models, AWA De-salting – Seawater and Brackish Water Conference, Perth, Sept. 2008.

5- J Woodworth, "Marine Toxicity Tests – Report prepared for the Water Corporation" Geotechnical Services, December 2007

6- P.S. Yeates, P. Okely, J.P. Antenucci, J. Imberger, "Hydrodynamic modelling of the impact of the Perth Seawater Desalination Plant discharge on Cockburn Sound", Centre for Water Research, University of Western Australia, November 2006, WP2127PY

7- P. Okely, J.P. Antenucci, P.S. Yeates, C.L. Marti, J. Imberger, "Summary of Investigations into the Impact of the Perth Seawater Desalination Plant discharge on Cockburn Sound", Centre for Water Research, University of Western Australia, August 2007, WP2160PO http://www.watercorporation.com.au/D/desalination_environment.cfm

8- P. Okely, P.S. Yeates, J.P. Antenucci, J. Imberger, M.R. Hipsey, "Modelling the Impact of the Perth Seawater Desalination Plant discharge on dissolved oxygen in Cockburn Sound", Centre for Water Research, University of Western Australia, November 2006, WP2136PO http://www.watercorporation.com.au/D/desalination_environment.cfm

9 – S. Shute, "Perth Metropolitan Desalination Plant – Cockburn Sound Benthic Macrofauna Community and Sediment Habitat – Repeat Macrobenthic Survey", Oceanica, June 2009, 604_001/1 http://www.watercorporation.com.au/D/desalination_environment.cfm

10 – K. Holloway, "Perth Seawater Desalination Plant Water Quality Monitoring Programme – Final Programme Summary Report 2005 – 2008", Oceanica, Jan 2009, 445_001/3 http://www.watercorporation.com.au/D/desalination_environment.cfm

11- V. Bonnelye, G. Mercer, L. Daniel, S. Sibma, N. Winsor, G. Crisp, Perth reverse osmosis facility: an environmentally integrated desalination plant, 2nd IWA- ASPIRE Conference & &Exhibition, Perth, Oct. 2007.

12- M.A. Sanz, R. Stover, Low energy consumption in the Perth seawater Desalination Plant, IDA World congress on Desalination and Water Reuse, Maspalomas, 2007.

ADDENDUM

**TO:** Regional Water Quality Control Board – Santa Ana Region
3737 Main Street, Suite 500
Riverside, CA 92501-3348

**FROM:** Surfrider Foundation

**DATE:** November 27, 2011

*Via Electronic Mail:* kberchtold@waterboards.ca.gov & gstewart@watrboards.ca.gov

**RE: ADDENDUM: Waste Discharge Requirements for Poseidon Resources Huntington Beach Desalination Facility; Order No. R8-2011-0046; NPDES No. CA 8000403**

Dear Chair Beswick and Board Members:

We are writing to supplement our comment letter dated November 21 and sent to the Regional Water Quality Control Board on behalf of Surfrider Foundation and Orange County Coastkeeper.

The purpose of this letter is to support our comments on the "Alternative Intakes" section of the Fact Sheet, beginning on page 12 of our letter dated November 21. As we explained in that earlier letter, full compliance with the mandates of Water Code section 13142.5(b) requires the use of the "best" site, design, technology and mitigation measure feasible to minimize the intake and mortality of marine life."

Much of the analyses of "Alternative Intakes" discounts, if not ignores, the benefits of "subsurface intakes", by excluding documentation of the benefits of horizontal drilled wells and other methods for withdrawing "feed water" for operation of the Facility.

For the record, we are submitting a study conducted for the Municipal Water District of Orange County (MWDOC) in response to concerns that sub-surface intakes may cause harm to marine life.[1] As you will see, the conclusions of that study are that sub-surface intakes dramatically reduce marine life mortality in comparison to other alternatives.

We also believe that studies of operating subsurface intakes such as the "infiltration galleries"[2] currently operating at Fukuoka, Japan, would show similar benefits in reducing the intake and mortality of marine life at an existing and operating ocean desalination facility.

We are submitting the attached MWDOC study, and link to a website for the ocean desalination facility in Japan, simply as examples of documents that should have been reviewed in order to conduct a thorough analysis of "Alternative Intakes" and documentation of their comparative value in minimizing the intake and mortality of marine life.

---

[1] Attachment B: "Evaluation of Potential Impacts to Marine Life Due to Operation of Slant Beach Wells"; Chambers Group
[2] See eg: http://www.f-suiki.or.jp/english/seawater/system.php

Subsurface intakes appear to be the "best" available technology for minimizing the intake and mortality of marine life. **This fact should be clearly and unambiguously stated in the Fact Sheet accompanying the Tentative Permit.**

**We respectfully request that this letter and the attached study conducted for the Municipal Water District of Orange County be admitted into the administrative record along with our comment letter dated November 21. We also request that the Tentative Order be amended to thoroughly document the benefits of sub-surface intakes of all types, and compare those analyses with the proposed continued use of the cooling water intake structure at HBGS, to determine which technology is the "best" at minimizing the intake and mortality of marine life for a "stand alone" operation of the Facility.**

**As before, we also strongly recommend that the analysis include a review that integrates alternative sites, alternatives for different designed production capacity, as well as alternative intake technologies, that, as a whole, demonstrate conditions on permitting the design, construction and operation of the Facility in "stand alone" operation in a manner that is consistent with the Water Code mandates to minimize the intake and mortality of marine life.**

Once again, thank you for your careful consideration of these comments. We look forward to working with the Regional Water Quality Control Board on revisions to this Tentative Order, as well as other issues to restore and protect our waterways and ocean.

Sincerely,

Joe Geever
Surfrider Foundation
Water Programs Manager
jgeever@surfrider.org
(949) 636-8426

**MEMORANDUM**

TO:
Richard Bell, P.E
Principal Engineer
Municipal Water District of Orange County
10500 Ellis Avenue
Fountain Valley, CA 92728

FROM:
Noel Davis, Ph.D.
Chambers Group, Inc.
5 Hutton Centre Drive, Suite 750
Santa Ana, CA 92707

**SUBJECT: Evaluation of Potential Impacts to Marine Life Due to Operation of Slant Beach Wells**

Because of the critical need to bolster the reliability of water supply to south Orange County, the Municipal Water District of Orange County (MWDOC) prepared and adopted the South Orange County Water Reliability Plan in 2002/2003 (Plan). That Plan recommended development of an ocean desalination water supply for the south Orange Coastal area. As part of this planning process, MWDOC conducted a scoping study to identify environmental compliance and permitting issues associated with the construction and operation of a desalination facility (Chambers Group 2002).

During the scoping study, MWDOC held three in-person meetings with permitting and consulting agencies including the Regional Water Quality Control Board San Diego Region (RWQCB), U.S. Army Corps of Engineers (USACE), the National Marine Fisheries Service (NMFS), the U.S. Fish and Wildlife Service (USFWS), the California Department of Fish and Game (CDFG), the California Coastal Commission (CCC) and the City of Dana Point. During those meetings the resource and permitting agencies expressed concerns about the impacts of conventional ocean intakes on marine life. These impacts include impingement of marine organisms against the intake screen and the entrainment of planktonic organisms small enough to pass through the screen. Based on this input, MWDOC made the decision to determine if wells could be used to withdraw ocean water for the desalination facility. Hydrogeologic borings, construction of a test slant well in spring 2006, and subsequent groundwater modeling showed that slant wells were feasible. Slant beach wells avoid impingement and entrainment of marine organisms, provide filtered water, and were found to be cost-effective for the Dana Point site.

The first slant well is now operating and producing 3 mgd. This well is being used to gather process treatment design information over an extended period of pumping and includes use of mobile test facility located at Doheny State Beach. Ongoing activities include hydrogeologic data collection, groundwater and environmental monitoring, groundwater modeling, water quality sampling/analyses, material corrosion testing, and engineering work. The project is in the process of expansion to nine slant wells, with three wells each in three well clusters. The slant wellfield would be constructed and buried along Doheny State Beach. The slant wells are to be drilled approximately 500 feet out under the ocean

floor, with the screened intake interval located 50 to 140 feet below the ocean floor. The average distance from the ocean floor to the middle of the screened intake area of the wells is approximately 100 feet.

Benthic organisms live in the top 2 feet of the sediment (most of them in the top 2 inches). Therefore, the distance between the marine life in the sea floor sediments and the intake of the slant wells will be on the average greater than 100 feet. The vertical infiltration rate of ocean water migrating downward through the seafloor during slant wellfield operation is estimated to be quite low, at approximately 0.000051 feet per second (ft/sec) in the immediate vicinity overlying the wellfield and 0.00000078 ft/sec at the outer limits of the ocean water source area (Williams 2010). This intake velocity is four orders of magnitude less than the 0.5 ft/sec through-screen velocity that has been found to be gentle enough to avoid impingement on the screens of conventional ocean intakes (SWRCB 2010). This slow rate of infiltration would be imperceptible to benthic organisms, which routinely experience much greater currents and wave surge in the active wave climate offshore Doheny Beach. This area is subject to significant sand transport and movement from San Juan Creek discharges, wave and tidal forces, and littoral currents. For example, during a March, 1983, storm, there were 20 foot high breakers off Dana Point and 7 to 13 foot high wave runup on Doheny Beach (Jenkins 2010). Such major storms cause as much as 7 foot loss in the thickness of beach sediment cover. Although the March, 1983, storm event is extreme, waves of 4 to 6 feet are common off Doheny Beach and the associated bottom surge from these waves at the shallow water depths of the wellfield produce forces on the sediment and the sediment-dwelling organisms that are much, much greater than the very slight drawdown from the wells.

Dr. Scott Jenkins, an expert in physical oceanography at Scripps Institution of Oceanography analyzed the potential for the ocean water infiltration to affect benthic organisms by inducing scour and erosion of the ocean floor and to affect planktonic organisms by suction induced forces that might pull plankton and floating eggs towards the bottom and thus potentially impinge them on the sea floor (Jenkins 2010). To quantify the potential for ocean floor erosion, the infiltration rates over the wellfield calculated by Williams (2010) were compared to the threshold velocity for transport of the bottom sediments, which have a median grain size of 0.22 millimeters. The maximum increase in wave induced bottom stress was calculated to be 1% directly over the well field and 0.02% at the outer limit of the recharge zone. This value is insignificant because it is nine times smaller than the error implicit in the net shear stress increases to move sand-sized sediment determined under controlled laboratory conditions. Therefore, the net increase in bottom stress calculated for the well field would be negligible and, thus, the slant wellfield will have no discernible effect on the ocean floor. A 1 percent or less increase in bottom stress attributable to the slant well infiltration is trivial compared to the thousands of percent increases in wave induced stresses that occur naturally during major storms and which cause dramatic erosion and seasonal variation in beach profiles (Jenkins 2010).

The very low infiltration rate along the ocean floor that would be caused by the slant wellfield operation may have a very slight potential to trap freely drifting eggs and plankton against the seabed if the suction forces of the slant well are greater than the movement of water that can break the organisms free of the suction and transport them off the seafloor (Jenkins 2010). Organisms potentially impinged would only be those organisms occurring within a few centimeters of the ocean floor that might be

affected by these very low infiltration suction forces. Jenkins determined that only minute oscillatory wave velocities are required to prevent these small organisms from becoming trapped or impinged by the seabed. The wave climate off Doheny Beach always produces water movement that exceeds these minimal oscillatory velocities at the depths of the well field and recharge zone. The force balance calculations done by Jenkins show that the ocean would have to become completely quiescent for neutrally buoyant, freely drifting small organisms to become impinged or trapped on the seabed by the vertical pressure gradient induced by the slant well field. Such a quiescent wave climate has never been observed in the vicinity of Doheny Beach.

Based on the analyses performed by Williams and Jenkins, it can be concluded that the intake of ocean water through slant beach wells will have no impact on marine life. This environmentally friendly approach has received wide support from the public, environmental organizations, elected officials, and local, State and Federal resource and regulatory agencies including the California Coastal Commission.

**Literature Cited**

Chambers Group, Inc.
2002 Scoping of CEQA Compliance and Permitting Issues for an Ocean Desalination Facility in Southern Orange County. Prepared for Municipal Water District of Orange County

Jenkins, S.A.
2010 Potential Impacts on Wave and Current Transport Processes Due to infiltration Rates Induced by the South Orange Coastal Desalination Project. Submitted to R. Bell, P.E., Municipal Water District of Orange County.

