

Amended 2015

Report of Waste Discharge

CARLSBAD DESALINATION PROJECT

*Submitted in Application for
Renewal of NPDES CA0109223*



September 2015



September 4, 2015

David Gibson
Executive Officer
California Regional Water Quality Control Board, San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108-2700

Dear Mr. Gibson:

Subject: Submittal of Amended Report of Waste Discharge
Renewal of NPDES CA0109223
Carlsbad Desalination Project (CDP)

Regional Water Quality Control Board (Regional Water Board) Order No. R9-2006-0065 (NPDES CA0109223) establishes requirements for the discharge of reverse osmosis (RO) concentrate and pretreatment backwash flows from the Carlsbad Desalination Project (CDP) into the Pacific Ocean via the Encina Power Station (EPS) effluent channel. In accordance with the requirements of the Order, Poseidon Resources (Channelside) LP (Poseidon) filed a Report of Waste Discharge on March 29, 2011 in application for renewal of NPDES CA0109223. The March 29, 2011 Report of Waste Discharge proposed no changes to the CDP operational conditions that were addressed within Order No. R9-2006-0065, which included:

- co-located operational conditions when EPS power generation activities generate sufficient cooling water flows for CDP intake and effluent blending needs, and
- temporary stand-alone conditions when EPS cooling water flows are insufficient, and EPS circulates non-cooling flows for the benefit of CDP.

The March 29, 2011 Report of Waste Discharge also proposed no changes in the discharge flows or effluent concentration standards established within Order No. R9-2006-0065.¹

Submittal of Amended Report of Waste Discharge. Attached in electronic format is an Amended Report of Waste Discharge submitted in application for renewal of NPDES CA0109223. The attached Amended Report of Waste Discharge amends project descriptions and requested permit provisions that were previously presented within Poseidon's March 29, 2011 Report of Waste Discharge. The Amended Report of Waste Discharge:

¹ Order No. R9-2006-0065 does not establish any mass emission standards or performance goals for CDP operations. Almost all of the constituent mass within the CDP intake flow (except for a small quantity that remains within the RO product water) is returned back to the ocean.

- Requests that existing NPDES CA0109223 requirements governing co-located and temporary stand-alone CDP operations be continued.
- Addresses CDP compliance with May 2015 amendments to the *Water Quality Control Plan, Ocean Waters of California* (Ocean Plan) that establish requirements governing operations and discharges from seawater desalination facilities.
- Requests that the Regional Water Board establish requirements governing CDP operations under permanent stand-alone conditions (defined within the 2015 California Ocean Plan as an expanded project²). Permanent stand-alone operations would be implemented when the EPS once-through cooling discharge is permanently terminated.
- Requests that the Regional Water Board modify allowable effluent flow limits and discharge salinity limits that govern CDP operations under permanent stand-alone conditions, in accordance with 2015 Ocean Plan amendments.
- Presents an update on CDP construction, operational testing, and scheduled implementation.
- Describes the pretreatment process selected for implementation at CDP.
- Presents an update on California Environmental Quality Act (CEQA) compliance.
- Documents that existing entrainment mitigation measures implemented for the currently regulated co-located and temporary stand-alone operations are adequate to address proposed permanent CDP stand-alone operating conditions.

Report of Waste Discharge Components. To address these issues, this Amended Report of Waste Discharge is comprised of:

- EPA Form 1,
- EPA Form 2D³,
- supplemental figures and water quality tables,
- State of California Form 200,
- NPDES and Regional Board Contributions Disclosure Certifications, and
- technical appendices that address a variety of intake, discharge, and compliance issues.

No Requested Changes in Water Quality Standards for Currently Permitted Operations.

As part of this Amended Report of Waste Discharge, Poseidon does not request any changes in the effluent or receiving water standards established in Order No. R9-2006-0065 under either co-located or temporary stand-alone operations. Co-located or temporary stand-alone operations described in Order No. R9-2006-0065 remain valid, with only three minor clarifications:

2 Section III.M.1.b(2) of the 2015 California Ocean plan establishes that seawater desalination projects that are transitioning from co-located operating conditions to permanent stand-alone conditions are defined as "Expanded Projects."

3 EPA Form 2D (new discharge sources) is presented in lieu of EPA Form 2C (existing discharge sources). While construction of CDP facilities is nearing completion and initial onsite CDP process testing has begun which involves the discharge of process test water, CDP full-scale plant production, the co-located CDP discharge, and potable water deliveries are not scheduled to begin until later in 2015.

- Order No. R9-2006-0065 allows for two potential pretreatment technologies: granular media filtration or microfiltration. CDP has been constructed using the granular media filtration method of pretreatment.
- Order No. R9-2006-0065 indicates that backwash from the granular media filtration units will be clarified (treated), blended with RO concentrate, and discharged to the EPS effluent channel. In addition to this ocean discharge method for treating and handling granular media filter backwash, CPD processes have been designed to also allow plant operators (at their discretion) to divert the backwash to the CDP headworks for retreatment.
- Order No. R9-2006-0065 indicates that under typical operations, 12 of the 13 RO banks will be in operation, and that all 13 RO banks will be simultaneously operated only in rare circumstances. As constructed, the CDP has 14 RO banks. Under actual operating conditions, CDP will produce approximately 56,000 acre-feet/year of potable supply but to allow for operational flexibility and accommodate the San Diego County Water Authority demand requirements, it is possible that all 14 RO banks will be continuously operated with production capacities varying from 48 million gallons per day (mgd) to 54 mgd in order to achieve the annual average daily production of 50 mgd.

In addition to these clarifications, Poseidon also requests that the renewed NPDES CA0109223:

- Acknowledge that Poseidon has completed all special study requirements of Section VI.C of Order No. R9-2006-0065 that were required prior to startup of the CDP.
- Acknowledge that biological performance standards established in the March 27, 2009 Minimization Plan (submitted pursuant to Section VI.C.2 of the Order) are no longer applicable, as (1) subsequent to the adoption of Order R9-2009-0038 establishing the biological performance standards, Poseidon agreed to increase the size of the Marine Life Mitigation Plan from 55.4 acres to 66.4 acres to ensure that the project related impingement impacts are fully mitigated, thereby eliminating the need for the biological performance standards, and (2) the destructive nature of the biological performance tests would result in adverse impacts to wetlands habitat and organisms.
- Eliminate as unnecessary the daily monitoring provisions established within footnote 15 of Table 4, Section IV.A of the Monitoring and Reporting Program for discharges of filtered seawater and RO product water, as monitoring to date has demonstrated no impacts to receiving water quality or toxicity from such filtered seawater and RO product water discharges.
- Authorize the discharge of dewatering flows of up to 1 MGD during the construction of the intake/discharge structures needed for transition of the CDP to stand-alone operations. Such dewatering flow would be commingled with the other discharges from the CDP.

Permanent Stand-Alone Operations. In addition for allowing continuation of the currently-permitted co-located and temporary operation modes, Poseidon requests that NPDES

CA0109223 be modified to allow for permanent stand-alone operations that would be implemented upon the permanent termination of EPS power operations. NRG Energy, the owner of EPS, has notified Poseidon of its intent to permanently terminate operation of EPS once-through cooling water pumps by June 1, 2017. When this occurs, the existing co-located operations or temporary stand-alone operations addressed within Order No. R9-2006-0065 will be terminated, and permanent stand-alone CDP operations will be initiated which will include:

- A dedicated CDP intake structure for supplying seawater to the RO pumps. The RO intake structure will feature 1 millimeter screens that are hydraulically designed to ensure that through-screen velocities are less than 0.5 foot per second.
- The discharge of RO concentrate (and granular media backwash when it is not being recirculated to the CDP headworks) to a discharge channel where it is blended with diverted lagoon water.
- A second dedicated CDP intake/discharge structure for supplying flow augmentation (blending) seawater to the discharge channel. This second intake/discharge structure features Ocean Plan-compliant 1-millimeter screens that are hydraulically designed to ensure that through-screen velocities are less than 0.5 foot per second. The structure also features fish-friendly, low-impact pumps for lifting diverting lagoon water into the discharge channel.
- The diversion of a small portion (up to 1 mgd) of the intake flow back into the lagoon via a short dedicated line to return any fish or organisms that are rinsed off the intake screens back into the lagoon.
- Implementing flow augmentation to maintain salinity concentrations within the existing EPS discharge pond⁴ (Monitoring Location M-002) at 42 parts per thousand (ppt) or less to ensure that (per new Ocean Plan requirements) receiving water salinity concentrations are less than 2 ppt above ambient at the edge of a 200-meter (656 feet) Brine Mixing Zone (BMZ) under virtually all hydrodynamic conditions.

Requested Increase in CDP Production Capacity. As an additional operational change under permanent stand-alone operations, Poseidon has determined that desalination facilities and equipment installed at the CDP site is capable of achieving a maximum potable water production capacity of 60 mgd. To reflect conditions under which such maximum potable water production is achieved, Poseidon requests that NPDES CA0109223 be amended to allow permanent stand-alone operations that result in:

- average annual potable water production of 60 mgd,
- average annual RO concentrate discharges of up to 60 mgd,

⁴ Through agreement with NRG Energy, CDP under permanent stand-alone operations will have permanent use of the existing EPS discharge pond (Monitoring Location M-002, as designated within Order No. R9-2006-0065) and the existing EPS effluent discharge channel for discharging blended RO concentrate to the Pacific Ocean.

- clarified (treated) granular media backwash flows of up to 7 mgd, with the option (at the discretion of plant operators) to recycle backwash flows into CDP pretreatment processes in lieu of discharging the clarified backwash flow to the ocean,
- intake and discharge structures screen rinsing and fish return flows of 1 mgd, and
- intake and discharge of bypassed lagoon water (flow augmentation) of up to 171 mgd when filter backwash flows are discharged to the ocean and up to 178 mgd when backwash flows are recycled back to the plant headworks.

The total CDP discharge under this maximum production scenario would be 239 mgd, regardless of whether clarified filter backwash flows are discharged to the ocean or recycled to the plant headworks. When clarified backwash is discharged to the ocean, the 239 mgd total CDP discharge flow would be comprised of 68 mgd of wastewater streams and 171 mgd of bypassed intake flow used to dilute the RO concentrate. When backwash is recycled back to the plant headworks, the 239 mgd CDP discharge flow would consist of 61 mgd of wastewater streams and 178 mgd of bypassed intake flow. Proposed flows would insure that receiving water salinities are maintained at less than 2 ppt above ambient at a discharge distance of 656 feet (200 meters) unless the Regional Water Board approves a facility-specific receiving water limit.

Table 1 (page 6) summarizes flows for proposed CDP permanent stand-alone operations. The table also presents a comparison with the currently permitted co-located and temporary stand-alone operations. As shown in Table 1, the 239 mgd CDP discharge flow is less than the combined CDP/EPS flows allowed under existing co-located and temporary stand-alone conditions.

California Ocean Plan Amendments. The State Water Resources Control Board on May 5, 2015 adopted revisions to the Ocean Plan that established requirements governing operations and ocean discharges from seawater desalination facilities. Key 2015 Ocean Plan amendments, in part:

- Require that receiving water salinity is not to exceed 2 ppt above ambient at the edge of the Brine Mixing Zone (BMZ) unless the Regional Board authorizes a facility-specific receiving water salinity limitation.
- Establish requirements under which Regional Water Boards may consider and approve a facility-specific receiving water salinity limitation of more than 2 ppt above ambient.
- Establish BMZ dimensions at a distance of 100 meters (328 feet) from the discharge point for new projects, and establish BMZ dimensions at a distance of 200 meters (656 feet) for expanded projects.⁵

5 Section III.M.3.d of the 2015 Ocean Plan establishes that desalination facility owners or operators may seek approval for a BMZ that extends 200 meters (656) feet from the discharge point, provided that (1) flow augmentation technology is proposed for ensuring compliance with receiving water salinity standards, (2) the facility has received an existing Water Code Section 13142.5 determination, and (3) the facility is 80 percent constructed by the effective date of the 2015 Ocean Plan. The CDP qualifies under these requirements for such a 200-meter BMZ.

Table 1
Summary of CDP Production and Discharge Flows
Existing Permitted Discharge and Proposed Discharge

Parameter		Current Permitted Discharge ⁶ (to be continued under the updated NPDES permit until the EPS once-through cooling water discharge is permanently terminated)				Proposed Revised Discharge (When EPS discharge is terminated)
		Co-Located Operating Conditions ⁷		Temporary Stand-Alone Operating Conditions ⁷		Permanent Stand-Alone Operating Conditions ⁸
		Average Daily Flow	Maximum Daily Flow	Average Daily Flow	Maximum Daily Flow	Annual Average Flow
Potable water production capacity		50 mgd	54 mgd	50 mgd	54 mgd	60 mgd
CDP Intake Flows	Intake from EPS Effluent Channel	104 mgd	114 mgd	104 mgd	114 mgd	---
	Intake from CDP Lagoon Intake Structure	---	---	---	---	299 mgd
Wastewater discharge components	Granular Media Filtration Backwash	4 mgd	6 mgd	4 mgd	6 mgd	7 mgd
	RO concentrate	50 mgd	54 mgd	50 mgd	54 mgd	60 mgd
	Screen wash/fish return from CDP Intake	NA	NA	NA	NA	1 mgd
	CDP stand-alone intake flows bypassed ⁹	NA	NA	NA	NA	171 mgd ⁹
	Total CDP discharge flow	54 mgd	60 mgd	54 mgd	60 mgd	239 mgd
	Minimum EPS discharge flow required to achieve salinity standard ¹⁰	200 mgd ¹⁰	210 mgd ¹⁰	200 mgd ¹⁰	210 mgd ¹⁰	NA

- 6 Existing permitted conditions under Regional Water Board Order No. R9-2006-0065 (NPDES 0109223), as amended by Order No. R9-2009-0038. The NPDES Report of Waste Discharge submitted by Poseidon on March 29, 2011 proposed continuation of these requirements. The Amended 2015 Poseidon Report of Waste Discharge presented herein requests continuation of these existing NPDES requirements as long as the EPS once-through cooling water discharge remains in operation. Once EPS is permanently taken out of operation, the CDP would be operated in permanent stand-alone operating mode (per the far right hand column).
- 7 For conditions under which EPS is discharging sufficient power plant cooling water flows to the EPS effluent channel (pursuant to EPS NPDES discharge permit requirements), Order No. R9-2006-0065 authorizes the CDP to discharge water into the EPS effluent channel (downstream from the co-located CDP intake point) where it is blended with sufficient flow from the EPS to meet the blended effluent salinity requirements prior to discharge to the EPS discharge pond (Monitoring Location M-002). For conditions under which EPS is not discharging sufficient power plant cooling water flows to meet the blended effluent salinity requirements prior to discharge, Order No. R9-2006-0065 authorizes the EPS to run the cooling water pumps under such "temporary stand-alone" conditions for CDP's benefit to meet the blended effluent salinity requirements prior to discharge to the EPS discharge pond (Monitoring Location M-002).
- 8 Conditions under which EPS operations are terminated and the CDP is operated in permanent stand-alone mode. Under such stand-alone conditions, CDP influent flows are withdrawn from the lagoon via a new stand-alone CDP intake system, a portion of the withdrawn flows are directed to CDP for desalination, and remaining withdrawn intake flows are blended back into the CDP RO concentrate and filter backwash streams prior to discharge to the final effluent pond (Monitoring Location M-002).
- 9 Intake water flows under stand-alone CDP operations that bypass CDP and are directed into the effluent channel for blending with CDP RO concentrate and filtration backwash (when backwash is not being recycled to CDP pretreatment). At the discretion of plant operators, however, filter backwash may instead be recycled to the plant headworks. When backwash flows are being recycled to the CDP pretreatment processes rather than discharged to the ocean, a commensurate increase in the bypass flow rate will be required to ensure that effluent pond salinities are maintained at 42 ppt or less and receiving water salinities 200 meters from the discharge point are less than 2 ppt above ambient. Total CDP intake flows would remain at 299 mgd and total CDP discharge flows would remain at 239 mgd regardless of whether filter backwash is discharged to the ocean or recycled back to the headworks. When filter backwash is recycled to the headworks, 178 mgd of the 299 mgd intake flow would be bypassed. When filter backwash is discharged to the ocean, 171 mgd of the 299 mgd intake flow would be bypassed.
- 10 Minimum EPS discharge flow (over and above CDP intake requirements) under EPS/CDP co-located operations required to ensure that the combined EPS and CDP discharges achieve a blended salinity equal to or lower than the average daily salinity standard. To the extent that backwash flows are being recycled to the front of the CDP pretreatment rather than discharge to the ocean (see footnote #9), the reduction in the discharge flow rate will require an equivalent increase in the minimum EPS discharge flow to replace initial dilution of the RO concentrate discharge that would have been accomplished through commingling the RO concentrate with the filter backwash water.

