Appendix J. Response to Public Comments received by April 9, 2015. Per the March 20, 2015 Public Notice, responses are generally limited to comments on the revisions to the proposed Desalination Amendment and Staff Report with SED that was distributed and posted on July 3, 2014.

Letter ID	Commenter(s)	Submitted by
1	South Coast Water District and South Orange County Wastewater Authority	Andrew Brunhart Betty Burnett
2	San Diego County Water Authority	Maureen Stapleton
3	Municipal Water District of Orange County	Richard Bell
4	General Public	Gary Griggs
5	City of Santa Barbara	Rebecca Bjork
6	General Public	William Bourcier
7	Brownstein Hyatt Farber Schreck, LLP on behalf of Mesa Water District	Diane De Felice
8	General Public	Brent Constantz
9	Heal the Ocean	Hillary Hauser James Hawkins
10	Tenera Environmental	John Steinbeck
11	Poseidon Water LLC	Peter MacLaggan
12	California Coastkeeper Alliance Natural Resources Defense Council Heal the Bay Surfrider Foundation Sierra Club California California Coastal Protection Network Planning & Conservation League Center for Biological Diversity Coastal Environmental Rights Foundation Southern California Watershed Alliance Resident for Responsible Desalination Wholly H2O 7th Generation Advisors Endangered Habitats League Environmental Action Committee of West Marin Desal Response Group Environmental Water Caucus	Sean Bothwell
13	CalDesal	Ron Davis
14	California Coastal Commission	Tom Luster

Letter ID	Commenter(s)	Submitted by
15	West Basin Municipal Water District	Rich Nagel
16	DeepWater Desal-LATE 13 minutes	Brent Constanz
17	General Public-LATE 23 minutes	Joan Timpany

***Please note all references to response to comment numbers in Appendix J refer to responses in Appendix J unless otherwise noted.**

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1.1	South Coast Water District ("SCWD") and South Orange County Wastewater Authority ("SOCWA") hereby provide the following comments on the draft Ocean Plan Amendments (issued on July 3, 2014 and as revised on March 20, 2015). We would like to join in the comments made by CalDesal and hereby incorporate those comments by reference.	Comment noted.
1.2	We would like to express our appreciation for your efforts to address our point of compliance issue pertaining to the brine discharge from SCWD's groundwater recovery facility. It was a collaborative process and State Board staff was helpful and a pleasure to work with.	Comment noted.
1.3	Given that is the intent of the State Board to address only desalination facilities using seawater with the Desalination Amendments as indicated in your response to comments, "chapter III.M does not apply to water recycling facilities, brackish groundwater desalination facilities, or any other desalination facility not using seawater as defined," we request that you further clarify this intent in the language of the Desalination Amendments. We suggest that you insert "only" to the first sentence of Section M.1.a.: "Chapter III.M applies only to desalination facilities* using seawater.*" Appendix A -Ocean Plan Proposed Desalination Amendment ("Amendments") at p. 28.	Disagree. The language that chapter III.M applies to desalination facilities using seawater is clear as stated.
1.4	We are also concerned that a permit writer may be confused by Appendix III (Standard Monitoring Procedures) which under "Receiving Water* Characteristics" states: *"Salinity* must also be monitored by all point sources discharging desalination brine* as part of their core monitoring program. Desalination facilities* discharging brine* into ocean waters* shall monitor salinity as described in chapter III.M.4."*	To clarify the intent of the proposed Desalination Amendment and the Ocean Plan, the language in the Appendix III of the Ocean Plan was revised to: *"Salinity* must also be monitored by all point sources discharging ~~desalination~~ brine* as part of their core monitoring program. Seawater desalination facilities* discharging brine* into ocean waters* and wastewater facilities that receive brine from seawater desalination facilities and discharge into ocean waters shall monitor salinity as described in chapter III.M.4."* Additionally, we made the following conforming changes to chapter III.M.1.d and e in the proposed Desalination Amendment:

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		"d. Chapter III.M.3 (Receiving Water Limitation for Salinity) applies to all desalination facilities* that discharge into ocean waters* and wastewater facilities that receive brine from seawater desalination facilities and discharge into ocean waters.*"* *"e. Chapter III.M.4 (Monitoring and Reporting Programs) applies to all desalination facilities* that discharge into ocean waters.* Chapter III.M.4 shall not apply to a wastewater facility that receives brine from a seawater desalination facility and discharges~~ing~~ a positively buoyant commingled effluent through an existing wastewater outfall that is covered under an existing NPDES permit as long as the owner or operator monitors for compliance with the receiving water limitation set forth in chapter III.M.3. For the purposes of chapter III.M.4, a positively buoyant commingled effluent shall mean that the commingled plume rises when it enters the receiving water body due to salinity levels in the commingled discharge being lower than the natural background salinity.** The proposed Desalination Amendment addresses potential impacts to beneficial uses associated with the construction and operation of seawater desalination facilities. In some instances, the brine produced from a seawater desalination facility will be commingled with wastewater prior to discharge into ocean waters. The permittee discharging the commingled brine waste may not be the owner or operator of the seawater desalination facility. However, there may be elevated salinity at the site of the commingled discharge if there is not a sufficient volume of wastewater to adequately dilute the brine. For this reason, a wastewater treatment plant (WWTP) that accepts brine waste from a seawater desalination facility should monitor for salinity at the edge of the brine mixing zone. Please see responses to comments 6.11, 8.4 in Appendix H of the Staff Report with SED.
1.5	Amendments at p. 69. Here, there is no differentiation for desalination facilities using seawater so it may appear that Chapter II.M.4 could apply to other desalination facilities such as brackish groundwater	Disagree. The statement at the beginning of chapter III.M that states the proposed Desalination Amendment applies to desalination facilities using seawater applies to all portions of chapter III.M,

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	treatment facilities. Without the qualification that "Chapter III.M applies only to desalination facilities* using seawater," a permit writer could interpret Chapter III.M.4. to apply to other desalination facilities.	including chapters, III.M.3 and III.M.4. The proposed Desalination Amendment is not applicable to other non-seawater desalination facilities such as brackish groundwater desalination facilities.
1.6	Alternatively, if the intent of the State Board is for portions of the Amendments to apply to all desalination facilities (i.e., Chapter III.M.3 (Receiving Water Limitations for Salinity)) to apply to all desalination facilities (including brackish groundwater facilities), we request that the State Board make this clear. However, as set forth in Chapter III.M.4, the monitoring and reporting requirements "would not apply to a wastewater facility discharging a positively buoyant commingled effluent through an existing wastewater outfall ..." As such, the State Board should clarify in Appendix III that the Chapter III.M.4 (Monitoring and Reporting Programs) requirements apply only to negatively buoyant effluent. We request that you modify the language in Appendix III as follows: *"Salinity* must also be monitored by all point sources discharging desalination brine* as part of their core monitoring program. Desalination facilities* discharging brine* **resulting in a negatively buoyant effluent** into ocean waters* shall monitor salinity as described in chapter III.M.4."*	Please see response to comment 1.4 above. Chapter III.M.1.e acknowledges that wastewater treatment plants have existing monitoring and reporting requirements and if the wastewater facility that accepts brine from a seawater desalination facility is compliance with the receiving water limitation set forth in chapter III.M.3, then the additional monitoring and reporting requirements in chapter III.M.4 do not apply.
1.7	With respect to future events which may trigger of a new Water Code section 13142.5(b) determination, we would request clarification of what constitutes "a reduction in the volume of wastewater available for the dilution of brine" pursuant to Section M.2.a.(5). Amendments at p. 31. Publicly owned treatment works ("POTWs") experience seasonal variations in the volume of wastewater and these variations should not, on their own, be triggering events. We would suggest that a better triggering event would be when a reduction in the volume of wastewater impacts the buoyancy of the plume.	This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf) and the responses to comments in Appendix H of the Staff Report with SED. Nevertheless, the language provided in the proposed Desalination Amendment serves as an example of an event that may trigger the need for a new Water Code section 13142.5(b) determination where the originally determination is expressly conditioned on a future event. The actual triggering events will be determined on a case-by-case basis by the regional water boards depending on the conditions at a given facility. The receiving water limitation for salinity must be met regardless of the availability of wastewater for commingling, and the owner or operator should plan accordingly for such events.

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1.8	We are concerned about the definition of "Natural Background Salinity" as applied to small POTWs like SOCWA. SOCWA does not have 20 years of historical salinity data, and the alternative determination involves "measuring salinity at the depth of proposed discharge for three years, on a weekly basis prior to a desalination facility* discharging brine,* and the mean monthly natural salinity* shall be used to determine natural background salinity." Amendments at p. 49. We request that there be some flexibility for determining background salinity, such as allowing the use of available nearby reference site data.	This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf). Nevertheless, this comment was previously addressed in the responses to comments 6.9, 13.130, and 15.17 in Appendix H of the Staff Report with SED.
2.1	We commend the Board and the staff for the thorough and comprehensive approach taken to address the numerous comments received on the draft Desalination Amendment, released last July. In particular, we appreciate your thoughtful responses to the Water Authority's August 18, 2014, comment letter. It is clear that the changes to the proposed final Amendment address many of the Water Authority concerns including the following: • Consideration of site-specific conditions and alternative approaches to compliance with desalination intake and discharge requirements under Section 13142.5(b) of the State Water Code • The inclusion of the CEQA definition of feasibility in keeping with the Carlsbad Project appellate court decision • The addition of a provision in the proposed final Amendment to account for previously approved mitigation projects for projects making a new Water Code Section 13142.5 (b) determination • The adjustment of the study period required for key empirical studies such as entrainment or flow augmentation from 36 months to a more reasonable 12 months	Comment noted and appreciated.
2.2	The Water Authority has one primary area of concern outstanding	Please see response to comment 2.3 regarding the definition of brine

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	regarding the regulation of brine discharges. The proposed final Amendment provides for alternative brine disposal methods, but as currently drafted, the definitions for Brine Mixing Zone and Natural Background Salinity may render it impossible to demonstrate that alternative brine disposal methods, such as flow augmentation provide a comparable level of protection to wastewater dilution and multiport diffusers. My understanding is that the State Water Board desires to provide an opportunity for desalination project proponents to propose alternative brine disposal methods. Therefore, the comments that follow are aimed at ensuring that the proposed final Amendment provides a workable process for demonstrating such alternatives provide a comparable level of protection.	mixing zone and 2.4 regarding the definition of natural background salinity. These definitions were crafted based on the best available science to ensure the protection of beneficial uses. The intent of the proposed Desalination Amendment is to allow for future technological innovations in brine disposal technology. However, an owner or operator must demonstrate that the alternative method is equally protective as multiport diffusers. Chapter III.M.2.d.(c) requires that an owner or operator demonstrate that, *"the technology provides a comparable level of intake and mortality of all forms of marine life* as wastewater dilution if wastewater is available, or multiport diffusers if wastewater is unavailable."* Commingling brine with wastewater and discharging brine through multiport diffusers are both technologies that can reduce or eliminate toxic effects of salinity within a relatively small area (100 m from the discharge). Alternative discharge technologies that are equally protective as commingling with wastewater of discharging through diffusers should also be designed to minimize the area where salinity exceeds 2 ppt above natural background salinity or the alternative receiving after limitation (other than 2 ppt). For additional information, please see the Staff Report with SED including the responses to comments in Appendix H.
2.3	The definition of "BRINE MIXING ZONE" (Desal Amendment, Draft Final, March 20, 2015 at p. 20.) provides in part that, "The brine mixing zone shall not exceed 100 meters laterally form the points of discharge." By imposing an inflexible mixing zone limited to100 meters, the proposed final Amendment could have two, equally problematic consequences. First, a 100 meter mixing zone limitation could render flow augmentation, the discharge method utilized for the Carlsbad Desalination Project, infeasible due to the excessive amount of dilution	Chapter III.M.2.d.(2)(c) of the proposed Desalination Amendment require project applicants to analyze the overall, comparative, and holistic impacts of the alternative brine disposal technology relative to wastewater dilution if wastewater is available or diffusers if wastewater is unavailable. An owner or operator must evaluate "intake-related entrainment, osmotic stress, turbulence that occurs during water conveyance and mixing, and shearing stress at the point of discharge." As stated in response to comment 2.2, commingling brine with

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	water required to meet the receiving water salinity limitation. Second, even if relying on high volumes of dilution water were deemed to be feasible, it may not necessarily result in the most environmentally beneficial discharge method for the project. The question that Regional Boards (in consultation with State Water Board staff) should require project applicants to analyze the overall, comparative, and holistic impacts of all technologies. For example, a modest increase in the size of the brine mixing zone would significantly reduce the amount of dilution water required to meet the receiving water salinity limitation and could provide an environmentally preferable configuration. The proposed final Amendment should include the flexibility to require the project applicant to demonstrate the approach that is environmentally superior on an overall basis.	wastewater and discharging brine through multiport diffusers are both technologies that can reduce or eliminate toxic effects of salinity within a relatively small area (100 m from the discharge). Further, neither commingling brine with wastewater nor discharging brine through diffusers requires the intake of additional seawater. As stated in the proposed Desalination Amendment, "Unless demonstrated otherwise, organisms entrained by flow augmentation* are assumed to have a mortality rate of 100 percent." To put the mortality in context, if seawater at a site contained only one hundred marine organisms per gallon, a facility withdrawing 10 million gallons per day (MGD) for flow augmentation would entrain and kill 1 billion organisms per day. It may be possible to design a system where entrainment mortality associated with the intake of seawater is less than 100 percent. However, there are no studies to date that have demonstrated this. Examining flow augmentation technology alone, a modest increase in the size of the brine mixing zone would reduce the amount of dilution water required to meet the receiving water salinity limitation. However, as the comparison is narrowly focused and contradicts the commenter's request for an "overall, comparative, and holistic [analysis of] impacts." The alternative brine disposal technology should not be compared to itself, but rather to the preferred disposal technologies. This comparison would account for the fact that commingling brine with wastewater and discharging brine through multiport diffusers do not require a larger brine mixing zone and do not require the additional intake of seawater for dilution. Below is a brief discussion on potential sources of mortality associated with the first and second preferred discharge technologies. These factors should be considered when analyzing the overall, comparative, and holistic impacts of the alternative brine disposal technology relative to wastewater dilution if wastewater is available, or diffusers if wastewater is unavailable. If an adequate volume of wastewater is available to commingle with the brine, the resulting discharge will not have toxic effects related to salinity and may result in insignificant shearing-related mortality. If

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		an alternative method is being proposed and wastewater is available for dilution, to be equally protective, the alternative method must also: be able to meet the receiving water limitation no further than 100 meters from the discharge, not result in intake-related mortality, not have toxic effects related to salinity, and not result significant shearing-related mortality. If wastewater is unavailable, the alternative discharge technology would be compared to multiport diffusers. To be equally protective, the alternative method must also: be able to meet the receiving water limitation no further than 100 meters from the discharge and the mortality associated with the alternative method must be less than or equal to the mortality that results from shearing at the discharge. Mortality related to exposure to elevated salinity of the brine will be similar for flow augmentation and diffusers. The difference is that organisms entrained in the flow augmentation dilution water will not be able to swim away or avoid the exposure. Whereas, organisms that can swim will be able to avoid the brine mixing zone. The brine and flow augmentation dilution water will need to be adequately mixed prior to discharge to prevent stratification. In addition to exposure to elevated salinity, the organisms present in the flow augmentation dilution water may be subject to lethal turbulence as the brine is mixed with the diluent water. Please section 8.5.1.2 of the Staff Report with SED for a potential way to assess discharge-related mortality. Also, please see responses to comments 15.14 and 6.11 in Appendix H of the Staff Report with SED and response to comment 11.6 below for more information regarding the 100 meter requirement for the brine mixing zone.
2.4	The proposed final Amendment provides that brine discharges from desalination facilities shall not exceed 2.0 parts per thousand (ppt) above the "NATURAL BACKGROUND SALINITY." Natural background salinity is defined as the 20-year mean monthly salinity at the project location. The database that makes up the natural background salinity for the Carlsbad Project shows a monthly mean that ranges from a low of 33.4 ppt to a high of 33.7 ppt. Under the proposed final Amendment, with approximately15 percent of the daily salinity measurements above	The intent of the receiving water limitation is to ensure adequate protection of beneficial uses. Since the mean monthly range at the Carlsbad varies by only 0.3 ppt, species in the area are likely not well adapted to large fluctuations in salinity relative to species that inhabit tide pools or estuaries that can tolerate wider salinity fluctuations. On days when salinity is naturally higher, organisms are already experiencing a physiological challenge to adapt to the higher salinity levels. Increasing salinity past the organisms' threshold of tolerance could have significant negative impacts, which highlights the

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	the monthly mean, the Carlsbad facility would be required to operate with less than a 2 ppt increase over the ambient salinity more than 60 days per year, which would severely impact plant reliability. To address this problem, the Water Authority is requesting the proposed final Amendment be revised such that the Natural Background Salinity is defined as the 20-year mean monthly salinity at the project location unless the actual salinity measured at the facility intake, absent any influence from the discharge, is greater than the 20 year mean monthly salinity, in which case, the Natural Background Salinity shall be the actual salinity measured at the intake, absent any influence from the discharge.	importance of meeting the 2 ppt above natural background salinity on a daily basis. The suggestion of adding "absent from any influence of the discharge" does not consider any of the other factors that may influence the salinity at any given time such as the presence of other ocean outfalls in the area (e.g. WWTPs or power plants). For similar reasons, using reference locations to establish natural background salinity is not advisable. For example, establishing reference locations can be particularly challenging in the Southern California where there are numerous ocean outfalls (e.g. Point Loma, Camp Pendleton, Oceanside, Escondido, Encina, AES, South Orange County Wastewater Authority, Orange County Sanitation District, City of Los Angeles' Hyperion treatment Plant, Los Angeles County Sanitation District's Joint Water Pollution Control Plant, etc.) that discharge wastewater with salinity significantly lower than natural background salinity. Even if all ocean outfall plumes were modeled and considered when developing a reference location, the ocean currents fluctuate and have the potential to move plumes. There are too many other confounding factors to consider that prevent establishing a reference location that is "absent from any influence" of the discharge, other ocean discharges, or other environmental factors that could influence the salinity at a site. If an owner or operator demonstrated compliance with the receiving water limitation for salinity by developing an effluent limitation or effluent limitations based on historic monthly averages, they would not have to do daily monitoring of receiving water or undergo the complicated and potentially fruitless exercise of trying to establish an adequate reference location. Compliance with the receiving water limitation relative to the mean monthly average would mean that if the historical average for August is 33.7 ppt then the August receiving water limitation for August months will be 35.7 ppt and if the historical monthly average for February is 33.4 ppt then the receiving water limitation for February months would be 35.4 ppt. If salinity is consistent over a few months, the regional water board could establish seasonal receiving water

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		limitations rather than monthly. This approach should allow enough flexibility to account for periodic salinity spikes. However, we anticipate that all owner or operators of seawater desalination facilities will choose to develop effluent limitations rather than demonstrating compliance with the receiving water limitation for salinity by monitoring salinity in the receiving water body. Receiving water compliance would require daily sampling at 100 meter distances all around the point of discharge and throughout the water column. If an owner or operator elects to demonstrate compliance by receiving water monitoring, there may be a potential issue if there is a temporary spike in salinity of the receiving water body and the real-time measurement is compared to a historical average. Again, based on discussions with stakeholders, we anticipate, in all cases, an owner or operator will elect to convert the receiving water limitation to an effluent limitation particularly to avoid the extensive sampling requirements. Since the effluent limitation could be used to demonstrate compliance with the receiving water limitation for salinity, the 2 ppt increment above natural background salinity would be based on a historical average and would not be influenced by a periodic spike in "real-time" salinity of the intake or receiving water body. The effluent limitations could be developed for monthly changes in historical salinity or less frequently when historical monthly averages are the same or similar.
2.5	The Water Authority is prepared to support the proposed final Amendment if the definitions for Brine Mixing Zone and Natural Background Salinity are revised to accommodate the use of alternative brine disposal methods. I understand that Poseidon has provided your staff with amendment language that would address these issues. The Water Authority fully supports the inclusion of this language into the final adopted Ocean Plan Amendment.	Comment noted and appreciated. Please see responses to comment 2.3 and 2.4 above regarding the definitions for Brine Mixing Zone and Natural Background Salinity.
2.6	Finally, we call your attention to two critical data errors in supporting scientific analyses that are being relied upon as the scientific basis for the receiving water salinity limitation of 2.0 ppt.	The receiving water limitation for salinity was developed using the best available science from the Expert Panel I on Impacts and Effects of Brine Discharges found here : http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/