State Water Resources Control Board. (SWRCB)
2010 Statewide Water Quality Control Policy for the Use of Coastal and Estuarine Waters for Power Plant Cooling.

Williams, D.E.
2010 South Orange Coastal Ocean Desalination Project – Vertical Infiltration Rate of Ocean Water Migrating through the Seafloor in the Vicinity of the Slant Well Intake System. Technical Memorandum to R. Bell, P.E. Municipal Water District of Orange County.

12 October 2010

# Potential Impacts on Wave and Current Transport Processes Due to Infiltration Rates Induced by the South Orange Coastal Ocean Desalination Project

Submitted by:
Dr Scott A. Jenkins Consulting
14765 Kalapana St
Poway CA 92064

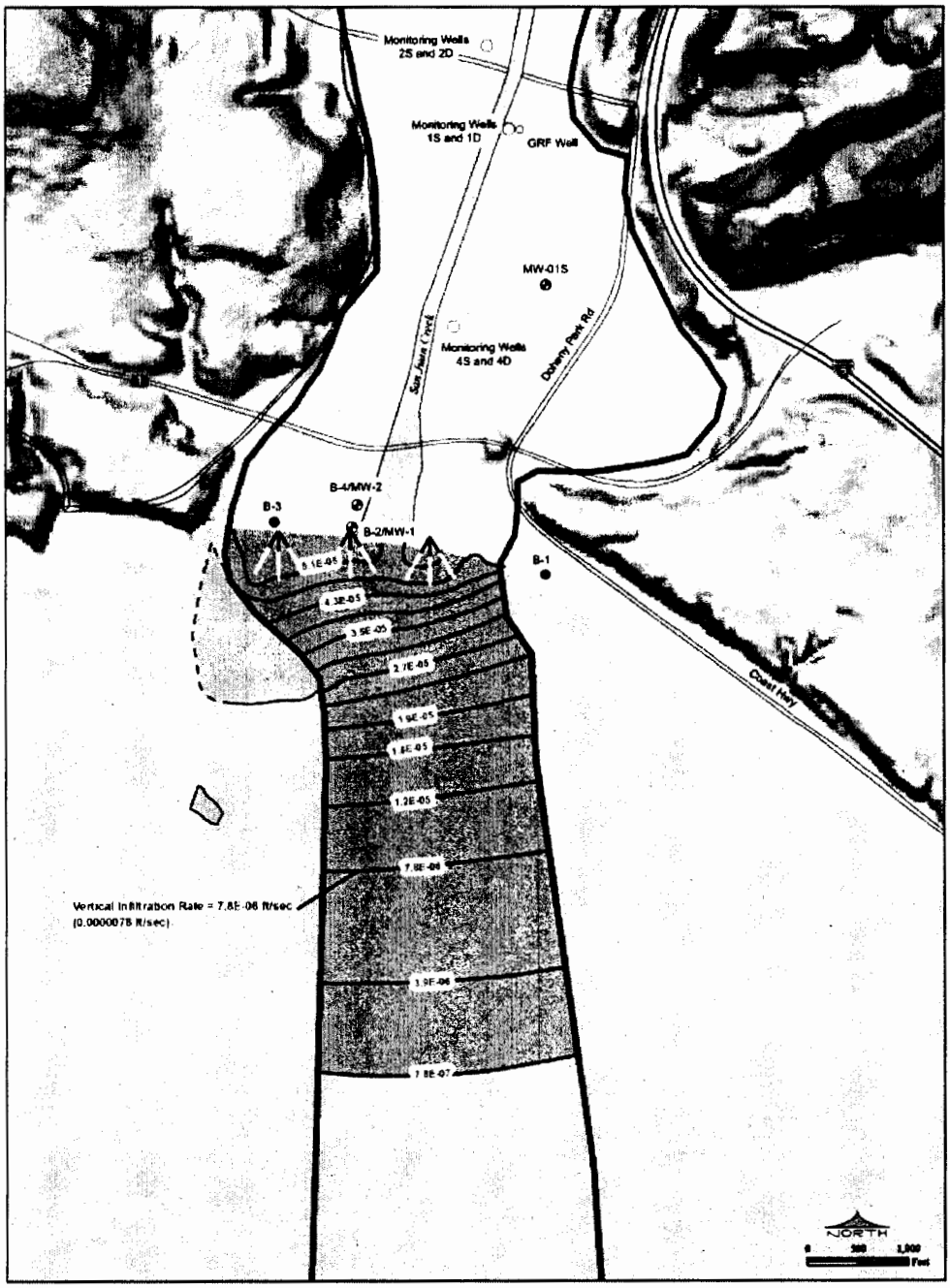
Submitted to:
Richard Bell, PE
Principal Engineer & Project Manager
Municipal Water District of Orange County
18700 Ward Street
Fountain Valley, CA 92708

**Statement of the Issues:** There are two potential marine biology impacts that may arise as a consequence of the infiltration of ocean water through the seafloor in the vicinity of the slant well field of the South Orange Coastal Ocean Desalination Project. **1)** In a technical memorandum by Geoscience dated 1 October 2010, vertical infiltration rates in the immediate vicinity of the slant well field were estimated to be 5.1 X $10^{-5}$ ft/sec, decaying to 7.8 X $10^{-7}$ ft/sec at the outer limits of the ocean water source area (see Figure 1). It is well known that vertical suction flows through a sedimentary seabed (also known as ventilated boundary layers) increase the bed shear stresses arising from waves and currents (Conely and Inman, 1994). The decisive determination in assessing this potential impact is whether or not infiltration rates of this magnitude when combined with ambient waves and currents are sufficient to induce scour or erosion of the seabed and thereby disturb resident benthic organisms. **2)** There might be an additional impact on neutrally buoyant, freely drifting micro-organisms (eggs and plankton) if they become impinged on the seabed by the suction forces produced by the vertical pressure gradients of the slant wells that cause the infiltration of ocean water through the seafloor.

**Background:** Laboratory measurements by Conely and Inman, 1994, show that even very small infiltration rates through a porous seabed result in remarkably large increases in the wave induced shear stress, $\tau$, acting on that bed. The wave induced shear stress in turn causes scour and erosion of the seabed when it exceeds the critical or threshold shear stress, $\tau_{crit}$, that induces sediment motion, or when $\tau \geq \tau_{crit}$. They refer to infiltration rates, $w_m$, as "ventilation" and quantify it relative to the wave velocity amplitude, $u_m$, in terms of a ventilation parameter, $\widetilde{V} = w_m / u_m$. Figure 2 plots the time variation of the wave induced shear stress on a porous bed for one half cycle of motion, as under a wave crest. The solid curve in Figure 2 plots the bottom stress for no infiltration or ventilation, when $\widetilde{V} = 0$. The shear stress curves are normalized by the maximum shear stress with no ventilation, $\tau_{m0}$, and

MUNICIPAL WATER DISTRICT
OF ORANGE COUNTY

SOUTH ORANGE COASTAL OCEAN DESALINATION PROJECT
VERTICAL INFILTRATION RATE OF OCEAN WATER IN THE
VICINITY OF THE SLANT WELL INTAKE SYSTEM




EXPLANATION

NOTE: The vertical infiltration rate is the average rate.

Area of Ocean Water Source

Alluvium Boundary

Approximate Location of Offshore Bedrock Outcrop (source: Lowry, 1977). Dashed where estimated.

— 4.3E-05 — Vertical Infiltration Rate (ft/sec) Under Full-Scale Operation of Ocean Desalination Project Conditions.

white line: Slant Well Screen

Slant Well Blank Casing

MWDOC Borehole

MWDOC Monitoring Well

San Juan Basin Authority Monitoring Well

SCWD Monitoring Well

SCWD Monitoring Well

5-Oct-10

Prepared by: DWB

Map Projection
State Plane 1983, Zone VI

GEOSCIENCE

VARIATION OF
VERTICAL INFILTRATION
RATE IN OCEAN WATER
SOURCE AREA

Figure 1

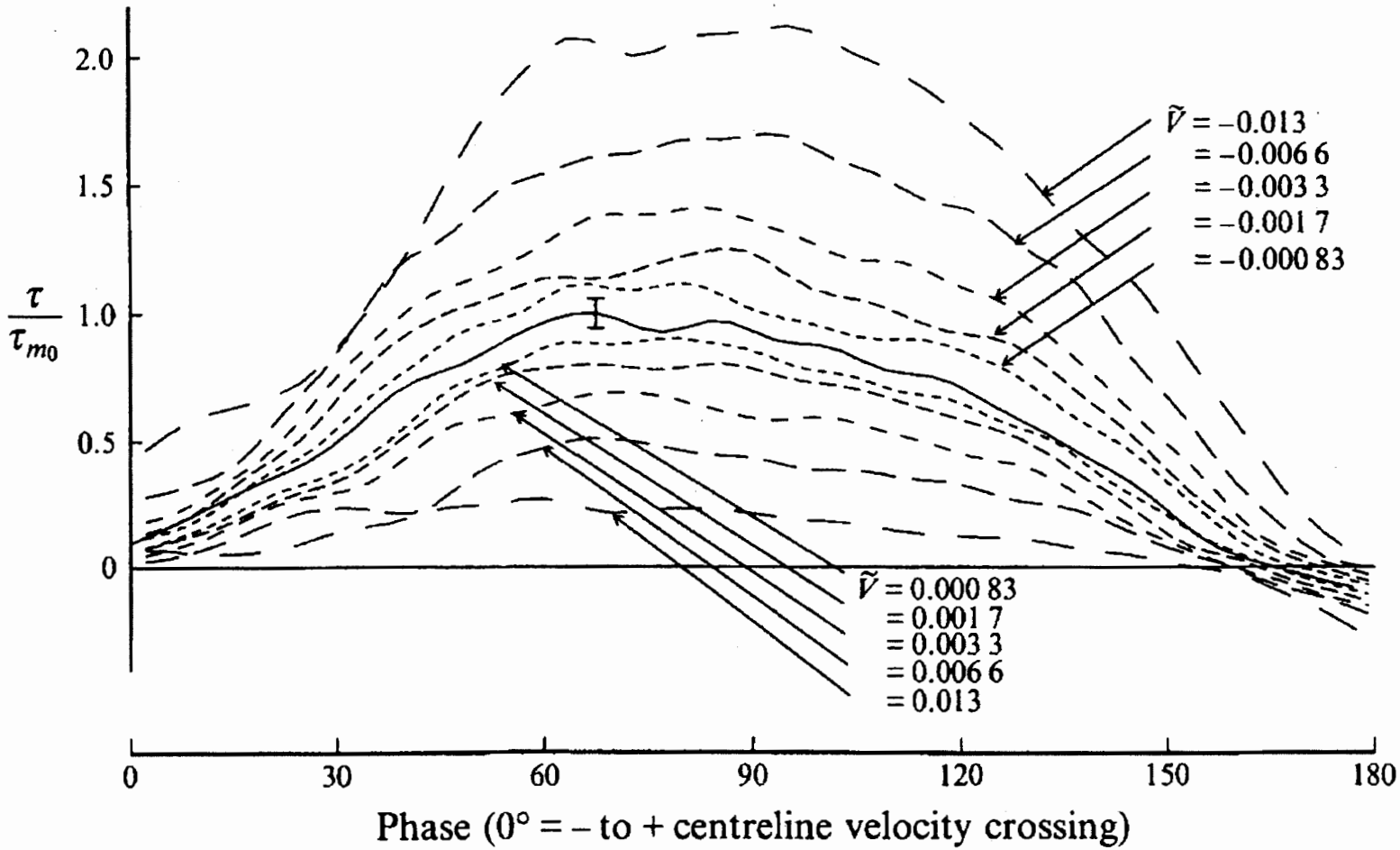



FIGURE 2. Ensemble-averaged bed stress for various values of $\tilde{V}$. Values are normalized by the maximum unventilated bed stress. Solid line is bed stress for unventilated case. The error bar represents 95% confidence level of peak stress [from Conley and Inman, 1994].

we find that the curve for no ventilation reaches a maximum of $\tau / \tau_{m0} = 1.0$. Above this curve are other bottom shear stress curves for negative ventilation, $\widetilde{V} < 0$, when water is being drawn or sucked into the bed, as would occur with infiltration into the seabed above buried slant wells. Figure 2 shows that the maximum bottom stress doubles when the infiltration rate or ventilation is only 1.3% as large as the wave velocity amplitude, when $\widetilde{V} = -0.013$. On the other hand, the wave induced bottom stress is diminished when water is forced out of the bed, a condition referred to as injection, when $\widetilde{V} > 0$. The injection examples in Figure 2 (when $\widetilde{V} > 0$) show that $\tau / \tau_{m0} < 1.0$

The wave induced bottom stress in Figure 2 can be integrated over time to give the average bottom stress over a wave length with no ventilation, $\langle |\tau_0| \rangle$, and with ventilation, $\langle \tau_v \rangle$. The ratio of these two time-averaged shear stresses give the percentage increase in bottom stress due to ventilation, as plotted in Figure 3. Conely and Inman, 1994, show that this ratio follows a simple linear relationship,

$$\frac{\langle \tau_v \rangle}{\langle |\tau_0| \rangle} = \frac{b\widetilde{V}}{2f_w} \qquad (1)$$

Where $b = 0.9$ for ideal granular sedimentary seabeds and $f_w = 2\tau_{m0} / \rho u_m^2$ is the wave friction factor after Jonsson, 1963, and $\rho$ is the density of the ocean water.