- Require use of the best available site, design, technology, and mitigation measures feasible to minimize the intake and mortality of all forms of marine life.
- Establish monitoring and reporting requirements for assessing receiving water, benthic communities, and sediments to ensure that brine discharges do not cause adverse effects to marine life outside of the brine mixing zone.

Proposed Brine Mixing Zone Dimensions. As documented with Technical Appendix A of this Amended Report of Waste Discharge, the CDP qualifies with applicable Ocean Plan Section III.M.3.d provisions that allow designation of a BMZ that extends 200-meters (656 feet) outward from the existing end of the effluent discharge channel jetty. In accordance with the 2015 Ocean Plan amendments, Poseidon requests that NPDES CA0109223 be revised to reflect such a 200-meter BMZ.

Potential for Facility-Specific Receiving Water Salinity Requirements. In lieu of the standard that receiving water salinity not exceed 2 ppt above ambient at the edge of the brine mixing zone, Section III.M.3.c of the Ocean Plan amendments establishes criteria under which the Regional Water Board may establish a facility-specific receiving water salinity standard. Toxicity studies conducted to date (see attached Technical Appendices G and H) suggest that a facility-specific receiving water salinity standard of 3 ppt above ambient at the edge of the brine mixing zone may be (1) consistent with Ocean Plan requirements, and (2) fully protective of marine life and beneficial uses. Accordingly, Poseidon requests that NPDES CA0109223 identify future research, studies and monitoring required to evaluate and identify a project-specific receiving water salinity limit for the CDP discharge.

Summary of Requested NPDES Permit Modifications. Table 2 (page 8) summarizes requested modifications within NPDES CA0109223 prior to the retirement of EPS. Table 3 (page 8) summarizes requested NPDES permit provisions governing proposed permanent stand-alone operating conditions after EPS retirement.

No changes are proposed in the existing performance concentration goals established within Table 10 of Order No. R9-2006-0065. It is proposed that these performance goals be maintained and apply to CDP operations under both (1) co-located and temporary stand-alone conditions, and (2) permanent stand-alone conditions.¹¹

¹¹ Table 10 of Order No. R9-2006-0065 establishes effluent concentration performance goals for receiving water parameters regulated under Table 1 of the California Ocean Plan.

Table 2
Summary of Requested NPDES Permit Modifications
Co-located or Temporary Stand-Alone Operations Prior to EPS Retirement

Category	Proposed Revision in NPDES CA0109223
Changes in Water Quality Limits or Standards	None
Other Proposed Changes	Update the CDP project description to acknowledge that: <ul style="list-style-type: none"> • Granular media filtration is to be used for RO pretreatment. • Granular media filter backwash may be either discharged to the CDP headworks or to the effluent discharge channel. • All 14 RO banks may be simultaneously operated with production rates varying from 48 mgd to 54 mgd, to achieve an annual average production of 50 mgd.
	Acknowledge completion of Special Study Provisions (Section VI.C of Order No. R9-2006-0065).
	Acknowledge that the biological performance standards established within the March 27, 2009 CDP Minimization Plan are no longer applicable.
	Eliminate Footnote 15 of Table 4, Section VI.A of Monitoring and Reporting Program R9-2006-0065.

Table 3
Summary of Requested NPDES Permit Modifications
Permanent Stand-Alone Operations After EPS Retirement

Category	Proposed Revision in NPDES CA0109223
Changes in Water Quality Limits or Standards	Establish an effluent salinity standard of 42 ppt at the existing effluent pond (Monitoring Location M-002) under permanent stand-alone operations.
	Establish a BMZ dimension of 200 meters (656 feet) from the end of the effluent discharge channel jetty (per the 2015 Ocean Plan), and establish a receiving water salinity of standard of 2 ppt above ambient at the edge of the BMZ.
Other Proposed Changes	Reflect permanent stand-alone operations that involve: <ul style="list-style-type: none"> • up to 60 mgd of potable water production. • the discharge of up to 60 mgd of RO concentrate. • the discharge of up to 7 mgd of treated (clarified) filter backwash (or at the discretion of plant operators, recycling the filter backwash to the CDP headworks). • 1 mgd of intake fish return to the lagoon. • 171 mgd of flow augmentation (blending) intake when clarified backwash is discharged to the ocean, and up to 178 mgd of flow augmentation when clarified backwash is recycled back to the CDP headworks.
	Identify future special studies or investigations (per 2015 Ocean Plan revisions) required for supporting the development of a facility-specific receiving water salinity standard.

Amended Report of Waste Discharge Technical Appendices. Table 4 (pages 9 and 10) identifies technical appendices presented in support of this Amended Report of Waste Discharge and summarizes key conclusions. As shown within the attached technical appendices:

- The Ocean Plan preferred technology of subsurface intakes is not feasible.
- The proposed CDP RO feedwater intake complies with Ocean Plan requirements for surface intake screen sizes (1 millimeter or less) and through-screen velocities (0.5 feet per second or less).
- CDP qualifies for designation of a BMZ that extends 200 meters (656 feet) beyond the end of the existing EPS discharge channel.
- The Ocean Plan preferred discharge technologies of commingling brine with wastewater is not available, and discharging to the ocean through multiport diffusers is not the best available technology feasible to minimize the intake and mortality of all forms of marine life.
- The use of high-velocity multi-port diffusers would result in a greater degree of individual and cumulative impacts on marine life than the proposed CDP use of flow augmentation (dilution) and the existing EPS effluent discharge channel.
- The proposed CDP intake will comply with Ocean Plan requirements for flow augmentation (dilution) discharge technology that (1) mandates use of low turbulence intakes and conveyance pipes, and (2) requires that conveyance facilities must minimize thermal, shear, and osmotic stress.
- The proposed discharge pond salinity limit of 42 ppt is consistent with (1) achieving compliance with the Ocean Plan receiving water salinity standard, (2) preventing acute and chronic toxicity beyond the brine mixing zone, and (3) ensuring protection of marine organisms.
- Under proposed permanent stand-alone operating conditions, minimum month initial dilutions achieved within the 200 meter (656 foot) BMZ are projected to be significantly in excess of the dilution required to achieve compliance with the Ocean Plan receiving water salinity standard.

Adequacy of Existing Mitigation. As noted within Poseidon's March 29, 2011 Report of Waste Discharge, Poseidon has complied with applicable requirements of Special Provision VI.C.2.e of Order No. R9-2006-0065 that required Poseidon to prepare and submit a Flow, Entrainment and Impingement Minimization Plan (Minimization Plan) that:

- assessed alternative sites, design features, and technology to minimize entrainment and impingement effects,
- quantified potential impingement and entrainment effects, and
- established a Marine Life Mitigation Plan (MLMP) to mitigate against potential impingement and entrainment effects.

Table 4
Summary of Amended Report of Waste Discharge Technical Appendices

Appendix	Study	Key Conclusions/Findings
Appendix A	Compliance with Ocean Plan Amendments	Proposed CDP operations are in compliance with all applicable provisions of the 2015 Ocean Plan, including requirements governing receiving water salinity; use of best available site, design, technology and mitigation; and consideration of preferred technologies. Subsurface intake alternatives were determined to be infeasible. The multiport diffuser is not the best technology measure feasible to minimize the intake and mortality of all forms of marine life.
Appendix B	Intake/Discharge Feasibility Report	Poseidon has considered the feasibility of all intake and discharge technologies as well as the Ocean Plan preferred technology requirements in developing an intake and discharge plan that provides the best combination of the best available site, design, technology, and mitigation feasible to minimize the intake and mortality of all forms of marine life.
Appendix C	Hydrodynamic Discharge Study	The existing discharge structure provides for significant additional dilution through a range of hydrodynamic conditions. Actual initial dilutions are projected to be in excess of the dilution credits assigned within Order No. R9-2006-0065.
Appendix D	Coastal Process Effects of Reduced Intake	Reduced intake flows under permanent stand-alone operations will not create any significant adverse impacts on either the lagoon environment or local beaches, and will result in environmental benefits resulting from the reduced frequency of required lagoon maintenance dredging.
Appendix E	Resolution No. R9-2011-0028	The Resolution approves selection of the Otay River Floodplain wetlands restoration site for mitigating entrainment and impingement effects that may be caused by operation of the CDP.
Appendix F	Water Circulation in Agua Hedionda Lagoon	The location of the fish return system takes into account lagoon mixing that occurs as a result of tidal actions and other hydrodynamic drivers.
Appendix G	Acute Toxicity Study	The proposed salinity discharge standard of 42 ppt within the effluent pond will ensure that the CDP discharge will comply with Ocean Plan acute toxicity standards.
Appendix H	Chronic Toxicity Study	The proposed salinity discharge standard of 42 ppt within the effluent pond will ensure that the CDP discharge will comply with Ocean Plan chronic toxicity standards.
Appendix I	Brine Dilution Salinity Tolerance	The proposed salinity discharge standard of 42 ppt within the effluent pond is consistent with Ocean Plan requirements to minimize osmotic shock and consistent with ensuring protection of marine species.
Appendix J	Fish-Friendly Pumping	The proposed fish-friendly flow augmentation pumps are consistent with the Ocean Plan requirements to minimize turbulence and shear stress on marine organisms.
Appendix K	Intake/Discharge Entrainment Analysis	Entrainment effect associated with the proposed CDP flow augmentation system are less than impacts that result from a multiport diffuser discharge.
Appendix L	CFD Modeling of Flow Augmentation System	Computational fluid dynamics (CFD) modeling using particle tracking was utilized to estimate exposure times of marine organisms in the CDP intake flow under permanent stand-alone conditions.
Appendix M	Antidegradation Analysis	Proposed CDP production rates, discharge flows, and effluent pond salinities are in keeping with Tier I antidegradation requirements for the protection of beneficial uses and maintenance of existing high quality receiving water.
Appendix N	Life Cycle Cost Analysis	Life cycle costs for CDP facilities demonstrate the economic superiority of surface intake with flow augmentation and surface discharge as the preferred intake/discharge alternative.

Table 4
Summary of Amended Report of Waste Discharge Technical Appendices

Appendix	Study	Key Conclusions/Findings
Appendix O	NPDES Order No. R9-2009-0038	Order No. R9-2009-0038 makes certain findings pursuant to Water Code Section 13142.5(b), approves the March 27, 2009 Minimization Plan submitted by Poseidon, and modifies NPDES CA0109223 to acknowledge Minimization Plan approval and to establish performance standards for Minimization Plan implementation.
Appendix P	Flow, Entrainment and Impingement Minimization Plan	The Minimization Plan implements Water Code 13142.5(b) requirements and establishes the best available site, design, technology, and mitigation feasible to minimize CDP intake effects associated operations under co-located and temporary stand-alone conditions.
Appendix Q	Final EIR	CDP facilities and operations under co-located and temporary stand-alone conditions are in compliance with requirements of the California Environmental Quality Act (CEQA).
Appendix R	California Coastal Commission Approval of Marine Life Mitigation Plan	California Coastal Commission findings and habitat restoration requirements for mitigating against potential CDP entrainment and impingement effects.
Appendix S	Hydrogeologic Investigation SDG&E Encina Power Plant, Carlsbad, CA	Prior hydrogeologic assessment of EPS site has identified opportunities and limitations associated with developing onsite groundwater supplies.
Appendix T	Drought Proofing Through Desalting, the SDG&E Approach	Prior SDG&E assessment has identified opportunities and limitations at the EPS site for developing power plant water supplies through desalination of pumped groundwater.
Appendix U	Huntington Beach Desalination Project, ISTAP Phase I & II Reports	An Independent Scientific Technical Advisory Panel evaluated alternatives for subsurface intakes for the Huntington Beach Desalination Project.
Appendix V	U.S. Fish and Wildlife Service MOU	The Memorandum of Understanding establishes responsibilities for Poseidon and U.S. Fish and Wild Life Service in restoring and enhancing habitat in the San Diego Bay National Wildlife Refuge.
Appendix W	SDCWA 2010 Urban Water Management Plan and 2013 Facilities Master Plan Update	The San Diego County Water Authority (SDCWA) plans identify the importance of seawater desalination in meeting projected regional water supply demands and enhancing regional water supply reliability.
Appendix X	Construction Cost Estimates for Intake/Discharge Alternatives	Construction cost estimates for intake/discharge alternatives considered in developing a recommended intake and discharge plan that provides the best combination of best available site, design, technology, and mitigation feasible to minimize the intake and mortality of all forms of marine life.
Appendix Y	Implementation Schedules for Intake/Discharge Alternatives	Permitting and construction schedules for intake/discharge alternatives considered in developing a recommended intake and discharge plan that provides the best combination of the best available site, design, technology, and mitigation feasible to minimize the intake and mortality of all forms of marine life.
Appendix Z	Proposed Monitoring and Reporting Plan	The proposed CDP monitoring and reporting plan incorporates enhanced receiving water sediment, benthic, and water column monitoring in order to comply with monitoring provisions established within Section III.M.4 of the 2015 Ocean Plan amendments.