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	Paragraph M.3.b. of the proposed final Amendment provides that the daily maximum receiving water limit for salinity shall not exceed 2.0 parts per thousand above natural background. According to the "*Draft Staff Report Including the Draft Substitute Environmental Documentation Amendment to the Water Quality Control Plan For Ocean Waters of California Addressing Desalination Facility Intakes, Brine Discharges, and the Incorporation of Other Non-Substantive Changes*" that accompanied the Desal Amendment (hereafter, "SED"), it appears that this salinity limit was predicated on the hyper-salinity toxicity study performed by University of California, Davis, Department of Environmental Toxicology (Philips et al. 2012). The Phillips, et al. study concluded that red abalone was one of the most developmentally sensitive species to brine, with a LOEC of 35.6 ppt. This value, in turn, was based on two definitive salinity tolerance tests performed by Granite Canyon, both of which were conducted on July 18, 2012, using adult abalone from two sources; one batch came from Monterey Bay and another from The Cultured Abalone in Goleta, California. The results of these tests were submitted to the SWRCB as supporting the basis for the Desal Amendment receiving water salinity limit of 35.5 ppt at 100 meters. Recently, Nautilus Environmental reviewed the Granite study and the raw data made available. Nautilus Environmental discovered that the definitive test conducted with the abalone from The Cultured Abalone was invalid and should not be considered in the determination of the salinity results. Upon review of the data entry for the definitive test conducted with the abalone from Monterey Bay, Nautilus Environmental also discovered two data entry errors. Based on the corrected Granite Canyon Laboratory values, the red abalone salinity test results show a LOEC of 36.7 ppt; 1.1 ppt higher than the LOEC value of 35.6 ppt originally reported. Therefore, receiving water salinity limit should be approximately 3 ppt above natural background. It is our understanding that Nautilus Environmental has communicated the results of its review and analysis to Granite Canyon, and that Granite Canyon personnel were going to communicate this information	docs/dpr.pdf (Roberts et al. 2012) as well as the Phillips et al. 2012) study. Roberts et al. (2012) conducted an extensive review of material including, peer-reviewed journal articles, articles in the gray literature, NPDES permits, data from monitoring studies, and various regulations from around the world to assess the toxic effects of brine concentrates on marine life. Below is one of the conclusions from the report, which was used to develop the receiving water limitation for salinity: *"Based on the studies of effects of brine discharges we recommend an incremental salinity limit at the mixing zone boundary of no more than 5% of that occurring naturally in the waters around the discharge...For most California open coastal waters this increment will be about 1.7 ppt"* In addition to the results from the Expert Panel I on Impacts and Effects of Brine Discharges, the State Water Board commissioned Granite Canyon (Phillips et al. 2012) to conduct salinity toxicity studies on species indigenous to California. We appreciate the external review of the Phillips et al. (2012) report and have been in contact with Granite Canyon Laboratories to further investigate the issue. Please see Attachment 1 below for a response from Dr. Bryn M. Phillips of the Marine Pollution Studies Laboratory addressing the issues raised by Nautilus Environmental. The analysis provided by Nautilus Environmental did not follow the U.S. EPA flow chart methodology, and consequently the results from their analysis are not valid under U.S. EPA methods. After continued discussions with Drs. Bryn M. Phillips and Brian Anderson and after further review of the raw data and revised data analysis, we agree with the conclusion that the original test results were valid and accurate. The receiving water limitation for salinity was developed based on the best available science. However, chapter III.M.3.c of the proposed Desalination Amendment includes flexibility for an owner or operator to conduct additional studies to develop an alternative (other than 2 ppt) receiving water limitation for salinity because the effect of salinity toxicity in marine species in California is under-studied. More data could be compiled and used to develop a stronger data set to better

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	to State Water Board staff. While our approval of the proposed final Amendment will not be contingent on addressing this data integrity concern prior to adoption, we highly recommend that the State Board address this issue, and its implications, prior to adoption of the proposed final Amendment.	assess salinity toxicity thresholds for marine species in California.
3.1	We thank the Board for the opportunity to submit comments on the Proposed Final Amendment to the Ocean Plan for desalination facilities. We compliment staff for their excellent work on this important amendment.	Comment noted and appreciated.
3.2	M.2.b (7) page 5: Applicability and General Provisions, Site: Requires brine disposal siting at sufficient distances from MPA/SWQPA areas so that there are "no impacts" on the MPA or SWQPA. Suggest this be modified to read "no discernible impacts" as "no impacts" is an absolute and can't be achieved.	This comment was addressed in response to comment 6.4 in Appendix H of the Staff Report with SED. Chapter III.M.2.b.(7) of the March 20, 2015 draft of the proposed Desalination Amendment states: *"Ensure that the intake and discharge structures are not located within a MPA or SWQPA* with the exception of intake structures without associated construction-related marine life mortality (e.g. slant wells).Discharges shall be sited at a sufficient distance from a MPA or SWQPA* so that the salinity* within the boundaries of a MPA or SWQPA* does not exceed natural background salinity.* To the extent feasible,* surface intakes shall be sited so as to maximize the distance from a MPA or SWQPA.*"*
3.3	M.4 Monitoring page 21: definition for Natural Salinity. The Expert Panel recommended an"... incremental salinity limit at the mixing zone boundary of no more than 5% of that occurring naturally... a percentage increase allows for natural variability in the background waters..." We request that the definition be modified to read"... ocean salinity from a representative area that is not under the influence of brine discharge and storm flows..." Compliance for brine discharge should be allowed above the natural ocean variability as recommended by the Expert Panel. Ocean salinity may exceed the long-term mean by 2 to 3 percent (670 to 1,000 mg/L) in El Niño years. As proposed the allowance of 2,000 mg/l from the long-term mean would reduce by up to 50% the discharge allowance in El Niño years, making compliance	Please see response to comment 2.4.

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	difficult or not achievable in certain cases. We recommend that the Regional Board's apply this receiving water limitation as a technology based effluent limitation. This should be addressed in the staff report. This approach reduces burdensome and unnecessary compliance salinity monitoring, saving public funds.	
4.1	The issue of desalination and proposals for new plants, intakes and outfalls will likely increase in California in the decades ahead. Policies set now will no doubt be with us for some years into the future, and I think everyone would agree that they should be informed by the best available science.	Comment noted.
4.2	One issue that I don't believe has been given adequate consideration is that of the carbon dioxide content of source water for any future desalination plant. While subsurface drilling or slant wells along the shoreline has been generally presumed to be more environmentally friendly than pumping from surface ocean water, from what I can gather, the carbon dioxide content of this subsurface water is substantially higher than that of surface ocean water, which is already in equilibrium with the atmosphere.	This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts and was previously addressed in responses to comments in Appendix H of the Staff Report with SED. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf) and the Staff Report with SED. Nevertheless, the carbon dioxide content of subsurface water will vary depending on site-specific conditions. It would be speculative to provide any more information as to the carbon dioxide content in subsurface water relative to that of the surface ocean water at a specific location at a future desalination facility. If a project proponent elects to develop desalination as an alternative supply of water, the proponent must assess the project's contribution to greenhouse gas emissions, including any associated with the withdraw of subsurface intake water, and ensure that those emissions comply with the appropriate Air Quality Management District CEQA requirements for greenhouse gas emissions. Furthermore, carbon dioxide content of source water was previously considered. The issue of greenhouse gas emissions from subsurface intakes was addressed in the original responses to the letter from Dr. William Bourcier (comment letter #28) where staff estimated potential carbon dioxide emissions from a potential 50 MGD plant to be on the order of 1,000 tons per year. This is less than 2 percent relative to overall emissions related to desalination facility power consumption. In addition, the emissions estimate was

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		within the estimate of greenhouse gas reductions due to elimination of power requirements associated with removal of pretreatment requirements (see also response to comment 8.4 below). As a result, this amount was considered to be less than significant within the meaning of CEA. Please see also responses to comments 6.1 and 8.4 below.
4.3	It would appear that the cumulative impacts of multiple desalination plants all withdrawing water through slant wells or subsurface waters would produce significantly more carbon dioxide emissions to the atmosphere than direct ocean withdrawals. There appear to be large enough concerns or uncertainties of the impacts of this recommended intake policy that a thorough review of this issue should be undertaken before making a decision on a final recommendation.	Disagree. Carbon dioxide emissions from subsurface intakes are unlikely to be either individually or cumulatively significant. To the extent that evaluation is needed, this would need to be done on a per project basis and is not appropriate for a programmatic CEQA document. Please see also response to comment 4.2, 6.1 and 8.4 below.
5.1	The City of Santa Barbara appreciates the opportunity to comment on the revisions to the proposed Desalination Amendment and draft Final SED. As the State Board is likely aware, in January of 2015, the Central Coast Regional Water Quality Control Board amended the City's NPDES permit to include express findings under Water Code section 13142.5(b) (See Amended Order No. R3-2010-0011 (January 30, 2015)). These findings are based on the facility's permitted production capacity of up to 10,000 AFY, which equates to an intake flow rate of 15,898 gpm (See Amended Order No. R3-2010-0011, pages 3-4, 9-10, 27 and Attachment "G"; see also, Supplemental Sheet for Regular Meeting of January 29-30, 2015). Consistent with the proposed Desalination Amendment, the Regional Board's action confirms the status of the City's permitted desalination facility as an existing facility that is not subject to Chapter III.M.2 of the proposed Desalination Amendment. The discharges from the facility will, of course, be subject to the receiving water limitation for salinity contained in Chapter III.M.3 of the proposed Desalination Amendment.	Comment noted and appreciated. We have confirmed that the Santa Barbara facility is an existing facility as defined by the proposed Desalination Amendment.
5.2	The City wishes to thank the State Board, the Regional Board and their staffs for working with the City to clarify the status of the City's desalination facility. The City knows that your staff and the staff of the Regional Board have many demands placed on their time, so the City sincerely appreciates their efforts. Because the City's facility is now	Comment noted and appreciated.

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	confirmed to be an existing facility, the City has no further comment on the proposed Desalination Amendment, draft Final SED or the approval of these documents by the State Board.	
6.1	In regard to your reply to my previous comment (Comment 28 in Appendix H) having to do with potential greenhouse gas (GHG) emissions from intakes, I appreciate your thoughtful reply and check on the estimated carbon dioxide emissions that I submitted. I do not agree with your overall assessment but agree in some cases the emissions might not be significant. What is simply not true is your statement that "there are no potentially significant effects from GHG emissions resulting from the use of subsurface intakes." To prove this you would need to provide analytical data from existing subsurface intake systems. To my knowledge no such data are available. You or anyone else have not shown this to be true. I had two objectives in bringing up this issue. The first was to make sure there was an awareness of the potential problem. The second, and equally important is to point out that the issue can be addressed by simply requiring in your permitting process a GHG analysis based on the chemical composition of sampled feeds - - in other words to carry out an analysis similar to what you did in your reply to my comment, based on measured carbon dioxide and methane contents of the feed. If the fluid has low potential to release carbon dioxide and methane, it is a non-issue and can be ignored. If the fluid has high potential, the GHG release needs to be addressed, and presumably that would be a factor in choice and location of intake system.	This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf) and the Staff Report with SED. Nevertheless, the potential emissions from subsurface intakes are a small contribution (less than 2%) relative to overall emissions related to desalination facility power consumption, and are within the estimate of greenhouse gas reductions due to elimination of power requirements associated with removal of pretreatment requirements (see also response to comment 8.4 below). The commenter did not provided any new information to support his position or further explain why a different result would be reached, but simply states that he disagrees. Without additional information the Water Board cannot ascertain how to further address this concern. With regards to sampling source water feeds, we concur that additional studies would be needed before a more accurate assessment of potential emissions could be generated. Site specific conditions may change assumptions used in this analysis (e.g. other commenters have suggested that pretreatment may still be needed at least in the short term in some facilities even where subsurface intakes are used). Furthermore, as discussed in the Staff Report with SED, potential greenhouse gas emissions will be highly dependent on the source of energy used to power these facilities. It would be speculative to provide any more information as to the carbon dioxide content in subsurface water relative to that of the surface ocean water at a specific location at a future desalination facility. Consideration of these site-specific factors is beyond the scope of this programmatic review and is more appropriately addressed during project level CEQA.
6.2	I believe you should add to the list of factors for determination of whether or not subsurface intakes be used for feed (page 6 of draft	While greenhouse gas emissions are evaluated in the Staff Report with SED and will also be required for project level CEQA analysis

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	amendment) a requirement that an analysis of potential GHC emissions be carried out. This will not be costly. The designers of membrane desalination plants all acquire these data and use them to carry out design calculations. Carbon dioxide content is important to them both for system design and scale control. The necessary information will be available; the SWRCB simply needs to request these data and an analysis of estimated GHG release for each proposed project. Note also that any GHG source of greater than 10,000 tons per year needs to be reported to CARB. The plant operator will need a GHG analysis regardless of whether it exceeds this limit or not in order to satisfy their requirements. How do you know the size of the GHG emission if you do not require that it be measured or monitored?	(see response to comment 6.1), the Water Boards' mandate is to implement the Clean Water Act and California Water Code. Within this context, the purpose of the proposed Desalination Amendment is to provide guidance to the regional water boards on how to implement section 13142.5(b) of the Water Code, which requires the regional water boards to ensure the use of the best available site, design, technology, and mitigation measures feasible to minimize the intake and mortality of all forms of marine life. Authority to require monitoring for air emissions is beyond the scope of this mandate as well as outside the range of the Water Board's expertise, and thus the consideration is more appropriate to an analysis pursuant to CEQA, which establishes state policy that public agencies should not approve projects as proposed if there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects. Consideration of air impacts beyond CEQA analysis are the purview of the air pollution control agencies such as the California Air Resources Board and the local air districts and are better left to their permitting processes. If in the course of those agencies review, or pursuant to a site-specific CEQA analysis, it is determined that greenhouse gas emissions would constitute an unacceptable impact such that an air permit could not be obtained, the regional water boards could consider that under the technology portion of the amendment (M.2.d) as grounds to determine that subsurface intakes are not feasible.
6.3	As far as sourcing water using subsurface intakes, you are optimistic that in general the intakes will operate in a way that fresh open seawater is pulled down and into the system. It is equally likely that fluids from lateral or deeper horizons will be drawn into the system. It is also likely that if in fact fluids from the open ocean are drawn in, they will be oxygenated compared to sediment pore waters. This increases the likelihood for increased aerobic microbial activity in the sediment causing GHG generation. The release would not be observed until the open ocean waters infiltrate the sediments and reach the intakes. So it would not even be possible to monitor the emissions until the plant has been in operation for some time.	Disagree. Sources of CO_2 in fresh groundwater are plant-root respiration and oxidation of organic carbon in the unsaturated zone (Macpherson 2009) and dissolved and particulate organic carbon in the saturated zone being oxidized by the aerobic microbial community (Wood and Petraitis 1984). The former process does not occur in substrates below the seafloor and the latter process might occur when oxygenated seawater replaces water pumped out previously. There is no reason to assume that the contribution of CO_2 would be any higher than that occurring in freshwater aquifers. Even if fresh open sea waters do not replace pumped water in all cases the analysis provided in response to comment letter 28 of Appendix H of the Staff Report with SED estimated that carbon dioxide emissions

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		will be small (less than 2%) relative to overall emissions related to desalination facility power consumption, and are within the estimate of greenhouse gas reductions due to elimination of power requirements associated with removal of pretreatment requirements (see also responses to comments 6.1, 6.2 and 8.4).
6.4	The intake system for a desalination plant is actually quite complex. The variability and heterogeneous nature of the subsurface are difficult to predict. The simplest way to reduce the risk of improper site and intake design is to require a GHG analysis for any potential feed. A requirement for such a GHG analysis is currently missing from your Water Quality Control Plan and, in my opinion, should be added.	Please see response to comment 6.2.
7.1	Mesa Water appreciates the Board's careful consideration of the comments and supports the following modifications that were made to the Amendment: (1) The inclusion of the term "available" into the determination of a range of feasible alternatives for the best site, design, technology and mitigation measures. (Section M.2.a.2); (2) The addition of the requirement to consider whether a proposed facility site is the best available site "feasible,"1 as defined in the California Environmental Quality Act (CEQA) in determining the best available site (Section M.2.b); (3) The reduction in time required to conduct a marine life mortality study period from 36 months to at least 12 consecutive months to demonstrate the effectiveness of an alternative method of preventing entrainment (Section M.2.d.1.c.iii); and (4) The removal of the requirement to collect additional samples with a 0.2-mm mesh net to provide a broader characterization of entrained organisms and the potential requirement to mitigate for entrainment of organisms 0.2–0.335 mm in length (Section M.2.e.1).	Comment noted and appreciated.
7.2	Mesa Water remains concerned that the Amendment favors subsurface	This comment is out of the scope of the clarifying edits to the March

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	intakes over surface intakes as the preferred technology for seawater intakes for all new or expanded desalination facilities. Mesa Water again respectfully requests the Board to revise the Amendment to provide applicants with greater site design flexibility in selecting the most appropriate and economically and technologically feasible intake for new projects, including the latest available technology for new desalination projects. As described below, desalination projects require site-specific analysis that will not be achieved if applicants are required to overcome a preference for subsurface intakes.	20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf). Please see response to comment 15.4 in Appendix H and section 8.3 of the Staff Report with SED for more information regarding the selection of subsurface intakes as the preferred intake technology.
7.3	The Amendment's mitigation requirements violate CEQA by requiring replacement of all marine life and by assuming a level of entrainment inconsistent with scientific studies and project-specific factors, such as surface intake screen design. This conclusion is supported by an analysis from experts at MBC Applied Environmental Sciences that addresses the Amendment and SR/SED's technical analysis of impacts to marine life.	This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf) and the Staff Report with SED. Nevertheless, we disagree. The intake of seawater for desalination is regulated under Water Code section 13142.5(b), which requires mitigation for intake and mortality of all forms of marine life. The additional analysis by experts at MBC Applied Environmental Sciences is appreciated; however, we disagree that entrainment of small planktonic organisms for all new or expanded desalination facilities will be less than significant or that mitigation should only be required for marine life mortality if there is an impact to the population. These small organisms serve a critical purpose in California's marine ecosystem because they form the base of the marine food web. Organisms that are not consumed sink and are degraded by microbes that recycle the nutrients. This process is an integral part of California's seasonal coastal upwelling that delivers nutrient-rich waters to nearshore habitats. Furthermore, Water Code section 13142.5(b) requires mitigation for intake and mortality of all forms of marine life. For a further discussion of how the Water Code section 13142.5(b) mitigation requirement does not import the CEQA standard of reducing impacts to a level that is "less than significant", see response to comment 7.19 below.
7.4	Given the severe drought, California must seek out multiple water supply sources to meet its future needs. Additionally, desalination facilities must be made available quickly. These two requirements are highlighted in Mesa Water's August 18, 2014 letter, and are further	Comment noted. One of the goals of the proposed Desalination Amendment is to support the use of ocean water as a reliable supplement to traditional water supplies while protecting beneficial uses.

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	underscored by Governor Brown's 2015 Executive Order requiring Californians to reduce water consumption. Just one day after the Governor issued that Executive Order, the State Board informed water users that they could expect water curtailment orders in the months to come. In addition to drought conditions, the recently enacted Sustainable Groundwater Management Act will increase groundwater use planning and oversight, and will likely require steadily decreasing reliance on groundwater over the next twenty years.	
7.5	Mesa Water's fundamental concern is that the SR/SED and Amendment, as proposed, may jeopardize, delay, or add unnecessary or unclear regulatory and economic burdens to this essential water supply source, thereby impacting the ability of the state and Mesa Water to meet water supply needs.	This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf) and the Staff Report with SED. Nevertheless, one of the goals of the proposed Desalination Amendment is to support the use of ocean water as a reliable supplement to traditional water supplies while protecting beneficial uses. Furthermore, chapter III.M.1.a allows for the Executive Director of the State Water Board to temporarily waive the application of the proposed Desalination Amendment to serve as a critical short term water supply during a state of emergency as declared by the Governor, including an emergency drought declaration.
7.6	Mesa Water supports the development of new sources of water, including desalination. As you know, ocean desalination offers a variety of benefits, including: (1) a safe and reliable water supply source functionally independent of regional water conveyance systems; (2) a reduced dependence on limited State Water Project supplies and sensitive Delta habitat; (3) less reliance on both freshwater sources which have associated environmental and regulatory constraints, and groundwater supplies, which are often limited due to contamination, overdraft or water rights issues; (4) a supplemental source of groundwater recharge to restore groundwater levels and prevent subsidence and seawater intrusion to crucial aquifers; and, (5) the opportunity for local agencies to exercise more control over their water supplies.	Comment noted.
7.7	Mesa Water recognizes and appreciates the enormous task that the State Board has undertaken in this effort, and understands that the	Comment noted.

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	intent was to create guidance that protects the environment and "seeks to ensure an efficient approach to permitting desalination facilities to address needed water supplies," with the limited resources at the Regional Water Board level. However, Mesa Water believes that if the Amendment to the Ocean Plan is adopted as it stands now, the unintended effect of the regulations would result in greater regulatory burden at the state and Regional Water Board levels.	
7.8	The Amendment should consider both surface and subsurface intakes equally depending on the site's location, topography, and specific impacts. The Amendment as currently drafted provides that Regional Water Boards "shall require subsurface intakes" unless they make an affirmative finding of infeasibility under Section M.2.a.2. (Section M.2.d.) In its response to comments, the State Board explained why it does not take a technology-neutral approach—namely, that subsurface intakes are the environmentally preferred technology because they do not impinge or entrain marine life and that construction of subsurface wells will have minimal to no impact on marine organisms. (Response to Comments, 15.2.) The Amendment and the environmental community continue to prefer subsurface intakes because of their potentially lower impingement and entrainment impacts on marine life. However, this narrow analysis ignores that subsurface intakes have found limited application to date, especially to medium- and large-scale desalination projects. In addition, specific conditions in California militate against this preference, including (1) water quality contamination; (2) lack of favorable aquifer conditions; and (3) potential beach aesthetic and erosion impacts. As noted in Mesa Water's August 18, 2014 letter, the SR/SED fails to adequately analyze the impacts that will result from subsurface intakes.	This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf). Please see response to comment 15.4 in Appendix H and section 8.3 of the Staff Report with SED for more information regarding the selection of subsurface intakes as the preferred intake technology. Furthermore the analysis in chapter III.M.2 is in context of Water Code section 13142.5(b) that requires consideration to minimize intake and mortality of all forms of marine life. Water quality contamination, lack of favorable aquifer conditions, and potential beach aesthetic and erosion impacts would be evaluated under a project level CEQA analysis. We assume the commenter is referring to the potential for seawater intrusion when it refers to water quality contamination. These factors are already incorporated throughout chapter III.M.2 would be assessed for a project in two ways. First, is that a regional water board would consider the factors to inform the determination of feasibility since the factors are specifically noted in chapter III.M.2. (e.g., hydrology, impacts on freshwater aquifers and existing water users, and design constraints). Second, the abovementioned factors would be analyzed during a project-level CEQA analysis and may influence a regional water board's determination of feasibility.
7.9	The SR/SED fails to adequately discuss in detail the types of construction/operational impacts associated with subsurface intakes or the magnitude of those impacts. Instead, the Project's significant environmental impacts are limited to a less than one page discussion	This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf) and the Staff Report with SED.