**Analysis of Potential for Seabed Erosion:** Figure 3 and equation (1) indicate that the percentage increase in wave induced bottom stress grows linearly with the ventilation parameter, $\widetilde{V} = w_m / u_m$. To quantify the potential for seabed erosion we calculate this parameter in terms of the size of the reported infiltration rates $w_m$ over the slant well field relative to the threshold velocity for transport, $u_m = u_{crit}$, of the native beach sediment. Figure 4 plots the grain size distribution of the native beach sand taken from the surf zone at Doheney Beach by Reed, et al, 1975. The median grain size is shown to be 0.22 mm (220 microns). Figure 5 gives the threshold velocity for transport (black curve) as a function of median grain size. Inspection of Figure 5 indicates that the threshold velocity for transport for 0.22 mm sized sand is $u_m = u_{crit} = 0.6$ ft/sec. Therefore the ventilation parameter directly over the well field when the wave oscillatory velocity is at the threshold of beach scour is:

$$\widetilde{V} = w_m / u_m = \frac{5.1 \times 10^{-5}}{6 \times 10^{-1}} = 8.5 \times 10^{-5} \qquad (2)$$

With this value of ventilation parameter inserted into equation (1) or plotted in Figure 3, the infiltration rate over the well field will cause a net increase in wave induced bottom stress of $\langle \tau_v \rangle / \langle |\tau_0| \rangle = 1\%$. Figure 6 gives contours of net bottom stress increases over a near shore region from the slant well field extending offshore to the outer limits of the recharge zone based on the infiltration rates calculated by Geoscience, 2010, in Figure 1. While the

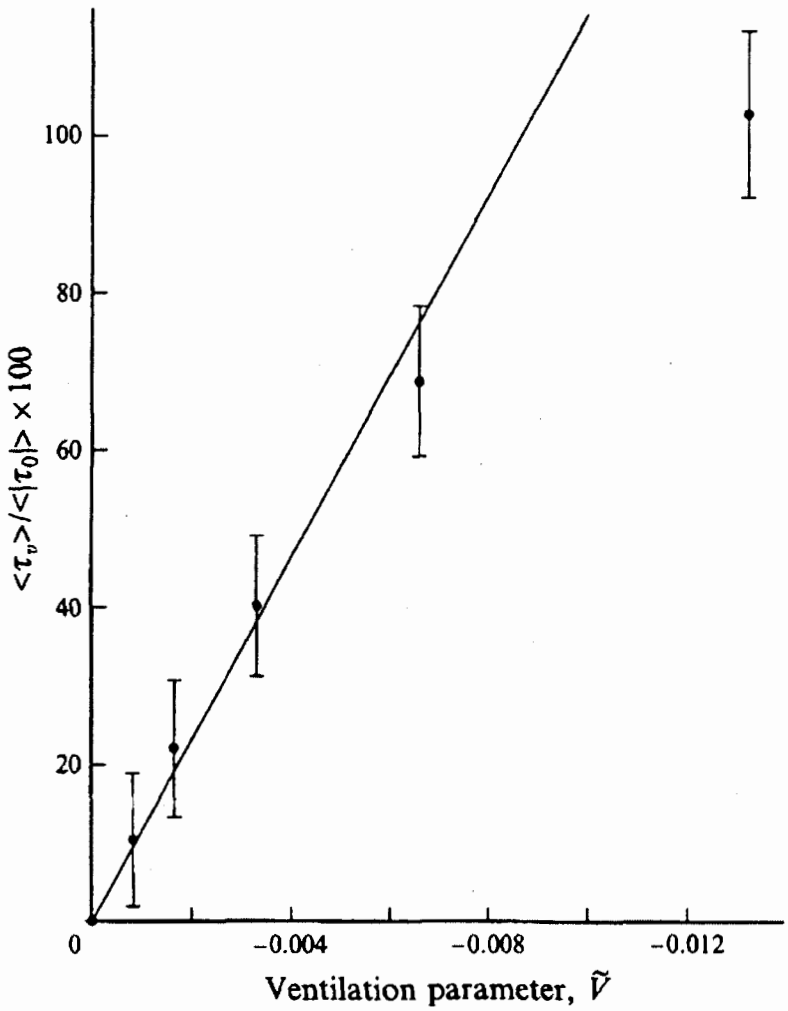



FIGURE 3. Average net ventilated bed stress as a percentage of average gross unventilated bed stress *vs.* $\tilde{V}$. Solid line is computed from (1) with $b = 0.9$. Error bars are 95% confidence interval [from Conley and Inman, 1994].

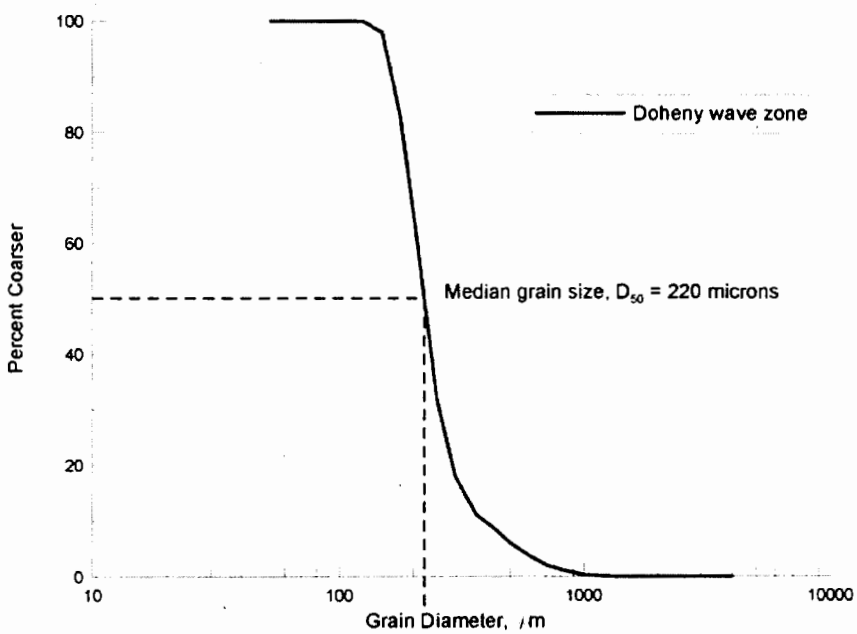



**Figure 4 . Grain size distribution at Doheny Beach, from surfzone measurements after Reed et al., 1975.**

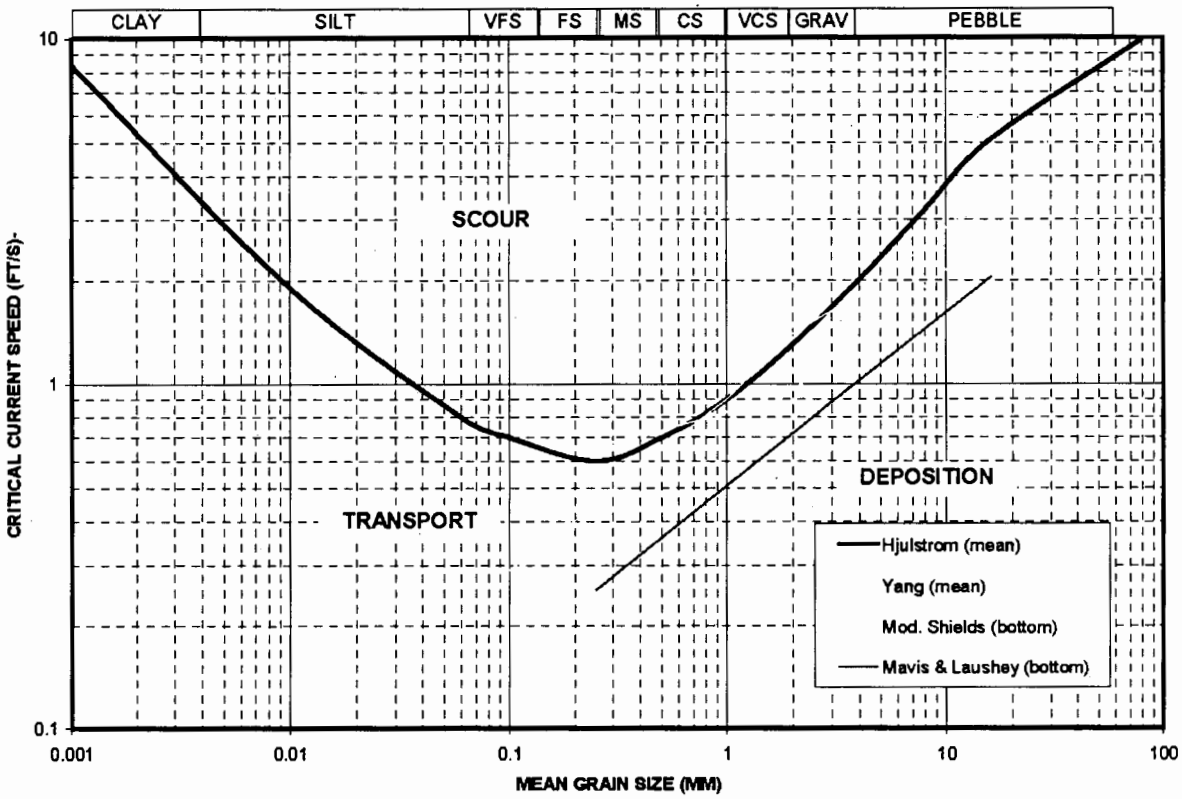



**Figure 5:** Threshold velocity of transport for quartz sediment as a function of mean grain size, (from Everest, 2007).