Regional Water Board Order No. R9-2009-0038 (adopted on May 13, 2009) conditionally approved the Minimization Plan and MLMP, and directed Poseidon to develop a mitigation proposal. In accordance with the provisions of the MLMP, Poseidon on July 28, 2010 submitted a preliminary wetlands restoration plan to restore a 66 acre site in the Lower Otay River Floodplain.

Poseidon's proposed mitigation site and restoration plan were approved by the California Coastal Commission on February 9, 2011. Regional Water Board approval of the proposed site and restoration plan occurred on March 9, 2011 with the adoption of Regional Board Resolution No. R9-2011-0028. In accordance with the MLMP and site restoration plan, Poseidon has continued to coordinate with the California Coastal Commission, Regional Water Board, and other agencies in the development and implementation of the final wetlands restoration plan for the selected Otay River Valley Floodplain site.

As documented within this Amended Report of Waste Discharge, intake and entrainment effects associated with proposed CDP permanent stand-alone operations are projected to be less than those associated with currently permitted co-located or temporary stand-alone operations and impingement effects have been eliminated through installation of improved technology (per the 2015 Ocean Plan amendments). As a result, the previously approved mitigation is adequate for both (1) the existing exiting co-located and temporary stand-alone operations and flows, and (2) the proposed permanent stand-alone CDP operations and flows.

Conformance with Anti-Backsliding Provisions. As noted, when the CDP is operated under permanent stand-alone conditions, Poseidon requests that a 42 ppt (average day) effluent concentration standard be imposed at Monitoring Location M-002 (effluent pond). While the 42 ppt daily average limit for permanent stand-alone operations is less stringent than the current 40 ppt daily average limit established within Order No. R9-2006-0065 for co-located and temporary stand-alone operations, such a 42 ppt effluent limit is consistent with federal anti-backsliding provisions established within Section 402(o)(2) of the Clean Water Act (CWA), as

- no change is proposed in the existing salinity standards of 44 ppt (maximum hour) and 40 ppt (average day) that regulate co-located and temporary stand-alone operations,
- the 42 ppt effluent salinity standard is protective of beneficial uses and is consistent with achieving the Ocean Plan receiving water salinity standard at the edge of the BMZ,
- CDP permanent stand-alone facilities and operations proposed herein represent a material and substantial alteration of conditions addressed within co-located and temporary stand-alone conditions addressed within Order No. R9-2006-0065 (as amended), and

- CWA Section 402(o)(2) allows for establishing less stringent effluent standards where material and substantial alterations or additions to the permitted facility have occurred after NPDES permit issuance.

Antidegradation Compliance. As noted, this Amended Report of Waste Discharge does not request any changes in the effluent performance goals for constituents regulated under Table 1 of the Ocean Plan. Additionally, proposed CDP operations do not result in adding any pollutant mass emissions to the ocean, as the same mass of constituents taken out of the ocean are returned to the ocean.¹² Further, while an increase in potable water production is proposed, the 239 mgd total CDP discharge flow proposed under permanent stand-alone operations (see Table 1 on page 6) is less than combined discharge flows currently allowed under Order No. R9-2006-0065 under co-located and temporary stand alone conditions. As a result, total discharge flows withdrawn from the lagoon and returned to the ocean would be reduced under proposed 60 mgd production operations in permanent stand-alone mode.

Compliance with the 2015 Ocean Plan receiving water salinity standard (see Appendix C) can be achieved under virtually all hydrodynamic conditions if the effluent pond salinity is 42 ppt or less. While the 42 ppt effluent pond concentration limit proposed by Poseidon for permanent stand-alone operating conditions is higher than the 40 ppt daily average limit established within Order No. R9-2006-0065 for co-located and temporary stand-alone operations, hydrodynamic modeling indicates that proposed discharge conditions (compared to the currently regulated discharge) will not result in any significant difference in:

- receiving water salinity concentrations, or
- the area of benthic habitat within the BMZ that is subjected to receiving water salinity concentrations in excess of 2 ppt above ambient.

As a result, proposed CDP operations will not result in a lessening of water quality compared to existing permitted discharge conditions. Proposed increases in CDP production rates, discharge flows, and effluent pond salinities are in keeping with Tier I antidegradation requirements for the protection of beneficial uses and the maintenance of existing high quality receiving water. Further, as documented within Appendix M, proposed CDP permanent stand-alone facilities and operations are consistent ensuring maximum benefit to the people of the State of California and are necessary to support important economic and social development in the San Diego Region. Existing and proposed CDP operations are in compliance with antidegradation provisions of State Water Board Resolution No. 68-16 and antidegradation regulations promulgated by EPA within Title 40, Section 131.12 of the Code of Federal Regulations (40 CFR 131.12).

¹² A small amount of the salinity within the intake flow remains within the RO product water. As a result, CDP operations result in slightly more salinity mass being withdrawn from the ocean than is returned in the CDP discharge. The proposed increase in CDP production rate to 60 mgd thus results in a slight reduction in net salinity mass emissions, compared to a 50 mgd production rate.

Proposed Monitoring and Reporting Program. Provision III.M.4 of the 2015 Ocean Plan amendments require desalination owners or operators to submit a Monitoring and Reporting Plan (MRP) to monitor effluent and receiving water quality and assess impacts to all forms of marine life. Poseidon's proposed MRP builds on effluent and receiving water monitoring requirements established within Order No. R9-2006-0065, and incorporates additional receiving water monitoring to address impacts under existing permitted co-located and temporary stand alone conditions and permanent stand-alone conditions. Additional monitoring proposed (see Appendix Z) includes water quality monitoring, sediment quality monitoring, and benthic biota monitoring at proposed new monitoring stations along the edge of the BMZ and beyond.

California Environmental Quality Act (CEQA) Compliance. Subsequent to the adoption of Order No. R9-2006-0065, minor modifications to the CDP site design were addressed in four Addenda to the original project Environmental Impact Report (EIR). Table 5 (page 15) summarizes CEQA compliance actions completed since the adoption of the Order. Poseidon has initiated a CEQA evaluation of CDP operations under permanent stand-alone conditions. CEQA certification of the CDP stand-alone operation is scheduled for completion in 2016 in advance of the Regional Water Board's consideration of adoption of the NPDES permit.

Submittal of Additional Information. This Amended Report of Waste Discharge is being submitted electronically in Portable Document Format (PDF) in accordance with Regional Water Board policies that encourage paperless submittal. After receipt of your review comments, we will (if requested) provide your office with updated copies of this Amended Report of Waste Discharge that incorporate any additional information or revisions requested by your staff.

Please contact me at (760) 655-3999 (email: PMacLaggan@Poseidon1.com) if you have any questions.

Thank you for your assistance.

Sincerely,



Peter M. MacLaggan
Senior Vice President

Table 5
Summary of CEQA Compliance

Compliance Document	Scope	Lead Agency	Certification Date
Environmental Impact Report (EIR)	Construction and operation of CDP under co-located and temporary stand-alone operations. Construction and operation of associated product water conveyance facilities.	City of Carlsbad	June 13, 2006
First EIR Addendum	Relocation and resizing of select treatment processes and conveyance facilities within the EPS site.	City of Carlsbad	August 15, 2009
Second EIR Addendum	Minor modifications to potable water conveyance facilities.	San Diego County Water Authority	November 29, 2012
Third EIR Addendum	Minor modifications to potable water conveyance facilities.	San Diego County Water Authority	August 26, 2013
Fourth EIR Addendum	Minor modifications to potable water conveyance facilities.	San Diego County Water Authority	July 9, 2014
Supplemental EIR (proposed)	Permanent stand-alone operation of CDP, and associated stand-alone facilities and operations, including CDP stand-alone intake structures and onsite conveyance modifications. Minor increase in plant capacity to capture improved efficiencies in reverse osmosis membranes.	San Diego County Water Authority	2016 (projected)



Amended Report of Waste Discharge

*Renewal of NPDES CA0109223
Carlsbad Desalination Project*

Table of Contents

Letter of Transmittal

EPA Form 1

EPA Form 2D

EPA Form 2D - Effluent Characteristics

EPA Form 2D - Figures and Graphics

State of California Form 200

Certification Statements

Technical Appendices:

Appendix A	Compliance with California Ocean Plan Amendments
Appendix B	Intake Discharge Feasibility Report
Appendix C	Hydrodynamic Discharge Study
Appendix D	Coastal Process Effects on Reduced Intake
Appendix E	Order No. R9-2011-0028 (Approval of Wetlands Restoration Site)
Appendix F	Water Circulation in Agua Hedionda Lagoon - Fish Return
Appendix G	Acute Toxicity Study
Appendix H	Chronic Toxicity Study
Appendix I	Brine Dilution Salinity Tolerance
Appendix J	Fish-Friendly Pumping
Appendix K	Intake Discharge Entrainment Analysis
Appendix L	CFD Modeling of Flow Augmentation System
Appendix M	Antidegradation Analysis
Appendix N	Life Cycle Cost Analysis
Appendix O	Order No. R9-2009-0038 (Water Code 13142.5(b) Determination)
Appendix P	Flow, Entrainment, Impingement Minimization Plan
Appendix Q	Final EIR
Appendix R	California Coastal Commission Approval of Marine Life Mitigation Plan
Appendix S	Hydrogeologic Investigation, SDG&E Encina Power Plant
Appendix T	Drought Proofing through Desalting, the SDG&E Approach
Appendix U	Huntington Beach Desalination Project, ISTAP Phase I & II Reports
Appendix V	U.S. Fish & Wildlife Service Memorandum of Understanding
Appendix W	SDCWA 2010 Urban Water Management Plan and 2013 Facilities Master Plan Update
Appendix X	Construction Cost Estimates for Intake/Discharge Alternatives
Appendix Y	Implementation Schedules for Intake/Discharge Alternatives
Appendix Z	Proposed Monitoring and Reporting Plan

List of Abbreviations

BMZ	brine mixing zone
BOD	biochemical oxygen demand
CDP	Poseidon Resources Carlsbad Desalination Project
CEQA	California Environmental Quality Act
CFD	computational fluid dynamics (computer model)
COD	chemical oxygen demand
Commission	California Coastal Commission
EIR	Environmental Impact Report
EPA	United States Environmental Protection Agency
EPS	Encina Power Station
ISTAP	Independent Scientific Advisory Panel
lb/day	pounds per day
ml/l	milliliters per liter
mgd	million gallons per day
mg/l	milligrams per liter
ML	Minimum Level (sample detection reporting level)
MLMP	Marine Life Mitigation Plan
MRP	Monitoring and Reporting Plan
NA	not applicable or not available
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Units
Ocean Plan	<i>Water Quality Control Plan, Ocean Waters of California</i>
ppt	parts per thousand
RWQCB	California Regional Water Quality Control Board, San Diego Region
RO	reverse osmosis
SDCWA	San Diego County Water Authority
SDG&E	San Diego Gas & Electric
SWRCB	State of California Water Resources Control Board
TOC	total organic carbon
TSS	total suspended solids
TUa	acute toxicity units
TUc	chronic toxicity units
µg/l	micrograms per liter
USFWS	United States Fish and Wildlife Service
ZID	zone of initial dilution



EPA Form 1

***Renewal of NPDES CA0109223
Carlsbad Desalination Project***

FORM 1 GENERAL	U.S. ENVIRONMENTAL PROTECTION AGENCY GENERAL INFORMATION Consolidated Permits Program <i>(Read the "General Instructions" before starting.)</i>	I. EPA I.D. NUMBER <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:5%;">S</td> <td style="width:85%;"></td> <td style="width:5%;">T/A</td> <td style="width:5%;">C</td> </tr> <tr> <td>F</td> <td></td> <td></td> <td>D</td> </tr> <tr> <td>1</td> <td>2</td> <td>13</td> <td>14 15</td> </tr> </table>	S		T/A	C	F			D	1	2	13	14 15
S		T/A	C											
F			D											
1	2	13	14 15											
LABEL ITEMS I. EPA I.D. NUMBER III. FACILITY NAME V. FACILITY MAILING ADDRESS VI. FACILITY LOCATION		PLEASE PLACE LABEL IN THIS SPACE	GENERAL INSTRUCTIONS If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill-in area below. Also, if any of the preprinted data is absent (<i>the area to the left of the label space lists the information that should appear</i>), please provide it in the proper fill-in area(s) below. If the label is complete and correct, you need not complete Items I, III, V, and VI (<i>except VI-B which must be completed regardless</i>). Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.											
II. POLLUTANT CHARACTERISTICS														
INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold-faced terms .														
SPECIFIC QUESTIONS		SPECIFIC QUESTIONS												
A. Is this facility a publicly owned treatment works which results in a discharge to waters of the U.S.? (FORM 2A)		B. Does or will this facility (<i>either existing or proposed</i>) include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters of the U.S.? (FORM 2B)												
C. Is this a facility which currently results in discharges to waters of the U.S. other than those described in A or B above? (FORM 2C) See Note Below		D. Is this a proposed facility (<i>other than those described in A or B above</i>) which will result in a discharge to waters of the U.S.? (FORM 2D)												
E. Does or will this facility treat, store, or dispose of hazardous wastes? (FORM 3)		F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)												
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)												
I. Is this facility a proposed stationary source which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		J. Is this facility a proposed stationary source which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)												
III. NAME OF FACILITY														
Carlsbad Desalination Project														
IV. FACILITY CONTACT														
A. NAME & TITLE (<i>last, first, & title</i>)		B. PHONE (<i>area code & no.</i>)												
Peter M. MacLaggan, Vice President		(760) 655-3999												
V. FACILITY MAILING ADDRESS														
A. STREET OR P.O. BOX														
5780 Fleet Street, Suite 140														
B. CITY OR TOWN		C. STATE	D. ZIP CODE											
Carlsbad		CA	92008											
VI. FACILITY LOCATION														
A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER														
4590 Carlsbad Boulevard														
B. COUNTY NAME														
San Diego														
C. CITY OR TOWN		D. STATE	E. ZIP CODE											
Carlsbad		CA	92008											
F. COUNTY CODE (<i>if known</i>)														
NA														

CONTINUED FROM THE FRONT

VII. SIC CODES (4-digit, in order of priority)			
A. FIRST		B. SECOND	
7	4941 (specify)	7	(specify)
Water Supply			
C. THIRD		D. FOURTH	
7	(specify)	7	(specify)

VIII. OPERATOR INFORMATION	
A. NAME	B. Is the name listed in Item VIII-A also the owner?
Poseidon Resources (Channelside) LP	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO

C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box: if "Other," specify)	D. PHONE (area code & no.)
F = FEDERAL S = STATE P = PRIVATE M = PUBLIC (other than federal or state) O = OTHER (specify)	(760) 655-3999
P	

E. STREET OR P.O. BOX
5780 Fleet Street, Suite 140

F. CITY OR TOWN	G. STATE	H. ZIP CODE	IX. INDIAN LAND
Carlsbad	CA	92008	Is the facility located on Indian lands? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO

X. EXISTING ENVIRONMENTAL PERMITS			
A. NPDES (Discharges to Surface Water)		D. PSD (Air Emissions from Proposed Sources)	
9	N	9	P
CA0109223		NA	
B. UIC (Underground Injection of Fluids)		E. OTHER (specify)	
9	U	9	
NA		NA (specify)	
C. RCRA (Hazardous Wastes)		E. OTHER (specify)	
9	R	9	
NA		NA (specify)	

XI. MAP
Attach to this application a topographic map of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers, and other surface water bodies in the map area. See instructions for precise requirements.