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	for five topical impacts (Aesthetics, Air Quality, Biological Resources, Greenhouse Gas Emissions and Hydrology and Water Quality). (SR/SED, Section 12.4, pp. 207-223.) Specifically, the SR/SED fails to adequately consider recent coastal desalination projects which are supported by readily available scientific literature and environmental documents. By failing to conduct this analysis, the State Board has created a conclusory document which supports its Amendment instead of complying with CEQA and providing an analysis of environmental impacts that the State Board must consider before approving or denying the Amendment.	This comment was addressed in responses to comments 13.45 to 13.51 of Appendix H of the Staff Report with SED. Nevertheless, the Staff Report with SED does discuss the types of construction and operational impacts in detail. The CEQA analysis is not limited to less than one page as the commenter asserts, but, as discussed in the Staff Report with SED and response to comments, was arranged in multiple parts. Section 12.1 describes potential environmental impacts from the construction and operation of desalination facilities in general (p. 116). This discussion is on the overall impacts of desalination facilities and provides a baseline with which the proposed project and project alternatives may be compared. Section 12.4 analyzes the additional reasonably foreseeable environmental impacts associated with and specific to the State Water Board's proposed Desalination Amendment (p. 177). While the analyses in section 12.1 are quantitative and detailed, the analyses in Section 12.4 are necessarily less detailed and more qualitative. This is appropriate for a programmatic level CEQA analysis where site, design, technology, and mitigation are not known. The programmatic nature of the Staff Report with SED allows the State Water Board to consider broad policy alternatives and program-wide mitigation measures. Each proposed desalination facility will require the preparation of environmental review documentation, which will be the appropriate time for site-specific, project-level review. Furthermore, response to comments 13.45 in Appendix H of the Staff Report with SED, there are only five resource areas discussed in Section 12.4 because the other 13 resource areas were found to be not significantly affected by the proposed Desalination Amendment in the Environmental Checklist (Appendix B of the Staff Report with SED) and were therefore not discussed in detail in Section 12.4 This is entirely consistent with the requirements of CEQA (see §15128 of the CEQA Guidelines). With regard to recent projects environmental documentation for a wide variety of desalination facilities was reviewed. However, the review was not, and did not need to be exhaustive. The purpose of the

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		review was to identify the typical range of environmental impacts that could be expected from the construction and operation of a desalination facility in general. As noted in the responses to comments in Appendix H of the Staff Report with SED, the documents identified by the commenter were previously reviewed. However, they did not provide new information that would materially change the analysis of the Staff Report with SED, thus they were not included.
7.10	The State Board's explanation for analyzing only five impacts in detail violates CEQA because the Project that must be analyzed is the Amendment (including the preference for subsurface intakes) and not desalination projects in general. (See State Board's response to comment 13.48.) Because the Amendment proposes to require subsurface intakes, the impacts of this specific policy decision must be analyzed. Alternative 2, which purports to be the "Proposed Project," is not accurately described because the SR/SED provides it "would consist of an amendment to the Ocean Plan that allows a greater range of intake methods and discharge technologies than Alternative 1 (subsurface)." (SR/SED, p. 209.) In reality, the Amendment requires subsurface intakes, unless infeasible.	This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf) and the Staff Report with SED. This comment was addressed in responses to comments 13.45 to 13.51 of Appendix H of the Staff Report with SED. Nevertheless, neither the proposed Desalination Amendment nor the Staff Report with SED states or suggests that the analysis of desalination facilities in general obviated the need to consider all resource areas. All resources areas were evaluate (see response to comment 7.9). Furthermore, the purpose of evaluating desalination facilities in general was described in the introduction to section 12 of the Staff Report with SED and further explained in the responses to comments (see response to comment 7.9 above and response to comment 13.45 in Appendix H of the Staff Report with SED). Specifically, the analysis of desalination projects in general provides a baseline with which the proposed project and project alternatives may be compared. Finally, Alternative 2 accurately describes the proposed project because the proposed alternative does allow a greater range of intake and discharge technologies than simply subsurface intakes. As noted by the commenter, and as specifically provided for in chapterM.2.d, the proposed Desalination Amendment provides for the use of surface intakes where subsurface intakes are infeasible. Furthermore, chapter M.2.d.(1)(a) of the proposed Desalination Amendment provides a list of factors that the regional water boards shall consider in the process of determining feasibility. Once infeasibility is demonstrated, the only technology constraint identified

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		in the amendment is that surface intake be screened with a 1.0 mm or smaller slot size screen, or use other controls that provide equivalent or less intake and mortality of marine life. In addition, as noted in the response to comment 12.43 in Appendix H of the Staff Report with SED, claims that the project description is inaccurately described are incorrect as the exact project (the proposed Desalination Amendment) is provided in its entirety in Appendix A of the Staff Report with SED.
7.11	Mesa Water understands that SED is a programmatic document and is not looking for a project-level review. However, at a minimum, the State Board must consider additional resource areas and comprehensively analyze its policy change (Amendment 2) because an EIR must discuss and analyze the significant environmental effects of the entire project. (CEQA Guidelines §§ 15124, 15126.2, 15165.) This analysis must be consistent with Section III.M.2.d.(1)(a) of the proposed Desalination Amendment, which includes a lengthy list of considerations in determining feasibility of subsurface intakes, including: geotechnical data, hydrogeology, benthic topography, oceanographic conditions, presence of sensitive habitats, presence of sensitive species, energy use, impact on freshwater aquifers, local water supply, and existing water users. This conclusion is supported by an analysis from experts at MBC Applied Environmental Sciences that addresses the physical and biological effects of infiltration galleries on marine life. (See Exhibit B.) In sum, the State Board's policy decision to prefer one type of intake may only be made after a comprehensive analysis is completed and the impacts between the two types of intakes are compared.	This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf) and the Staff Report with SED, including response to comments 13.45-15.51 in Appendix H. Also, please see response to comment 12.6 below regarding the comparative analysis of the factors for surface and subsurface intakes.
7.12	The SR/SED fails to cite recent reports that analyze desalination plant intake alternatives. For example, the WateReuse Association's 2011 report notes that "while it is typically stipulated that subsurface intakes yield better seawater water quality than open ocean intakes, this assumption holds true for very site specific conditions…" (WateReuse. 2011, "Overview of Desalination Plant Intake Alternatives, p. 6.)2 The report goes on to explain that existing seawater desalination beach wells in California "indicate that some desalination plants using subsurface intakes may face a costly challenge – high concentrations of manganese and /or iron in the intake water…The treatment of beach	This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf), the Staff Report with SED, and response to comment 7.9 above. Furthermore, as stated in section 8.3.1 of the Staff Report with SED, *"Source water withdrawn through a surface water intake requires pretreatment to remove suspended solids and biological material that can otherwise clog or reduce the*

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	well water….requires chemical conditioning and installation of conservatively designed "green sand" pretreatment filers…This costly pretreatment requirement may significantly reduce the potential cost benefits of the use of beach wells as compared with an open sea water intake." (Id. at 7.)	*efficiency of the RO membranes. RO membranes can scale and corrode if minerals precipitate from the source water. For this reason, many desalination facilities acidify source water or add chemical antiscalants to prevent scaling and corrosion. Following a media filtration, chemicals are also added to enhance the coagulation of suspended solids in order to easily remove the sediment from the source water. Pretreatment increases costs and energy requirements, and is an additional step that is often not necessary when using subsurface intakes. The natural filtration process of a subsurface intake significantly reduces or eliminates the need for pretreatment requirements. (National Research Council 2008; SDCWA 2009))"* Section 8.8.1 of the Staff Report with SED specifically acknowledges that specific considerations will influence the type and extent of pretreatment for a facility. If a facility has high concentrations of iron and manganese in the source water, this would be considered when determining the best available site, design, and technology feasible. Furthermore, cost is a considered in the definition of feasible and in the project life cycle cost (see responses to comment 6.12 in Appendix H of the Staff Report with SED regarding the definition of feasible).
7.13	While the State Board's Response to Comments cites to the recent report "Technical Feasibility of Subsurface Intake Designs for the Proposed Poseidon Water Desalination Facility at Huntington Beach, California," it notes only that "[s]hould the ISTAP [the Independent Scientific Technical Advisory Panel] determine that subsurface intakes are not feasible, the proposed Desalination Amendment provides a mechanism whereby surface intakes may be permitted." (Response to Comments, 15.92.) The report is the product of coastal development permit (CDP) review, California Coastal Commission (CCC or the Commission) recommendations, and a scientific and technical review conducted by an independent expert panel (ISTAP). ISTAP itself was convened by staff of the Commission and Poseidon Resources LLC in September 2014. This report evaluates whether any of several subsurface intake designs would be technically feasible to build and	Contrary to the commenter's assertion that the ISTAP report for Poseidon's Huntington Beach project demonstrates that *most* types of subsurface intakes for medium- to large-scale desalination projects in California are often technically infeasible, the report only analyzed the feasibility of subsurface intake for the Huntington Beach project. While the data are informative for other projects, each project will need to do an analysis to determine if subsurface intakes are feasible. Furthermore, the Independent Scientific Technical Advisory Panel (ISTAP) report determined subsurface intakes were technically feasible.

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	operate as part of the Poseidon seawater desalination facility proposed for the City of Huntington Beach. The report focuses on technical "feasibility" as defined by CEQA, namely: (1) geotechnical data for the site, (2) hydrogeology, (3) benthic topography, (4) oceanographic conditions, (5) impact on freshwater aquifers, and (6) other site and project-specific factors. ISTAP identified all possible subsurface intake options that use currently available technology, regardless of economic considerations or the other factors identified under the CEQA definition of "technical feasibility." The ISTAP evaluated nine types of subsurface intakes for technical feasibility at the Huntington Beach site. ISTAP concluded that seven subsurface intake options for the desired capacity range (100-127 MGD) had at least one technical fatal flaw that eliminated it from further technical consideration. ISTAP recommends that consideration be given solely to seabed infiltration galleries (SIG) and beach gallery intake systems in the Phase 2 assessment. This report demonstrates that, contrary to the Staff Report's findings, most types of subsurface intakes for medium- to large-scale desalination projects in California are often technically infeasible, and are narrowly limited to more expensive gallery intake systems (which may be financially infeasible). In light of this recent study, we urge the State Board to remain neutral instead of continuing to favor subsurface intakes.	
7.14	The Amendment establishes a regulatory preference for use of subsurface intakes over open ocean intakes, and requires desalination facilities to use subsurface intakes if feasible possible. Because subsurface intakes are often infeasible, this conflicts with both the Project goals and the State Board's mission. While one of the Project goals is to "provide a consistent statewide approach for minimizing intake and mortality of all forms of marine life, protecting water quality, and related beneficial uses of ocean waters," the Amendment ignores the second Project goal: to "support the use of ocean water as a reliable supplement to traditional water supplies while protecting beneficial uses." (SR/SED, pp. 27-28.) The Amendment also ignores that the State Board's Water Rights Mission Statement is "to establish and maintain a stable system of water rights in California *to best develop, conserve, and utilize in the public interest the water resources of the*	This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf) and the Staff Report with SED. Nevertheless, the proposed Desalination Amendment does not ignore the second project goal, but rather provides direction for the regional water boards on how to meet the goal of supporting the use of ocean water as a reliable supplement to traditional water supplies while protecting beneficial uses. Nothing in the proposed Desalination Amendment is contrary to the State Water Board's Water Rights Mission Statement. There is no evidence to support that the preference for subsurface intakes would result in substantially increased project costs. On the contrary, there are studies to support that while the initial capital investment may be higher for

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	State while protecting vested rights, water quality and the environment." While the State Board's response to comments provides that "there are multiple opportunities for an owner or operator to seek an alternative compliance pathway in the proposed Desalination Amendment" (Appendix H, 13.10), requiring the owner to design and study a subsurface intake would substantially increase Project costs, which would be passed on to ratepayers (see below), and could potentially discourage development of new desalination projects during a severe drought period.	subsurface intakes, the project life cycle cost is equivalent to or lower than open intakes for facilities that operate at least 10 to 15 years. (Missimer et al. 2013) This is because pre-treatment may be reduced or eliminated. Additionally, facilities using subsurface intakes will not have to conduct an ETM/APF analysis or mitigate for intake-related mortality, which could result in significant cost savings. Consequently, it would be advantageous to the ratepayers in the long-term to have new or expanded desalination facilities developed in their area use subsurface intakes.
7.15	Mesa Water appreciates the State Board's inclusion of the Economic Analysis in the SR/SED by Abt Associates Inc., which purports to provide an economic analysis with cost estimates for methods of compliance with the requirements set forth in the proposed Desalination Amendment, in order to more fully inform public comment and the decision-making process. However, the SR/SED's Economic Analysis is flawed in its analytical approach and its conclusions are not supported by concrete data. The analysis fails to account for the potential costs created by increased regulatory burden and compliance requirements associated with subsurface intakes. Higher capital and construction costs of subsurface intakes are acknowledged, but the Economic Analysis does not provide a side-by-side comparison to illustrate how significant the difference is. The qualification that elevated capital costs will be offset through reduced operating and maintenance (O&M) costs is a unsupported conclusion, and there is no side-by-side data comparison to support it. As a result, the Economic Analysis undervalues the extent of the elevated economic costs associated with subsurface intakes. The costs for subsurface intakes are likely to be greater than just the capital costs of constructing a subsurface intake at a desalination facility and will include the costs associated with the environmental impacts that flow from use of that method. The Economic Analysis fails to account for the potential costs created by the increased regulatory burden and compliance requirements associated with implementing subsurface intakes instead of surface intakes. The longer permitting	This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf) and the Staff Report with SED. Please see responses to comments 13.38 to 13.44 in Appendix H of the Staff Report with SED.

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	and approval process impacts the timing of construction, which in turn has implications for financing and construction costs. None of these factors are reflected in the Economic Analysis. These considerations should be discussed in Section 9 of the SR/SED and analyzed in the Economic Analysis.	
7.16	The Economic Analysis plainly states that capital and construction costs of subsurface well intakes are greater than those of surface intake structures. The facility-specific details included at pages G-30 through G-38 support that finding. Even if the $33,174,664 cost of retrofitting surface intakes with screens is factored in, the cost of subsurface intakes is significantly greater than screened surface intakes. The Economic Analysis qualifies the difference in capital costs by stating that the O&M costs of subsurface intakes are less than those of screened surface intakes, and will therefore offset construction costs. The Economic Analysis concludes that total project capital costs may be 2-9% less because of reduced pretreatment costs. The data sets on pages G-30 through G-38 do not provide a direct comparison of O&M costs to support that conclusion. In addition, as explained above, pretreatment costs for subsurface intakes may actually be higher than surface intakes based on the presence of manganese and /or iron. The absence of specific examples to support the conclusion that increased capital costs will be offset by reduced O&M costs indicates hopeful thinking without solid support. In short, the Economic Analysis is incomplete and foundationally flawed. Without accounting for all costs involved in subsurface intakes, from land acquisition to environmental compliance costs, the analysis is incomplete.	This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf) and the Staff Report with SED. Please see responses to comments 13.38 to 13.44 in Appendix H of the Staff Report with SED.
7.17	Section III.M.2.e defines “mitigation” as the replacement of all forms of marine life or habitat that is lost due to the construction and operation of a desalination facility after minimizing mortality of all forms of marine life through the best available site, the best available design, and the best available technology measures. This requirement violates CEQA, which only requires that an EIR propose mitigation measures that will lessen or avoid a project’s significant impacts. (Pub. Res. Code, §§ 21002;	This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf) and the Staff Report with SED. Mitigation requirements set forth in the Desalination Amendment do not violate CEQA. While CEQA together with it regulations and case law is instructive, it does not control interpretation of Water Code

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	21100(b)(3).) Mitigation measures must be designed to minimize significant environmental impacts, not necessarily to eliminate them. (Pub. Res. Code, § 21100(b)(3); CEQA Guidelines, §15126.4(a)(1).) Any action that is designed to minimize, reduce or avoid a significant environmental impact or to rectify or compensate for the impact qualifies as a mitigation measure. (CEQA Guidelines, §§ 15126(a)(1), 15370.) Under CEQA, lead agencies have the option of addressing potential significant project impacts either by imposing their own mitigation measures through a Mitigation Monitoring and Reporting Plan or including project design features which would minimize any potential impacts by virtue of the project design and management. (See, e.g., Association of Irritated Residents v. County of Madera (2003) 107 Cal.App.4th 1383, 1397-98 (lead agency entitled to make its own determination that mitigation measures would mitigate potential impacts to listed species).)	section 13142.5(b). See, *Surfrider Foundation v. California Regional Water Quality Control Board* (2012) 211 Cal.App.4th 557, at 577. See also, Response 7.19 below.
7.18	The Amendment limits mitigation to replacing habitat, which, as MBC points out, cannot adequately account for the entrainment of smaller organisms such as phytoplankton. Pelagic fishes, invertebrates, and algae, including phytoplankton, are aquatic rather than terrestrial. In compliance with CEQA, other forms of mitigation should be permitted on a project-by-project basis. (CEQA Guidelines, §§ 15126(a)(1), 15370.)	The mitigation in the proposed Desalination Amendment is intended to meet the requirements of mitigating for marine life mortality as required in Water Code section 13142.5(b). Other mitigation may be required associated with findings in the project level CEQA analysis. Furthermore, chapter III.M.2.e.(3)(b)i of the proposed Desalination Amendment requires: *"Mitigation shall be accomplished through expansion, restoration or creation of one or more of the following: kelp beds, estuaries, coastal wetlands, natural reefs, MPAs, or other projects approved by the regional water board that will mitigate for intake and mortality of all forms of marine life* associated with the facility."* These habitat-types are arguably not terrestrial. Section 8.5.2 of the Staff Report with SED discussed how these habitat types have the potential to mitigate for the impacts associated with marine life mortality. The proposed Desalination Amendment recognizes that mitigation for pelagic and some soft-bottom species may be impractical or infeasible and allows for out-of-kind mitigation for these

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		species. Finally, the proposed Desalination Amendment clearly states "or other projects approved by the regional water board" to provide an opportunity for other mitigation projects if the regional water board determines is appropriate.
7.19	The requirement that mitigation must replace all forms of lost marine habitat violates Water Code section 13142.5(b), which includes required mitigation as one of four elements, requiring "best available site, design, technology, and mitigation measures feasible . . . to minimize the intake and mortality of all forms of marine life." The State Board's dictionary definition of "minimize" does not comport with CEQA and the lead agency's discretion to identify mitigation measures. As the First District Court of Appeal recently recognized, an EIR must include "[m]itigation measures proposed to minimize significant effects on the environment." (Lotus v. Department of Transportation (2014) 223 Cal.App.4th 645, citing Pub. Resources Code § 21100(b); see also CEQA Guidelines § 15126. "For each significant effect, the EIR must identify specific mitigation measures ... " Lotus, citing Sacramento Old City Assn. v. City Council (1991) 229 Cal.App.3d 1011, 1027.)	The State Water Board's interpretation of "minimize" as used in Water Code section 13142.5(b) violates neither that statute nor CEQA. While CEQA case law is instructive, it does not control interpretation of Water Code section 13142.5(b). See, *Surfrider Foundation v. California Regional Water Quality Control Board* (2012) 211 Cal.App.4th 557, at 577. Water Code section 13142.5(b) requires "the best available site, design, technology, and mitigation measures feasible" to "minimize the intake and mortality of all forms of marine life." By contrast, CEQA provides that "it is the policy of the state that public agencies should not approve projects as proposed if there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects . . " Pub. Resources Code section 21002. The commenter provides no basis to conclude that Water Code section 13142.5(b) requires mitigation only in accordance with CEQA, nor for the proposition that the State Water Board may require mitigation of intake and mortality only to a level that is less than significant. Had the Legislature wished to require that the best available site, technology and mitigation measures feasible be used to substantially lessen intake and mortality, or to reduce intake and mortality to a level that is less than significant, in accordance with CEQA, it could have done so. The requirement to "minimize intake and mortality of all forms of marine life," together with the superlative "best," signals a broader intent to protect against the adverse effects resulting from seawater intakes.
7.20	The Amendment's alternative proposed language assumes a level of entrainment using screens that is not rooted in science or actual project impacts: "The regional water board may apply a one percent reduction to the APF acreage calculated in the Marine Life Mortality Report to account for the entrainment reduction when using a 1.0 mm slot size screen." (Section M.2.e.1.a.) As explained in the attached comments from MBC, the citation is mischaracterized. (Exhibit A.) Further, CEQA	Please see response to comment 7.24 regarding the one percent mitigation credit and responses to comments 7.3 and 7.19 for a discussion of how the mitigation requirement in Water Code section 13142.5(b) does not import the CEQA standard of mitigation.