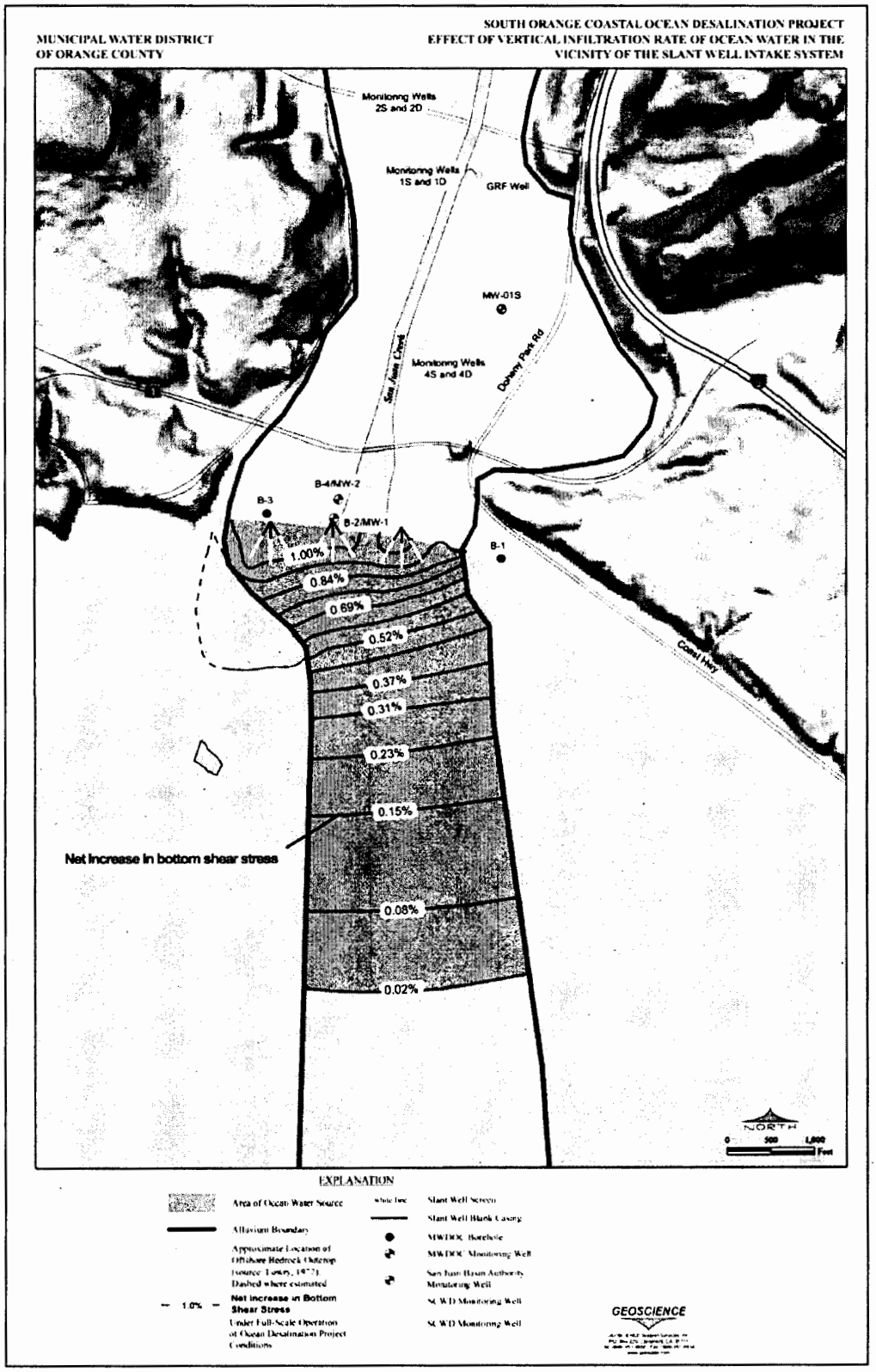



**Figure 6.** Net increase in wave-induced bottom stress at scour onset due to infiltration rates plotted in Figure 1 [after GEOSCIENCE, 2010].

maximum net increase in bottom stress is 1% directly over the well field, the net stress increase drops to only 0.02% at the outer limit of the recharge zone where infiltration rates are only $w_m = 7.8 \text{ X } 10^{-7}$ ft/sec. Regardless, the net increase in bottom stress calculated for the well field at the onset of scour from equation (1) is every where substantially smaller than the error bars of the net shear stress increase in Figure 3, even under carefully controlled laboratory conditions. At these very small values of ventilation parameter, the error in the net shear stress increase calculated from equation (1) is about +/- 9%, nine times greater than the theoretical maximum effect of the slant wells. Therefore the net increase in bottom stress calculated for the well field may be regarded as negligible in a statistical sense. In a physical sense, it is equally negligible in comparison to naturally occurring broad-scale seasonal beach profile variation and erosion at Doheny Beach and the surrounding Dana Point headland. Figure 7 gives a refraction/diffraction plot for the 1 March 1983 storm, indicating 6m high breakers off Dana Point and 2m – 4m high wave runup at Doheny Beach. Such storms can cause as much as 2m loss in the thickness of the beach sediment cover, as evidenced by the envelope of variability in beach profiles shown in Figure 8. A 1% increase in bottom stress as attributable to the maximum effect of the slant well infiltration rates is trivial by comparison to the thousands of percent increases in wave induced stresses that occur naturally during such storms and which cause such dramatic erosion and seasonal variation in beach profiles shown in Figure 8.

**Analysis of Potential for Seabed Impingement of Micro-organisms:** The vertical pressure gradients in the seabed sediments produced by of the slant wells have the potential to trap or cause neutrally buoyant, freely drifting micro-organisms (eggs and plankton) to impact on the seabed by the action of suction forces, $F_s$. Figure 9 gives a force and moment balance of a micro-organism that has hypothetically been impacted on the seabed by the action of these suction forces forming an impact crater on a seabed sloping at angle $\beta$. The vertical pressure gradients causing such an impact are assumed to be isotropic through the seabed sediments and arise from the hydraulic head difference, $\Delta h$, acting across the average vertical distance, $\Delta x$ between the seafloor and the middle of the intake well screen sections. If we assume these pressure gradients act on small spherical micro organisms whose equivalent diameter is $D$, then the suction force holding these organisms against the seabed is

$$F_s = \frac{1}{8} \rho g \pi D^3 \frac{\Delta h}{\Delta x} \qquad (3)$$

Here $g$ is the acceleration of gravity and from Geoscience (2010) the vertical gradient of hydraulic head through the seabed is $\Delta h / \Delta x = 65$ ft/120 ft = 0.54. Nanoplankton have an equivalent spherical diameter of 5 microns, and net plankton have an equivalent spherical diameter of 20 -30 microns (Langdon, 1988). The impacted or impinged plankton will remain trapped on the sea bed until the suction moment restraining its motion $F_s \times r_1$ is exceeded by the sum of hydrodynamic moments acting to move it out of its impact crater, as shown by the moment balance in Figure 9. This moment balance reduces to:

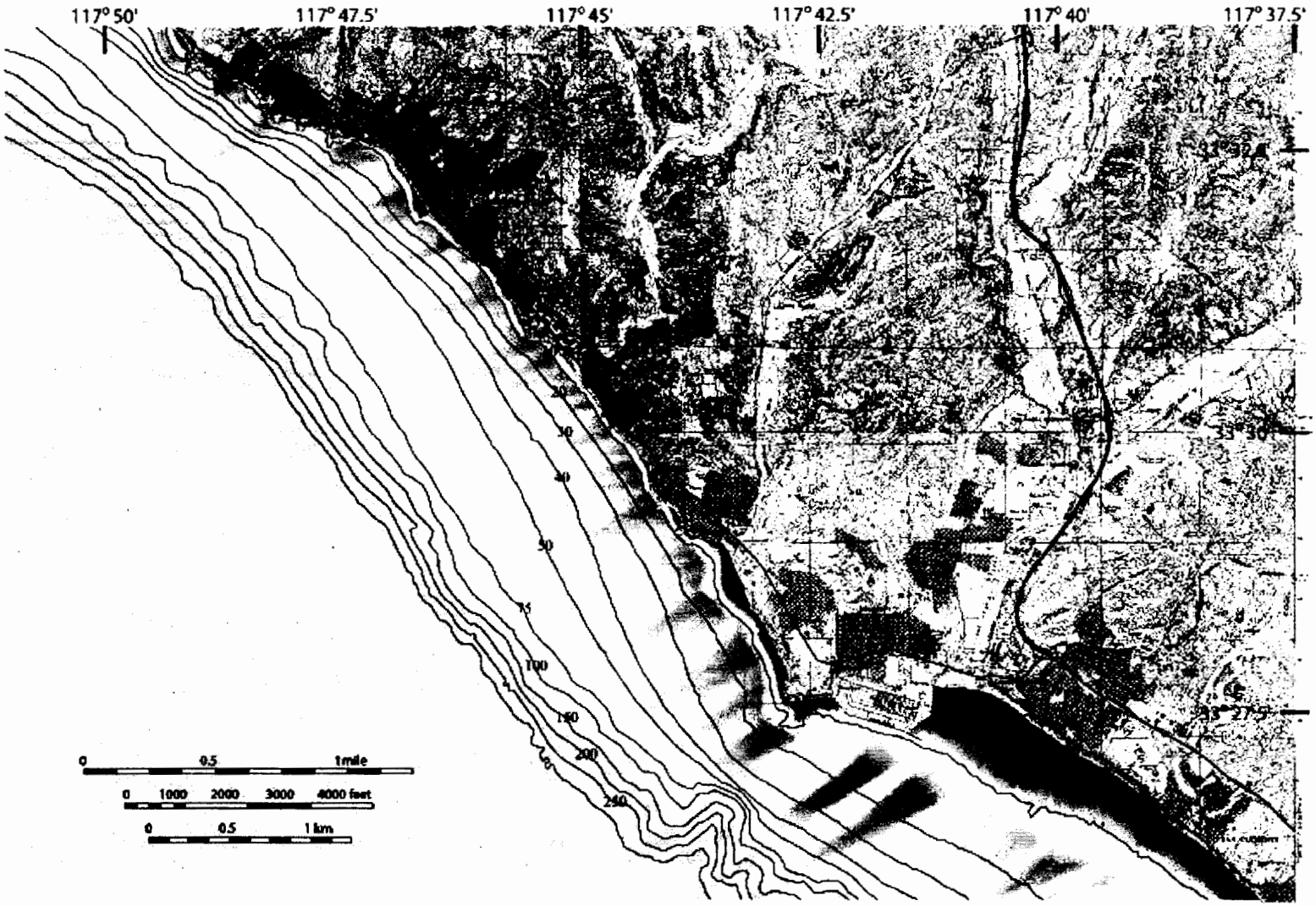


Figure 7. Dana Point wave refraction for the 1 March 1983 storm
Wave height at offshore control point = 6.5 m, T=15.5 sec, from 223.5°
from Jenkins and Wasyl, (2002), Headland Reserve Project Certified EIR.

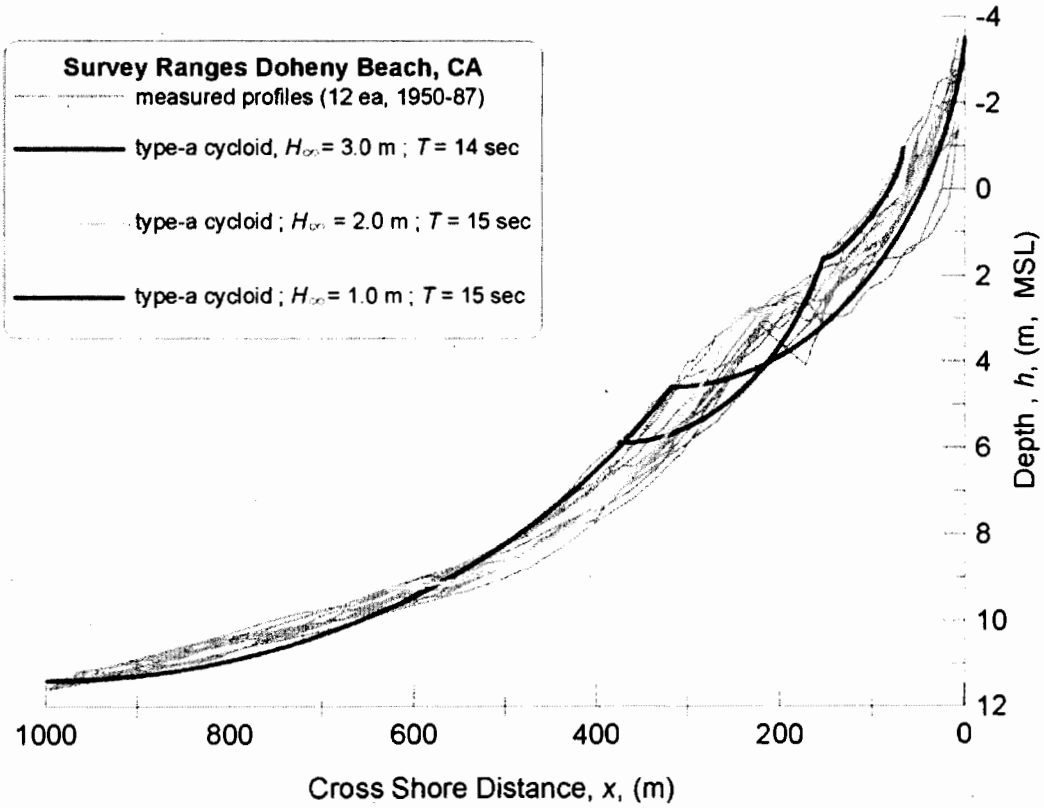
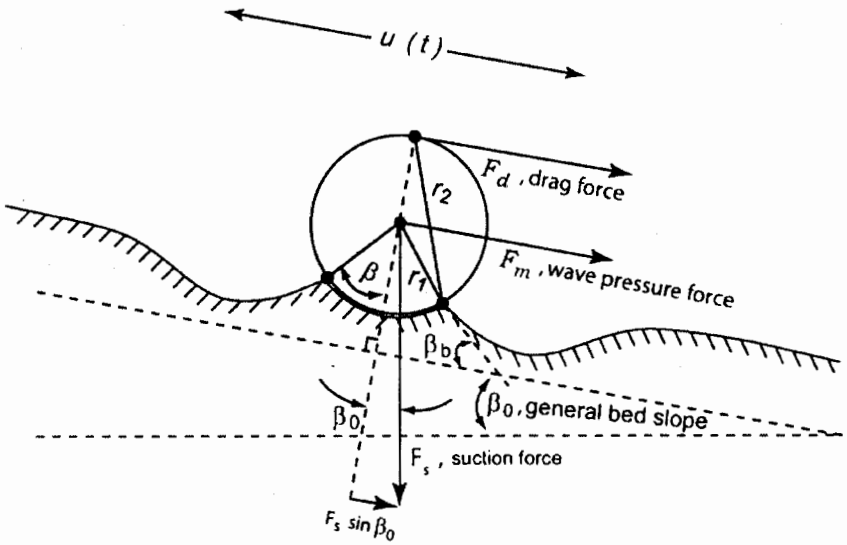