XII. NATURE OF BUSINESS (provide a brief description)

Poseidon Resources (Channelside) LP is the owner and operator of the Carlsbad Desalination Project.

XIII. CERTIFICATION (see instructions)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE (type or print)	B. SIGNATURE	C. DATE SIGNED
Peter M. MacLaggan Vice President		9/4/15

COMMENTS FOR OFFICIAL USE ONLY	
C	
C	



EPA Form 2D

***Renewal of NPDES CA0109223
Carlsbad Desalination Project***

Please print or type in the unshaded areas only	EPA I.D. NUMBER (copy from Item 1 of Form 1)	
---	--	--

Form 2D NPDES		New Sources and New Dischargers Application for Permit to Discharge Process Wastewater
----------------------------	--	---

I. Outfall Location

For each outfall, list the latitude and longitude of its location to the nearest 15 seconds and the name of the receiving water.

Outfall Number <i>(list)</i>	Latitude			Longitude			Receiving Water <i>(name)</i>
	Deg.	Min.	Sec.	Deg.	Min.	Sec.	
001	33	8	17	117	20	22	Pacific Ocean via effluent pond & surface discharge channel

II. Discharge Date (When do you expect to begin discharging?)

Full potable water production operations to begin in late 2015; initial treatment process testing discharges initiated in spring 2015.

III. Flows, Sources of Pollution, and Treatment Technologies

A. For each outfall, provide a description of: (1) All operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water, and storm water runoff; (2) The average flow contributed by each operation; and (3) The treatment received by the wastewater. Continue on additional sheets if necessary.

Outfall Number	1. Operations Contributing Flow <i>(List)</i>	2. Average Flow <i>(Include Units)</i>	3. Treatment <i>(Description or List codes from Table 2D-1)</i>
Discharge Currently Permitted under NPDES CA0109233: Co-Located operations with Encina Power Station (EPS) or temporary stand-alone operations when EPS augments cooling water flows			
001	Concentrated seawater from reverse osmosis desalination	50 mgd average day 54 mgd maximum day	4-A*
001	Filter backwash from reverse osmosis desalination	4 mgd average day 6 mgd maximum day	1-U; 4-A*

**Proposed Discharge:
Permanent stand-alone CDP operations when EPS cooling water discharge is permanently terminated**

001	Concentrated seawater from reverse osmosis desalination	60 mgd average annual	4-A*
001	Filter backwash from reverse osmosis desalination	7 mgd annual average	1-U; 4-A*
001	Screen wash and fish return from CDP intake structure	1 mgd annual average	4-A*
001	Bypassed seawater from CDP intake structure	171 mgd annual average	4-A*

<p>Note: Annual average discharge flows will be equal to or less than the values shown above. To the extent that backwash flows are recycled back to the headworks rather than discharged to the ocean, the reduction in discharge flow rate will require an equivalent increase in bypass flow to replace dilution provided by the filter backwash. Total intake and discharge flows under either mode of operation (filter backwash recycling to headworks or discharge to the ocean) would be identical.</p>	<p>* Discharge to the ocean via an effluent pond and effluent surface discharge channel</p>

B. Attach a line drawing showing the water flow through the facility. Indicate sources of intake water, operations contributing wastewater to the effluent, and treatment units labeled to correspond to the more detailed descriptions in Item III-A. Construct a water balance on the line drawing by showing average flows between intakes, operations, treatment units, and outfalls. If a water balance cannot be determined (e.g., for certain mining activities), provide a pictorial description of the nature and amount of any sources of water and any collection or treatment measures.

C. Except for storm runoff, leaks, or spills, will any of the discharges described in Items III-A be intermittent or seasonal?

YES (complete the following table)

NO (go to Section IV)

Outfall Number	1. Frequency		2. Flow		
	a. Days Per Week (specify average)	b. Months Per Year (specify average)	a. Maximum Daily Flow Rate (in mgd)	b. Maximum Total Volume (specify with units)	c. Duration (in days)
NA	NA	NA	NA	NA	NA

IV. Production

If there is an applicable production-based effluent guideline or NSPS, for each outfall list the estimated level of production (projection of actual production level, not design), expressed in the terms and units used in the applicable effluent guideline or NSPS, for each of the first 3 years of operation. If production is likely to vary, you may also submit alternative estimates (attach a separate sheet).

Year	A. Quantity Per Day	B. Units Of Measure	c. Operation, Product, Material, etc. (specify)
NA	NA	NA	Not applicable

CONTINUED FROM THE FRONT	EPA I.D. NUMBER (copy from Item 1 of Form 1)	
--------------------------	--	--

C. Use the space below to list any of the pollutants listed in Table 2D-3 of the instructions which you know or have reason to believe will be discharged from any outfall. For every pollutant you list, briefly describe the reasons you believe it will be present.

1. Pollutant	2. Reason for Discharge
See attached tables	See attached tables

VI. Engineering Report on Wastewater Treatment

A. If there is any technical evaluation concerning your wastewater treatment, including engineering reports or pilot plant studies, check the appropriate box below.

Report Available No Report

B. Provide the name and location of any existing plant(s) which, to the best of your knowledge resembles this production facility with respect to production processes, wastewater constituents, or wastewater treatments.

Name	Location
Tampa Bay Seawater Desalination Plant (25 mgd operational)	13041 Wyandotte Road Hillsboro County Gibson, FL 33534
Poseidon Huntington Beach Desalination Facility (50 mgd proposed)	21730 Newland Avenue Orange County Huntington Beach, CA 92647

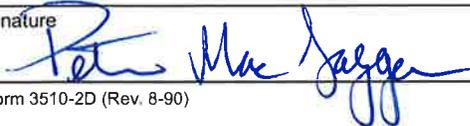
VII. Other Information (Optional)

Use the space below to expand upon any of the above questions or to bring to the attention of the reviewer any other information you feel should be considered in establishing permit limitations for the proposed facility. Attach additional sheets if necessary.

See attached technical information and reports

VIII. 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.

A. Name and Official Title (type or print) Peter M. MacLaggan, Vice President	B. Phone No. (760) 655-3999
C. Signature 	D. Date Signed 9/14/15



***EPA Form 2D
Effluent Characteristics***

***Renewal of NPDES CA0109223
Carlsbad Desalination Project***

**Summary of Production and Discharge Flows
Existing Permitted Discharge and Proposed Discharge
Carlsbad Desalination Project (CDP)**

Parameter		Current Permitted Discharge ¹ (to be continued under the updated NPDES permit until the EPS once-through cooling water discharge is permanently terminated)				Proposed Revised Discharge (EPS permanently taken out of operation)
		Co-Located Operating Conditions ²		Temporary Stand-Alone Operating Conditions ²		Stand-Alone Operating Conditions ³
		Average Daily Flow	Maximum Daily Flow	Average Daily Flow	Maximum Daily Flow	Annual Average
Potable water production capacity		50 mgd	54 mgd	50 mgd	54 mgd	60 mgd
CDP Intake Flows	Intake from EPS Effluent Channel	104 mgd	114 mgd	104 mgd	114 mgd	---
	Intake from CDP Lagoon Intake Structure	---	---	---	---	299 mgd
Wastewater discharge components	Granular Media Filtration Backwash	4 mgd	6 mgd	4 mgd	6 mgd	7 mgd
	RO concentrate	50 mgd	54 mgd	50 mgd	54 mgd	60 mgd
	Screen wash and fish return from CDP Lagoon Intake Structure	NA	NA	NA	NA	1 mgd
	CDP stand-alone intake flows bypassed ⁴	NA	NA	NA	NA	171 mgd ⁴
	Total CDP discharge flow	54 mgd	60 mgd	54 mgd	60 mgd	239 mgd
	Minimum EPS discharge flow (in excess of CDP intake) required to achieve salinity standard ⁵	200 mgd ⁵	210 mgd ⁵	200 mgd ⁵	210 mgd ⁵	NA

- Existing permitted conditions under Regional Water Board Order No. R9-2006-0065 (NPDES 0109223), as amended by Order No. R9-2009-0038. The NPDES Report of Waste Discharge submitted by Poseidon on March 29, 2011 proposed continuation of these requirements. The revised 2015 Poseidon Report of Waste Discharge presented herein requests continuation of these existing NPDES requirements as long as the EPS once-through cooling water discharge remains in operation. Once EPS is permanently taken out of operation, the CDP would be operated in permanent stand-alone operating mode (per the far right hand column).
- For conditions under which EPS is discharging sufficient power plant cooling water flows to the EPS effluent channel (pursuant to EPS NPDES discharge permit requirements), Order No. R9-2006-0065 authorizes the CDP to discharge water into the EPS effluent channel (downstream from the co-located CDP intake point) where it is blended with sufficient flow from the EPS to meet the blended effluent salinity requirements prior to discharge to the EPS discharge pond (Monitoring Location M-002). For conditions under which EPS is not discharging sufficient power plant cooling water flows to meet the blended effluent salinity requirements prior to discharge, Order No. R9-2006-0065 authorizes the EPS to run the cooling water pumps under such "temporary stand-alone" conditions for CDP's benefit to meet the blended effluent salinity requirements prior to discharge to the EPS discharge pond (Monitoring Location M-002).
- Conditions under which EPS operations are terminated and the CDP is operated in permanent stand-alone mode. Under such stand-alone conditions, CDP influent flows are withdrawn from the lagoon via a new stand-alone CDP intake system, a portion of the withdrawn flows are directed to CDP for desalination, and remaining withdrawn intake flows are blended back into the CDP RO concentrate and filter backwash streams prior to discharge to the final effluent pond (Monitoring Location M-002).
- Intake water flows under stand-alone CDP operations that bypass CDP and are directed into the effluent channel for blending with CDP RO concentrate and filtration backwash (when backwash is not being recycled to CDP pretreatment). At the discretion of plant operators, however, filter backwash may instead be recycled to the plant headworks. When backwash flows are being recycled to the CDP pretreatment processes rather than discharged to the ocean, a commensurate increase in the bypass flow rate will be required to ensure that effluent pond salinities are maintained at 42 ppt or less and receiving water salinities 200 meters from the discharge point are less than 2 ppt above ambient. Total CDP intake flows would remain at 299 mgd and total CDP discharge flows would remain at 239 mgd regardless of whether filter backwash is discharged to the ocean or recycled back to the headworks. When filter backwash is recycled to the headworks, 178 mgd of the 299 mgd intake flow would be bypassed. When filter backwash is discharged to the ocean, 171 mgd of the 299 mgd intake flow would be bypassed.
- Minimum EPS discharge flow (over and above CDP intake requirements) under EPS/CDP co-located operations required to ensure that the combined EPS and CDP discharges achieve a blended salinity equal to or lower than the average daily salinity standard. To the extent that backwash flows are being recycled to the front of the CDP pretreatment rather than discharge to the ocean (see footnote #4), the reduction in the discharge flow rate will require an equivalent increase in the minimum EPS discharge flow to replace initial dilution of the RO concentrate discharge that would have been accomplished through commingling the RO concentrate with the filter backwash water.

Group A Parameters
General Physical/Chemical Constituents

Group A Parameters ¹ EPA Form 2D	Units	Analytical Method	CDP Wastewater Streams ²		Combined CDP Effluent Discharge into EPS Cooling Water Channel	
			Treated Backwash Concentration ^{3,4}	RO Concentrate Concentration ³	Concentration ⁵	Mass Emission ⁶ (lbs/day)
Ammonia (as N)	mg/l	SM 4500 NH3	< 0.1	0.12	< 0.12	< 67
BOD (biochemical oxygen demand)	mg/l	SM 5210 B	< 10	< 10	< 10	< 5600
COD (chemical oxygen demand)	mg/l	EPA 410.4	76	< 100	< 98	< 55000
Temperature (winter)	deg. C	---	21.7 ⁷	21.7 ⁷	21.7 ⁷	---
Temperature (summer)	deg. C	---	24.7 ⁷	24.7 ⁷	24.7 ⁷	---
TOC (total organic carbon)	mg/l	SM 5310 C	< 1.3	0.7	< 0.8	< 450
TSS (Total suspended solids)	mg/l	EPA 160.2	33	< 5	< 8	< 4500
Oil and Grease	mg/l	EPA 1664	< 5	< 5	< 5	< 2800
Surfactants	mg/l	SM 5540 C	0.07	0.08	0.08	< 44
pH	pH Units	SM 4500 H B	7.21	7.49	7.5	---

- 1 Group A parameters, as classified by EPA NPDES Application Form 2D. A "<x" value indicates that the parameter was not detected at a Minimum Level (ML) concentration of "x".
- 2 CDP wastewater streams under co-located, temporary stand-alone, or permanent stand-alone operations. Once EPS facilities are permanently shut down, CDP permanent stand-alone operations would also include discharges of 1 mgd of screen wash and fish return flow from the CDP lagoon intake structure and 171 mgd of diverted lagoon water that will be used for diluting salinity from the RO concentrate. Blending flow diverted from the CDP lagoon intake structure will have the same water quality as the intake lagoon water.
- 3 Data from February 12, 2003 sampling of CDP pilot plant waste streams for treated filter backwash and RO concentrate.
- 4 Concentration of treated backwash from granular media filtration pretreatment.
- 5 Concentration of combined filter backwash and RO concentrate discharges.
- 6 Mass emission for CDP wastewater flows (e.g. RO concentrate and filter backwash) are computed on the basis of a RO concentrate flow of 60 mgd and a clarified filter backwash flow of 7 mgd.
- 7 Based on EPS cooling water effluent temperatures for November-April (winter) and May-October (summer) which will be characteristic of CDP operations under co-located conditions. Under permanent stand-alone conditions, CDP intake flow would be unheated and at the ambient temperature of the lagoon waters.