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	requires that each individual project analyze project impacts based on project design and actual impacts. (CEQA Guidelines, §15064.) Therefore, it is premature to assume a level of impact (99% entrainment) from a surface intake screen, especially as surface intake technology evolves. Instead, the Amendment must allow project applicants to analyze individual impacts and obtain mitigation credits based on the project site, water source, presence of plankton, and intake technology.	
7.21	Mesa Water is open to a mitigation fee (Section M.2.e.4), but believes it is critical that the fee have a direct nexus to the potential impacts of a project and be calculated and applied one time to cover all marine organism mitigation requirements for a project, inclusive of all state permitting agencies. Assuming the Board is able to develop a mitigation fee that Mesa Water and other stakeholders support, Mesa Water submits that each desalination project proponent should have the option of paying the mitigation fee, or developing its own mitigation program or utilizing an existing restoration project. Moreover, Mesa Water is ready to work with the appropriate state agencies to draft legislation that frames the mechanics for a mitigation fee. In addition, the magnitude and significance of the impacts of desalination on the overall marine environment should be understood in context of the more significant issues facing our oceans: overfishing and pollution.	This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf). This issue was addressed in responses to comments in Appendix H of the Staff Report with SED.
7.22	All Forms of Marine Life Section M.2.a.1. (Water Code Section 13142.5(b) Determinations) “All forms of marine life” is a term that was added to the Draft Amendment, and is defined as “all life stages of all marine species”. This differs substantially from the SWRCB’s OTC policy, which requires: “Entrainment impacts shall be based on sampling for all ichthyoplankton and invertebrate meroplankton species” (http://www.waterboards.ca.gov/water_issues/programs/ocean/cwa316/docs/otc_2014.pdf). Thus, the SWRCB is now considering impacts to marine organisms, such as phytoplankton and holoplankton, even though it has removed the requirement to sample holoplankton. There	The intake of seawater for desalination is regulated under the Water Code section 13142.5(b), a California state law, rather than the federal Clean Water Act 316(b), which applies only to cooling water intakes using seawater. The Once Through Cooling (OTC) Policy implements section 316(b), which requires that the location, design, construction and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impacts. The proposed Desalination Amendment was developed using the requirements in Water Code section 13142.5(b). Unlike other regulations requiring mitigation only for impacts deemed “significant,” the proposed Desalination Amendment implements statutory language that requires mitigation for the loss of all forms of marine life, as expressly provided. The sampling requirement of holoplankton was removed because the estimates from the ETM/APF

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	is no evidence of potential significant impacts to these organisms, and as long as a mesh size of ≤335 µm is required, impact and mitigation analyses should be limited to ichthyoplankton (and potentially some invertebrate meroplankton), which would be consistent with the OTC policy.	model are based on a limited number of target species and then used as the best estimate for all entrainable species. Please see response to comment 15.48 in Appendix H of the Staff Report with SED regarding the removal of the 200 micron requirement.
7.23	Mitigation Section M.2.e.1.a (Mitigation) The APF analysis is required to be calculated using the one-sided, upper 95% confidence bound for the 95th percentile of the APF distribution (95% confidence interval, or 95% C.I.). The SED states: "A key assumption in the ETM/APF approach is that the APF estimates for specific species are representative of all species present at that location, even those that were not directly measured. As with any technique for calculating mitigation habitat area, it is not possible to be 100 percent confident the calculated APF will fully compensate for impacts" (p. 89). First, we recommend less prescriptive requirements in the policy. While the ETM and APF are useful for wetland assessments, they would be of limited use if considering pelagic species with no particular affiliation to substrate or habitat other than water. Second, there are multiple assumptions that are part of ETM/APF analyses, including estimates of larval movement, survival, and growth that are subject to error. Even if these parameters are available, they are likely still estimates at best. Moving beyond those sources of error in the policy does not make sense. Instead, owners/operators should work with regional boards when developing study plans. Lastly, mitigation projects usually result in multiple indirect benefits. For example, wetland restoration can result in increased water quality, reduced sedimentation, enhance breeding habitat for non- impacted species (such as birds), and recreational and aesthetic opportunities for the public. In summary, the use of APF and the 95% C.I. should be discussed at the project level, not in the policy.	The proposed Desalination Amendment recognizes that mitigation for pelagic and some soft-bottom species may be impractical or infeasible and allows for out-of-kind mitigation for these species. Please see sections 8.5.2 and 8.5.4.2 of the Staff Report with SED for more information regarding out-of-kind mitigation. Additionally, chapter III.M.2.e.(3)(b)i of the proposed Desalination Amendment states "or other projects approved by the regional water board" to provide an opportunity for other mitigation projects if the regional water board determines it is appropriate. The ETM/APF model is the best and most appropriate model available to estimate the impacts associated with the intake of seawater. One of the project goals is to provide a consistent statewide approach to protect beneficial uses of ocean waters. Please see responses to comment 10.2 and 10.3 below regarding the continued inclusion of the 95th percent confidence level requirement. Please see response to comment 21.90 in Appendix H and section 8.5.4.1 of the Staff Report with SED for more information regarding the inclusion of the 95th percent confidence level.
7.24	1% Credit for Screened Intake	The proposed Desalination Amendment includes an opportunity for a

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	Section M.2.e.1.a (Mitigation) *"The regional water board may apply a one percent reduction to the APF acreage calculated in the Marine Life Mortality Report to account for the entrainment reduction when using a 1.0 mm slot size screen."* The SED summarizes the following (p. 62): *"Some studies on screen efficacy are contradictory. The majority of studies that examine the efficacy of wedgewire screens only looked at impacts on ichthyoplankton; yet there are many other organisms that are abundant in the water. Pilot studies on wedgewire screens have indicated that the total number of aquatic organisms that are entrained at screened intakes is not statistically different compared to entrainment at an uncontrolled intake. (Kennedy/Jenks Consultants 2011; scwd2 2010; Foster et al. 2012) Modeling data demonstrates that even though screens may preclude a small portion of the larval population from entrainment, a significant percentage of the population (e.g., all of the smaller sized organisms) can still pass through the screen slots. (Tenera Environmental 2012,2013a) The portion of organisms that are not entrained because of the wedgewire screen is relatively small compared to the number of organisms in the water. (Foster et al. 2012) Consequently, there is only an approximate one percent reduction in entrainment mortality between screened and unscreened intakes. (Foster et al. 2013)."* The ineffectiveness of wedgewire screens is mischaracterized. The actual text from Kennedy/Jenks (2011) is as follows: > *"For fish and marine organisms that are larger than the 2 mm screen slot size, the passive screened intake prevents entrainment. [Note: For fish and marine organisms that are smaller than the 2 mm screen slot size there would likely be no statistically significant difference between the entrainment of a screened and unscreened intake (Tenera 2010)]."* (scwd2 is not listed in the reference section of the SED.)	100 percent mitigation credit for intake-related impacts associated with the intake. If an owner or operator uses a subsurface intake, an ETM/APF analysis and mitigation for operational mortality associated with the intake would not be required since subsurface intakes do not impinge or entrain marine life. Mitigation would still be required for any construction- or discharge-related impacts associated with facilities using subsurface intakes. However, the significantly reduced mitigation requirements and associated cost incentivizes the use of subsurface intakes. If subsurface intakes are not feasible, an owner or operator should use the best intake site, design, and technology to minimize intake and mortality of all forms of marine life (sections 8.3, 8.4 and 8.6 of the Staff Report with SED). This is another way an owner or operator can reduce the amount of mitigation required. A one percent mitigation credit associated with surface water intakes screened with a 1.0 mm slot size screen is appropriate and an owner or operator should not be able to determine their own mitigation credit. A one percent credit for 1.0 mm screens would (1) provide a consistent statewide standard for mitigation credits for using 1.0 mm screens, (2) prevent an owner or operator from having to perform additional studies, and (3) would prevent the risk of inadequate mitigation resulting from either the use of an inappropriate mitigation assessment model or an incorrect calculation in the ETM/APF model (See responses to comments 18.8 and 29.2 in Appendix H). Furthermore, the mitigation habitats are not expected to produce large adult organisms on the onset. The mitigation habitats will attract reproductively mature organisms that will spawn to increase productivity, or larvae and juveniles will settle in the newly created or restored habitats. The majority of organisms produced by the mitigation habitat will be small in size, thus compensating for those small organisms that are entrained. The one percent mitigation credit should not be used to make inferences about the effectiveness of wedgewire screens because their effectiveness is entirely based on perspective. The same 1.0 mm slot size screen can be 100 percent effective or zero percent effective, or somewhere in between, depending on the size of the organisms and the species sampled in the study. The proposed Desalination Amendment includes a requirement for a 1.0 mm or

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	The actual text from Foster et al. (2013) states *"For the small mesh screens being considered, the reduction in entrainment mortality (and APF) is likely to be less than 1%."* Note that this statement is not based on any data or studies. However, Foster et al. (2012) includes calculated reductions in entrainment from use of 1-mm slot size wedgewire screens on two species, and the reductions in entrainment of Age-1 equivalents were 40% and 75%, respectively (http://www.waterboards.ca.gov/water_issues/programs/ocean/desalination/docs/erp_inta ke052512.pdf). The calculated reduction in gobies, the most commonly entrained taxon at the Huntington Beach Generating Station, using 0.5-mm wedgewire screens was 64% (Alden Research Laboratory, Inc. 2007). Therefore, the 1% reduction seems arbitrary and likely inaccurate. If it was the intent of the SWRCB to account for the entrainment of smaller organisms, such as phytoplankton, realize that for pelagic fishes, invertebrates, and algae, including phytoplankton, no amount of coastal habitat restoration would offset entrainment losses because these organisms rely on water as habitat.	smaller slot size screen because these small-opening screens can be extremely effective at preventing entrainment of many marine organisms. Appendix D of the Staff Report includes summary tables with entrainment data for fish eggs and larval fish that show how small slot-sized wedgewire screens can be either very effective at reducing entrainment or show no significant reduction in entrainment. As demonstrated by the data in Appendix D of the Staff Report, the effectiveness of a 1.0 mm slot size screen varies by species and how large that organism is. An excerpt from an EPRI report (2005) showed that entrainment studies, "suggested that larvae longer than 6 to 8 mm had sufficient swimming abilities to avoid being entrained through the 1-mm slot screen, despite being small enough to fit through the slots. Otto et al. (1981) also found that larvae over 10 mm in length have exclusion efficiencies approaching 100 percent." Again, entrainment is species and size dependent, but a general rule of thumb is that entrainment through a 1.0 mm slot size screen is significantly reduced or eliminated for organisms 10 mm or larger. We assume that all organisms smaller than 1.0 mm will be entrained through a 1.0 mm slot size screen and that entrainment will vary for organisms between 1 and 10 mm. Organisms smaller than 10 mm in ocean water are primarily plankton, gametes, larval invertebrates, and larval fish. These organisms serve a critical purpose in California's marine ecosystem because they form the base of the marine food web. Organisms that are not consumed sink and are degraded by microbes that recycle the nutrients. This process is an integral part of California's seasonal coastal upwelling that delivers nutrient-rich waters to nearshore habitats. As presented in Figure 18.8-1 in Appendix H of the Staff Report with SED, gametes and small planktonic organisms are the most abundant in the marine ecosystem and will all be entrained through a 1.0 mm slot size screen. In the example provided, 99 percent of the species between 1 and 10 mm were entrained through a 1.0 mm screen, but none of the species larger than 10 mm were entrained. Given this is only an example, and actual data would need to be collected for a facility. However, the example illustrates the point that the same 1.0 mm slot size screen can be 100 percent effective or

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		0 percent effective. But from the perspective of the abundance of total species in the water, a 1.0 mm screen reduces entrainment by about one percent. The proposed Desalination Amendment requires an owner or operator meet the standard in Water Code section 13142.5(b) of using the best mitigation measures feasible to minimize intake and mortality of all forms of marine life, which by definition includes all life stages of all marine species. The requirement in this section of the Water Code is thus inconsistent with the perspective that the losses of the larval fish are not significant from a population standpoint. For a further discussion of how the Water Code section 13142.5(b) mitigation requirement does not import the CEQA standard of reducing impacts to a level that is "less than significant", see response to comment 7.19. To clarify that the mitigation credit for 1.0 mm slot site screens is to compensate for the reduction in entrainment of all forms of marine life, the proposed Desalination Amendment was revised as follows: *"The regional water board may apply a one percent reduction to the APF* acreage calculated in the Marine Life Mortality Report to account for the reduction in entrainment ~~reduction of all forms of marine life~~* when using a 1.0 mm slot size screen."* The counterarguments presented in the comments state that a one percent mitigation credit is a misrepresentation; however, it is appropriate when considering entrainment reduction of all forms of marine life. The one percent mitigation credit is a conservative approach that is based on the conclusions in Foster et al. 2013. While this approach does not take into account the juvenile and adult organisms that will be 100 percent protected, there is no available or appropriate model to factor that consideration in. There is no scientific basis to support a 50 percent mitigation credit. Furthermore, a 50 percent mitigation credit would be inappropriate because it does not take into account that it is often impractical or infeasible to mitigate for some of the entrained species smaller than

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		10 mm. In-kind mitigation projects are available for species that utilize habitats such as kelp beds, rocky reefs, coastal wetlands or estuaries. But providing mitigation for phytoplankton, zooplankton, and larval pelagic fishes and invertebrates will provide a significant challenge, as seawater and open-water mitigation projects are often impractical or not feasible. The proposed Desalination Amendment includes a provision allowing a regional water board to approve out-of-kind mitigation at their discretion. This option was included to compensate for circumstances where mitigation is impractical or not feasible, as long impacts from the operation and construction of a seawater desalination facility are fully mitigated. But as stated above, the mitigation habitats are not expected to produce large adult organisms on the onset, making a 50 percent mitigation credit inappropriate. This is because the majority of organisms produced by the mitigation habitat will be small in size, thus compensating for those small organisms that are entrained. Further, it is illogical to provide a mitigation credit for a mitigation habitat attracting large reproductive adults because those large adults already existed and are not "new productivity." The gametes and larvae they produce are what should be considered or purposes of determining the appropriate credit.
7.25	New Information in the SED Page 45. There is new data regarding the salinity tolerance of the European squid (*Loligo vulgaris*). This squid does not occur in the Pacific Ocean, and market squid (*Doryteuthis opalescens*) is no longer in the same genus. Mantle lengths of *D. opalescens* reach 17–19 cm (about 7 inches), whereas those of *Loligo vulgaris* reach 64 cm (about 25 inches). Therefore, the relevance of this new information is questionable.	When data is limited or unavailable for a given species, it is standard practice to compare taxonomically similar species. Even though the two species are no longer in the same genus, they are still classified in the same family (Loliginidae) and the information provides some context for effects of elevated salinity on squid.
8.1	It seems reasonable to assume that we can minimize entrainment and impingement of marine life by drawing marine phreatic water, marine groundwater, from subsurface intakes up to the surface for desalination because we know that there's only microbial marine life in the pore waters below the ocean floor, except for the benthic macrofauna in the upper few meters below the sediment-water interface. The rule as	This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf). Furthermore, this comment was previously addressed in the Staff Report with SED. Please see the Staff Report with SED regarding the selection of subsurface

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	currently stated assumes that installing, operating, and maintaining subsurface intakes for desalination will have zero environmental impact and require no mitigation. In fact, the rule [amendment] as written essentially mandates that subsurface seawater intakes be used for all seawater intakes for desalination by requiring they be tested and constructed to full scale unless proved infeasible before any other intake technology is even considered. Due to high cost of permitting and constructing test wells, this mandate, though stated as only a preference, is an absolute mandate, picking on approach to seawater intake for desalination as the 'winner', and ruling out and stifling new ideas and innovation of other methods of seawater intake for desalination. It's simply not only a preference for subsurface intakes, but due to excessive costs that represent revenues to a multi-billion dollar drilling industry who will profit from being selected by the Water Board as the winning technology, rules out any other approach for all intents and purposes.	intakes as the preferred intake technology.
8.2	The rule [amendment] goes on to say that in the event that regulators agree that subsurface intakes are infeasible after years and millions of dollars paid to the drilling industry who lobbied for the State Board's subsurface intake selection preference in the rule, all ocean intakes for desalination that are not subsurface are assumed to have environmental impacts that are significant as determined by any detectable level of entrainment and impingement of marine life alone, and no concern is mentioned of other possible environmental impacts. The rule presents a vaguely described Area Production Foregone (APF) methodology for calculating mitigation of the assumed entrainment and impingement of marine life impact by non-subsurface intakes that is widely open to interpretation and controversial. By contrast, a commonly cited example of subsurface intake is an infiltration gallery which destroys large tracts of benthic habits on the sediment bottom, killing all benthic macrofauna and requires periodic reconstruction due to clogging and further possibilities of unleashing abundant methane seeps such areas as Monterey Bay. Because infiltration galleries fit in the category of a subsurface intake 'winner' technology as specified by the rule [amendment], there is no discussion	This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf) and the Staff Report with SED.

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	about how one would assess the mitigation necessary for an infiltration gallery type of subsurface seawater intake for desalination.	
8.3	The rule [amendment] is essentially silent about the whole concept of identifying the best available site, design, technology and mitigation measures feasible to minimize the intake and mortality of all forms of marine life, but only mandates subsurface intake wherever feasible, with no explanation of what feasibility means, and due to the costs and timelines, essentially rules out any other intake technology or approach that may in fact be more likely the best available site, design, technology and mitigation measures feasible to minimize the intake and mortality of all forms of marine life. For example, the rule [amendment] does not discuss how site selection can minimize the intake and mortality of all forms of marine life. California's diverse coastline holds several unique opportunities for intake site selection that minimize the intake and mortality of all forms of marine life such as the several marine canyon that drop to deep sea depths close to the shoreline, allowing access to deepwater masses nearly devoid of marine life. This rule would require that attempts be made to permit, drill and test subsurface intakes at the mouth of a near shore submarine canyon before the environmental impact of drawing water from the deepwater canyon even be considered. The rule as written assumes there is no mitigation necessary for any subsurface forms of intake. However, I am aware of no data, anywhere suggesting that subsurface seawater intakes have no environmental impact.	This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf). Nevertheless, neither the proposed Desalination Amendment nor the Staff Report with SED asserts that subsurface intakes have no associated environmental impacts. The proposed Desalination Amendment provides clear direction for the regional water boards and the Staff Report with SED includes a detailed discussion on identifying the best available site, design, technology and mitigation measures feasible to minimize the intake and mortality of all forms of marine life. Furthermore, the proposed Desalination Amendment requires mitigation for intake and mortality of all forms of marine life associated with the construction and operation of seawater desalination facilities, including those with subsurface intakes. Please also see the Staff Report with SED for an extensive discussion on mitigation.
8.4	Of particular concern is the potential off-gassing of fugitive greenhouse gases from deep subsurface intake slant wells and vertical wells. When ground water is pumped to the surface it is released from pressure like a carbonated soda bottle and off-gasses it's dissolved carbon dioxide into the surrounding atmosphere. This fact has been brought to the State Water Board's staff on several occasions, but has been both ignored and fallaciously rebutted. For instance, Dr. William Bourcier, a distinguished groundwater geochemist from Lawrence Livermore National Laboratories in Livermore California, submitted a written comment last August, showing the a 50 MGD desalination plant using subsurface well intakes could off-gas 200,000 tons of carbon dioxide	The comments provided in Mr. Bourcier's August 19, 2014 letter (see letter #28 in Appendix H of the Staff Report with SED) were neither ignored, nor fallaciously rebutted , we simply disagree. As discussed in response to comments 28.1 to 28.4, we were unable to replicate Dr. Bourcier's calculations or conclusions with the information provided in the comment letter. To the extent staff was able to replicate Dr. Bourcier's calculations, staff's result was less than half that reported by Dr. Bourcier. Response 28.2 provided in Appendix H of the Staff Report with SED neither stated nor intend to suggest that 100,000 tons per year was a reasonable estimate of carbon dioxide emissions, but only cited that number to highlight that it could not replicate Dr.

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	per year. The State Board's written response is that at most it would only off-gas about 100,000 tons of carbon dioxide a year and a desalination plant off-gasses about 80,000 tons a year anyway, so it's potential was insignificant. This would in fact more than double the total GHG emission from the desalination plant which is already criticized as being too carbon intensive. In fact, AB 32, California's Global Warming Solutions Act, requires facilities, not excluding desalination facilities, enter a mandatory registry if they are responsible for the emission of more than 10,000 tons of GHGs per year, and are in the Cap-and-Trade system if they are responsible for the emission of more the emission of more than 25,000 tons of GHGs per year. This is 1/10th the level the State Board is calling insignificant. The State Board's interpretation of the Ocean Plan Amendment would be in direct conflict with AB 32 significance levels. For the State Water Board officials to say that the GHG potential of 100,000 tons per year is something they considered 'insignificant' in their written comments response responding to Dr. Bourcier's thoughtful comments on the Water Board's draft Ocean Plan points out the complete lack of concern by the Water Board for making a rule that will identify the best available site, design, technology and mitigation measures feasible to minimize the mortality of all forms of marine life. In fact, climate change may be the largest potential impact to marine life from seawater intake, as has already been demonstrated throughout the literature, and the Ocean Plan's preference for subsurface intake will only worsen the situation.	Bourcier's results. Instead, we independently reviewed the Macpherson (2009) study provided by Dr. Bourcier and used Macpherson's "worst case" estimate of CO^2 outgassing from pumped groundwater to arrive at a value of 1,220 tons per year, less than two percent of the CO^2 emissions from plant operations. This is also within the estimate of the amount of greenhouse gas reduction that could occur as pretreatment processes (and associated power consumption) are reduced or eliminated through the use of subsurface intakes (see the staff report discussion in 12.4.4 Alternative 1). As such, the potential change in emissions from the use of subsurface intakes relative to surface intakes is not considered either individually or cumulatively significant. While the results from our analysis does not consider carbon dioxide emissions from subsurface intakes to be a significant contribution to overall greenhouse gas emissions, emissions from the construction and operation of a desalination plant may indeed be significant, and require registration as described by the commenter. The potential significance of these emissions is discussed in the Staff Report with in sections 12.1.7, 12.1.18 and 12.4.4. Additional studies are needed before a more accurate assessment of potential emissions can be generated. Site-specific conditions may change assumptions used in this analysis (e.g. other commenters have suggested that pretreatment may still be needed at least in the short term in some facilities even where subsurface intakes are used). Finally, as discussed in the Staff Report with SED, potential greenhouse gas emissions will be highly dependent on the source of energy used to power these facilities. Consideration of these site-specific factors is beyond the scope of this programmatic review and is more appropriately addressed during project level CEQA.
8.5	Desalination plant proponents that started their projects before AB 32 and general concern for climate change assumed that the State Water Board would be requiring subsurface intakes and have already started the multiple years of testing and failure of subsurface intakes to the	This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf) and the Staff Report with SED.