**Figure 8.** Envelope of variability of measured beach profiles (1950-87) at Doheny Beach, CA (grey) compared to the ensemble of elliptic cycloid solutions (colored) for selected incident wave heights and periods with $D$ = 220 $\mu$m, $N$ = 10, $\gamma$ = 0.8, and $\Lambda$ = 0.81. (after Jenkins and Inman, 2006).

$$F_s \sin(\phi - \beta) = \rho C_d A_0 u_m^2 (1 + \cos\phi) + \rho c_m V_0 \frac{du}{dt}(1 + \cos\phi) \qquad (4)$$

where $\phi$ is the angle of repose; the first term on the right hand side of equation (4) is due to hydrodynamic drag; and the second term is due to the wave pressure (virtual mass force) acting on the impinged organism. Since the organism is very small in relation to the wave height or oscillatory amplitude, the virtual mass force is negligible compared to the drag force (Jenkins and Inman, 1985, Batchelor, 1970). The hydrodynamic drag due to the wave oscillations acting to scrub these tiny organisms free of the suction forces can be represented as

$$F_d = \frac{1}{4} \rho C_d \pi D^2 u_m^2 \qquad (5)$$




Threshold of migration criteria: Σ moments = 0

$$\vec{F_s} \times \vec{r_1} = \vec{F_m} \times \vec{r_1} + \vec{F_d} \times \vec{r_2}$$

**Figure 9.** Criteria for incipient motion of neutrally buoyant micro-organism impacted on the seabed by well infiltration rates. Organism moves when the sum of moments due to hydrodynamic forces (right side of equation) exceed the moment due to suction forces arising from vertical pressure gradient induced by the buried slant wells (left side of equation).

Where $C_d = 24/R_e$ is the drag coefficient on a tiny sphere (Stokes approximation); $R_e = u_m D/\upsilon$ is the Reynolds number and $\upsilon = 10^{-2}$ cm$^2$/sec is the kinematic viscosity (Batchelor, 1970, Jenkins and Inman, 1985). In a worst case scenario, we take $\sin(\phi - \beta) \cong 1$ and $(1 + \cos\phi) \cong 1$, whence the organism will break free of the pressure gradient holding it on the sea bed when the oscillatory wave velocity exceeds the following:

$$u_m \geq \frac{gD^2}{48\upsilon}\frac{\Delta h}{\Delta x} \cong 0.01 \text{ cm/sec} \qquad \text{(netplankton)}$$
$$\cong 0.003 \text{ cm/sec} \qquad \text{(nanoplankton)} \tag{6}$$

In either case, only minute oscillatory wave velocities are required to prevent these micro-organisms from becoming trapped or impinged by the seabed. The wave climate at Doheny Beach and the Dana Point region *always* produces waves that exceed these minimal oscillatory velocities in the depth regime of the well field and recharge zone shown in Figure 1, (USACOE, 1987, 1991).

**Conclusions:** Analytic calculations were made to determine the potential for seabed erosion and micro-organism impingement on the seabed due to infiltration rates and pressure gradients induced by the slant well field of the South Orange Coastal Ocean Desalination Project. The calculations were based on infiltration rates and seabed pressure gradients modeled by Geoscience, (2010). While the modeled infiltration rates were found to increase net bottom shear stress by no more than 1% at the onset of erosion, this value is considered statistically insignificant as it is nine times smaller than the error implicit in the net shear stress increases determined under controlled laboratory conditions. Even then, whatever sediment transport is attributable to this 1% increase in bottom stress is both limited to the immediate vicinity of the slant well intake and is insignificant in comparison to naturally occurring seasonal beach profile variation and storm induced erosion. Force balance calculations show that the ocean would have to become perfectly quiescent in order for nano- and netplankton and other neutrally buoyant, freely drifting micro-organisms to become impinged or trapped on the seabed by the vertical pressure gradient induced by the slant well field. Such a quiescent wave climate has never been measured or observed at this site.

**References**:

Batchelor, G.K., 1970, *An Introduction to Fluid Mechanics*, Cambridge Univ. Press., 615 pp.

Conely, D. C. and D. L. Inman, 1994, "Ventilated oscillatory boundary layers", *Jour. Fluid Mech.*, v.273, p.261-284.

Geoscience, 2010, "South Orange Coastal Ocean Desalination Project- Vertical Infiltration Rate of Ocean Water Migrating Through the Seafloor in the Vicinity of the Slant Well Intake System", Tech Memo, submitted to Municipal Water District of Orange County, 5 October 2010, 3pp.

Jenkins, S. A. and D. L. Inman, 1985, "On a submerged sphere in a viscous fluid excited by small amplitude periodic motion," *Jour. Fluid Mech.*, v. 157, p. 199-124.

Jenkins, S. A. and D. L. Inman, 2006, "Thermodynamic solutions for equilibrium beach profiles", *Jour. Geophys. Res.,* v.3, C02003, doi:10.1029, 21pp.

Jonsson, I. G. , 1963, "Measurements in turbulent wave boundary layers," *Proc. 20th Congr. IAHR*, pp. 85092.

Langdon, C., 1988, "On the causes of interspecific differences in the growth-irradiance relationship of phytoplankton", *Jour Plankton Res.*, v. 10, pp1291-1312.

Reed, W.E., Le Fever, R., and M. J. Gordon, 1975, "Depositional environment interpretation from settling velocity distributions", *Geo. Soc. Am. Bull.*, v. 86, pp 1321-1328.

US Army Corps of Engineers (USACOE), 1987, "Coast of California storm and tidal waves study", no. 90-2, Los Angeles, District, 234 pp.

US Army Corps of Engineers (USACOE), 1991, "Coast of California storm and tidal waves Study, San Diego Region", v. 2, Los Angeles, District, 301 pp.

GEOSCIENCE

# Technical Memorandum

| | |
|---|---|
| **To:** | Mr. Richard Bell, P.E.<br>Principal Engineer<br>Municipal Water District of Orange County<br>10500 Ellis Avenue<br>Fountain Valley, California 92728 |
| **From:** | Dennis E. Williams, Ph.D.<br>President<br>GEOSCIENCE Support Services, Inc. |
| **Date:** | October 5, 2010 |
| **Subject:** | **South Orange Coastal Ocean Desalination Project – Vertical Infiltration Rate of Ocean Water Migrating Through the Seafloor in the Vicinity of the Slant Well Intake System** |

## Background

The South Orange Coastal Ocean Desalination Project will be located near the mouth of San Juan Creek in Dana Point, Southern California. The 15 mgd desalination plant will include a subsurface feedwater supply system consisting of seven slant wells[1] producing a total of 30 mgd. Based on results from ground water modeling, 95% of the recharge to the 30 mgd slant well supply is derived from ocean water sources migrating through the alluvium beneath the ocean. Figure 1 shows the area of the ocean water source for the slant well feedwater supply system along with the alluvial boundary in the vicinity of the wellfield. The area of the ocean water source was delineated based on groundwater model drawdowns greater than one foot in the alluvial aquifer beneath the ocean. This area is the area of recharge to the main aquifer tapped by the well screens. The purpose of this technical memorandum is to quantify the vertical

[1] A total of nine slant wells will be constructed, with seven wells operating continuously at any given time to produce the 30 mgd feedwater supply. Operation of the wellfield will include periodic rotation of slant well pumping in order to provide for routine maintenance.

GEOSCIENCE SUPPORT SERVICES INCORPORATED
*Ground Water Resources Development*
P.O. Box 220, Claremont, CA 91711
T: 909-451-6650
F: 909-451-6638

infiltration rate of ocean water migrating through the seafloor in the vicinity of the slant well intake system under full-scale project conditions (i.e., 30 mgd).

**Calculation of Vertical Infiltration Rate of Ocean Water Migrating Through the Seafloor**

The vertical infiltration rate of ocean water migrating through the seafloor in the vicinity of the slant well intake system under full-scale project conditions (30 mgd) can be calculated using the following equation:

$$w = \frac{Kv}{\theta} \bullet \frac{\Delta h}{\Delta x}$$

Where:

$w$ = Vertical infiltration rate of ocean water migrating through the seafloor (ft/sec),

$Kv$ = Vertical hydraulic conductivity of seafloor sediments (0.000014 ft/sec),

$\theta$ = Effective porosity of seafloor sediments (0.15),

$\Delta h$ = Hydraulic head difference between the ocean surface and ground water levels in the vicinity of feedwater supply wellfield (65 ft),

$\Delta x$ = Average vertical distance from the seafloor to the middle of the intake well screen[2] sections (120 ft)

The vertical hydraulic conductivity value of 0.000014 ft/sec and the effective porosity value of 0.15 were based on field data (on-shore and test slant well lithologic logging and lab permeameter measurements) and verified by the calibrated ground water model. The maximum hydraulic head difference between the ocean surface and the slant well pumping levels was estimated to be 65 ft under the full-scale project conditions.[3] The average distance from the seafloor to the middle of the screened portions of the slant well feedwater supply is

[2] Assuming 1,000 ft slant wells drilled at 9 degrees below horizontal with 500 ft of screen in the lower portion of the wells

[3] GEOSCIENCE Support Services, Inc., 2007. Subsurface System Intake Feasibility Assessment. Task 4 Report. Prepared for the Municipal Water District of Orange County.

approximately 120 ft. Therefore, the maximum vertical infiltration rate of ocean water migrating vertically downward through the seafloor to the slant well intake screens is estimated to be 0.000051 ft/sec. That is the maximum vertical infiltration rate of ocean water migrating through the seafloor over the zone of ocean water recharge is in the vicinity of the maximum drawdowns (i.e., near the slant well intakes).