Group B Parameters
Mineral/Radioactivity/Physical/Metals

Group B Parameters ¹ EPA Form 2D	Units	Analytical Method	CDP Wastewater Streams ²		Combined CDP Effluent Discharge into EPS Cooling Water Channel	
			Treated Backwash Concentration ^{3,4}	RO Concentrate Concentration ³	Concentration ⁵	Mass Emission ⁶ (lbs/day)
Boron	mg/l	EPA 200.8	4.1	7.6	7.2	4,000
Bromide	mg/l	EPA 300.0	65	120	114	64,000
Chlorine residual, total	mg/l	---	< 0.1	< 0.1	< 0.02 ⁶	< 11
Color	Units	EPA 110.2	3.0	3.0	3.0	---
Coliforms, fecal ⁷	#/100 ml	SM 9221 E	20 ⁷	< 2 ⁷	< 4 ⁷	---
Fluoride	mg/l	EPA 300.0	< 0.5	2.1	< 2	< 1100
Nitrate (as N)	mg/l	EPA 300.0	< 0.5	< 0.5	< 0.5	< 280
Oil and Grease	mg/l	EPA 1664	< 5	< 5	< 5	< 2800
Phosphorus (as P) Total	mg/l	EPA 365.3	0.44	< 0.05	< 0.1	< 50
Radioactivity - gross alpha	pcuries/l	SM 7110C	6.2	3.4	3.7	---
Radioactivity - gross beta	pcuries/l	EPA 900.0	175	765	700	---
Radioactivity - radium 226	pcuries/l	EPA 903.0	0.192	0.128	0.13	---
Radioactivity - radium 228	pcuries/l	Ra-05	< 0.1	0.123	< 0.12	---
Sulfate	mg/l	EPA 300.0	2600	5300	5000	2,800,000
Sulfide	mg/l	SM 4500 S2 D	< 0.1	< 0.1	< 0.1	< 56
Sulfite	mg/l	SM 4500 SO3	< 2	< 2	< 2	< 1100
Surfactants	mg/l	SM 5540 C	0.07	0.08	< 0.08	< 0.04
Aluminum	µg/l	EPA 200.8	850	24	110	62
Barium	µg/l	EPA 200.8	8.4	15	14	8.0
Cobalt	µg/l	EPA 200.8	1.6	2.8	< 2.7	< 1.5
Iron	µg/l	EPA 200.7	8700	< 40	< 950	< 530
Magnesium	µg/l	EPA 200.7	1500	3100	2900	1700
Manganese	µg/l	EPA 200.8	14	17	17	9.3
Molybdenum	µg/l	EPA 200.8	12	28	26	15
Tin	µg/l	EPA 200.8	< 2.5	< 2.5	< 2.5	< 1.4
Titanium	µg/l	EPA 200.7	< 10	< 10	< 10	< 5.6

- 1 Group B parameters, as classified by EPA NPDES Application Form 2D. A "<x" value indicates that the parameter was not detected at a Minimum Level (ML) concentration of "x".
- 2 CDP wastewater streams under co-located, temporary stand-alone, or permanent stand-alone operations. Once EPS facilities are permanently shut down, CDP permanent stand-alone operations would also include discharges of 1 mgd of screen wash and fish return flow from the CDP lagoon intake structure and 171 mgd of diverted lagoon water that will be used for diluting salinity from the RO concentrate. Blending flow diverted from the CDP lagoon intake structure will have the same water quality as the intake lagoon water.
- 3 Data from February 12, 2003 sampling of CDP pilot plant waste streams for treated filter backwash and RO concentrate.
- 4 Concentration of treated backwash from granular media filtration pretreatment.
- 5 Concentration of combined filter backwash and RO concentrate discharges.
- 6 Mass emission for CDP wastewater flows (e.g. RO concentrate and filter backwash) are computed on the basis of a RO concentrate flow of 60 mgd and a clarified filter backwash flow of 7 mgd. Values rounded to two significant figures. The listed mass emissions represent mass within intake lagoon water that is recirculated back into the ocean. CDP desalination operations do not result in any of the above constituents being added to the discharge stream.
- 7 Chlorine residual was not detected in the CDP pilot plant testing at a detection limit of 0.1 mg/l.
- 8 Coliform concentrations based on sample results from the February 2003 sampling of CDP pilot plant operations. The February 2003 sampling occurred during non-storm conditions, and is representative of dry weather operations. To characterize lagoon water quality during storm events, Poseidon Resources collected hourly wet-weather coliform samples during two storm events in December 2002 and one storm in January 2005. The wet weather sampling demonstrated that temporarily high coliform concentrations can exist in Agua Hedionda Lagoon during storm periods. CDP treatment facilities are designed to remove all coliform from the influent flow. For the granular media filtration scenario, much of the removed coliform will be concentrated in backwash water solids that are removed from the waste stream discharged back into the EPS channel. As a result, the total number (mass emissions) of coliform organisms in the CDP effluent discharged back into the EPS effluent channel are projected to be less than the total number of coliform organisms in the CDP influent under both normal (dry-weather) and storm conditions.

**Group B1 and B2 Parameters
Toxic Metals/Cyanide and TCDD**

Group B1 & B2 Parameters ¹ EPA Form 2D	Analytical Method	CDP Wastewater Streams ²		Combined CDP Effluent Discharge into EPS Cooling Water Channel	
		Treated Backwash Concentration ^{3,4} (µg/l)	RO Concentrate Concentration ³ (µg/l)	Concentration ⁵ (µg/l)	Mass Emission ⁶ (lbs/day)
Antimony	EPA 200.8	< 5	< 5	< 5.0	< 2.8
Arsenic	EPA 200.8	10	< 2	< 2.8	< 1.6
Beryllium	EPA 200.8	< 0.3	< 0.3	< 0.3	< 0.15
Cadmium	EPA 200.8	< 0.5	< 0.5	< 0.5	< 0.28
Chromium, total	EPA 200.8	< 4	< 4	< 4	< 2.2
Copper	EPA 200.8	< 2	< 2	< 2	< 1.1
Lead	EPA 200.8	< 1	< 1	< 1	< 0.56
Mercury	EPA 245.1	< 0.2	< 0.2	< 0.2	< 0.11
Nickel	EPA 200.8	14	19	19	10
Selenium	EPA 200.8 Hy	< 0.4	< 0.4	< 0.4	< 0.22
Silver	EPA 200.8	< 0.5	< 0.5	< 0.5	< 0.28
Thallium	EPA 200.8	< 0.5	< 2.5	< 2.3	< 1.3
Zinc	EPA 200.8	11	< 10	< 10	< 5.6
Cyanide	SM 4500 CN E	< 50	< 50	< 50	< 28
2,3,7,8-TCDD	---	< 0.001	< 0.001	< 0.001	< 0.00056

- 1 Group B1 parameters (toxic metals and cyanide) and Group B2 parameters (TCDD), as classified by EPA NPDES Application Form 2D. A "<x" value indicates that the parameter was not detected at a Minimum Level (ML) concentration of "x".
- 2 CDP wastewater streams under co-located, temporary stand-alone, or permanent stand-alone operations. Once EPS facilities are permanently shut down, CDP permanent stand-alone operations would also include discharges of 1 mgd of screen wash and fish return flow from the CDP lagoon intake structure and 171 mgd of diverted lagoon water that will be used for diluting salinity from the RO concentrate. Blending flow diverted from the CDP lagoon intake structure will have the same water quality as the intake lagoon water.
- 3 Data from February 12, 2003 sampling of CDP pilot plant waste streams for treated filter backwash and RO concentrate.
- 4 Concentration of treated backwash from granular media filtration pretreatment.
- 5 Concentration of combined filter backwash and RO concentrate discharges.
- 6 Mass emission for CDP wastewater flows (e.g. RO concentrate and filter backwash) are computed on the basis of a RO concentrate flow of 60 mgd and a clarified filter backwash flow of 7 mgd. Values rounded to two significant figures. The listed mass emissions represent mass within intake lagoon water that is recirculated back into the ocean. CDP desalination operations do not result in any discernible concentrations of the above constituents being added to the discharge stream.

**Group B3 Parameters
Volatile Organic Compounds**

Group B3 Parameters ¹ Volatile Organic Compounds EPA Form 2D	Analytical Method	CDP Wastewater Streams ²		Combined CDP Effluent Discharge into EPS Cooling Water Channel	
		Treated Backwash Concentration ^{3,4} (µg/l)	RO Concentrate Concentration ³ (µg/l)	Concentration ⁵ (µg/l)	Mass Emission ⁶ (lbs/day)
2-Butanone	524.2	< 5	< 5	< 5	< 2.8
Bromoform	524.2	< 0.5	1.4	< 1.3	< 0.73
All other Group B3 volatile compounds	524.2	Not Detected ⁷	Not Detected ⁷	Not Detected ⁷	Not Applicable

- 1 Group B3 volatile organic compounds, as classified by EPA NPDES Application Form 2D. A "<x" value indicates that the parameter was not detected at a Minimum Level (ML) concentration of "x".
- 2 CDP wastewater streams under co-located, temporary stand-alone, or permanent stand-alone operations. Once EPS facilities are permanently shut down, CDP permanent stand-alone operations would also include discharges of 1 mgd of screen wash and fish return flow from the CDP lagoon intake structure and 171 mgd of diverted lagoon water that will be used for diluting salinity from the RO concentrate. Blending flow diverted from the CDP lagoon intake structure will have the same water quality as the intake lagoon water.
- 3 Data from February 12, 2003 sampling of CDP pilot plant waste streams for treated filter backwash and RO concentrate.
- 4 Concentration of treated backwash from granular media filtration pretreatment.
- 5 Concentration of combined filter backwash and RO concentrate discharges.
- 6 Mass emission for CDP wastewater flows (e.g. RO concentrate and filter backwash) are computed on the basis of a RO concentrate flow of 60 mgd and a clarified filter backwash flow of 7 mgd. Values rounded to two significant figures. The listed mass emissions represent mass within intake lagoon water that is recirculated back into the ocean. CDP desalination operations do not result in any of the above constituents being added to the discharge stream.
- 7 All other Group 3 volatile organic compounds were not detected at a Method 524.2 detection limit of 5 µg/l.

**Group B3 Parameters
Acid Extractable Compounds**

Group B3 Parameters ¹ Acid Extractable Compounds EPA Form 2D	Analytical Method	CDP Wastewater Streams ²		Combined CDP Effluent Discharge into EPS Cooling Water Channel	
		Treated Backwash Concentration ^{3,4} (µg/l)	RO Concentrate Concentration ³ (µg/l)	Concentration ⁵ (µg/l)	Mass Emission ⁶ (lbs/day)
2-Chlorophenol	EPA 625	< 5	< 5	< 5	< 2.8
4-Chloro-3-methylphenol	EPA 625	< 5	< 5	< 5	< 2.8
2,4-Dichlorophenol	EPA 625	< 5	< 5	< 5	< 2.8
2,4-Dimethylphenol	EPA 625	< 5	< 5	< 5	< 2.8
2,4-Dinitrophenol	EPA 625	< 20	< 20	< 20	< 11
2-Methyl-4,6-dinitrophenol	EPA 625	< 10	< 10	< 10	< 5.6
2-Nitrophenol	EPA 625	< 10	< 10	< 10	< 5.6
4-Nitrophenol	EPA 625	< 10	< 10	< 10	< 5.6
Pentachlorophenol	EPA 625	< 5	< 5	< 5	< 2.8
Phenol	EPA 625	< 5	< 5	< 5	< 2.8
2,4,6-Trichlorophenol	EPA 625	< 10	< 10	< 10	< 5.6

- 1 Group B3 acid extractable compounds, as classified by EPA NPDES Application Form 2D. A "<x" value indicates that the parameter was not detected at a Minimum Level (ML) concentration of "x".
- 2 CDP wastewater streams under co-located, temporary stand-alone, or permanent stand-alone operations. Once EPS facilities are permanently shut down, CDP permanent stand-alone operations would also include discharges of 1 mgd of screen wash and fish return flow from the CDP lagoon intake structure and 171 mgd of diverted lagoon water that will be used for diluting salinity from the RO concentrate. Blending flow diverted from the CDP lagoon intake structure will have the same water quality as the intake lagoon water.
- 3 Data from February 12, 2003 sampling of CDP pilot plant waste streams for treated filter backwash and RO concentrate.
- 4 Concentration of treated backwash from granular media filtration pretreatment.
- 5 Concentration of combined filter backwash and RO concentrate discharges.
- 6 Mass emission for CDP wastewater flows (e.g. RO concentrate and filter backwash) are computed on the basis of a RO concentrate flow of 60 mgd and a clarified filter backwash flow of 7 mgd. Values rounded to two significant figures. The listed mass emissions represent mass within intake lagoon water that is recirculated back into the ocean. CDP desalination operations do not result in any of the above constituents being added to the discharge stream.

**Group B3 Parameters
Base Neutral Compounds**

Group B3 Parameters ¹ Base Neutral Compounds EPA Form 2D	Analytical Method	CDP Wastewater Streams ²		Combined CDP Effluent Discharge into EPS Cooling Water Channel	
		Treated Backwash Concentration ^{3,4} (µg/l)	RO Concentrate Concentration ³ (µg/l)	Concentration ⁵ (µg/l)	Mass Emission ⁶ (lbs/day)
Acenaphthene	EPA 625	< 5	< 5	< 5	< 2.8
Acenaphthylene	EPA 625	< 5	< 5	< 5	< 2.8
Anthracene	EPA 625	< 5	< 5	< 5	< 2.8
Benzidine	EPA 625	< 5	< 5	< 5	< 2.8
Benzo(a)anthracene	EPA 625	< 5	< 5	< 5	< 2.8
Benzo(a)pyrene	EPA 625	< 5	< 5	< 5	< 2.8
Benzo(b)fluoranthene	EPA 625	< 5	< 5	< 5	< 2.8
Benzo(g,h,i)perylene	EPA 625	< 5	< 5	< 5	< 2.8
Benzo(k)fluoranthene	EPA 625	< 5	< 5	< 5	< 2.8
Bis (2-chloroethoxy)methane	EPA 625	< 5	< 5	< 5	< 2.8
Bis(2-chloroethyl)ether	EPA 625	< 5	< 5	< 5	< 2.8
Bis(2-chloroisopropyl)ether	EPA 625	< 5	< 5	< 5	< 2.8
Bis(2-ethylhexyl)phthalate	EPA 625	< 5	< 5	< 5	< 2.8
4-Bromophenyl phenyl ether	EPA 625	< 5	< 5	< 5	< 2.8
Butyl benzyl phthalate	EPA 625	< 5	< 5	< 5	< 2.8
2-Chloronaphthalene	EPA 625	< 5	< 5	< 5	< 2.8
4-Chlorophenyl phenyl ether	EPA 625	< 5	< 5	< 5	< 2.8
Chrysene	EPA 625	< 5	< 5	< 5	< 2.8
Dibenzo(a,h)anthracene	EPA 625	< 5	< 5	< 5	< 2.8
1,2-Dichlorobenzene	EPA 625	< 5	< 5	< 5	< 2.8
1,3-Dichlorobenzene	EPA 625	< 5	< 5	< 5	< 2.8
1,4-Dichlorobenzene	EPA 625	< 5	< 5	< 5	< 2.8
3,3'-Dichlorobenzidine	EPA 625	< 5	< 5	< 5	< 2.8
Diethyl phthalate	EPA 625	< 5	< 5	< 5	< 2.8
Dimethyl phthalate	EPA 625	< 5	< 5	< 5	< 2.8
Di-n-butyl phthalate	EPA 625	< 5	< 5	< 5	< 2.8
2,4-Dinitrotoluene	EPA 625	< 5	< 5	< 5	< 2.8
2,6-Dinitrotoluene	EPA 625	< 5	< 5	< 5	< 2.8
Di-n-octyl phthalate	EPA 625	< 5	< 5	< 5	< 2.8
1,2-Diphenyl hydrazine	EPA 625	< 5	< 5	< 5	< 2.8
Fluoranthene	EPA 625	< 5	< 5	< 5	< 2.8
Fluorene	EPA 625	< 5	< 5	< 5	< 2.8

NOTE: Table for Group B3 base neutral compounds is continued on the following page.