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	benefit of the drilling industry and cost to the people of California trying to follow this already failing draft rule, and it will be difficult for the Water Board to reverse their stand on subsurface intakes after the millions of dollars and years that have been wasted attempting to follow this failing draft rule, but the world has now awoken to climate change and the subsurface intake rule is simply obsolete. The decade-old assumption that subsurface intakes will always draw fresh seawater free of marine life and therefore have no environmental impact despite destroying large tracts of benthic habits and producing very significant GHG emissions simply isn't true. Rules need to be technology agnostic, and should not pick a winner as the Ocean Plan does. This rule stifles innovation because the law requires by preference the drilling industry's products and services, excluding any new ideas or innovations, giving the drilling industry a monopoly on seawater intakes for desalination. The mandate for subsurface intakes need to be removed from the Ocean Plan and replaced by the definition in California Water Code section 13142.5, subdivision (b) which requires that any "new or expanded coastal power plant or other industrial installation using seawater for cooling, heating or industrial processing" must utilize "the best available site, design, technology and mitigation measures feasible to minimize the intake and mortality of all forms of marine life.	
9.1	We are specifically concerned that the Desalination Amendment's prioritization of comingling of wastewater supplies with brine discharge will limit the expansion of future recycled water supplies. We appreciate staff's thoughtful response to our previous letter and the associated edits included in Chapter 11 of the Draft Staff Report, especially the sentence stating that "WWTPs, water recycling facilities, and desalination facilities will work together to identify the best use of the treated wastewater."	Comment noted.
9.2	In contrast to the staff report's assertion that wastewater for brine dilution will not "promote or inhibit water recycling efforts," HTO maintains that comingling wastewater will inhibit the expansion of future recycled water supplies. The Desalination Amendment needs to go further in securing wastewater as the source for more environmentally	This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf) and the Staff Report with SED. The State Water Board supports recycled water projects. As stated

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	favorable recycled water projects for the following reasons: First, the second guiding principle for developing environmentally and economically acceptable desalination projects from the "California Desalination Planning Handbook" states that "to the extent possible, conservation and recycled water use measures should be maximized before desalination or other new sources of water are pursued." We see no reason why the Desalination Amendment should not better reflect the State's own planning guidelines for desalination projects. The State should undertake greater evaluation of recycled water supplies prior to the approval of desalination facilities across the state and ensure that wastewater supplies are not unnecessarily locked up for the purposes of brine dilution. Second, as we stated in our August 19 letter, the State's recycled water goals aim for 1.5 million AFY of production by 2020, and approximately 2.5 million AFY by 2030. HTO's own research has found that coastal cities and wastewater districts discharged approximately 1.5 million AFY in 2005. These ocean discharges represents a significant amount of the 2020 and 2030 goals, even when considering the approximate 670,000 AFY of recycled water produced statewide in 2009 and the inevitable decreases in overall wastewater supplies due to water conservation with the drought. Allocating an increasing quantity of wastewater supplies for comingling with wastewater could increasingly jeopardize the State's recycled water goals. Finally, plans for recycled water and desalination should be evaluated on an even playing field but comingling of wastewater threatens to tip the balance against recycled water.	in chapter III.M.2.d.(2)(a) of the proposed Desalination Amendment, the wastewater used for commingling must be “wastewater (e.g., agricultural, municipal, industrial, power plant cooling water, etc.) that would otherwise be discharged to the ocean… Nothing in this section shall preclude future recycling of the wastewater.”
9.3	As an example, imagine two communities: Community A and Community B. Community A has not built a desalination facility and is not comingling wastewater supplies but, instead, is discharging wastewater to the Pacific. They are free to consider their wastewater as an uninhibited source of water for a potential recycled water project. In Community A, the marginal cost of that recycled water project will only include conventional recycled water components like treatment trains and distribution systems. On the other hand, Community B has an	Comment noted. Please see response to comment 9.2.

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	existing desalination facility and is comingling wastewater for brine discharge. Prompted by the need for greater supplies, Community B is now considering a recycled water facility and must free up wastewater supplies currently used for comingling by its desalination facility. In contrast to Community A's recycled water facility, which only had to budget for conventional recycled water components, Community B's recycled water facility must also budget for the cost of installing multiport diffusers that will ensure adequate brine disposal for its existing desalination facility. In other words, even if the two recycled water facilities are identical in all other respects, the marginal cost of Community B's recycled water facility is greater than that of Community A because Community B's recycled water facility must incur the cost of installing multiport diffusers at the desalination facility to comply with the State's Desalination Amendment. While it is true that the recycled water projects in either of these communities may require multiport diffusers to adequately dispose of recycled water related brine, the recycled water project in Community B would still incur greater costs from installing a multiport diffuser than Community A since it would need to provide adequate additional capacity to adequately dispose of the brine from Community B's desalination facility. We believe the scenario described for Community B is likely to occur in at least some instances across the state. In cases where this does occur and desalination is prioritized first, future consideration of recycled water will be at a net disadvantage due to the costs of installing multiport diffusers. Ultimately, those costs may be manageable and may be outweighed by the need for recycled water, but at a time when the state is pushing to encourage recycled water production to the greatest extent possible, the Desalination Amendment tips the scales in the wrong direction. Simply put, desalination projects should not be permitted to utilize wastewater without taking into consideration the effect of comingling on future recycled water supplies.	
9.4	Heal the Ocean recommends that the Desalination Amendment include a provision for all desalination applicants to fully evaluate all potential recycled water supplies in their service areas prior to NPDES permit	Comment noted. Please see response to comment 9.2.

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	approval. The Central Coast Regional Water Quality Control Board (Regional Water Board) took this exact approach when considering approval of the City of Santa Barbara's (City) proposed reactivation of the Charles E. Meyer Desalination Facility. As a part of a conditional use permit (which, it should be noted, will not stop the plant from moving forward in the interim), the City is required to report back to the Regional Water Board with a work plan for evaluating potable reuse options within the City. We believe that this is a reasonable, balanced approach for ensuring that recycled water is adequately prioritized compared to desalination. This approach would not stop desalination projects from moving forward, but it would give communities and decision makers greater information regarding the extent of wastewater supplies that can be feasibly converted to recycled water relative to those wastewater supplies needed for comingling in a desalination project. Under this approach more informed long-term planning can take place and adequate contingencies, like multiport diffusers, could be included in desalination project plans.	
9.5	Page 144: In the sentence that reads "...either promote or inhibit water recycling efforts," change "either" to "neither."	The revision was made in the Staff Report with SED.
9.6	Heal the Ocean understands that comingling of wastewater supplies is being prioritized by the State Water Board because it is an environmentally superior method for brine disposal. However, given the severity of the drought, and the environmental benefits of recycled water, we believe requiring desalination applicants to fully evaluate potential recycled water supplies will ensure that recycled water projects are appropriately prioritized and kept on an even playing field with desalination projects that plan to comingle brine waste with wastewater supplies. Ultimately, if implemented, this recommendation will help local water purveyors better plan for future recycled water supplies and better comply with the staff report's recommendation that "WWTPs, water	Comment noted. Please see response to comment 9.2.

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	recycling facilities, and desalination facilities [...] work together to identify the best use of the treated wastewater."	
10.1	The staff is to be commended on the large amount of work they have done on responding to comments and incorporating revisions into the Amendment. As a former member of Expert Review Panels for this Amendment and the OTC Policy, I was impressed by the extent of the independent outside expert review that was done in preparing the latest draft of the Amendment.	Comment noted and appreciated.
10.2	My comments on the revisions to the Amendment are related to the addition of the text at the end of Section 2.e.(1)(a) on the application of APF, especially the use of the 95th percentile value to estimate the level of required mitigation. The language in the last sentence of the section does not reflect the approach used in the SED which uses an estimate of the 95th percentile value from a set of Area of Production Foregone (APF) estimates. A more detailed appraisal of the problems on the use of APF can be found in a guidance document that Tenera has prepared on the development of mitigation programs for desalination plant intakes through a grant from the WateReuse Research Foundation. (excerpts from the final report for the project, which is nearing completion, included as an attachment to comment letter) The attachment includes the Executive Summary from the report, and the sections relevant to the application of the Empirical Transport Model (ETM) and APF in the impact assessment and mitigation scaling process, respectively. The larger report reviews programs used to mitigate for the effects of ocean intakes, including for projects in California. The report also reviews the different approaches used for scaling mitigation, including APF. The conclusions from the report support the use of ETM and APF as the preferred approaches for impact assessment and mitigation scaling, respectively.	The additional information is appreciated. Please see responses to comments 10.3 and 10.4.
10.3	While, the WateReuse Research Foundation report does support the use of ETM and APF, there are details of the methodology that are still open to discussion. Most of the development of the ETM and APF has been based on work by Dr. Peter Raimondi and me, and we had hoped	We appreciate that the commenter and Dr. Raimondi are continuing the development of the ETM/APF methodology and recognize there are some areas of disagreement on the methodologies. Since these issues will not be resolved before the proposed Desalination

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	to work together on closing some of these areas of disagreement through our collaboration on the WateReuse Research Foundation project. Unfortunately, our schedules have limited our ability to collaborate on the project. I have recently spoken with Dr. Raimondi and he is in agreement that there is still an opportunity to resolve some of the areas of disagreement through our collaboration on the WateReuse Research Foundation project. This same approach was used on the development of the intake impact assessment report that was prepared for the California Energy Commission and has been the de facto guidance document for these types of studies in California. The resulting document from the WateReuse Research Foundation project would be of great value to state resource agencies as additional desalination projects are considered for development along the coast. One of the sources of disagreement regarding the application of APF is the statistical use of the estimates of APF. The ability to generate data from an ETM-based intake assessment that could provide the data necessary for a statistical analysis of APF will be highly site and study dependent. Using the approach provided in the Amendment and SED, the amount of additional acreage required for mitigation is directly related to the number of species analyzed, and not as stated on page 91 of the SED – "The amount of additional acreage needed will largely depend on how well the study was done." Increased confidence in the APF estimates from a study is more dependent on the quality of the underlying data and ETM estimates than the number of taxa included in the analysis. The problem of emphasizing the number of species instead of data quality is reflected in the estimates of the 95th percentile value provided in the SED for the two example data sets. The 95th percentile value for the data set with ten species is 97.7 acres and the value for the data set with 20 species is 87.9 acres. The decrease between the two estimates is an expected outcome due to the differences in the sample size used in the two data sets. Normally, when estimating the mean value for a population, the confidence in the estimate of the average is increased as more data are included in the sample. The assumption of the approach provided in the SED is based on treating the APFs as replicate estimates that ". . . are representative	Amendment is considered for adoption at the May 5, 2015 board meeting, the current approach will remain in the proposed Desalination Amendment because it is the more conservative approach. Furthermore, as discussed in the Staff Report with SED, the State Water Board has previously required added statistical confidence in other projects. The 95th percent confidence level in the proposed Desalination Amendment is consistent with previous Board direction and other statistical requirements in the Ocean Plan. The example provided in response to comment 21.90 in Appendix H and section 8.5.4.1 of the Staff Report with SED was not intended to illustrate that the added confidence is based solely on the number of species, but as the Staff Report with SED states, on the quality of the study. The two data sets represent a data set with high variability and another with lower variability. While variability and a poor-study design are not always directly correlated, poor study designs often result in data sets with high variability. The example data sets were intentionally simple and were included merely to illustrate how the 95th percent confidence interval can vary based on the quality of the data. However, the actual data from the project is expected to be more complicated and nuanced based on site-specific variables and the study design. Appendix E of the Staff Report with SED was provided as a guidance document for how to develop a well-designed ETM and APF analysis and should be used when designing the studies.

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	of all species present at that location, even those that were not directly measured." The APF estimates cannot be treated as if they were all equivalent independent replicates using conventional statistical techniques. Each APF estimate is calculated using a complex set of underlying data that varies among species, but may also overlap with data from other species. This complicates any interpretation of a set of APF estimates, since they should not be treated as equivalent data points as would be required of any standard statistical sample. There are several factors which can affect the underlying quality of the data used in the calculation of APF. As a result, ETM estimates, which are the basis for the calculation of APF, are only calculated for a few taxa on many studies. This is partially due to the large changes in the composition and abundance of fish larvae through the year. These factors exist regardless of the quality of the study. It may still be possible to calculate ETM estimates for a large number of species, but the underlying confidence in some of the estimates will be very low. Based on the approach in the SED, if enough species were analyzed the 95% percentile value from the resulting APF values could be reduced regardless of the quality of the underlying data.	
10.4	On the basis of these significant, and currently unresolved methodological details, I would encourage the Board staff to recommend that the last sentence of Section 2.e.(1)(a) in the Amendment be deleted. This will not weaken the policy position and provides an opportunity to develop the details of an approach that ensures that adequate compensation is provided to address the effects of desalination plant intakes. It would also provide the opportunity to explore techniques to ensure that the underlying complexities of the ETM are incorporated into the final APF estimates.	Again, we appreciate the dedication to improving the mitigation model. However, we disagree that the deletion of the 95th percent confidence level will not weaken the policy position. As stated in response to comment 10.3, the current approach is the more conservative approach and it is consistent with prior Water Board actions. The proposed Desalination Amendment is not so overly prescriptive that future methodological developments such as the incorporation of the underlying complexities of the ETM into the final APF estimates could not be included in the ETM/APF analysis for a facility. We assume an owner or operator required to conduct an ETM/APF analysis will rely on experts in the field to ensure the studies are well done. Additionally, if there are changes and improvements in the methodologies that the Desalination Amendment does not accommodate for, it may be amended.
11.1	Poseidon Water LLC ("Poseidon") appreciates the hard work that the Members and staff of the State Water Board have devoted to the	Comment noted and appreciated.

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	process of developing a policy for regulating desalination facilities in California. The approach taken by State Board Members and staff over the past few years appears to have produced a reasonable set of guidelines to help Regional Water Boards make specific desalination permitting decisions. As Governor Brown last week issued his fourth drought-related Executive Order in the past two years, we are reminded of the importance desalination must play in supplementing traditional sources of water supplies to our arid state. Indeed, one of the stated goals of the Desalination Amendment is to, "Support the use of ocean water as a reliable supplement to traditional water supplies while protecting beneficial uses." (Draft Staff Report Including the Draft Substitute Environmental Documentation Amendment to the Water Quality Control Plan For Ocean Waters of California Addressing Desalination Facility Intakes, Brine Discharges, and the Incorporation of Other Non-Substantive Changes," Section 4.3 at p. 28 (March 20, 2015) (hereafter, "SED"). Poseidon supports this goal, and believes the draft Desalination Amendment go a long way to reaching that important balance. Poseidon greatly appreciates State Water Board staff's efforts in addressing the hundreds of comments received on the July 3, 2014 draft Desalination Amendment, and for addressing many of the concerns we and the San Diego County Water Authority raised relative to continued permitting and operation of the nearly-completed Carlsbad Desalination Project ("CDP"). As you know, the entire San Diego region is counting on the CDP to provide roughly 50 million gallons per day of desperately-needed potable water beginning Fall of 2015, and it is our joint mission to ensure that the CDP can continue be operated without extended interruption or substantial investment in additional capital facilities following the scheduled retirement of the Encina Power Station on December 31, 2017.	
11.2	We believe that many changes proposed by staff in the March 20, 2015 draft Desalination Amendment will satisfactorily address several of the most important issues raised by Poseidon in its August 18, 2014 comment letter. These include:	Comment noted and appreciated.

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	• The addition of a provision in the proposed final amendment to account for previously approved mitigation projects for projects making a new Water Code Section 13142.5 (b) determination; • Consideration of site-specific conditions and alternative approaches to compliance with desalination intakes and discharge requirements under Section 13142.5 (b) of the State Water Code; • The inclusion of the CEQA definition of feasibility in keeping with the Carlsbad Project appellate court decision;	
11.3	As currently drafted, the definitions for "Brine Mixing Zone" and "Natural Background Salinity" may render it impossible to demonstrate that alternative brine disposal methods, such as flow augmentation, provide a comparable level of protection to wastewater dilution and multiport diffusers. The definition of "BRINE MIXING ZONE" (Desalination Amendment, Draft Final, March 20, 2015 at p. 20.) provides in part that, "The brine mixing zone shall not exceed 100 meters laterally form the points of discharge." By imposing an inflexible mixing zone limited to 100 meters, the proposed final amendment could have two, equally problematic consequences. First, as indicated in the Table 1 of the comment letter, a 100 meter mixing zone limitation could render flow augmentation, the discharge method utilized for the Carlsbad Desalination Project, infeasible due to what may be determined by the Regional Water Board to be an excessive amount of dilution water required to meet the receiving water salinity limitation. Second, even if relying on high volumes of dilution water were deemed acceptable, it may not necessarily result in the most environmentally beneficial discharge method for a given project. The question that Regional Boards (in consultation with State Water Board staff) should require project applicants to analyze is, what are the overall, comparative and holistic impacts of all technologies? For example, a modest increase in the size of the brine mixing zone	Please see responses to comments 2.2 and 2.3.

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	would significantly reduce the amount of dilution water required to meet the receiving water salinity limitation and could provide an environmentally preferable configuration. Turning to the table above, third row highlighted in yellow, if a Regional Board were to approve an increase in the size of the brine mixing zone from 100 meters to just 168 meters, it would result in the reduction of dilution water intake by more than 150% - potentially more protective to the near-range ecosystem than a strict adherence to the 100 meter brine mixing zone limit. Poseidon strongly believes that the proposed final Desalination Amendment should include the flexibility to allow Regional Boards (in consultation with State Water Board staff) to approve modest increases in the 100 meter brine mixing zone, provided that a project applicant can successfully demonstrate that such in increase is environmentally superior on an overall basis, taking into account the totality of all site, design, technology, mitigation and impact minimization features of the proposed project.	
11.4	The Desalination Amendment provides that brine discharges from desalination facilities shall not exceed 2.0 parts per thousand above the "NATURAL BACKGROUND SALINITY." Natural background salinity is defined as the 20-year mean monthly salinity at the project location. The database that makes up the natural background salinity for the Carlsbad Desalination Project shows a mean salinity of 33.5 ppt, a minimum salinity of 27.4 ppt, and a maximum salinity of 34.2 ppt over the last 20 years. The monthly mean, on the other hand, has a much narrower range from a low of 33.4 to a high of 33.7. Sixty-four percent of daily salinity measurements over the last 20 years are above the annual mean monthly salinity, as shown in Figure 1 of the comment letter, 15 percent of the daily salinity measurements are above the maximum monthly mean. Under the proposed requirements, the Carlsbad facility would have to operate with less than a 2 ppt increase over the ambient salinity more than 60 days per year, which would severely impact plant reliability. To address this problem, Poseidon requests the Desalination Amendment be revised to provide that the "natural background salinity" at a given location is defined as the 20-year mean monthly salinity at	Please see response to comment 2.4.

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	the project location *unless the actual salinity measured at the facility intake absent any influence from the discharge is greater than the 20 year mean monthly salinity, in which case, the natural background salinity shall be the actual salinity measured at the intake absent any influence from the discharge*. Poseidon's August 18, 2014 comments on the July 3, 2014 draft Desalination Amendment included a similar request. However, that request did not include the requirement that the actual salinity measured at the intake be "absent any influence from the discharge." We have added this clarification in an effort to address staff's concern with the initial request as noted in staff's response to comment No. 15.17.	
11.5	Poseidon is eager to support the proposed final Desalination Amendment if the definitions of "Brine Mixing Zone" and "Natural Background Salinity" are revised to accommodate the use of alternative brine disposal methods, outlined below. Poseidon previously provided staff with amendment language that would address these issues, and further believes that the proposed changes to these two definitions is consistent with the State Water Board's declared intent to provide flexible approaches to addressing the brine discharge issues as long as an applicant can demonstrate a comparable level of protection to beneficial uses.	Please see response to comment 2.5.
11.6	(1) Modify the definition of BRINE MIXING ZONE found at page 20; the underscore / ~~strikeout text~~ depicts the language contained in the March 20 draft; the **bold text** is proposed new changes to that language: "BRINE MIXING ZONE is the area where ~~the~~ salinity* exceeds 2.0 parts per thousand above natural background salinity,* or the concentration of salinity approved as part of an alternative receiving water limitation.* The brine mixing zone shall not exceed 100 meters (328 feet) laterally from the points of discharge and throughout the water column ~~unless otherwise authorized by the regional water board in accordance with this plan~~ **unless otherwise authorized by**	Please see response to comment 2.3. In addition to increasing the area or volume of environmental impacts when increasing the brine mixing zone, the proposed language change creates the potential for regulatory uncertainty and inconsistencies. The proposed language revisions in the comment are not consistent with the project goal of providing a consistent statewide approach for minimizing intake and mortality of all forms of marine life, protecting water quality, and related beneficial uses of ocean waters. Furthermore, the proposed language change would place an unnecessary burden on the regional water boards to have to analyze whether an alternative technology can provide a comparable level of protection as wastewater dilution if wastewater is available, or multiport diffusers if wastewater is

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	the regional board in accordance with this chapter L." (2) Add new sub-paragraph "d." to Chapter III.M.3. at page 18, and then re-letter each subsequent sub-paragraph accordingly: "d. An owner or operator proposing brine* disposal technologies other than wastewater dilution and multiport diffusers,* such as flow augmentation,* may submit a proposal to the regional water boards for approval of an alternative brine mixing zone*. An alternative brine mixing zone* may be used if an owner or operator can demonstrate to the regional water board that the technology provides a comparable level of intake and mortality of all forms of marine life* as wastewater dilution if wastewater is available, or multiport diffusers if wastewater is unavailable. To determine whether a proposed facility-specific alternative brine mixing zone* provides a comparable level of intake and mortality of all forms of marine life*, the owner or operator must evaluate the individual and cumulative effects of the alternative brine mixing zone* as an applicable element of the evaluation of the proposed alternative discharge method described in chapter III.M.2.d.(2)(c)." (3) Add language to Chapter III.M.3.b.(2)(a) and (b) at page 16 as follows; underscore / ~~strikeout text~~ depicts the language contained in the March 20 draft; the **bold text** is proposed new changes to that language: "(a) The fixed distance referenced in the initial dilution* definition shall be no more than 100 meters (328 feet), **or an alternative brine mixing zone* approved by the regional water board in accordance with chapter III.M.3.d.** (b) In addition, the owner or operator shall develop a dilution factor (Dm) based on the distance of 100 meters (328 feet) **(or the alternative brine mixing zone where applicable)**, or initial *dilution,* whichever is smaller. The dilution factor (Dm) shall be developed within the brine mixing zone* using applicable water quality models that have been approved by the regional water boards in consultation with State Water Board staff."	unavailable. There is sufficient evidence that commingling brine with wastewater and discharging brine through multiport diffusers are both technologies that can reduce or eliminate toxic effects of salinity within a relatively small area (100 m from the discharge). Further, neither commingling brine with wastewater nor discharging brine through diffusers requires the intake of additional seawater. Alternative brine disposal technologies should be able to meet the receiving water limitation of 2 ppt above natural background salinity or an approved alternative receiving water limitation for salinity (other than 2 ppt) within 100 meters of the outfall.