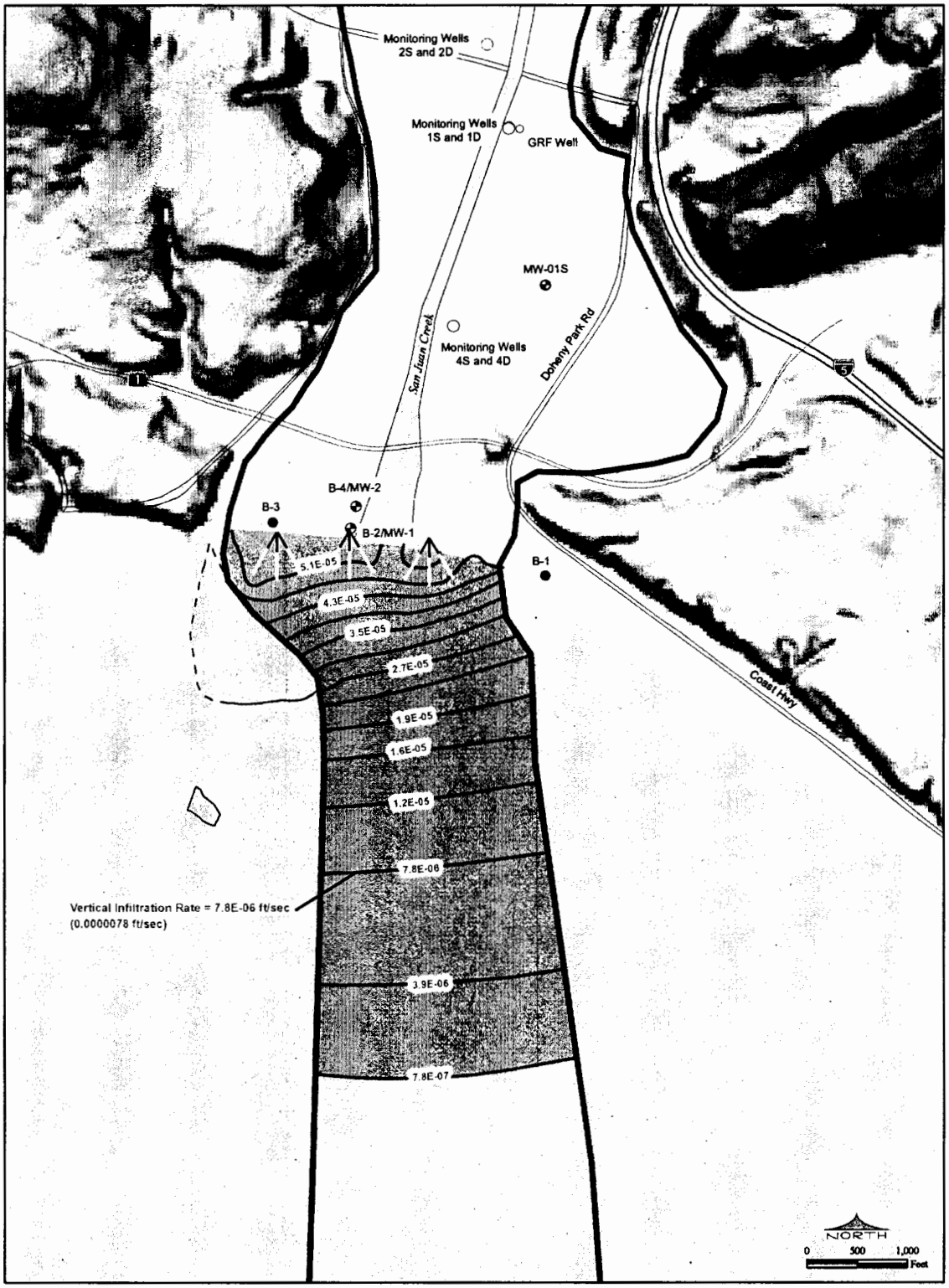
**Variation of Vertical Infiltration Rate within the Ocean Water Source Area**

The variation of vertical infiltration rate of ocean water migrating through the seafloor for the area within the ocean water source area (to the wellfiled) was calculated using the same equation as used above. However, the hydraulic head difference was varied over the area of the ocean water source area, specifically 65 ft in the immediate vicinity of the wellfield to one foot at the boundary of the ocean water source area. The same vertical hydraulic conductivity value of 0.000014 ft/sec and effective porosity value of 0.15 were used. It was also assumed that infiltration from the ocean travels vertically downward to a depth representing the middle point of the slant well intake screens (i.e., 120 ft). In other words, in areas away from the slant well intakes, vertically migrating ocean water was assumed to travel vertically 120 ft under a varying hydraulic head difference before turning horizontal and migrating to the wellfield area.

Based on these assumptions, the vertical infiltration rate varies (under full-scale operating conditions) from 0.00000078 ft/sec at the outer limits of the ocean water source area to 0.000051 ft/sec in the immediate vicinity of the wellfield (see Figure 1).

MUNICIPAL WATER DISTRICT
OF ORANGE COUNTY

SOUTH ORANGE COASTAL OCEAN DESALINATION PROJECT
VERTICAL INFILTRATION RATE OF OCEAN WATER IN THE
VICINITY OF THE SLANT WELL INTAKE SYSTEM




EXPLANATION

NOTE: The vertical infiltration rate is the average rate.

Area of Ocean Water Source

Alluvium Boundary

Approximate Location of Offshore Bedrock Outcrop (source: Lowry, 1977). Dashed where estimated.

— 4.3E-05 — Vertical Infiltration Rate (ft/sec) Under Full-Scale Operation of Ocean Desalination Project Conditions.

white line — Slant Well Screen

Slant Well Blank Casing

MWDOC Borehole

MWDOC Monitoring Well

San Juan Basin Authority Monitoring Well

SCWD Monitoring Well

SCWD Monitoring Well

5-Oct-10

Prepared by: DWB

Map Projection:
State Plane 1983, Zone VI

GIS_proj\mwdoc_model_9-08/00_Memo_Fig_1_area_influenced_10-10.mxd

VARIATION OF
VERTICAL INFILTRATION
RATE IN OCEAN WATER
SOURCE AREA

GEOSCIENCE

Figure 1

THE METROPOLITAN WATER DISTRICT
OF SOUTHERN CALIFORNIA

Office of the General Manager

December 6, 2011

Ms. Carole H. Beswick
Chair
California Regional Water Quality Control Board
Santa Ana Region 8
3737 Main Street, Suite 500
Riverside, CA 92501-3348

Dear Ms. Beswick:

Huntington Beach Seawater Desalination Project

The Metropolitan Water District of Southern California's (Metropolitan) service area supports over 19 million people and a nearly $1 trillion-dollar economy. Through cooperative efforts, Metropolitan and the water agencies in Orange County are statewide leaders in water conservation, wastewater recycling, and brackish groundwater desalination. However, additional local water management actions such as seawater desalination are needed to help the region manage long-term water supply risks and short-term disruptions to imported supplies.

Metropolitan supports the development of a seawater desalination project in Huntington Beach that would include the participation of its four Orange County member agencies: the Municipal Water District of Orange County (MWDOC), and the cities of Anaheim, Fullerton, and Santa Ana. The completed project would help diversify Southern California's water resource portfolio and provide a new, local water supply that will help reduce the reliance on imported supplies to meet expected future demands.

We have informed the project proponents of the technical requirements for integrating this supply into Metropolitan's regional pipelines and look forward to working with them on the design.

Metropolitan's service area faces long-term water supply challenges including economic development, climate change impacts, uncertainty in imported supplies, and potential disruptions due to earthquakes. The project would help secure supply reliability in Southern California against these uncertainties.

Thank you for considering our comments.

Yours truly,

Deven N. Upadhyay
Manager, Water Resource Management

WAT:jc
o:\a\s\c\2011\WAT_Huntington Beach EIR Support Letter – RWQCB Hearing 12-9-2011.doc

cc: Mr. Kevin Hunt
General Manager
Municipal Water District of Orange County
18700 Ward Street
Fountain Valley, CA 92708

Mr. Peter M. MacLaggan
Poseidon Resources Corporation
501 West Broadway, Suite 840
San Diego, CA 92101

**TO:** Regional Water Quality Control Board – Santa Ana Region
3737 Main Street, Suite 500
Riverside, CA 92501-3348

**FROM:** Residents for Responsible Desal, Desal Response Group, Coastal Environmental Rights Foundation

**DATE**: December 4, 2011

*Via Electronic Mail*: kberchtold@waterboards.ca.gov & gstewart@waterboards.ca.gov

**RE: Waste Discharge Requirements for Poseidon Resources Huntington Beach Desalination Facility; Order No. R8-2011-0046; NPDES No. CA 8000403**

Dear Chair Beswick and Board Members:

Thank you for the opportunity to comment on the Tentative Order referenced above. On behalf of Residents for Responsible Desal, Desal Response Group, and Coastal Environmental Rights Foundation, and our collective members, dedicated to restoring and protecting our coast and ocean, **we urge your denial of the Permit for the Huntington Beach Desalination Facility**.

Residents for Responsible Desalination is a grass roots organization formed 10 years ago in response to the proposal of an ocean desalination plant proposed for the coastline of Surf City USA, Huntington Beach, CA. Huntington Beach's entire financial backbone is braced on the tourism industry. People visit this city to enjoy the surf and a clean ocean, not to see industrial complexes built on the beach. Education of the public regarding the building of the Huntington Beach plant is Residents for Responsible Desalination's primary concern. We support conservation, reclamation and recycling FIRST. When these efforts are exhausted ocean desal should be considered as a last resort. However, any desalination *must* be undertaken with the best available technology to ensure the least amount of damage to our marine environment and our beloved coastline.

The Desal Response Group is made up of organizations across the state reviewing ocean water desalination proposals and working on the environmental response and alternatives.

Coastal Environmental Rights Foundation (CERF) is a nonprofit environmental organization founded by surfers in North San Diego County and active throughout California's coastal communities. CERF was established to aggressively advocate for the protection and enhancement of coastal natural resources and the quality of life for coastal residents. CERF has been a longtime advocate for responsible water supply planning and development and has actively opposed Poseidon's similar, proposed desalination facility in Carlsbad, California.

We especially appreciate your offer to accept and consider public comments up to and during the December 9, 2011 hearing, as noted in the hearing notification. Below you will find our concerns with the staff analysis of the proposed ocean desalination facility (Facility), and the resulting recommendation to adopt the Tentative Order. Changed circumstances since the Board's initial

approval of the 2006 permit for the Huntington Beach Generating Station (HBGS), including the adoption of new state policy by the State Water Resources Control Board that restricts the use of seawater for cooling power plants, including the HBGS, are substantial and demand an exhaustive review of alternatives to the Facility proposed at that time.[1] Unfortunately, the analysis and draft tentative Order do not require any changes in the Applicant's plans in response to this significant change in State policy on the use of seawater for an industrial use – a change that directly affects the future use of the infrastructure on which their design depends. Further, the proposed re-issuance fails to acknowledge that the SWRCB is currently crafting policy that will specifically address the operation of seawater desalination facilities. At a minimum, the RWQCB should not be approving a permit that is likely to conflict with future state policy on the operation of seawater desalination facilities.

Our concerns about the inadequacies in the scope of the analysis, and the absence of any substantive conditions on the permit that address changes in law since the 2006 permit was issued, leave us with no alternative but to recommend;

- Denial of the permit as it is currently written;
- Direction to the Applicant and staff to do a more thorough review of alternative sites, designs and technologies to minimize the intake and mortality of marine life – specifically prohibiting the existing open ocean intake at Huntington Beach Generating Station for "source water" intake;
- Direction to the Applicant and staff to do a more thorough review of alternatives for the disposal and/or discharge of the separate waste streams from the Facility that both maximize protection of the marine ecology, and eliminate the need for additional withdrawal of seawater solely to dilute the waste stream before it is discharged.

We very much appreciate your thoughtful consideration of our comments. We look forward to your denial of the current re-issuance application, as well as an opportunity to review a proposal that meets the letter and intent of State policies and laws to protect our precious, yet threatened, marine ecosystems.

Sincerely,

Merle Moshiri
President
Residents for Responsible Desalination

R4RD@hbdesalfacts.org
19412 Pompano Ln. #107
Huntington Beach, CA 92648

Conner Everts
Co-Chair
Desal Response Group

connere@west.net
At Environment Now
2515 Wilshire Blvd.
Santa Monica, CA 90403

Marco Gonzalez
Interim Executive Director
CERF

marco@cerf.org
1140 S. Coast Highway 101
Encinitas, CA 92024

[1] See: Order No. R8-2006-0034, NPDES No. CA8000403, Attachment F, Section VII. B. 1, page F-3 [Reopener Provisions]

## COMMENTS

*I. The site, design and technology proposed in the Tentative Order violates the intent and the letter of Water Code section 13142.5(b) and undermines the intent of the recently adopted "Statewide Water Quality Control Policy On The Use Of Coastal And Estuarine Waters For Power Plant Cooling" (OTC Policy)*

As you know, relevant law applicable to the permit is found in the Water Code Section 13142.5(b). The Water Code clearly mandates:

> For each new or expanded coastal powerplant or other industrial installation using seawater for cooling, heating, or industrial processing, the best available site, design, technology, and mitigation measures feasible shall be used to minimize the intake and mortality of all forms of marine life.