**Group B3 Parameters
Base Neutral Compounds (continued)**

Group B3 Parameters ¹ Base Neutral Compounds EPA Form 2D	Analytical Method	CDP Wastewater Streams ²		Combined CDP Effluent Discharge into EPS Cooling Water Channel	
		Treated Backwash Concentration ^{3,4} (µg/l)	RO Concentrate Concentration ³ (µg/l)	Concentration ⁵ (µg/l)	Mass Emission ⁶ (lbs/day)
Hexachlorobenzene	EPA 508	< 0.5	< 0.5	< 0.5	< 0.28
Hexachlorobutadiene	EPA 625	< 5	< 5	< 5	< 2.8
Hexachlorocyclopentadiene	EPA 508	< 1	< 1	< 1	< 0.56
Hexachloroethane	EPA 625	< 5	< 5	< 5	< 2.8
Indeno(1,2,3-c)pyrene	EPA 625	< 5	< 5	< 5	< 2.8
Isophorone	EPA 625	< 5	< 5	< 5	< 2.8
Naphthalene	EPA 625	< 5	< 5	< 5	< 2.8
Nitrobenzene	EPA 625	< 5	< 5	< 5	< 2.8
N-nitrosodi-n-propylamine	EPA 625	< 5	< 5	< 5	< 2.8
N-Nitrosodimethylamine	EPA 625	< 5	< 5	< 5	< 2.8
N-Nitrosodiphenylamine	EPA 625	< 5	< 5	< 5	< 2.8
Phenanthrene	EPA 625	< 5	< 5	< 5	< 2.8
Pyrene	EPA 625	< 5	< 5	< 5	< 2.8
1,2,4-Trichlorobenzene	EPA 625	< 5	< 5	< 5	< 2.8

- 1 Group B3 base neutral compounds, as classified by EPA NPDES Application Form 2D. A "<x" value indicates that the parameter was not detected at a Minimum Level (ML) concentration of "x".
- 2 CDP wastewater streams under co-located, temporary stand-alone, or permanent stand-alone operations. Once EPS facilities are permanently shut down, CDP permanent stand-alone operations would also include discharges of 1 mgd of screen wash and fish return flow from the CDP lagoon intake structure and 171 mgd of diverted lagoon water that will be used for diluting salinity from the RO concentrate. Blending flow diverted from the CDP lagoon intake structure will have the same water quality as the intake lagoon water.
- 3 Data from February 12, 2003 sampling of CDP pilot plant waste streams for treated filter backwash and RO concentrate.
- 4 Concentration of treated backwash from granular media filtration pretreatment.
- 5 Concentration of combined filter backwash and RO concentrate discharges.
- 6 Mass emission for CDP wastewater flows (e.g. RO concentrate and filter backwash) are computed on the basis of a RO concentrate flow of 60 mgd and a clarified filter backwash flow of 7 mgd. Values rounded to two significant figures. The listed mass emissions represent mass within intake lagoon water that is recirculated back into the ocean. CDP desalination operations do not result in any of the above constituents being added to the discharge stream.

**Group B3 Parameters
Chlorinated Pesticides**

Group B3 Parameters ¹ Chlorinated Pesticides EPA Form 2D	Analytical Method	CDP Wastewater Streams ²		Combined CDP Effluent Discharge into EPS Cooling Water Channel	
		Treated Backwash Concentration ^{3,4} (µg/l)	RO Concentrate Concentration ³ (µg/l)	Concentration ⁵ (µg/l)	Mass Emission ⁶ (lbs/day)
Aldrin	EPA 508	< 0.075	< 0.075	<0.075	< 0.042
BHC-alpha	EPA 508	< 0.05	< 0.05	< 0.05	< 0.028
BHC-beta	EPA 508	< 0.05	< 0.05	< 0.05	< 0.028
BHC-delta	EPA 508	< 0.5	< 0.5	< 0.5	< 0.28
BHC-gamma (Lindane)	EPA 508	< 0.2	< 0.2	< 0.2	< 0.11
Chlordane-alpha	EPA 508	< 0.1	< 0.1	< 0.1	< 0.056
Chlordane-gamma	EPA 508	< 0.1	< 0.1	< 0.1	< 0.056
2,4'-DDD	EPA 508	< 1	< 1	< 1	< 0.056
2,4'-DDE	EPA 508	< 1	< 1	< 1	< 0.056
2,4'-DDT	EPA 508	< 1	< 1	< 1	< 0.056
4,4'-DDD	EPA 508	< 0.02	< 0.02	< 0.02	< 0.011
4,4'-DDE	EPA 508	< 0.01	< 0.01	< 0.01	< 0.011
4,4'-DDT	EPA 508	< 0.02	< 0.02	< 0.02	< 0.011
Dieldrin	EPA 508	< 0.02	< 0.02	< 0.02	< 0.011
Endosulfan I	EPA 508	< 0.02	< 0.02	< 0.02	< 0.011
Endosulfan II	EPA 508	< 0.01	< 0.01	< 0.01	< 0.011
Endosulfan sulfate	EPA 508	< 0.05	< 0.05	< 0.05	< 0.028
Endrin	EPA 508	< 0.1	< 0.1	< 0.1	< 0.056
Endrin aldehyde	EPA 508	< 0.05	< 0.05	< 0.05	< 0.028
Heptachlor	EPA 508	< 0.01	< 0.01	< 0.01	< 0.011
Heptachlor epoxide	EPA 508	< 0.01	< 0.01	< 0.01	< 0.011
Polychlorinated biphenyls (PCBs)	EPA 508	< 0.1	< 0.1	< 0.1	< 0.056
Toxaphene	EPA 508	< 1	< 1	< 1	< 0.56

- 1 Group B3 chlorinated pesticides, as classified by EPA NPDES Application Form 2D. A "<x" value indicates that the parameter was not detected at a Minimum Level (ML) concentration of "x".
- 2 CDP wastewater streams under co-located, temporary stand-alone, or permanent stand-alone operations. Once EPS facilities are permanently shut down, CDP permanent stand-alone operations would also include discharges of 1 mgd of screen wash and fish return flow from the CDP lagoon intake structure and 171 mgd of diverted lagoon water that will be used for diluting salinity from the RO concentrate. Blending flow diverted from the CDP lagoon intake structure will have the same water quality as the intake lagoon water.
- 3 Data from February 12, 2003 sampling of CDP pilot plant waste streams for treated filter backwash and RO concentrate.
- 4 Concentration of treated backwash from granular media filtration pretreatment.
- 5 Concentration of combined filter backwash and RO concentrate discharges.
- 6 Mass emission for CDP wastewater flows (e.g. RO concentrate and filter backwash) are computed on the basis of a RO concentrate flow of 60 mgd and a clarified filter backwash flow of 7 mgd. The listed mass emissions represent mass within intake lagoon water that is recirculated back into the ocean. CDP desalination operations do not result in any of the above constituents being added to the discharge stream.

**Group B3 Parameters
Other Compounds**

Group B1 & B2 Parameters ¹ Other Hazardous Compounds EPA Form 2D	Analytical Method	CDP Wastewater Streams ²		Combined CDP Effluent Discharge into EPS Cooling Water Channel	
		Treated Backwash Concentration ^{3,4} (µg/l)	RO Concentrate Concentration ³ (µg/l)	Concentration ⁵ (µg/l)	Mass Emission ⁶ (lbs/day)
Benzo(e)pyrene ⁷	EPA 625	< 5	< 5	< 5	< 2.8
Biphenyl hydrazine ⁷	EPA 625	< 5	< 5	< 5	< 2.8
2,6-Dimethylnaphthalene ⁷	EPA 625	< 5	< 5	< 5	< 2.8
Methoxychlor ⁸	EPA 508	< 10	< 10	< 10	< 5.6
1-Methylnaphthalene ⁷	EPA 625	< 5	< 5	< 5	< 2.8
2-Methylnaphthalene ⁷	EPA 625	< 5	< 5	< 5	< 2.8
1-Methylphenanthrene ⁷	EPA 625	< 5	< 5	< 5	< 2.8
Mirex ⁸	EPA 508	< 0.02	< 0.02	< 0.02	< 0.011
Perylene ⁷	EPA 625	< 5	< 5	< 5	< 2.8
2,3,5-Trimethylnaphthalene ⁷	EPA 625	< 5	< 5	< 5	< 2.8
trans-Nonachlor ⁸	EPA 508	< 0.01	< 0.01	< 0.01	< 0.056
Tributyltin	---	< 0.005	< 0.005	< 0.005	< 0.0028

- 1 Group B3 parameters classified as “other hazardous compounds” by EPA NPDES Application Form 2D. A “<x” value indicates that the parameter was not detected at a Minimum Level (ML) concentration of “x”.
- 2 CDP wastewater streams under co-located, temporary stand-alone, or permanent stand-alone operations. Once EPS facilities are permanently shut down, CDP permanent stand-alone operations would also include discharges of 1 mgd of screen wash and fish return flow from the CDP lagoon intake structure and 171 mgd of diverted lagoon water that will be used for diluting salinity from the RO concentrate. Blending flow diverted from the CDP lagoon intake structure will have the same water quality as the intake lagoon water.
- 3 Data from February 12, 2003 sampling of CDP pilot plant waste streams for treated filter backwash and RO concentrate.
- 4 Concentration of treated backwash from granular media filtration pretreatment.
- 5 Concentration of combined filter backwash and RO concentrate discharges.
- 6 Mass emission for CDP wastewater flows (e.g. RO concentrate and filter backwash) are computed on the basis of a RO concentrate flow of 60 mgd and a clarified filter backwash flow of 7 mgd. The listed mass emissions represent mass within intake lagoon water that is recirculated back into the ocean. CDP desalination operations do not result in any of the above constituents being added to the discharge stream.
- 7 Base neutral compound not listed within the EPA Form 2D Group B3 base neutral compounds.
- 8 Pesticide not listed within the EPA Form 2D Group B3 pesticides.