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11.7	(4) Modify the definition of NATURAL BACKGROUND SALINITY found at page 21; the underscore / ~~strikeout text~~ depicts the language contained in the March 20 draft; the **bold text** is proposed new changes to that language: NATURAL BACKGROUND SALINITY is the salinity* at a location that results from naturally occurring processes and is without apparent human influence. For purposes of determining natural background salinity, the mean monthly natural salinity shall be used. Mean monthly n~~N~~atural background salinity shall be determined by averaging 20 years of historical salinity* data ~~at a location~~ in the proximity of the proposed discharge location **unless the actual salinity measured at the facility intake, absent any influence from the discharge, is greater than the 20 year mean monthly natural salinity, in which case, the natural background salinity shall be the actual salinity measured at the intake absent any influence from the discharge** and at the depth of the proposed discharge, when feasible.* For historical data not recorded in parts per thousand, the regional water boards may accept converted data at their discretion. When historical data are not available, natural background salinity shall be determined by measuring salinity* at depth of proposed discharge for three years, on a weekly basis prior to a desalination facility* discharging brine,* and the mean monthly natural ~~average~~ salinity* shall be used to determine natural background salinity **unless the actual salinity measured at the facility intake, absent any influence from the discharge, is greater than the 20 year mean monthly natural salinity, in which case, the natural background salinity shall be the actual salinity measured at the intake absent any influence from the discharge.** Facilities shall establish a reference location with similar natural background salinity to be used for comparison in ongoing monitoring of brine* discharges.	Please see response to comment 2.4.
11.8	Salinity Study Data Errors Lastly, we call your attention to two critical data errors in supporting scientific analyses that are being relied upon as the scientific basis for the receiving water salinity limitation of 2.0 parts per thousand (ppt).	Please see response to comment 2.6.

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	We understand that State Board staff has been in contact with the outside contractor lab to discuss these data errors after they were recently discovered. Paragraph M.3.b. of the draft Desalination Amendment provides that the daily maximum receiving water limit for salinity shall not exceed 2.0 parts per thousand above natural background. According to the March 20 draft Desalination Amendment SED, it appears that this salinity limit was predicated on the hyper-salinity toxicity study performed by University of California, Davis, Department of Environmental Toxicology (Philips et al. 2012). The Phillips, et al. study concluded that red abalone was one of the most developmentally sensitive species to brine, with a LOEC of 35.6 ppt. This value, in turn, was based on two definitive salinity tolerance tests performed for the State Water Board by the Marine Pollution Studies Laboratory - Granite Canyon, both of which were conducted on July 18, 2012 using adult abalone from two sources; one batch came from Monterey Bay and another from The Cultured Abalone in Goleta, California. The results of these tests were submitted to the SWRCB as supporting the basis for the Desalination Amendment receiving water salinity limit of 35.5 ppt at 100 meters. Recently, Nautilus Environmental reviewed the Granite Canyon study and the raw data made available. Nautilus Environmental discovered that the definitive test conducted with the abalone from The Cultured Abalone was invalid and should not be considered in the determination of the salinity results. Upon review of the data entry for the definitive test conducted with the abalone from Monterey Bay, Nautilus Environmental also discovered two data entry errors. Based on the corrected Granite Canyon Laboratory values, the red abalone salinity test result show a LOEC of 36.7 ppt; 1.1 ppt higher than the LOEC value of 35.6 ppt originally reported. Therefore, receiving water salinity limit should be approximately 3 ppt above natural background. It is our understanding that Nautilus Environmental has communicated the results of its review and analysis to Granite Canyon, and that Granite Canyon personnel were going to communicate this information	

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	to State Water Board staff. Although Poseidon's support for the proposed final Desalination Amendment will not be contingent on addressing this data integrity concern prior to adoption, we wanted to bring this information to the attention of the State Board Members, recommend that the issue, and its implications, are addressed prior to adoption of the proposed final Desalination Amendment.	
11.9	Technology (Desal Amendment, Draft Final, March 20, 2015 at p. 8.) As amended, paragraph L.2.d.(2)(a) provides, in part, that, "The wastewater must provide adequate dilution to ensure salinity of the commingled discharge is less than or equal to the natural background salinity, or he commingled discharged through diffusers." This modifying condition would effectively eliminate a project proponent wishing to comingle the process brine with wastewater from OTC facilities – or virtually any other industrial wastewater facility - because the blend of brine and the seawater discharge from an OTC or other industrial facility will never be less than or equal to the salinity of seawater. [*Note: This comment was submitted to the State Water Board during the public comment period during a stakeholder outreach meeting with Poseidon*]	Chapter III.M.2.d.(2)(a) was revised as follows: *"The wastewater must provide adequate dilution to ensure salinity of the commingled discharge meets the receiving water limitation for salinity* in chapter III.M.3.~~is less than or equal to the natural background salinity,* or the commingled discharge shall be discharged through multiport diffusers.*~~"* The intent of the language is to ensure that dense-negatively buoyant plumes do not create hypoxic or anoxic zones or result in toxicity outside of the brine mixing zone. If the commingled discharge does not meet the receiving water limitation for salinity in chapter III.M.3, an owner or operator will need to re-design the outfall to meet the requirements in chapter III.M.3.
12.1	Our organizations spent decades working with state and federal agencies to develop regulations to implement the federal Clean Water Act (CWA) and minimize the intake and mortality of marine life from open ocean intakes and antiquated "once-through cooling" (OTC) technology for coastal power plants. Regulations adopted in 2010 by the State Board documented the significant impact to marine ecosystems from open ocean intakes, and required power plants on our coast and in estuaries to employ "best technology available" (BTA) to reduce the entrainment and impingement of marine life. The State Water Board concluded that open ocean intakes were not BTA, and prohibited them for new OTC facilities. Now, ocean desalination proponents are seeking to continue using the very same intakes regulated and intended to be phased-out under the OTC Policy – undermining the Policy's objective of minimizing marine life mortality from entrainment and impingement.	This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf). Regardless, the State Water Board's Statewide Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling (OTC Policy) applies only to existing power plants and did not adopt a prohibition for or otherwise address required "best technology available" under Clean Water Act section 316(b) for new power plants. Moreover, the federal statute does not apply to seawater intakes that are not cooling water intakes. The Desalination Amendment is governed by separate state law statutory authority under Water Code section 13142.5(b), applicable to a "new or expanded . . . industrial installation using seawater for cooling, heating or industrial processing. . . ." See also, Draft Staff Report with SED, Appendix H, responses to comments 21.1, 21.29.

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12.2	Desalination facilities will have a detrimental impact on the chemical, physical, and biological integrity of California's waters. Today, California's desalination facilities have a combined design capacity of approximately 6.1 MGD. That capacity would be dwarfed by the 15 seawater desalination plants currently proposed along the California coast, with a combined design capacity of 250 to 370 MGD—a 60-fold increase over today's current capacity. The drought places immense pressure on decision-makers to streamline and weaken water quality standards in the name of increased water supply. One only needs to be reminded of Australia's drought to understand why California should not rush to ocean desalination. Severe drought from the mid-1990s until 2012 prompted Australia to construct six large-scale seawater desalination plants at a cost of $10 billion to provide an alternative source of drinking water. At the same time, water policy reforms and improved efficiency measures were implemented. The facilities took years to build, and by the time they were operational, the drought had eased and cheaper alternatives made the water from the desalination plants impractical. Today, four of the six Australian plants stand idle. If California reacts to the drought in the same manner as Australia, we may also find ourselves in a regrettable position – with taxpayers footing the bill for years to come. If and when seawater desalination is appropriate, projects should be appropriately scaled to meet demonstrated water supply needs. Project permits should require the best available site, and technology to minimize the intake and mortality of marine life; minimize the brine discharge's adverse impacts to the marine environment; and avoid conflict with ecosystem-based management activities, especially ongoing implementation of the Marine Life Protection Act, and climate change and disaster preparedness.	This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf). Nevertheless, this comment was previously addressed in the Responses 21.133 in Appendix H of the Staff Report with SED.
12.3	The State Water Board should not rely on CEQA's definition of "feasible". The State Water Board has revised the Desalination Amendment to include a definition of "feasible" that is essentially identical to Public Resource Code § 15364 ("CEQA definition") definition of "feasible". To determine the feasibility of subsurface	The decision to rely on the CEQA definition was previously addressed in several responses to comments in Appendix H of the Staff Report with SED including numbers 6.12, 15.33, 21.15, 21.40, 21.41 and 21.50. The question of whether subsurface intakes are "capable of being accomplished in a successful manner within a reasonable

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	intakes, regional water board's will now be forced to interpret whether subsurface intakes are "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors."	period of time, taking into account economic, environmental, social, and technological factors," after consideration of the specified range of factors, represents an appropriate analysis of the potential variables that may influence the decision-making process.
12.4	*Clean Water Act §316(b) and Water Code §13142.5(b) are similar statutes, targeting a particular issue, and should be interpreted similarly.* Clean Water Act §316(b) and §13142.5(b) are similar statutes that remedy similar evils, and thus should be interpreted similarly. California courts have stated that where a state and federal statutory scheme have the same "objectives and relevant wording", as they do here, California courts look to federal precedent for guidance. The OTC Policy is based on §316(b), which has similar requirements as §13142.5(b), which applies to seawater withdrawals for "cooling water" and desalination facilities' "source water". For the OTC Policy the State Water Board developed a two-track approach, with Track 1 setting the best technology available standard, while Track 2 provided an alternative – but substantially the same – compliance track that could be pursued when an existing facility demonstrates to the State Water Board's satisfaction that Track 1 is "not feasible." The Desalination Amendment proposes a similar structure for the best available intake technology section. Section M.2.d.1.a. states that the "regional water board shall require subsurface intakes unless it determines that subsurface intakes are infeasible…" Like the OTC Policy, this sets-up a two-track approach for coming into compliance with the best available technology portion of Water Code Section 13142.5(b). Given the similar statutory language of CWA §316(b) and Water Code §13142.5(b), the similar two-track approach in both policies, and critical nature of the term "not feasible," the State Board should use the OTC Policy and CWA §316(b) as guidance for the desalination policy's definition of "not feasible." The State Water Board's interpretation of §316(b) to develop and adopt the OTC Policy should be similarly applied to the interpretation of Water Code §13142.5(b) for developing the Desalination Amendment. The borrowed statute rule states that "when Congress borrows a statute, it	As set forth more fully in previous responses to comments on the Desalination Amendment, Water Code section 13142.5(b) is a different statute than Clean Water Act section 316(b), requiring a different interpretation and implementation. See, Appendix H of the Staff Report with SED, responses 6.12, 9.3, 13.78, 21.32, 21.29, 21.34 and 21.35, 21.40, and others. The only California appellate case to interpret Water Code section 13142.5(b) found that federal case law interpreting section 316(b) was inapplicable and further rejected a request for judicial notice of the State Water Board's OTC Policy on the basis that it was "not relevant to our analysis because it concerns a federal statute not at issue here … " 211 Cal.App.4th at 569, FN 7. While certain aspects of the OTC Policy were used to inform the approach to the Desalination Amendments, the commenter's assumption that the approach to regulation of cooling water intake structures should control conclusions for desalination facility intakes is not otherwise supported. The Desalination Amendment does not impose a two-track structure as set forth in the OTC Policy, instead requiring "the best combination of feasible alternatives to minimize intake and mortality of all forms of marine life" after "analyz[ing] separately as independent considerations a range of feasible alternatives for the best available site, the best available design, the best available technology, and the best available mitigation measures to minimize intake and mortality of all forms of marine life." Thus, analysis of feasibility in the proposed Desalination Amendment is a broader inquiry justifying a separate approach. Similar comments comparing desalination facility requirements with once-thru cooling (OTC) facilities were described in Appendix H of the Staff Report with SED including numbers 13.35, 20.1, 21.35 21.36, 21.39. Co-location of OTC facilities and desalination facilities is addressed in Appendix H response to comment 21.129. While CEQA does not control interpretation of Water Code section 13142.5(b), it

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	adopts by implication interpretations placed on that statute, absent express statement to the contrary." It is obvious from the construction of both §316(b) and Water Code §13142.5(b) that the California Water Code section was adopted from the federal Clean Water Act. *In pari material*: "similar statutes should be interpreted similarly, unless legislative history or purpose suggests material differences." The California Legislature borrowed the Clean Water Act's §316(b)'s intent and similar terms when enacting Water Code §13142.5(b). Therefore, the State Water Board should apply the same narrow interpretation of "feasible" under the Desalination Amendment as it adopted in the OTC Policy. "Specific provisions targeting a particular issue apply instead of provisions more generally covering the issue." Clean Water Act §316(b) and Water Code §13142.5(b) target the same exact issue: the minimization of marine life mortality from the intake of seawater. They are two provisions addressing a particular issue – and thus should be applied similarly. California case law on an agency's statutory interpretation also suggests that the State Water Board should use the OTC Policy as guidance when determining feasibility for the Desalination Amendment. When determining whether the State Water Board properly interpreted §13142.5(b) a court will "`take into account matters such as context, the object in view, the evils to be remedied, the history of the times and of legislation upon the same subject, public policy, and contemporaneous construction.'" The State Water Board developed the OTC Policy with the intent to eliminate the unnecessary mortality of marine life from seawater intake – the same "evils to be remedied" as the Desalination Amendment. Moreover, the §316(b) applies to desalination facilities in certain situations. The Clean Water Act §316(b) applies to desalination facilities when they are co-located with an OTC facility and at least 25 percent of the combined intake is for cooling. As the State Water Board admits on page 28 of the SED: *CWA section 316(b) indirectly applies to desalination facilities co-located with power plants and other industrial cooling water intakes insofar as a cooling water intake structure, used to withdraw water for*	appropriately informs some conclusions about how to interpret the Water Code provision. See, *Surfrider*, 211 Cal.App.4th at 577-78. Note also that the Coastal Act, of which Water Code section 13142.5(b) was originally a part, defines "feasible" in the same manner as CEQA. See, Pub. Resources Code section 30108. Moreover, California case law has previously upheld use of the CEQA definition as appropriate in interpreting Water Code section 13142.5(b). 211 Cal.App.4th at 583, fn 24.

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	use by both facilities, must meet the requirements of the federal statute and applicable regulations. Thus, a desalination facility that collects source water through an existing, operational cooling water intake associated with a power plant, or certain other types of industrial facilities, may be required to comply with technology-based standards for minimizing impingement and entrainment impacts. While agreeing with the intent of the State Water Board's statement on page 28, §316(b) does not just apply "indirectly" to desalination facilities – but directly under certain circumstances. CWA section 316(b) requires that the location, design, construction, and capacity of cooling intake structures reflect the best technology available for minimizing adverse environmental impact. Unlike §13142.5(b) which is explicit what type of facilities are covered (ie cooling and industrial facilities), §316(b) limits its coverage to any facilities that use "cooling intake structures." Meaning, a desalination facility would be covered by §316(b) if the facility is co-located with an OTC facility and is using their cooling intake structure. The State Water Board acknowledges the close connection between §316(b) and §13142.5(b), and even states that desalination facilities may be regulated by the Clean Water Act by being "required to comply with technology-based standards for minimizing impingement and entrainment impacts." Furthermore, the State Water Board explains that "[m]uch of the information relied upon during the development of the OTC Policy was used to guide the development of the proposed Desalination Amendment described in this document."15 The similarities, and the "evils to be remedied", between §316(b) and §13142.5(b) cannot be denied, and thus the State Water Board should interpret both statutes the same. Yet rather than look to the Clean Water Act, and its own interpretation of "feasible" under the OTC Policy, the State Water Board instead uses the more general CEQA definition. The State Water Board attempts to distinguish §316(b) from §13142.5(b) by replying that determining "feasibility of subsurface intakes is a site-specific inquiry requiring consideration of a number of factors." We are unable to see how that is	

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	any different than the narrow definition of “not feasible” under the OTC Policy. The definition there included a site-specific inquiry requiring consideration of a number of factors: *Cannot be accomplished because of space constraints or the inability to obtain necessary permits due to public safety considerations, unacceptable environmental impacts, local ordinances, regulations, etc. Cost is not a factor to be considered when determining feasibility under Track 1.* The State Water Board goes on to explain that “a broader definition of feasible is appropriate, with additional criteria to inform the analysis for potential use of subsurface intakes.” This additional criteria greatly expands the scope of what is technically feasible, and considers cost, which as discussed in our 2014 comments, was not intended by the California Legislature. Finally, the State Water Board goes on to explain that a broader definition of feasible is necessary because “[a]ll communities that are suffering from limited water supplies should be able to consider desalination as a potential alternative means of meeting water supply demands.” Section 13142.5(b) does not allow the State Water Board to excuse the best available technology for minimizing marine life because communities are suffering from limited water needs. That is not an appropriate reason to interpret “feasible” to be broad and include cost. The California Environmental Quality Act (CEQA) and the Porter-Cologne Act have vastly different purposes. CEQA is primarily designed to identify and disclose to decision-makers and the public the significant environmental impacts of a proposed project prior to its consideration and approval. An EIR is "'the heart of CEQA'" and the "environmental ‘alarm bell’ whose purpose it is to alert the public and its responsible officials to environmental changes before they have reached ecological points of no return." It is intended, further, "'to demonstrate to an apprehensive citizenry that the agency has, in fact, analyzed and considered the ecological implications of its action.'"18 "Because the EIR must be certified or rejected by public officials, it is a document of accountability."	

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	CEQA is an information-forcing law that keeps the public informed and agencies accountable. Porter- Cologne's purpose is to regulate the "water resources of the state" and ensure "the quality of all the waters of the state shall be protected for use and enjoyment by the people of the state." Porter-Cologne expects sources of pollution, like desalination facilities, to "be regulated to attain the highest water quality which is reasonable." As such, the State Water Board should revise the definition of feasible to be narrowly tailored to those instances where subsurface intakes are not technically feasible, which should not include a cost consideration.	
12.5	*The State Water Board would not apply the CEQA definition of "feasible" to new OTC facilities.* The OTC Policy's narrow definition of "feasible" should be used as guidance for the Desalination Amendment because §13142.5(b) does not distinguish between withdrawals for cooling water and any other industrial withdrawal of seawater. In the Response to Comments, the State Water Board attempts to distinguish the OTC Policy from the Desalination Amendment because the OTC Policy was only regulating existing OTC facilities, while the Desalination Amendment applies to new and expanded facilities. We appreciate the difference between existing facilities under §316(b) and new or expanded facilities under Water Code §13142.5(b). But that begs the question, would the State Water Board apply the CEQA definition of "feasible" for a newly proposed coastal power plant looking to use OTC? By interpreting the term "feasible" under §13142.5(b) to be that as defined under CEQA, it seems that the State Water Board is suggesting that a newly proposed OTC facility would only be required to install cooling towers if they were "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors." This would result in an absurd interpretation of the law. Why would existing facilities be required to retrofit for cooling towers in almost all instances, while new facilities, yet to be constructed, would be allowed a broad definition to avoid using cooling towers as the best available technology?	Because the proposed Desalination Amendment does not include requirements for new power facilities, the comment is outside the scope of the proposed action. Regardless, OTC facilities are being phased out and replaced by facilities that utilize closed cycle cooling as described here (http://www.waterboards.ca.gov/water_issues/programs/ocean/cwa316/docs/otc_2014.pdf). The requirements associated with OTC are based on the Clean Water Act §316(b) as described in the above responses. A newly proposed coastal power plant would be required to comply with applicable laws and regulations governing construction of a new power plant, including federal regulations governing new facilities. See also, Response 12.4 above.