The original 2006 NPDES permit was issued for co-location with the Huntington Beach Generating Station (HBGS) primarily to take advantage of the cooling water discharge from that power plant.[2] Although the 2006 "Fact Sheet" acknowledged the Facility would withdraw "source water" from the HBGS, there was no accompanying analysis of alternatives to the use of the HBGS' discharge as the "source water." Nonetheless, the Applicant's CEQA analysis implied the proposed co-location with HBGS was the best site, design and technology for the Facility because the cooling water intake, and once-through cooling process, had already destroyed an assumed 100 percent of the marine life in the water withdrawn and discharged.

At the time of the original permit issuance it was arguable that the "best" site for the Facility was adjacent to the power plant because it allowed the use of the HBGS cooling water discharge as "source water" for the Facility without **adding** to the intake and mortality of marine life. While not expressly documented in the analysis or 2006 NPDES permit, we assume the Regional Board concurred.

In similar fashion, it was also arguably considered the "best" design because the Applicant could design a large production capacity for the Facility without concerns about the intake and mortality of marine life, again because the HBGS was assumed to be discharging ample volumes of seawater that were devoid of living organisms. Under the circumstances assumed at the time, there would be no need to withdraw additional seawater for either temporary or permanent "stand-alone operation" of the Facility.

Additionally, there was little need to assess alternate intake "technologies" because of the availability of the ample supply of water discharged from HBGS that was assumed to be devoid of marine life.

Finally, there was no analysis or consideration of other "mitigation" efforts that would minimize the intake of marine life -- presumably because the Board relied on the Fact Sheet stating that the

[2] See: Order No. R8-2006-0034, NPDES No. CA8000403, section II. B. [Facility Description]

Facility would utilize the HBGS discharge and no additional intake and mortality of marine life would occur.

It is important to recall that the Regional Board also approved a renewal of the HBGS' NPDES permit on the same day, with a Reopener Provision "… to assure compliance with the Clean Water Act Section 316(b) Phase II regulations and with relevant State policy for implementing those regulations."[3]

Since the Regional Board's approval of NPDES No. CA0001163 (HBGS discharge), and the concurrent approval of NPDES No. CA8000403 [Poseidon Seawater Desalination discharge], the State Water Resources Control Board (State Board) has adopted a statewide Policy on Cooling Water Intakes (OTC Policy).[4]

Therefore, the Regional Board should be considering this re-issuance as if it is an entirely **new** project proposal. The recent adoption of the OTC Policy has eliminated the basis for approving the 2006 NPDES permit – that basis being that the Facility should co-locate with the HBGS to utilize the existing discharge for the Facility's source water. Now, the withdrawal of seawater for the Facility during its lifetime of operation will be a "new" withdrawal and consequently demands an immediate and thorough analysis for compliance with the Water Code.

The assumptions and rationale for co-location in the 2006 NPDES permit are no longer applicable since the State Board adopted statewide policy to phase out the use of once-through cooling. The enforcement of that new policy is particularly relevant in the case of HBGS. Since adoption of the new Policy, the owner/operator of HBGS has submitted a "compliance plan" to the State Board indicating that they intend to dismantle the existing generators and replace them with a newer design that will employ closed-cycle "air cooling" – eliminating the need to withdraw and discharge seawater.[5] <u>In other words, the entire rationale in the 2006 NPDES permit for the site, design and lack of additional technological devices to minimize the intake and mortality of marine life, as mandated in the Water Code, has been eliminated with the adoption of the new "OTC Policy."</u>

Further, the OTC Policy clearly mandates HBGS to immediately cease withdrawing seawater unless the power plant is generating electricity or for specific emergency needs.[6] This requirement will dramatically reduce the average annual withdrawals cited in the Fact Sheet for the proposed re-issued NPDES permit currently before the Regional Board.

Also, it is our understanding that AES has sold the two newer and more efficient generators at HBGS to Mission Edison, and those two generators will be taken out of operation in the near future. HBGS is not a "base load" power plant and mostly operates during load demands that drive electricity prices high enough for the newer and/or older generators to produce electricity at a competitive price. This results in sporadic operation of the power plant. And it is reasonable to

---

[3] Order No. R8-2006-0011, NPDES No. CA0001163, Section VI. C. 1. (e) [reopener provision]
[4] Statewide Water Quality Control Policy On The Use Of Coastal And Estuarine Waters For Power Plant Cooling
[5] See Attachment A: "HBGS Implementation Plan" at Section 2.1, page 3.
[6] See: Statewide Water Quality Control Policy On The Use Of Coastal And Estuarine Waters For Power Plant Cooling, "Immediate and Interim Requirements", Section 2. C (2).

assume that, when the newer existing generators are taken out of commission, the power plant will operate even less frequently – again, reducing the average annual withdrawal of seawater cited in the Fact Sheet.

The analysis in the current tentative Order of the volume of water that will likely be available for "source water" during the so-called "temporary stand-alone operation" is based on historical records prior to adoption of the OTC Policy and the sale of two of the HBGS generators. This is now irrelevant information given the new mandate in the OTC Policy to discontinue seawater withdrawals when the plant is not generating electricity. A more accurate approach to estimate future discharge volumes would be calculated on a recent historical record of the days when the HBGS was actually *generating electricity*, how much water was withdrawn on those days, and whether or not that will likely diminish given the de-commissioning of the HBGS' most efficient generators. In fact, given the new OTC Policy, and the recent sale of the most efficient generators at the power plant, it is reasonably foreseeable that the HBGS intake and discharge volume will be dramatically less than what is assumed in the tentative Order Fact Sheet.

Finally, the State Board is currently developing statewide policy for guidance on the enforcement of the Water Code for the development of seawater desalination.[7] Given that the Water Code does not distinguish the use of seawater for "cooling, heating or other industrial processes", it is reasonably foreseeable the adopted policy will be as protective, if not more protective, in achieving the overriding goal to "minimize the intake and mortality of marine life" that was recently adopted in the OTC Policy – including the conclusion that existing open ocean intakes are not the best technology available.

**Because much of the analysis and recommendations in the tentative Order are inadequate for the reasons stated above. The Order should be denied until the flaws in the rationale for approving the NPDES permit are addressed and significantly improved.**

**Further, the Order should be denied because approving the Facility under the conditions in the tentative Order would undermine both the intent and letter of the new State Water Resource Control Board's "OTC Policy."**

*II. The analysis lacks a proposed methodology for integrating the components of Water Code section 13142.5(b) to ensure the overriding mandate to "minimize the intake and mortality of marine life."*

A new and thorough analysis of alternatives for a seawater desalination facility, and strict compliance with the mandates of the Water Code, is necessary given the changes in circumstances brought about by enforcement of the OTC Policy – in particular the plans by HBGS to permanently cease their withdrawal of seawater.

The phased approach for "temporary stand alone operation" and a subsequent "permanent stand alone operation" -- that is recommended in the Tentative Order -- is fatally flawed and must be denied. Any withdrawal of seawater above what is being discharged from HBGS is a **"new"** seawater withdrawal for industrial uses, and consequently regulated by Water Code Section

[7] SWRCB Public Notice can be found at: http://www.waterboards.ca.gov/water_issues/programs/ocean/desalination/

13142.5(b). In complying with the Water Code mandates, there is no rational distinction between withdrawing this new water above the volume currently discharged by HBGS on a "temporary basis" compared to withdrawing the total volume on a "permanent basis" once the HBGS discontinues withdrawing seawater. They are both "new" withdrawals for a "new industrial installation."

Nonetheless, the Tentative Order appears to postpone a full analysis of compliance with the mandates of the Water Code until after the HBGS has discontinued use of the cooling water intake.[8] This would allow construction on the HBGS site prior to a full analysis of compliance with the Water Code. This is unacceptable. As described in more detail below, a thorough analysis of compliance with the Water Code requires comparing alternatives for the best "technology" to minimize the intake and mortality of marine life, a "site" that is compatible with that technology, and finally a Facility "design" that is based on the production capacity allowed by the best technology and site feasible, and the associated intake volumes for "source water." This is the most reasonable method for analysis and enforcement of the Water Code if the Regional Board wants to ensure that the overriding mandate to minimize the intake of marine life is achieved.

The mandates of the Water Code must be analyzed as a whole, not as distinct parts unrelated to each other. But the Tentative Order, and the incorporated Fact Sheet and other attachments, do not describe the methodology for the analyses and consequently fail to reach a result that actually "minimizes the intake and mortality of marine life." We assert that one way to analyze the mandates of the Water Code to ensure actual minimization of the intake and mortality of marine life would be:

1. The "*best" technology* for minimizing the intake of marine life must be determined through a comparison of all available alternatives[9] [10];

2. The *"best" site* must be identified in consideration of its compatibility with the "best" technology to minimize the intake and mortality of marine life.

3. The *"best" design* must then be determined by the volume of water available from the best available site that is compatible with the best available technology.

For example, if the Regional Board made a determination that the best technology for minimizing marine life intake was subsurface intakes, but the site proposed by the Applicant was incompatible with that technology, then it must be determined that the Applicant has not chosen the "best site" for minimizing marine life intake. Then in the final step (after identifying the best technology, and a site compatible to support that technology) the Applicant can determine the volume of "source water" available when employing the best site and technology, and only then identify the *"best" design* for the Facility to match that intake volume.

---

[8] Tentative Order, Section II. C. at page 9.

[9] For example, see Attachments H, I, J, K, L and M (Assessments of various intake technologies, each indicating subsurface intakes superior at minimizing intake and mortality of marine. Other technologies, such as the more limited benefits of "wedgewire screens" and other technologies are also described.)

[10] Attachment G: (Assessment of marine life intake and mortality at MWDOC subsurface intake pilot in Dana Point. California, which as described in Attachment M)

We offer this as one example of an analytical methodology for ensuring that all the mandates in the Water Code are considered as a whole, not segmented in a way that does not ensure the greatest minimization of marine life intake and mortality. Unfortunately, the Fact Sheet and the Order inadequately interpret the language in the Water Code, and are void of any explanation of the methodology used for analyzing the project proposal to ensure full enforcement of the intent and letter of the Water Code. This renders the basis for the decision fatally inadequate, and the recommendation for temporary stand-alone operation premature.

In fact, the analyses and conditions in the Tentative Order appear to be based on the assumption that the Facility must produce 50 million gallons of potable water a day (MGD). However, there is no evidence that substantiates this baseline assumption. For example, there are, as of yet, no Water Purchase Agreements to purchase the Facility's produced water. And while it is not included in the analyses, there is an incentive program provided through Metropolitan Water District (MWD) with an expressed goal of producing a limited volume of potable water from ocean desalination region-wide. However, it does not require a 50 MGD Facility at this site. First, the MWD rebate incentive is a "soft target" for ocean desalination production and not a fixed quantity identified in their Urban Water Management Plan. It is simply a limit on available rebate funding. In short, a smaller production capacity design is both feasible and allows for a proposal employing a superior site, design AND technology – taken as a whole – to minimize the intake and mortality of marine life. Further, the MWD rebate program and the associated limited development of ocean desalination, even if it were a mandatory component of their supply portfolio, can be feasibly met through other desalination proposals in the region that are consistent with full enforcement of the Water Code's mandates. In brief, the pre-determined design capacity of 50 MGD limits a full analysis of alternative and superior sites and technologies that are consistent with the law.

Postponing a thorough analysis of alternatives for compliance with the elements in the Water Code for minimizing the intake and mortality of marine life until after the Facility is constructed on the HBGS site prematurely enshrines the HBGS *site* as the "best" available. This makes the provision in the tentative Order to reconsider the enforcement of the Water Code after HBGS permanently ceases withdrawing and discharging cooling water an illusory provision in that it would have already effectively precluded analysis of superior sites that are compatible with the best intake technology. As has been the experience with the Carlsbad project, once the Regional Board gives its stamp of approval for the desalination use, Poseidon then uses that approval to argue for relaxation of phase-out requirements for the once through cooling infrastructure of the power plant. This was never the intent of the OTC policy, and it certainly is not consistent with the framework contemplated by Porter-Cologne.