***EPA Form 2D
Figures and Graphics***

***Renewal of NPDES CA0109223
Carlsbad Desalination Project***

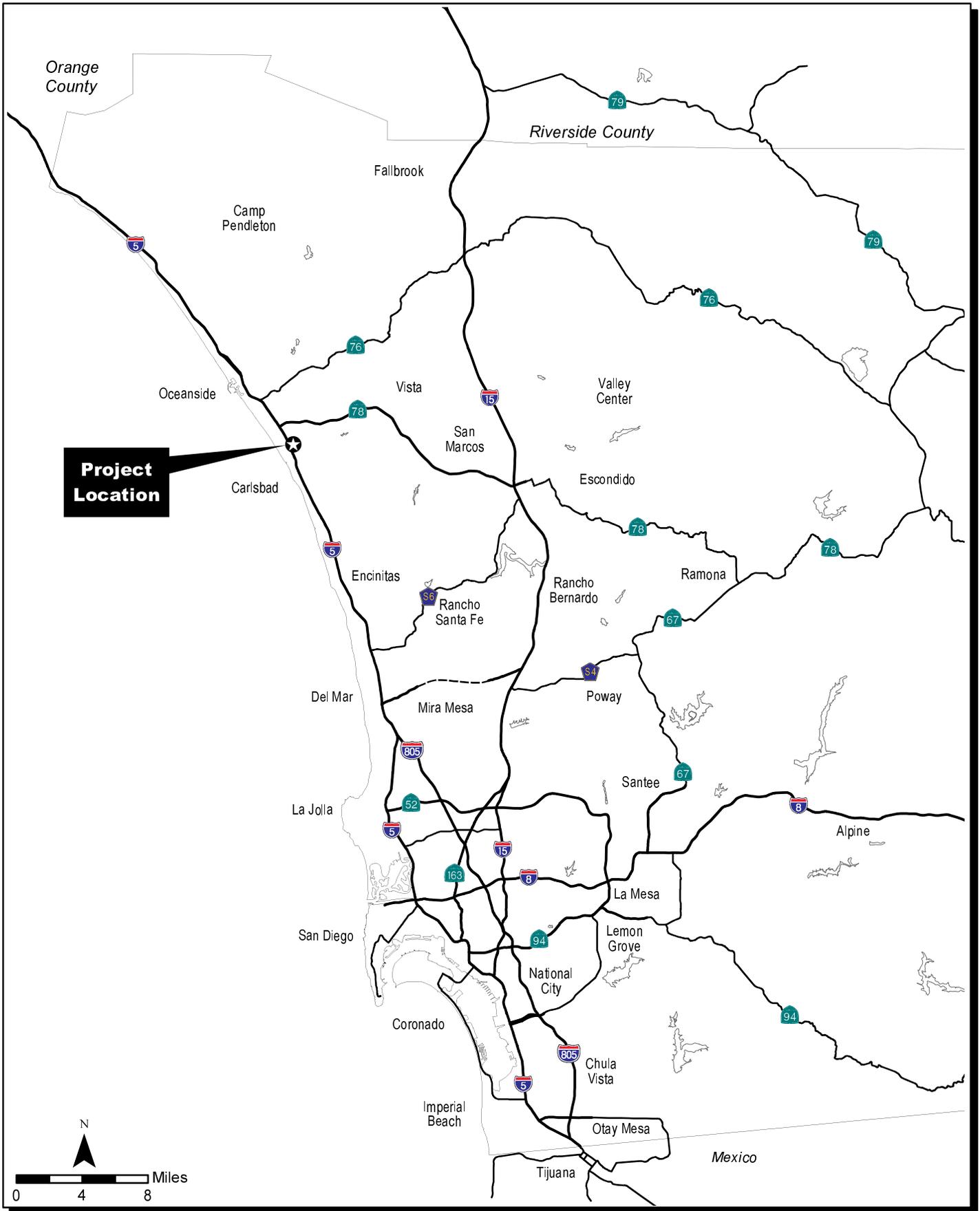


Figure 1
 Location Map
 Carlsbad Desalination Project

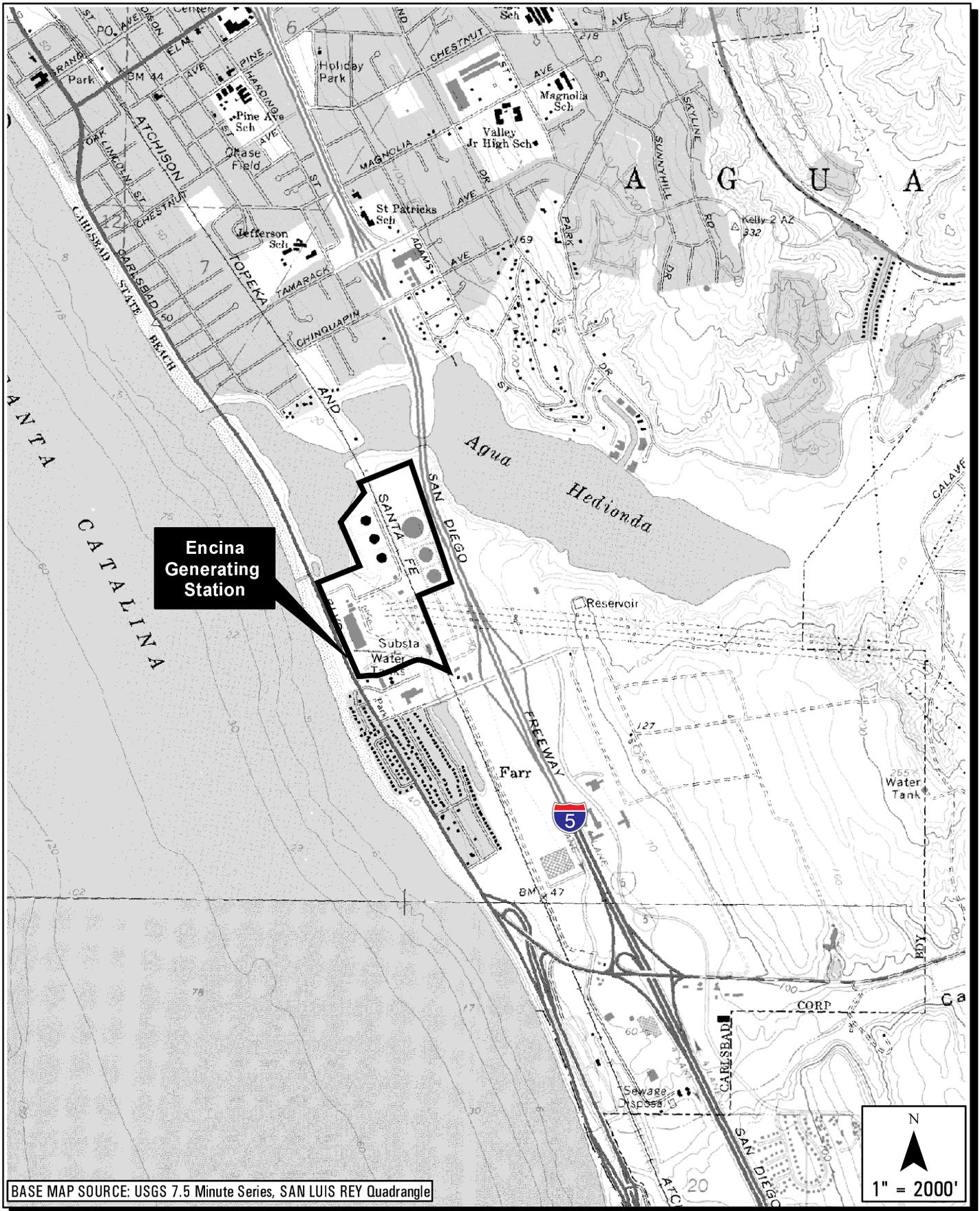


Figure 2
 Site Location
 Carlsbad Desalination Project and Encina Power Station



Figure 3
Site Layout
Carlsbad Desalination Project

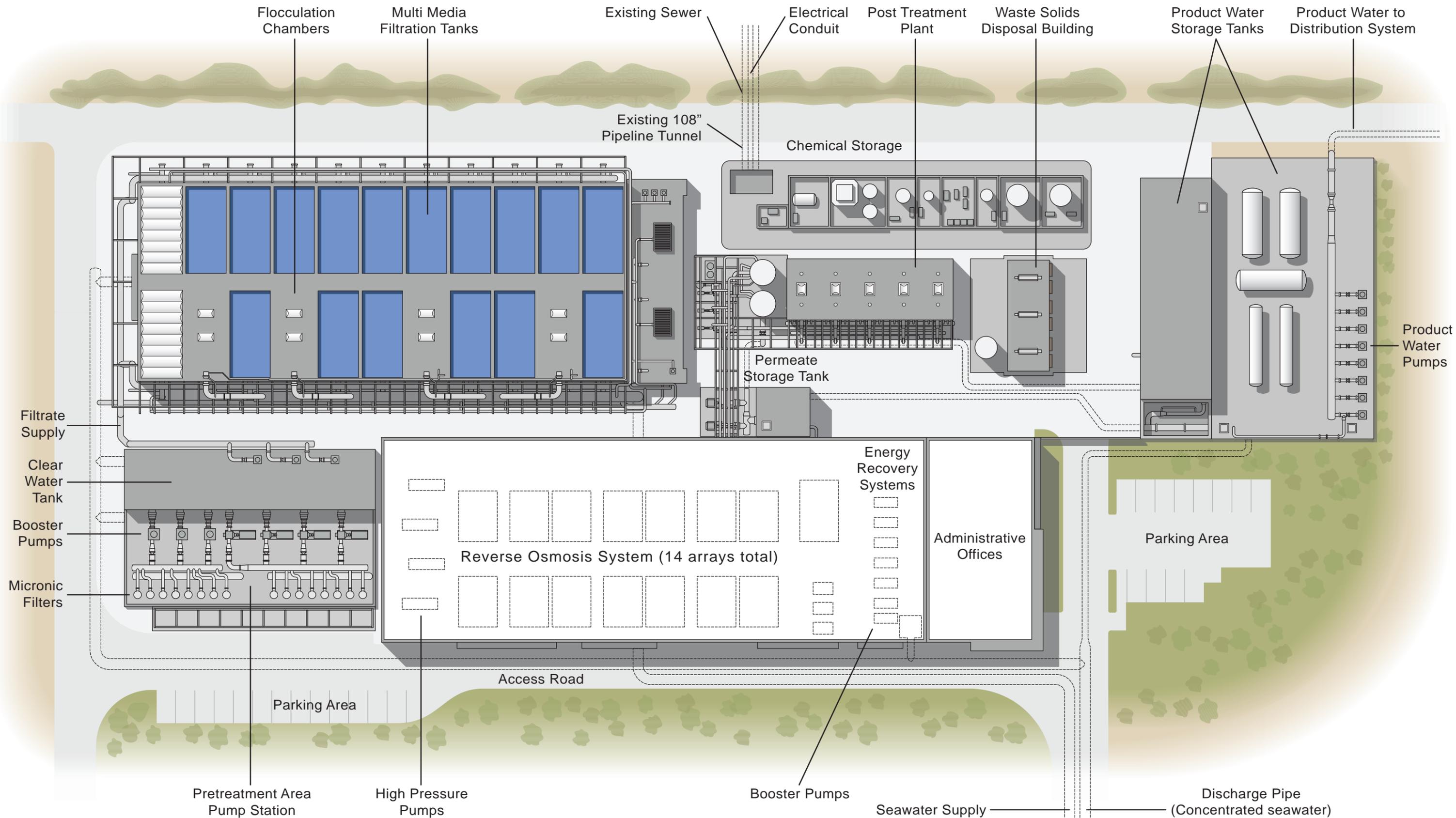
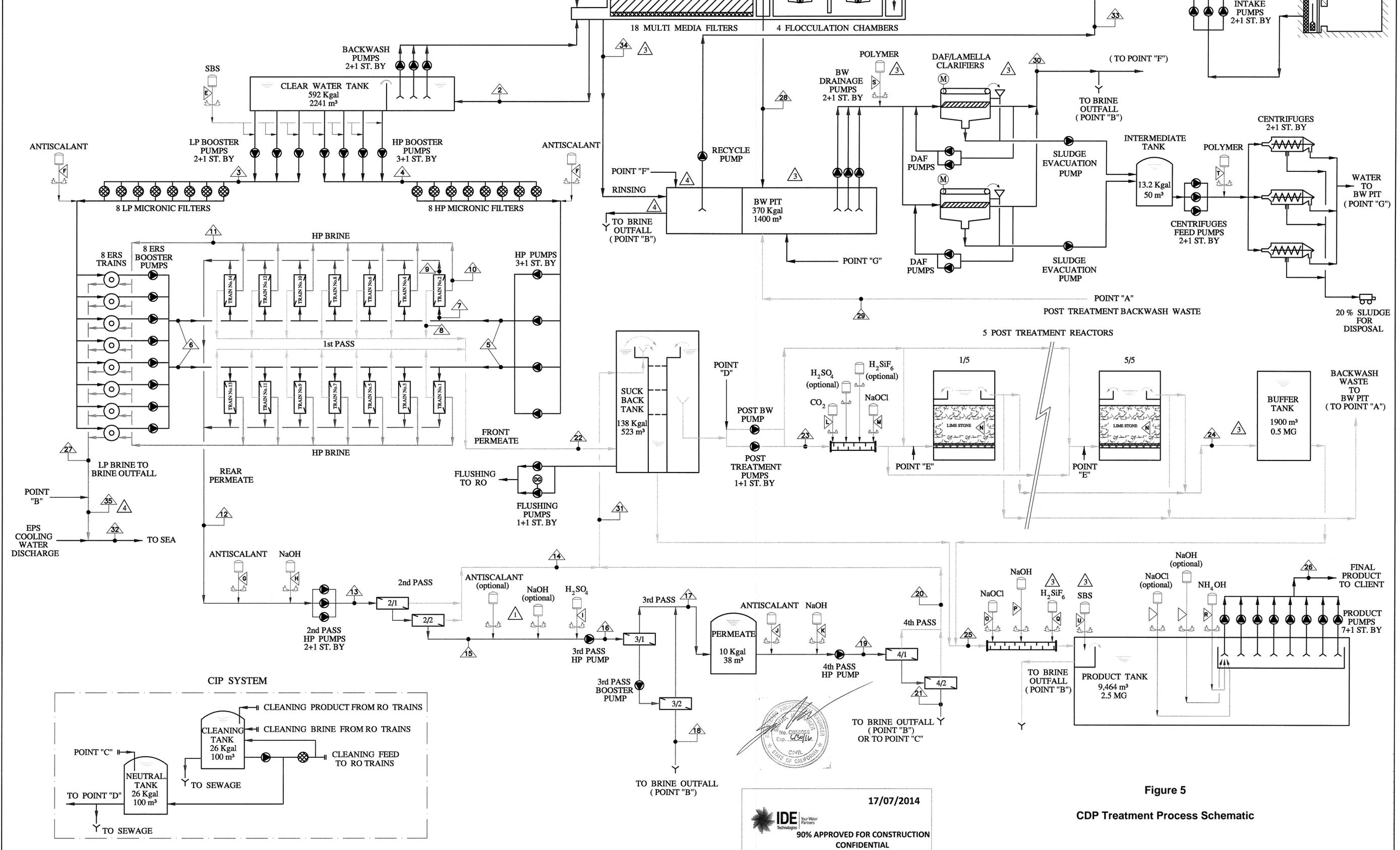


Figure 4
Plant Configuration
Carlsbad Desalination Project

REV	DESCRIPTION	DATE	APPROVED
03	"OPTIONAL" DELETED FROM FLUORIDE DOSAGE TO FINAL PRODUCT	02.07.13	I.S.
03	SBS INJECTION POINT LOCATION TO PRODUCT TANK OVERFLOW UPDATED	25.11.13	Y.B.
03	POLYMER INJECTION LOCATION TO CLARIFIERS FEED UPDATED.	25.11.13	Y.B.
03	POLYMER INJECTION TO BUFFER TANK CANCELLED.	25.11.13	Y.B.
03	FERRIC SULFATE INJECTION TO INTAKE PUMPS DISCHARGE ADDED.	25.11.13	Y.B.
03	POINT 34, FILTER TO WASTE, WAS ADDED	10.01.14	B.K.
03	CLARIFIERS EQUIPMENT WAS UPDATED	10.01.14	B.K.
04	POINT 35 OVERALL BRINE TO OUTFALL WAS ADDED	26.05.14	B.K.