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	The State Water Board cannot apply any other interpretation for "feasible" in the context of cooling water because §13142.5(b) makes no distinction in the statute between withdrawals for cooling water and any other industrial withdrawal of seawater. We request the State Water Board explain whether the CEQA definition of "feasible" would apply to a new OTC facility. If the State Water Board would apply a different definition of feasible for new cooling water intakes, please explain where in the record such a distinction between new cooling water withdrawals and new industrial withdrawals is justified. As the State Water Board has concluded several times, Water Code Section 13142.5(b) is more restrictive than Section 316(b) of the Clean Water Act. In the OTC Policy's CEQA document, the State Water Board admitted that: *Cal. Wat. Code §13142.5(b) contains specific requirements for "new or expanded coastal power plants" that mandate the "best available site, design, technology, and mitigation measures feasible shall be used to minimize the intake and mortality of all forms of marine life," but does not define the characteristics of an "expanded" facility.* ***The Cal. Wat. Code's explicit requirement to minimize intake and mortality can be read as more restrictive than §316(b)'s requirement to minimize adverse environmental impact****, but it remains unclear whether this requirement would be applicable to a facility meeting the Phase I definition of "existing" or if the term can be considered substantially similar to "expanded."* The State Water Board has already made the conclusion we argue throughout these comments – that 13124.5(b) is more restrictive than Section 316(b) because the Water Code requires several factors to be the "best available" to minimize "all forms of marine life", while Section 316(b) only requires the best technology available to minimize adverse environmental impacts. Therefore, there is no justification for why the definition of "feasible" in §13142.5(b) should be less restrictive than the definition of "feasible" under §316(b).	
12.6	*Project proponents should not be given two opportunities to argue*	Comments related to the definition of feasibility are addressed in 12.1

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	subsurface intakes are not feasible. The revised Desalination Amendment now offers two separate feasibility determinations: one general definition of feasible that applies to the entire Amendment, and a second feasibility determination under the best available technology section. In our previous comments, we requested that the feasibility criteria listed in Chapter III.M.2.(1) be replaced with a narrow definition of "feasible." Instead, the State Water Board has provided a broad CEQA definition of feasible, while retaining the second feasibility analysis under the best available technology section. This provides project proponents with two opportunities to argue that a subsurface intake is not feasible. Chapter III.M.2.(1).a. states that subsurface intakes are required unless the regional water board "determines that subsurface intakes are infeasible based upon an analysis of the criteria listed below…" Subsection (i) then goes on to list numerous factors a project proponent can use to exempt themselves from their legal responsibilities to install the best available technology, including: (1) Geotechnical data, hydrogeology, benthic topography, oceanographic conditions; (2) Presence of sensitive habitats; (3) Presence of sensitive species; (4) Energy use; (5) Impact on freshwater aquifers; (6) Local water supply, and existing water users; (7) Desalinated water conveyance, existing infrastructure, (8) Design constraints (engineering, constructability); and (9) Project life cycle cost. Only factors (1) and (8) should be considered when determining whether subsurface intakes are infeasible. Each and every other factor listed above has no relevance pertaining to whether subsurface intakes are feasible. And factor 1 is not a consideration of whether any sub-surface intake is feasible. The data in Factor 1 is useful only in determining whether an infiltration gallery is necessary and feasible or whether the geology is suitable for subsurface wells of different types.	through 12.5 above. Water Code section 13142.5(b) requires that best available site, design and technology and mitigation measures feasible be used to minimize the intake and mortality of marine life. The proposed Desalination Amendment requires each of these four elements to be evaluated independently and then in combination. The Amendment does not offer two separate feasibility determinations. Rather, it includes a general definition of what is meant by the term, and for the question of whether a subsurface intake is feasible technology, lists specific factors that are to be considered in applying that definition. The only change to the factors listed in Chapter III.M.2.(1)a was a substitution of the word "factors" for the previously used term "criteria." The criteria, including geotechnical data, hydrogeology, benthic topography, oceanographic conditions; presence of sensitive habitats; presence of sensitive species; energy use; impact on freshwater aquifers; local water supply, and existing water users; desalinated water conveyance, existing infrastructure, design constraints (engineering, constructability); and project life cycle cost, are appropriately included in considering feasibility of subsurface intakes. See response to comment 21.51 in Appendix H of the Staff Report with SED. The intent of including these considerations is to address the issue of whether subsurface intakes can be successfully done without causing other harm or an unreasonable cost. The list of factors provide needed information for a regional water board determination on whether subsurface intakes are capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors, at any given project proposed. The commenter's assumption that many of these factors are merely excuses not to use subsurface intakes makes the further assumption that a project proponent has no geographical or other limitations on where a project may be located or how it may be constructed. Subsurface is identified as the preferred technology, but not the only technology, for minimizing intake and mortality of all forms of marine life. The list provided examines specific issues affecting the construction

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	Factors (2) “Presence of sensitive habitats” and (3) “Presence of sensitive species” should not be a consideration because the “best available site” for minimizing marine life would not be in an area with sensitive habitat and/or species. Moreover, the operation of subsurface intakes would not result in any marine life mortality of sensitive species, and any possible construction impacts would be a one-time temporary impact. It is unacceptable that the “presence of sensitive species” is only considered in the feasibility for subsurface intakes, but is not a limiting factor in where a facility can place an open-ocean intake – for example the Hedionda Lagoon where source water will be withdrawn for the Poseidon-Carlsbad facility. Coastal wetlands have been filled and degraded in California to the point where 90 percent of that habitat type is lost. Surely the species inhabiting the 10 percent of coastal lagoons left are worthy of special protections. But the Water Code does not distinguish protections of “sensitive species.” There is no need for heightened protection of any species. All forms of marine life would be adequately protected by the Water Code, but for the inadequate protections in the revised Desalination Amendment. Feasibility criteria (4) “Energy use” has no bearing on whether subsurface intakes are feasible. There is nothing in the record to support the State Water Board’s conclusion that energy use has any bearing on whether subsurface intakes are feasible. Criteria (5) “Impact on freshwater aquifers” is not applicable because the best available site and design criteria should ensure no impact to aquifers exist. Criteria (6) “Local water supply, and existing water users” and Criteria (7) “Desalinated water conveyance, existing infrastructure” again has no bearing on whether subsurface intakes are feasible. These are just carefully disguised ways of using cost – again – to show infeasibility. And finally, Criteria (8) “project life cycle cost” should not be a consideration as discussed above. However, if the State Water Board intends #8 to be its interpretation of how "economics" will be analyzed under the CEQA definition – then the Board should make that clear. Furthermore, the State Water Board should be explicit that “project life cycle costs” should include the operational costs of the facility, and use recent studies evaluating the operational cost of a facility using subsurface intakes. Mitigation required for surface water intakes should also be considered when determining “life cycle cost”.	and operation of subsurface and surface intakes that should be analyzed and considered when determining whether subsurface intakes are not feasible for a specific proposed project. Some of the factors are inter-related (e.g. hydrogeology and impacts on freshwater aquifer or geotechnical data and design constraints) but they have been included to provide more specificity and guidance to the feasibility determination. Each of the factors should be considered in relation to social, economic, environmental, and technological impacts. For example, geotechnical data, including the sediment characteristic and properties that are used, informs the type of footings, foundations, trenching, anchoring, drilling, drilling equipment, seismic considerations, piping, etc. that will be used to construct and operate the intakes. Geotechnical data will dictate much of the design and technological aspects of constructing and operating the intakes as well as the associated cost implications. Hydrogeology and benthic topography will influence how much water an intake can withdraw and whether offshore conditions are conducive to constructing and operating an intake. For example, rocky substrate may prevent drilling and installation of subsurface wells due to technological challenges, but additionally, the installation of wells may cause significant environmental harm to a sensitive habitat. Oceanographic conditions such as wave action have the potential to help maintain the permeability of a subsurface intake or could present an engineering challenge for stabilizing and anchoring conveyance structures on the seafloor against lateral loads. Contrary to the commenter’s assertion that the presence of sensitive species is only considered in the feasibility for subsurface intakes, this section of the proposed Desalination Amendment requires a comparative analysis for surface and subsurface intakes. In addition to other siting and design considerations elsewhere in the amendment, this analysis will inform how construction and operation will impacts essential fish habitat, kelp beds, rocky substrate, surfgrass beds, eelgrass beds, oyster beds, spawning grounds for state or federally manages species, market squid nurseries, or other habitats in need of special protection, as well as sensitive species identified by a regional water board for surface and subsurface

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	Regardless of explicit language to explain "project life cycle costs", the State Water Board should not provide project proponents with two – if not more – opportunities to argue that cost considerations make subsurface intakes infeasible. We request the State Water Board explain how criteria factors 2-7, and 9, are determinative on whether subsurface intakes are feasible. There is no factual basis in the record to explain how these 7 factors are determinative of whether subsurface intakes are feasible. Instead, they constitute another opportunity for project proponents to escape using subsurface intakes as the best available technology, and instead are allowed to use the futile technology of open-ocean screened intakes. It is worth noting here that the difference between Track 1 and Track 2 in the Revised Amendment is in stark contrast to the 2-track approach in the OTC Policy. In the OTC Policy, Track 2 ensured an approximate equality in performance to the Track 1 option. Here, Track 1 virtually eliminates intake and mortality of all forms of marine life, and Track 2 accepts nearly complete intake and mortality of all forms of marine life, and mitigation through restoring wetlands habitat and "biomass" with little to no relationship to the marine life lost to the intake. This policy change from what was adopted in the OTC Policy is indefensible and unacceptable. As we state above, §13142.5(b) should be interpreted to be more restrictive – not less – than §316(b). The law requires the State Water Board to ensure use of the best available technology feasible for minimizing the intake and mortality of all forms of marine life. The law does not condition a determination of the best available technology on whether or not it meets the project proponents' business goals. Instead of providing a list of criteria for project proponents to excuse themselves from complying with the law, the State Water Board should look at the OTC Policy's definition of "not feasible." The State Board determined that "the technology must be "available" in the sense that it is technically and logistically feasible at most facilities subject to the proposed Policy…" From that definition of "available" the	intakes. The analysis will provide information as to whether an intake will result in significant environmental impacts at a site. The comparative analysis of energy use for subsurface and surface intakes would require a holistic comparison of energy consumption at the facility for the two intake designs. The comparative energy analysis should identify energy use associated with pumping or process requirements and water conveyance that may have economic, environmental, or technological implications. For example, a subsurface intake may require slightly more energy to pump the source water, but a surface water intake may require more energy for the pretreatment of water. The impacts on local freshwater aquifers, local water supply, and existing water uses are related to hydrogeology and should be considered because an improperly sited subsurface intake may cause or exacerbate seawater intrusion issues. The infrastructure required to convey the water and the presence of existing infrastructure should also be compared for subsurface and surface intakes since they can have associated environmental and economic impacts. Design constraints for surface and subsurface intakes are inter-related with some of the other factors, but will directly influence whether a subsurface intake is technologically feasible. Finally, a comparative analysis of the project life cycle cost will provide information as to whether a subsurface intake could be deemed not feasible for economic reasons. The requirement to consider life-cycle costs was included to ensure that when considering economics as part of a feasibility determination, that the regional water board considers not only short term capital costs, but long term capital, operation, maintenance, and decommissioning costs. The intent is to ensure that economics are not misused to declare infeasible otherwise feasible projects simply because capital costs appeared excessive without considering potential cost savings from more efficient operation and maintenance. Specifically, Missimer et al. (2013) mentions that while cost comparisons for surface and subsurface intakes typically show subsurface intakes to require a larger capital investment, the project life cycle cost of a facility using subsurface intakes are typically lower than a facility

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	State Board created a definition of "not feasible": *"Cannot be accomplished because of space constraints or the inability to obtain necessary permits due to public safety considerations, unacceptable environmental impacts, local ordinances, regulations, etc. Cost is not a factor to be considered when determining feasibility under Track 1."* In order to provide a legally defensible definition of "feasible", we suggest the following revisions to Chapter III.M.2.d.(1).a.i.: *The regional water board shall use the following definition of "not feasible" ~~consider the following criteria~~ in determining feasibility of subsurface* intakes: Cannot be constructed or operated given geotechnical data, hydrogeology, benthic topography, or oceanographic conditions. Cannot be accomplished because of the inability to obtain necessary permits due to unacceptable environmental impacts, local ordinances, State or local regulations, etc. Cost is not a factor to be considered when determining feasibility. Flow Augmentation for brine dilution is not a factor to be considered when determining feasibility. , ~~presence of sensitive habitats,* presence of sensitive species, energy use; impact on freshwater aquifers, local water supply, and existing water users; desalinated* water conveyance, existing infrastructure, co-location with sources of dilution water, design constraints (engineering, constructability), and project life cycle cost. Project life cycle cost shall be determined by evaluating the total cost of planning, design, land acquisition, construction, operations, maintenance, mitigation, equipment replacement and disposal over the lifetime of the facility, in addition to the cost of decommissioning the facility. In addition, the regional water board may evaluate other site- and facility-specific factors.~~*	using surface water intakes within 15 to 30 years. Thus inclusion of project life cycle cost ensures that economic considerations are considered narrowly. While the commenter argues that some of these issues are immaterial because they would be precluded by consideration of what constitutes best available site or design, the underlying assumption appears to be that a site should not be under consideration if subsurface intakes cannot be constructed, or that cost should form no part of a feasibility analysis. While subsurface is identified as preferred technology, the proposed Desalination Amendment is not intended to preclude desalination in areas where subsurface intakes are not capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors. While the limitations cited in the proposed language (inability to construct or operate, inability to obtain permits due to unacceptable environmental impacts or state regulations and local ordinances) would be relevant to determining feasibility, cost is an appropriate factor and should remain an allowable consideration. Given the above discussion, the range of variables justifies allowing a broader inquiry than that proposed by the commenter's alternative language. To the extent that the commenter objects consideration of cost as part of a feasibility analysis, see response to comment 6.12 in Appendix H of the Staff Report with SED.
12.7	*If CEQA's "feasible" definition remains in the Desalination Amendment, then the State Water Board should require a narrow reading of when subsurface intakes are not feasible.* If the State Water Board insists on using the CEQA definition for "feasible" then the Board should require a narrow reading of the	Comment noted. See responses to comments 12.1 through 12.5 The Desalination Amendment does not direct that a regional water board merely accept an infeasibility argument from a project proponent in making a Water Code section 13142.5(b) determination, nor is such an outcome intended. A regional water board, after consultation with State Water Board staff, must exercise independent

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	definition to ensure project proponents are required to truly use the best available technology feasible. To narrowly interpret the CEQA definition, the State Water Board should look to existing case law explaining how to limit the feasibility analysis demonstrating an economic burden. The burden of demonstrating economic (or other) infeasibility falls squarely on the project proponent, and the Water Boards should not merely accept the infeasibility claims of the project developers. Rather, the Water Boards must actually study and analyze any claim of infeasibility. Moreover, to pass legal muster, the feasibility analysis may not simply conclude that more environmentally protective options are infeasible because they will place the proponent at a competitive disadvantage or make project financing more expensive or difficult. Rather, to constitute substantial evidence in the record, the feasibility analysis must contain and assess "meaningful comparative data" and concrete information about lender positions. Significantly, "[t]he fact that an alternative may be more expensive or less profitable is not sufficient to show that the alternative is financially infeasible. What is required is evidence that the additional costs or lost profitability are sufficiently severe as to render it impractical to proceed with the project." That is, an environmentally superior technology or mitigation must be "truly infeasible," not just undesirable from the proponent's perspective. Recent case law makes it clear that the courts will demand a robust, credible, and well documented analysis to support any claim of economic infeasibility, even under the comparatively less stringent and more procedural California Environmental Quality Act. More specifically, the accompanying EIR in Goleta Valley concluded that archeological resources would be adversely affected by the proposed development and, therefore, the county imposed conditions of approval to mitigate some of these adverse impacts, including a requirement that the project proponent develop a cultural resources plan and avoid culturally significant burial sites. The project proponent argued that the project was, for this reason, "designed . . . to minimize impact on the sites, particularly the important and sensitive ones, to the maximum extent consistent with the development." The challengers, on	judgment in determining the best available site, design, technology and mitigation measures feasible to minimize the intake and mortality of all of forms of marine life, in accordance with the statutory requirement. Please see response to comment 15.92 in Appendix H noting that: "The fact that an alternative may be more expensive or less profitable is not sufficient to show that the alternative is financially infeasible. What is required is evidence that the additional costs or lost profitability are sufficiently severe as to render it impractical to proceed with the project." SPRAWLDEF v. San Francisco Bay Conservation and Development Commission (2014) 226 Cal.App.4th 905, 918 [citations]

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	the other hand, argued that the LCP required "avoidance of such sites, if possible, not just mitigation, and that only if such avoidance is infeasible is 'mitigation' permitted." The Goleta Valley court concluded that the board of supervisors erred, explaining that "[i]mposition of conditions to partially ameliorate adverse environmental impacts of the proposed project does not excuse failure to evaluate the alternative scaled-down alternative." The LCP, with language virtually identical to section 30260 of the Coastal Act, "requires that project design avoid such impacts, if possible." "In as much as there was no substantial evidence to support respondent's finding that the alternate design was economically infeasible, further consideration at the administrative level is required. . . . The economic feasibility of such a design should have been studied. Without such a study the preliminary plans for the development run afoul of the Local Coastal Program." In particular, CEQA's definition of "feasible" is identical to the definition in the Coastal Act: "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors." Accordingly, CEQA cases reviewing a proponent's or lead agency's claims of economic infeasibility provide useful guidance here. In interpreting the feasibility concept under CEQA, the courts have repeatedly held that the decision record must show that an alternative or mitigation measures is "truly infeasible," not merely undesirable from the proponent's perspective. The appropriate question for the feasibility analysis is whether the project as mitigated can be "economically successful" – that is, whether the mitigated project "cannot operate at a profit so as to render it impractical."	
12.8	The State Water Board's revised Desalination Amendment provides a broad definition of "feasible" leading to a weak standard for requiring subsurface intakes. Essentially, the State Water Board has created a "straw man" for requiring subsurface intakes, a requirement that can and will be easily knocked down by project proponents. This "straw man" requirement will allow proponents to escape the legally required	Disagree. Each applicant must perform a thorough evaluation, and the regional water board must exercise its independent judgment in analyzing the factors required for a section 13142.5(b) determination before a project can move forward. The proposed amendment continues to promote the use of subsurface intakes as preferred technology, as it did in previous iterations. Surface water intakes can

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	use of subsurface intakes as the best available technology, and instead will be allowed to use open-ocean screened intakes as the best available technology feasible. Open-ocean screened intakes have minimal – if any – reductions in marine life entrainment. The State Water Board is knowingly allowing projects to use a 1 mm screened open-ocean intake, which studies conclude have zero reduction of entrainment for certain species. Since the law requires the State Water Board to require the best available technology to reduce all forms of marine life intake and mortality, the option of using open-ocean screens as the best available technology feasible is illegal.	only be permitted when subsurface intakes are determined to be infeasible.
12.9	*The revised Desalination Amendment's weak feasibility standard will allow project proponents to escape using subsurface intakes as the best available technology.* Water Code §13142.5(b) requires "each new or expanded coastal power plant or other industrial installation using seawater for cooling, heating, or industrial processing, the best available site, design, technology, and mitigation measures feasible shall be used to minimize the intake and mortality of all forms of marine life." As discussed in detail above, the State Water Board has interpreted "feasible" to mean "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors." This broad definition allows project proponents great discretion to claim that subsurface surface intakes are not feasible. The definition is so broad that the State Water Board should foreseeably expect many, if not all, project proponents to successfully argue subsurface intakes do not fit into their economic considerations, and thus be allowed to use screened open-ocean intakes. Moreover, the list of feasible criteria regional water boards shall consider to excuse project proponents is broad and extensive. As noted above, seven of the nine feasibility criteria have no bearing on whether subsurface intakes are feasible. Instead, the feasibility criteria is simply a list of excuses project proponents can use to justify why surface intakes are more appropriate.	The decision to rely on the CEQA definition of feasibility was previously addressed in several responses to comments in Appendix H of the Staff Report with SED including numbers 6.12, 15.33, 21.15, 21.40, 21.41 and 21.50. In addition, the list of feasibility criteria does not direct that regional boards consider these factors in order to excuse project proponents from using subsurface intakes. Instead, regional water boards are directed to consider these factors in determining whether feasibility has been adequately evaluated. A project proponent's arguments are not determinative, nor should it be assumed that regional water boards will regard a subsurface feasibility determination pursuant to Water Code section 13142.5(b) as a ministerial action or foregone conclusion. Regional Water Boards regularly use their independent judgment in exercising their authority pursuant to Porter-Cologne.

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	Given these two broad feasibility analyses, the requirement to use subsurface intakes should be viewed as a "straw man" requirement, one that will foreseeably be knocked down by most, if not all, project proponents. It is inevitable that the majority, if not all, proposed projects will be allowed to use screened open-ocean intakes as a result of the Desalination Amendment.	
12.10	*The law requires the best available technology to minimize marine life mortality of "all forms of marine life".* Water Code §13142.5(b) is clear: the best available technology feasible is required to minimize *all forms of marine life*. However, the initial Amendment excluded the "all forms of marine life" reference. In our August 18th, 2014 Comment Letter, we stated that "the intent of the Amendment should not be to minimize the intake of "some" species at "some" life stage - instead, it should be to minimize the intake and mortality of "all" forms of marine life." In response to our comment, the State Water Board stated that they "[a]gree, per comment 21.8, a definition of 'all forms of marine life' was added to the proposed Desalination Amendment and 'all forms' was added in front of 'marine life' in the amendment language and Staff Report with SED as appropriate." We appreciate and thank the State Water Board for clearly and accurately stating the law. The State Water Board revised the SED to state: *Section 13142.5(b) requires that the Ocean Plan consider all forms of marine life, regardless of size. Subsurface intakes are more protective of marine life than surface water intakes. However, when subsurface intakes are proven to be infeasible, small slot-sized screens will protect larger juvenile and adult organisms (particularly fishes) from entrainment.* We agree with the State Water Board that §13142.5(b) requires minimization of marine life mortality for all forms of marine life, "regardless of size" or species. We also agree that "screens will protect larger juvenile and adult organisms from entrainment." However, this	This comment is addressed in Appendix H, response to comments 9.34, 15.4, 21.7, 21.21, 21.25, 21.55, 21.57, 21.58, 21.60, 21.61,and 21.65. As described in chapter III.M.2.e, aquatic mortality associated with construction and operational impacts requires full mitigation.