**The permit must be denied until there is a full analysis of alternative sites, designs, and technologies for minimizing the intake of marine life mortality. Further, this analysis and conditions in the permit must be based on the fact that there will no longer be a discharge of seawater from HBGS for the Facility's source water, and define what the best site, design and technologies are mandated for development of the Facility absent the HBGS discharge. Finally, as described below, the final Order cannot rely on attempts to replace the marine life killed by the facility through "after the fact" restoration projects -- the intake of marine life must be minimized in the first place.**

*III. The withdrawal of seawater for dilution of the brine discharge violates Water Code section 13142.5(b).*

The Fact Sheet and other attachments regarding the discharge and dilution of the brine waste are void of any analysis of alternative discharge technologies[11] that avoid the necessity to withdraw approximately 25% more seawater than is necessary for "source water." The additional volume of water withdrawn, and associated intake and mortality or marine life, is only for the purpose of meeting the dilution factor and other requirements in the Ocean Plan. Obviously, this additional withdrawal of seawater for what may be referred to as "in-plant dilution" would unnecessarily increase the intake and mortality of marine life, in violation of Water Code section 13142.5(b). The tentative Order, as it is currently drafted, is fatally deficient from lack of a thorough analysis of alternative discharge technologies to diffuse the discharge without the need for additional seawater withdrawals.

Also, the language in the Ocean Plan suggests that the dilution occur between the "edge of the outfall structure" and the edge of the zone of initial dilution (ZID), or 10% of the ZID for acute toxicity.[12] Obviously, "in-plant dilution" would be inconsistent with that language because the dilution would not occur outside the edge of the outfall structure.

Finally, while the Fact Sheet and other attachments have done a cursory attempt at segregating the several streams of discharges (e.g., pre-treatment waste materials, filter cleansing and backwash materials, RO membrane concentrate, etc), the analysis has not adequately identified a suite of alternative disposal technologies and/or practices that would be best suited for the constituents in the segregated wastewater streams.[13] A thorough analysis must list all potential disposal alternatives and match the best alternative to the potential adverse impacts from the constituents in the separate waste streams.

**The permit must be denied until alternative technologies for waste disposal, and/or discharge dilution technologies that do not require additional seawater withdrawals, are fully documented and incorporated into the permit requirements.**

**Further, there are superior "real time" monitoring technologies that should be evaluated and potentially mandated as a requirement in the permit.[14]**

*IV. "After the fact" restoration in lieu of the best site, design, and technology is prohibited.*

---

[11] See Attachments B, C, D and E (examples of several studies indicating the value of "brine diffusers" at the end of the discharge pipe.)

[12] Ocean Plan, Section III. C. 4(b): "[The] mixing zone for the acute* toxicity objective shall be ten percent (10%) of the distance from **the edge of the outfall structure** to the edge of the chronic mixing zone (zone of initial dilution)." [emphasis added]

[13] See e.g., Attachment F (analysis of constituents used in seawater reverse osmosis facilities and the potential adverse impacts from those constituents)

[14] See Attachment D: "Perth_2YrReport", Section III, pp 3 – 11(including page 7 and the description of "real time" monitoring.) For more information on "toxicity monitoring" see also Section IV ("Other Marine Monitoring") and for information on "stream flow mitigation" also see Section V ("Other Waste Discharge Management")

The new proposal for the Facility, necessitated by the recent adoption of the OTC Policy by the State Board, has offered no substantive changes from what was proposed prior to the change in State policy. Instead, the Discharger relies on "after the fact" restoration in lieu of altering the site, design and technology.

Federal law, articulated in *Riverkeeper I* (new facilities withdrawing cooling water over 50 MGD), and re-stated in *Riverkeeper II* (existing facilities withdrawing 50 MGD or more) make perfectly clear that "after the fact" restoration is illegal as a substitute for minimizing adverse environmental impacts in the first place. These federal decisions were specifically addressing US EPA's draft regulations to enforce Clean Water Act Section 316(b). Nonetheless, the reasoning in the federal court opinions is instructive for interpreting California's Water Code.

The federal court specifically stated:

> *Restoration measures correct for the adverse environmental impacts of impingement and entrainment; they do not minimize those impacts in the first place.*
>
> *Restoration measures resemble the pre-1972 approach to water pollution, which regulated point sources based on their effect on the surrounding water and allowed sources to discharge pollutants provided the discharge did not cause water quality to dip below an acceptable level. See CPC Int'l, Inc. v. Train, 515 F.2d 1032, 1034-35 (8th Cir.1975). Similarly, restoration measures would allow a facility, at least in theory, to impinge and entrain unlimited numbers of organisms provided that other steps maintained acceptable water quality, here measured by wildlife levels as opposed to pollutant concentration. But "[i]t was ... dissatisfaction with water quality standards as a method of pollution control that led to the proposal that they be replaced or supplemented with `effluent limitations.'" [citation omitted] A plaintiff attempting to prove a violation of the Clean Water Act faced "a virtually unbridgeable causal gap," [citation omitted] for "the burden of proving that a particular polluter had caused the water quality to dip below the standards was all but impossible to satisfy,"[citation omitted]. Allowing compliance through restoration measures would involve exactly the same hurdles. As the EPA itself recognized in the preamble to the Rule,*
> *[B]ecause of the complexity of biological studies, it is very difficult to assess the cause and effect of cooling water intake structures on ecosystems or on important species within an ecosystem.... [U]nlike in the laboratory, where conditions are controlled, a multitude of confounding factors make biological studies very difficult to perform and make causation, in particular, difficult to determine.*[15]

The California equivalent of the federal Clean Water Act is the Porter-Cologne Act, which has been enacted in the Water Code section 13142.5(b). So the federal court ruling, and the reasoning for the decision prohibiting "after the fact" restoration is relevant and binding on interpretation and enforcement of the Water Code.

Importantly, the Water Code regulates withdrawals of seawater for cooling purposes, but expands the limited scope of the "technology forcing" policy in several distinct ways.

First, the California Water Code is not limited to compelling the use of best technology available for cooling water intakes: <u>the California Water Code expands those mandates and inherent protections</u>

[15] *Riverkeeper, Inc. v. U.S. E.P.A.*, 384 F.3d 174, 189-190 (2d Cir. 2004).

of marine ecosystems to cover **any** withdrawal of seawater for industrial purposes. Withdrawals of seawater for ocean desalination would obviously be included. And importantly, the Water Code makes no distinction between the regulation and protection of marine ecosystems from cooling water intakes or other industrial withdrawals of seawater. Therefore, any prohibitions on "after the fact restoration" would be equally applicable to cooling water intakes as it would be to other seawater withdrawals. This prohibition has already been included in the OTC Policy in provisions clearly restricting reliance on restoration projects on an interim basis until existing power plants come into compliance with the technology mandates in the Policy.[16]

Second, the Water Code differs from the Clean Water Act in that it expands the scope of the elements to be considered when achieving the underlying intent of the law to "minimize the intake and mortality of marine life." While the Clean Water Act narrowly mandates best technology available for the intake, the Water Code expands this mandate to cover the "site" and "design" of the Facility.

Finally, the Water Code includes "mitigation" measures to minimize the intake and mortality of marine life. There is some debate whether "mitigation" may be interpreted to include "after the fact restoration." However, a clear read of the language indicates that, however the Regional Board may interpret the term, it would have to be consistent with the operative language to minimize the "*intake* and mortality of marine life." (emphasis added). By definition, "after the fact restoration" does nothing to mitigate the *intake* of marine life.

The tentative Order relies exclusively on a restoration project that was mandated by the California Energy Commission in a conditional emergency permit to upgrade two of the existing generators at HBGS as "mitigation" for the admitted intake and mortality of marine life caused by the operation of the "new" Facility. This condition on the CEC license of the HBGS would clearly be illegal today under the law established in *"Riverkeeper II"*. This is also verified and codified in the State Water Board's OTC Policy.

In summary, there is no distinction between the mandate on coastal power plants and other industrial installations to utilize "the best site, design, technology and mitigation feasible" to "minimize the intake and mortality of marine life", or prohibiting "after the fact restoration" for cooling water. Therefore, the Regional Board and/or State Board has a duty to interpret the term "mitigation" in the Water Code in a way that would be consistent with the prohibitions on "after the fact restoration" for all industrial installations – including this proposed Facility and tentative Order.

**The tentative Order must be denied as written, with instructions to the staff to delete any inclusion of "after the fact restoration" as a means of complying with the mandates of the water Code section 13142.5(b). While there may be acceptable "mitigation" measures feasible WORDING SEEMS AWKWARD, they must "minimize the *intake* and mortality of marine life." (emphasis added). After the fact restoration would only be an attempt to "replace" the loss of marine life, and consequently would not minimize the intake at all.**

[16] Statewide Water Quality Control Policy On The Use Of Coastal And Estuarine Waters For Power Plant Cooling, Section 2. C. (3) ["Immediate and Interim Requirements"]

*V. California State Policy prioritizes the use of recycled wastewater, and this alternative source of freshwater supply has not been included in the analysis of the design capacity of the proposed Facility.*

Water Code Section 13142.5(e) (1) reads:

> Adequately treated recycled water should, where feasible, be made available to supplement existing surface and underground supplies and to assist in meeting future water requirements of the coastal zone, and consideration, in statewide programs of financial assistance for water pollution or water quality control, shall be given to providing optimum water recycling and use of recycled water.

The tentative Order assumes a demand for a Facility designed to produce 50 MGD of potable water per day. As explained above, the analysis has not adequately analyzed a lower production capacity design that would be consistent with alternative sites and intake technologies to minimize the intake and mortality of marine life, in accordance with Water Code Section 13142.5(b).

In addition to this deficiency in the tentative Order, the Fact Sheet and other supporting documents, the analysis fails to document and consider State policy mandating a preference for the use of recycled water, as expressed in Water Code Section 13142.5(e) (1).

Orange County Sanitation District, in cooperation with Orange County Water District, is already producing recycled water through their "Groundwater Replenishment System" (GWRS), and there are current plans to marginally expand that production capacity. However, the GWRS, over time, can and should be expanded for even greater production. This is relevant to the analysis in the tentative Order because the expanded production of recycled water in the region would offset the pre-determined, yet unsubstantiated, assumed need for a 50 MGD seawater desalination Facility.

Further, the Fact Sheet asserts that there are several potential adverse impacts from the use of sub-surface intakes on coastal wetlands and aquifers in the immediate area. For example, the Fact Sheet uses terms such as "the potential" long term effects of dewatering local marshes, "possible interception" of contaminated groundwater, "possible interception" of injection water for the seawater barrier, "potential subsidence" of roads and structures.[17] These assertions appear to be speculative. But even accepting them as proven factual threats to the environment, which we do not, the analysis fails to identify methods to mitigate these asserted adverse impacts. In particular, there is no analysis of the benefits of expanding the GWRS to ensure against these asserted impacts.

**Therefore, the analysis is inadequate because it too narrowly looks at the proposal without consideration of State policy to first prioritize expansion of recycled water in the region. Further, a more thorough and adequate analysis would have considered the benefits of adding recycled water to the local water supply portfolio – in particular the benefit of reducing the 50 MGD production capacity from the proposed Facility, making it more compatible with the use of sub-surface intakes. Finally, the analysis and tentative Order fails**

[17] See e.g., Fact Sheet, 6 (g), (i), (j), and (k).

**to consider the benefits of expanding the GWRS to mitigate the potential adverse impacts of over-drafting groundwater that were identified in the Fact Sheet.**

*VI. Conclusion*

In conclusion, for all the reasons stated above, we respectfully request the Regional Board deny the re-issuance of the NPDES permit until the inadequacies in the analysis can be corrected and the conditions of approving the permit brought into compliance with the clear mandates of Water Code section 13142.5(b).

Sincerely,

**Merle Moshiri**
President
Residents for Responsible Desalination

R4RD@hbdesalfacts.org
19412 Pompano Ln. #107
Huntington Beach, CA 92648

**Conner Everts**
Co-Chair
Desal Response Group

connere@west.net
At Environment Now
2515 Wilshire Blvd.
Santa Monica, CA 90403

**Marco Gonzalez**
Interim Executive Director
CERF

marco@cerf.org
1140 S. Coast Highway 101
Encinitas, CA 92024

Attachments