17/07/2014

IDE Technologies
90% APPROVED FOR CONSTRUCTION
CONFIDENTIAL

Figure 5
CDP Treatment Process Schematic

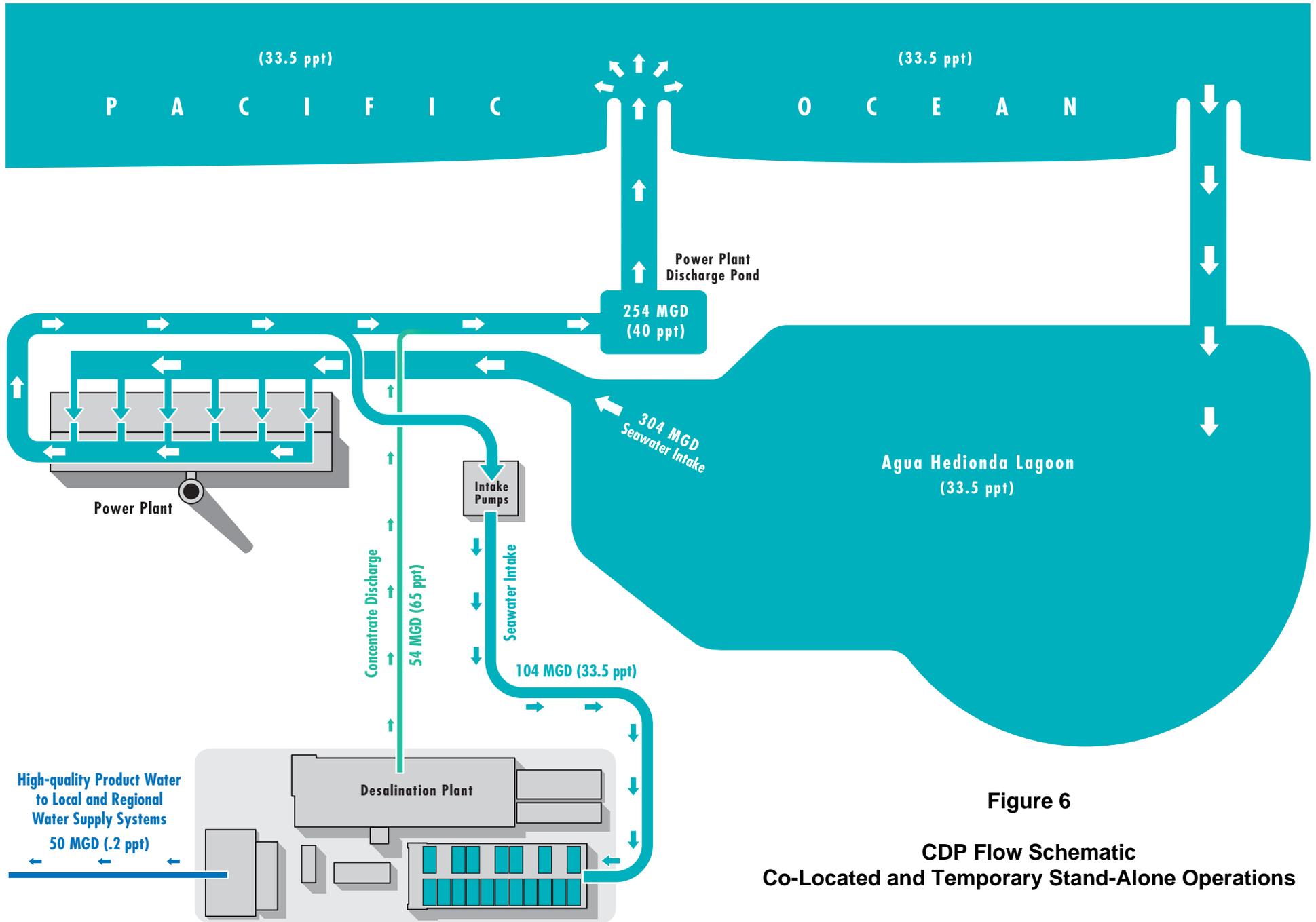


Figure 6
CDP Flow Schematic
Co-Located and Temporary Stand-Alone Operations

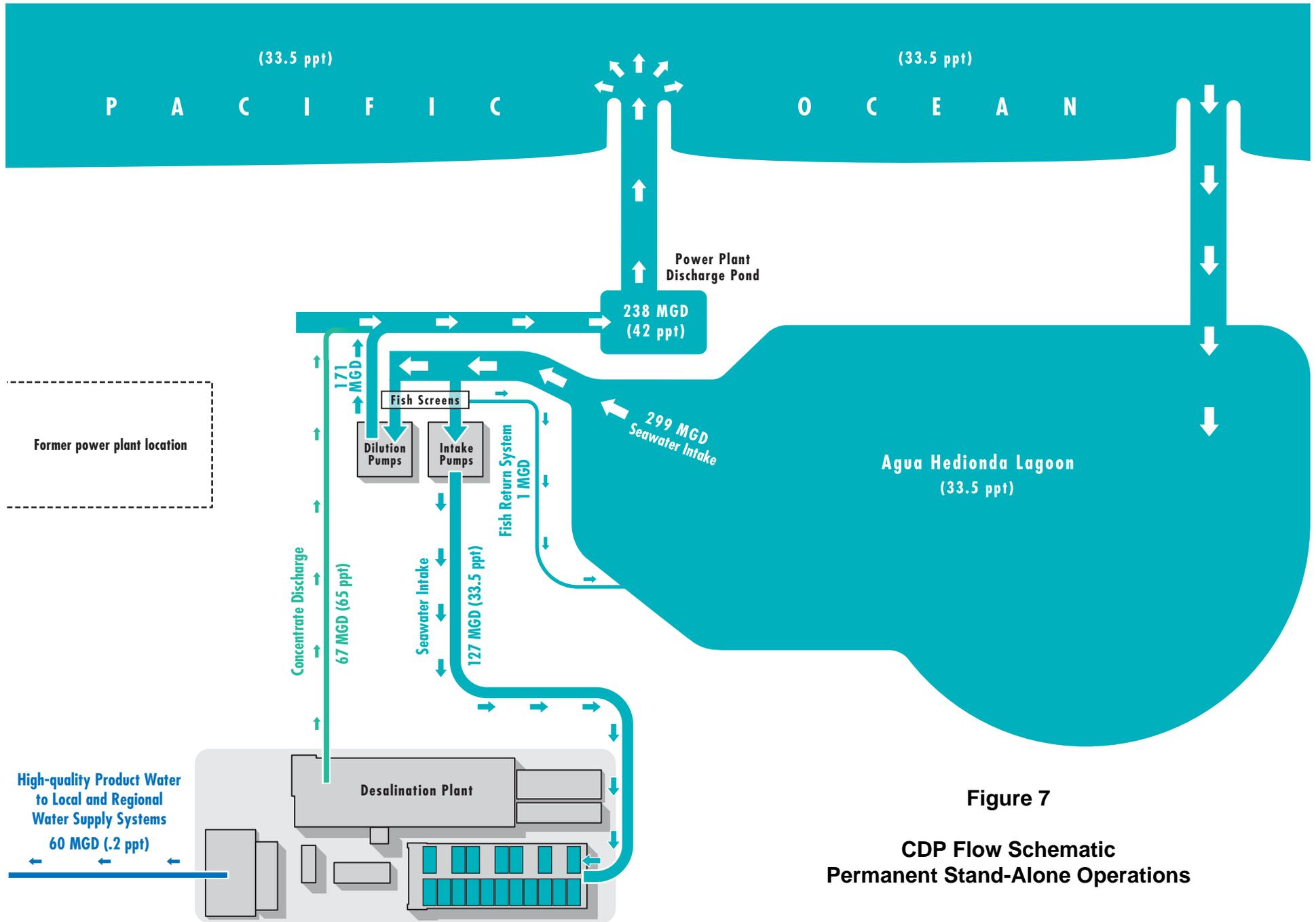


Figure 7
CDP Flow Schematic
Permanent Stand-Alone Operations



State of California Form 200

***Renewal of NPDES CA0109223
Carlsbad Desalination Project***



State of California
Regional Water Quality Control Board
**APPLICATION/REPORT OF WASTE DISCHARGE
GENERAL INFORMATION FORM FOR
WASTE DISCHARGE REQUIREMENTS OR NPDES PERMIT**



I. FACILITY INFORMATION

A. Facility:

Name: Carlsbad Desalination Project (CDP)			
Address: 4590 Carlsbad Boulevard			
City: Carlsbad	County: San Diego	State: CA	Zip Code: 92008
Contact Person: Peter M. MacLaggan, Vice President		Telephone Number: (760) 655-3999	

B. Facility Owner:

Name: Poseidon Resources (Channelside) LP			Owner Type (Check One)	
Address: 5780 Fleet Street, Suite 140			1. <input type="checkbox"/> Individual	2. <input checked="" type="checkbox"/> Corporation
City: Carlsbad			3. <input type="checkbox"/> Governmental Agency	4. <input type="checkbox"/> Partnership
State: CA			5. <input type="checkbox"/> Other: _____	
Zip Code: 92008				
Contact Person: Peter M. MacLaggan, Vice President		Telephone Number: (760) 655-3999	Federal Tax ID:	

C. Facility Operator (The agency or business, not the person):

Name: Poseidon Resources (Channelside) LP			Operator Type (Check One)	
Address: 5780 Fleet Street, Suite 140			1. <input type="checkbox"/> Individual	2. <input checked="" type="checkbox"/> Corporation
City: Carlsbad			3. <input type="checkbox"/> Governmental Agency	4. <input type="checkbox"/> Partnership
State: CA			5. <input type="checkbox"/> Other: _____	
Zip Code: 92008				
Contact Person: Peter M. MacLaggan, Vice President		Telephone Number: (760) 655-3999		

D. Owner of the Land:

Name: Cabrillo Power I, LLC			Owner Type (Check One)	
Address: 4600 Carlsbad Boulevard			1. <input type="checkbox"/> Individual	2. <input checked="" type="checkbox"/> Corporation
City: Carlsbad			3. <input type="checkbox"/> Governmental Agency	4. <input type="checkbox"/> Partnership
State: CA			5. <input type="checkbox"/> Other: _____	
Zip Code: 92008				
Contact Person: Sheila Henika		Telephone Number: (760) 268-4018		

E. Address Where Legal Notice May Be Served:

Address: Same as Facility Owner			
City:	State:	Zip Code:	
Contact Person:		Telephone Number:	

F. Billing Address:

Address: Same as Facility Owner			
City:	State:	Zip Code:	
Contact Person:		Telephone Number:	



State of California
Regional Water Quality Control Board
**APPLICATION/REPORT OF WASTE DISCHARGE
GENERAL INFORMATION FORM FOR
WASTE DISCHARGE REQUIREMENTS OR NPDES PERMIT**



II. TYPE OF DISCHARGE

Check Type of Discharge(s) Described in this Application (A or B):

- A. WASTE DISCHARGE TO LAND B. WASTE DISCHARGE TO SURFACE WATER

Check all that apply:

- | | | |
|---|---|---|
| <input type="checkbox"/> Domestic/Municipal Wastewater Treatment and Disposal | <input type="checkbox"/> Animal Waste Solids | <input type="checkbox"/> Animal or Aquacultural Wastewater |
| <input type="checkbox"/> Cooling Water | <input type="checkbox"/> Land Treatment Unit | <input type="checkbox"/> Biosolids/Residual |
| <input type="checkbox"/> Mining | <input type="checkbox"/> Dredge Material Disposal | <input type="checkbox"/> Hazardous Waste (see instructions) |
| <input type="checkbox"/> Waste Pile | <input type="checkbox"/> Surface Impoundment | <input type="checkbox"/> Landfill (see instructions) |
| <input type="checkbox"/> Wastewater Reclamation | <input checked="" type="checkbox"/> Industrial Process Wastewater | <input checked="" type="checkbox"/> Storm Water |
| <input checked="" type="checkbox"/> Other, please describe: <u>Concentrated seawater from seawater desalination process and clarified filter backwash</u> | | |

III. LOCATION OF THE FACILITY

Describe the physical location of the facility.

1. Assessor's Parcel Number(s)
Facility: 210-01-43
Discharge Point: NA

2. Latitude
Facility: 33 08' 21" N
Discharge Point: 33 08' 17" N

3. Longitude
Facility: 117 20' 06"
Discharge Point: 117 20' 22"

IV. REASON FOR FILING

New Discharge or Facility Changes in Ownership/Operator (see instructions)

Change in Design or Operation Waste Discharge Requirements Update or NPDES Permit Reissuance

Change in Quantity/Type of Discharge Other: _____

V. CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

Name of Lead Agency: City of Carlsbad and San Diego County Water Authority (SDCWA)

Has a public agency determined that the proposed project is exempt from CEQA? Yes No

If Yes, state the basis for the exemption and the name of the agency supplying the exemption on the line below.
Basis for Exemption/Agency: Not applicable

Has a "Notice of Determination" been filed under CEQA? Yes No

If Yes, enclose a copy of the CEQA document, Environmental Impact Report, or Negative Declaration. If no, identify the expected type of CEQA document and expected date of completion.

Expected CEQA Documents:

<input checked="" type="checkbox"/> EIR	<input type="checkbox"/> Negative Declaration
---	---

Final EIR certified by the City of Carlsbad on 6/13/2006
First EIR Addendum certified by the City of Carlsbad on 9/15/2009
Second EIR Addendum certified by SDCWA on 11/29/2012
Third EIR Addendum certified by SDCWA on 9/26/2013
Fourth EIR Addendum certified by SDCWA on 7/9/2014



APPLICATION/REPORT OF WASTE DISCHARGE GENERAL INFORMATION FORM FOR WASTE DISCHARGE REQUIREMENTS OR NPDES PERMIT



VI. OTHER REQUIRED INFORMATION

Please provide a COMPLETE characterization of your discharge. A complete characterization includes, but is not limited to, design and actual flows, a list of constituents and the discharge concentration of each constituent, a list of other appropriate waste discharge characteristics, a description and schematic drawing of all treatment processes, a description of any Best Management Practices (BMPs) used, and a description of disposal methods.

Also include a site map showing the location of the facility and, if you are submitting this application for an NPDES permit, identify the surface water to which you propose to discharge. Please try to limit your maps to a scale of 1:24,000 (7.5' USGS Quadrangle) or a street map, if more appropriate.

VII. OTHER

Attach additional sheets to explain any responses which need clarification. List attachments with titles and dates below:

See attached maps, schematics, data tables, and technical studies

You will be notified by a representative of the RWQCB within 30 days of receipt of your application. The notice will state if your application is complete or if there is additional information you must submit to complete your Application/Report of Waste Discharge, pursuant to Division 7, Section 13260 of the California Water Code.

VIII. CERTIFICATION

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

Print Name: Peter M. MacLaggan

Title: Vice President

Signature: [Handwritten signature]

Date: 9/4/15

FOR OFFICE USE ONLY

Table with 4 columns: Date Form 200 Received, Letter to Discharger, Fee Amount Received, Check #



Certification Statements

***Renewal of NPDES CA0109223
Carlsbad Desalination Project***

**CERTIFICATION SUPPLEMENT
FOR
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
PERMIT APPLICATION**

Legal Name of Applicant: Poseidon Resources (Channelside) LP

Facility: Poseidon Resources
Carlsbad Desalination Project
NPDES CA0109223

"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."

Peter M. MacLaggan
Printed Name


Signature

Vice President
Official Title

9/4/2015
Date Application Signed



POSEIDON CHANNELSIDE

a Poseidon Water company

CONTRIBUTIONS DISCLOSURE STATEMENT

Check the appropriate response:

I certify that Poseidon Resources (Channelside) LP
(name of applicant)
has not made contributions amounting to \$250 or more to any of
the current San Diego Water Board members within 12 months of
the date of this application for use in federal, state, or local election.

I certify that _____
(name of applicant)
has made contributions amounting to \$250 or more to the following
current San Diego Water Board members within 12 months of the
date of this application for use in federal, state, or local election.

<u>San Diego Water Board Member</u>	<u>Amount of Contribution</u>
-------------------------------------	-------------------------------

Signature

Name

Peter MacLaggan

Title

Vice President

Date

June 19, 2015

Organization

Poseidon Resources (Channelside) LP

Address

5780 Fleet Street, Suite 140, Carlsbad, CA 92008

Phone Number

760 655-3999

Poseidon Channelside

5780 Fleet St., Suite 140 Carlsbad, California 92008 Phone: (760) 655-3900 Fax: (760) 655-3901
www.poseidonwater.com