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	does not satisfy the law. The State Water Board's own response acknowledges that mortality from all forms of marine life, regardless of size, must be minimized, but goes on to say that open-ocean screens will only protect larger juvenile and adult organisms. Further, the Amendment fails to account for the potential adverse impact of greater *impingement* of organisms when using smaller mesh sizes to reduce entrainment. By not requiring a best available technology that reduces the entrainment of smaller and younger organisms, the State Water Board is failing to uphold its legal responsibility to minimize marine life mortality for all forms of marine life.	
12.11	*The requirement to use a 1 mm screen size will result in 100 percent entrainment of some marine organisms.* The State Water Board has determined that a 1 mm slot size is the best available technology for minimizing marine life intake and mortality when subsurface intakes are determined to not be feasible. However, studies cited in the State Water Board's SED show that a 1 mm screen size is not effective at minimizing marine life mortality, and in some instances results in a zero percent reduction of entrainment for some marine organisms. Studies of a 1 mm slot size screen have shown zero reductions of entrainment. In California, "data for two of the *most prevalent larva in California* waters showed that all northern anchovy larva less than 8 mm in length (74.5% of the population) and all CIQ gobies less than 6 mm (92.2% of the population) would be entrained using a 1 mm wedgewire screen." And in Maryland, an entrainment study on 1, 2, and 3 mm slot-size wedgewire screens showed that anchovy and goby larvae less than 5 mm long were entrained "*regardless of the screen slot size*." Other studies nationwide, using slower intake velocities than those required by the Desalination Amendment, have concluded that a 1 mm screened intake does not reduce entrainment of all forms of marine life. A laboratory study reported "screens with 1 mm slot size reduced entrainment of larvae with large head capsules, but *did not reduce entrainment* of eggs smaller than 2.3 mm in diameter." A study in Narragansett Bay, Rhode Island and Lake Erie, Ohio measured	As presented in Appendix Table D, and discussed Section 8.3.1.2.3 of the staff report with SED, selection of screen size represents a balance of many factors. The use of 1 mm or 0.5 mm or smaller screen size will never be 100% effective. That is why subsurface intakes are preferred. Given that subsurface intakes may not be feasible everywhere, the Water Board has selected 1 mm screen size as the best balance between reliability and protecting aquatic life from entrainment. The studies presented in section 8.3.1.2.3 suggest that the larger the screen size, the higher the entrainment. However, entrainment would also be affected by other factors as well including the intake velocity, organism size, avoidance ability, and currents. The only controllable factor is intake velocity and that is as important as screen size. See responses to comments 15.4, 20.12, 21.55, 21.58, 21.60 and 21.61 included in Appendix H.

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	entrainment of fish eggs and larvae through 1.0 mm wedgewire screens, both operating at lower through-slot velocities than required by the Desalination Amendment (0.15 and 0.30 m/s). The study concluded that the effects of a "1.0 mm screen on egg entrainment *were not distinguishable* from egg entrainment at an *unscreened intake*." Even for larger marine life organisms, studies find that a 1 mm slot screen reduces marine life mortality only marginally. According to a study that modeled entrainment based on head capsule size, "a 1 mm wedgewire-screened intake resulted in a net reduction in entrainment of approximately *10 percent*." In addition, a modeling study by Tenera Environmental (2013b) investigated reduction in entrainment at the Diablo Canyon Power Plant intake when using a 1 mm wedgewire screen. The study showed entrainment reductions ranging from 4.6-15.8 percent relative to open water intakes. Even the State Water Board's own Expert Review Panel, and the Desalination Amendment itself, admits that screens account for marginal, if any, minimization of marine life mortality. The Expert Review Panel was asked how to adjust the mitigation acreage for entrainment reduction devices like screens. The Expert Review Panel reported that while screens can be an effective tool for reducing entrainment of larger larval organisms, *when all organisms in seawater are considered*, screens reduce entrainment mortality *less than one percent*. The Expert Panel therefore concluded that "intake screens reduce entrainment of all organisms present in seawater *by no more than one percent*."49 The State Water Board relied on the Expert Panel's finding to revise the Desalination Amendment to account for the one percent minimization in the mitigation fee calculation. In Chapter M.2.e.(1).a. page 12 of the revised draft Amendment, the State Water Board states that the "the mitigation credit applied to the APF to account for entrainment reduction provided by a screen *should be no more than one percent*." The State Water Board's own studies within its SED find that 1 mm screened intakes will result in zero reductions of entrainment for "some of the most prevalent larva in California waters." Other studies conclude that even for larger species, a 1 mm screened intake will only	

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	maximize entrainment reductions by 15 percent. And when you consider all species as a whole, the State Water Board's Expert Review Panel concluded that the net benefit of a 1 mm screened intake is less than one percent. And because it is foreseeable that many, if not all, project proponents will be allowed to use a 1 mm screened open-ocean intake, the State Water Board has illegally ignored its duty to minimize the intake and mortality of all forms of marine life.	
12.12	The State Water Board's use of "mitigation" to purportedly "replace" all of the marine life lost due to a screened intake constitutes in-lieu mitigation. As discussed in Section I above, it is foreseeable that project proponents will be allowed to use a 1 mm screened intake to meet the best available technology requirement under §13142.5(b). As discussed in Section II, allowing a 1 mm screen will result in a net minimization of one percent – and a zero percent reduction for some species according to the SED's studies. Allowing mitigation to restore 99 percent of all marine life mortality after-the-fact is counter to the California Water Code – especially when the restorative measures allowed are not the same kind of habitat productivity as what was lost to intake and mortality. As the State Water Board is well aware, the Clean Water Act prohibits the use of "restorative" or "corrective" measures (that is, "after the fact" mitigation measures) to meet the §316(b) best available technology requirement. The Second Circuit has definitively affirmed that the technology requirement of §316(b) cannot be satisfied with "after-the-fact" mitigation. As the court explained in *Riverkeeper I,* which dealt with "new" cooling water intakes, as does Water Code §13142.5(b), "restoration measures correct for the adverse environmental impacts of impingement and entrainment; they do not *minimize those impacts in the first place*." It cannot be disputed that §316(b) and §13142.5(b) both require minimization of impacts. Regardless of sentence structure, Riverkeeper I demands that minimization be done in the first place – not done after-the-fact to correct for adverse impacts. A plain reading of §13142.5(b), like that of CWA §316(b), precludes interpreting the term "mitigation" as synonymous with, or inclusive of,	This argument is misleading in that the majority of the biomass is protected from entrainment. The 1% reduction only occurs in those organisms that are smaller than 10 mm. Some species will never reach the size to prevent entrainment at that slot size, however low velocity intake coupled with ocean currents will ensure that many organisms are not entrained. This residual entrainment will be mitigated. As described in Appendix H responses to comments 21.28, 21.29, 21.32, 21.34 to list a few, Clean Water Act §316(b) requirements are not applicable to these proposed amendments. The applicability of *Riverkeeper* and after the fact mitigation is also discussed extensively in Appendix H, responses to comments 21.32, 21.35, 21.54, 21.74, 21.75, 21.86 and 21.87. While the State Water Board has discretion to consider issues and information used and considered in regulating power plants and in developing the OTC Policy, California case law is clear that Water Code section 13142.5(b) is not controlled by federal case law interpreting Clean Water Act section 316(b). *Surfrider*, 211 Cal.App.4th 557, 578 – 581. Restorative measures have specifically been found consistent with the meaning of "mitigation" as set forth in Water Code section 13142.5(b). 211 Cal.App.4th at 581. The record amply supports the analytical framework developed to consider the best collective set of measures to minimize intake and mortality of all forms of marine life.

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	restorative measures. The language in the Porter-Cologne Act provides that all four elements – site, design, technology and mitigation -- whether read holistically or individually– must "…minimize the intake and mortality of all forms of marine life." As explained by the *Riverkeeper* court, and instructive to interpreting §13142.5(b): "restoration measures substitute after-the-fact compensation for adverse environmental impacts that have already occurred for the minimization of those impacts in the first instance." In like fashion, restorative measures, by definition, do nothing to "mitigate" the intake and mortality of all marine life in the first instance. Furthermore, the State Board cannot ignore that *Riverkeeper I* went beyond a mere statutory interpretation to include the practical limitations, that: *Restoration measures resemble the pre-1972 approach to water pollution, which regulated point sources based on their effect on the surrounding water and allowed sources to discharge pollutants provided the discharge did not cause water quality to dip below an acceptable level. See CPC Int'l, Inc. v. Train, 515 F.2d 1032, 1034-35 (8th Cir.1975). Similarly, restoration measures would allow a facility, at least in theory, to impinge and entrain unlimited numbers of organisms provided that other steps maintained acceptable water quality, here measured by wildlife levels as opposed to pollutant concentration. But "[i]t was ... dissatisfaction with water quality standards as a method of pollution control that led to the proposal that they be replaced or supplemented with `effluent limitations.'" Bethlehem Steel Corp. v. EPA, 538 F.2d 513, 515 (2d Cir.1976). A plaintiff attempting to prove a violation of the Clean Water Act faced "a virtually unbridgeable causal gap," CPC, 515 F.2d. at 1035, for "the burden of proving that a particular polluter had caused the water quality to dip below the standards was all but impossible to satisfy," Bethlehem Steel, 538 F.2d at 515. Allowing compliance through restoration measures would involve exactly the same hurdles. As the EPA itself recognized in the preamble to the Rule,* [B]ecause of the complexity of biological studies, it is very difficult to assess the cause and effect of cooling water intake structures on ecosystems or on important species within an ecosystem.... [U]nlike in the laboratory, where conditions are controlled, a multitude of	

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	confounding factors make biological studies very difficult to perform *and make causation, in particular, difficult to determine.* The flawed attempts in the Draft Amendment to calculate the intake and mortality of marine life, and replace that loss through inadequate "restorative measures", are the same as those rejected by the court in *Riverkeeper I* – despite the different language in the Clean Water Act and the Water Code. The State Board should look to the practical implication of attempts to restore marine life articulated in *Riverkeeper I* to interpret §13142.5(b) in interpreting similar language in §13142.5(b) of the Porter- Cologne Act -- as the State Board implicitly did in crafting its OTC Policy. Although CWA §316(b) does not apply, in most cases, to the intake systems for desalination facilities, §13142.5(b) of the Porter- Cologne Act is not limited to power plants and it applies equally to industrial installations utilizing seawater. It is illogical for the State Water Board to interpret §13142.5(b) to not to allow after-the-fact mitigation for power plants, while the Amendment allows the use of after-the-fact mitigation for other facilities using seawater. Indeed, as it currently stands, existing power plants must come into compliance with the OTC Policy by phasing out their open-ocean intake, while a brand new desalination facility operating under the same statutory provision would be allowed to use mitigation in lieu of satisfying best available site, design and technology requirements. It is hard to imagine which of these rules would apply to "new" cooling water intakes. And contrary to the opinion in *Surfrider*, that it is not the court's "role to interpret legislative [intent in order to harmonize federal and State statute]", that is the role of the State Board and now is the time to exercise that authority. The Desalination Amendment not only undermines the OTC Policy adopted by the State Board, but renders California's marine resource policies incomprehensible. After-the-fact restoration is an illegal substitution for fully enforcing the mandate to "minimize the intake and mortality of all forms of marine life" under the law. The State Water Board should distinguish the *Surfrider* decision as it was discretion allowed the Regional Board for a temporary permit and under much different facts. The State Board can	

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	and must revise the Amendment's definition of "feasible" to be narrowly interpreted as "capable of being accomplished considering geotechnical data, and permit or design constraints." Furthermore, "mitigation" should not be narrowly defined as "after-the-fact restorative measures", but should be more broadly interpreted to include any measure that would minimize the intake and mortality of marine life in the first place54. The State Water Board should avoid in-lieu restorative measures that, in hindsight, was clearly allowed in the *Surfrider* case, and is repeated in the draft Amendment.	
12.13	The State Water Board should prevent the illegal take of endangered and threatened listed species by requiring subsurface intakes in the Desalination Amendment. The Endangered Species Act (ESA) was enacted with the purpose of conserving endangered and threatened species and the ecosystems on which they depend. The ESA is "the most comprehensive legislation for the preservation of endangered species ever enacted by any nation." The Act empowers the Secretary of Commerce to recommend to the Secretary of the Interior that a species be listed as endangered or threatened and that the species' habitat be listed as a critical habitat. The Secretary of the Interior, if he concurs, shall implement the designation. The ESA prohibits any person from "taking any [endangered] species within the United States or the territorial sea of the United States." In addition, the ESA makes it unlawful for any person "to attempt to commit, solicit another to commit, or cause to be committed, any offense defined" in the ESA. The term "'take' means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." "'Take' is defined…in the broadest possible manner to include every conceivable way in which a person can 'take' or attempt to 'take' any fish or wildlife." The Secretary of the Interior has defined "harm" as "an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering." The term "person" includes "any officer, employee, agent, department, or instrumentality…of any State, municipality, or political subdivision of a State..."	The proposed Desalination Amendment is not an agency action that is subject to the relevant provisions of the federal Endangered Species Act. However, to the extent that state agency adoption of a water quality control plan that neither authorizes nor allows any specific regulated activity might be subject to the provisions of the ESA, the Desalination Amendment provides only an analytical framework for later application by regional water boards in making specific determinations about proposed facilities. It does not authorize any seawater intake. The commenter moreover provides no basis to conclude that a surface water intake would be approved at any specific site that may constitute critical habitat or where threatened or endangered species may be present. Further, in assuming that the Desalination Amendment approves use of surface water intakes in the absence of meaningful analysis, the commenter ignores clear and unambiguous provisions requiring consideration of issues such as presence of sensitive habitats and sensitive species, as well as direct and indirect effects on all forms of marine life. Finally, when a regional water board in future considers any specific seawater intake in accordance with the provisions set forth in the proposed Desalination Amendments, the Water Code section 13142.5(b) determination of best available site, design, technology and mitigation measures feasible will be included as part of the project proponent's NPDES permit. The Water Boards routinely include in NPDES permits a provision stating that the discharge authorization does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in future, under either the state or federal ESA. Specific project proponents will be responsible for complying with all applicable laws

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	The State Water Board's Desalination Amendment allows and authorizes desalination facilities to exact a taking of endangered and threatened species; and therefore, violates Section 9's prohibition against take of listed species. The State Water Board is a "person" as defined under the ESA. The authorization of a 1 mm screened intake will result in the entrainment of 99 percent of all endangered species existing in the source water body of an ocean desalination facility's open-ocean intake. The State Water Board acknowledges that critical habitat designated for federally listed species and Essential Fish Habitat designated for fisheries management *encompass significant portions* of California's nearshore marine waters. The take of listed species will be significant, and are avoidable if the Desalination Amendment required subsurface intakes as the best available technology and eliminated the broad path to open ocean intakes with screens. The Desalination Amendment will be the proximate cause of a take of endangered and threatened species because the State Water Board is authorizing third parties to use a 1 mm screened intake, which will knowingly lead to mortality of ESA species.	and requirements at the time any facility is constructed, including a site-specific CEQA analysis, assessing both construction and operational impacts to threatened and endangered species as required by CEQA.
12.14	*The State Water Board acknowledges that desalination operations will have adverse impacts on endangered and threatened federal and state species.* The State Water Board has concluded that desalination operations in California will lead to "significant impacts" on ESA species. There are three basic ways in which ESA-listed species are affected by open-ocean intakes: direct kill at the intake through impingement and entrainment; indirect harm through loss of prey species to the intake; acute and chronic toxicity from exposure to high salinity in the water; and habitat degradation caused by changes in flow regime, thermal discharge, and discharges of pollutants. On page 174 of the SED, the State Water Board acknowledges that even though previously permitted facilities found insignificant impacts to endangered species, "it is unlikely that all future facilities would result in similar impacts to biological resources." The State Water Board goes on to explain that foreseeable future desalination operations will have	See response to comment 12.13 above. In addition, while the commenter claims that the State Water Board has concluded that desalination operations in California will lead to "significant impacts" on ESA species, the basis for this statement is contained in section 12.1.4, an identification of potential impacts to biological resources that might generally occur from construction and operation of a coastal desalination facility, without regard to the requirements set forth in the State Water Board's proposed Desalination Amendment. See, Staff Report with SED, page 145 (describing section 12.1, as distinct from the impacts analysis set forth in Section 12.2. "[T]he discussion in section 12.1 presents a generalized analysis of the possible impacts that could occur from a desalination facility but does not present a detailed analysis of the resulting impacts of, and makes no conclusions in terms of these specific impacts for approval of a particular desalination facility." Staff Report with SED, p. 146.) The potential for impacts to biological resources as described in Section 12.1.4 does not support an argument as to any authorized "take" under the ESA as resulting from the proposed Desalination

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	significant impacts to endangered and threatened species. The State Water Board acknowledges that "critical habitat designated for federally listed species and Essential Fish Habitat designated for fisheries management *encompass significant portions* of California's nearshore marine waters." In addition, entrainment studies conducted for the Huntington Beach and Marin facilities indicated that fish and invertebrates are entrained by surface water intakes. While these studies concluded that the observed entrainment would have a less than significant impact, it cannot be concluded that all future facilities will also result in no impact on the sustainability of local species, or the recovery and propagation of state and federally listed species. The State Water Board admits that previously permitted facilities did not attempt to evaluate potential impacts to the food web. Larval fish and eggs represent a principal component of the food web. The State Water Board acknowledges that it "cannot be assumed that impacts associated with impingement will be less than significant for all future facilities." The Board goes on to conclude that it is "likely that significant impacts to biological resources may occur with implementation of a particular desalination facility." The California Ocean Plan requires the State Water Board to protect the beneficial uses of the ocean waters of the State, including: industrial water supply; "rare and endangered species; marine habitat; fish migration; fish spawning and shellfish harvesting." As discussed below, the only way to protect the beneficial uses of both industrial water supplies and rare and endangered species is to require subsurface intakes, and to not allow the Desalination Amendment to be the proximate cause of an ESA take.	Amendment.
12.15	*The State Water Board has identified specific endangered and threatened species that will be harmed due to desalination operations in California.* The State Water Board has identified numerous ESA species that will be impacted by the Desalination Amendment. The Amendment will be the proximate cause of take of ESA listed abalone in California. Abalone have historically been overfished in California and there has been	See response to comments 12.13 and 12.14 above. Even if the ESA were applicable to adoption of the Desalination Amendment, and even if the Desalination Amendment authorized specific seawater intakes, the commenter has not shown a connection between any potential seawater intake and an identified threatened or endangered species. To the extent that a specific seawater intake were under consideration for permitting and a determination pursuant to Water Code section 13142.5(b), the provisions of the Amendment clearly

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	inadequate protection of their natural habitat. These factors have led to the collapse of the abalone fishery and near extinction of certain species. White abalone (*Haliotis sorenseni*) and black abalone (*Haliotis cracherodii*) are both federally listed as endangered. Abalone are primarily found in crevices along rocky shorelines that provide both shelter from predators and attached algae as a food source. Black abalone are generally found at shallower depths from zero to six meters, and white abalone live at depths between 25 to 50 meters. In 2011, the National Marine Fisheries Service designated coastal areas along the California coast as critical habitat for endangered abalone to protection reproductive habitats. The State Water Board acknowledges that "[o]pen water intakes and brine discharges have the potential to increase mortality of larval marine organisms." This will put species like abalone at the "highest risk of entrainment" because few "gametes, and larval and juvenile organisms" have developed sufficiently to swim and avoid entrainment, "even when the intake is protected with *small slot sized intake* or mesh screens." Therefore, it is reasonable to conclude that the State Water Board's allowance of a 1 mm screened intake under the Desalination Amendment will be proximate cause of a take of ESA listed abalone species. The Desalination Amendment will also be the proximate cause of take of state and federally listed salmon. In 1995, coho salmon were listed by the California Fish and Game Commission as an endangered species within ocean waters south of San Francisco Bay. In 2002 this listing was expanded to include the northern coast of California to Oregon. Both chinook and steelhead are also state and federally listed threatened species. While the State Water Board disregarded an analysis of impacts to ESA listed salmon species, one can look to recent OTC studies to determine the potential impact an open- ocean intake can foreseeable have on the species. In May, 2014, NMFS and the U.S. Fish and Wildlife Service finalized its Biological Opinion on the U.S. EPA's 316(b) Rule in accordance with Section 7(a)(2) of the ESA. The Services' Biological Opinion discusses	require that siting and technology alternatives be analyzed in order to evaluate any potential impacts to sensitive habitats or species. For a discussion of commenter's assumption that surface water intakes will nearly always be approved, regardless of any impacts to sensitive species, see Response 12.9 above. The Biological Opinion cited by the commenter addresses power plants covered by Clean Water Act section 316(b) and thus has no implications for future, unspecified desalination facilities that may be proposed for construction at yet-to-be-determined locations along the California coast, and with necessarily unknown habitats and unknown presence of threatened or endangered species. However, to the extent that the opinion might be considered relevant to the proposed Desalination Amendment, the EPA's resulting final regulation now requires that for existing facilities subject to the rule, the permitting authority must forward a copy of the permit renewal application to the appropriate Field Office of the U.S. Fish and Wildlife Services and/or Regional Office of the National Marine Fisheries Service for a 60-day review. 40 C.F.R. sec. 125.98(h). Thus, the Opinion did not result in any prohibition of a continuing or future activity, but in a requirement for additional review. Some of the information provided by the commenter concerns species unlikely to be impacted by a seawater intake, or by a seawater intake within the parameters that might be later permitted by a regional water board consistent with the Desalination Amendment. Application of best siting, design and technology, in accordance with the clear requirements of the proposed analytical framework, would avoid sensitive habitats and species. Construction of intakes and outfalls in areas such as soft bottom habitats where early life stages of abalone are not present is just one example. A poorly-sited brine discharge could affect salmonids if the discharge was sited in close proximity to a stream mouth. The increased salinity could significantly alter natural salinity at a river mouth preventing salmonids from navigating back to natal streams. It is unlikely that a surface water intake with a 1.0 mm slot size screen would present an entrainment threat to salmon existing streams or rivers due to their size and mobility. It is unlikely an owner or operator would site the

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	impacts from cooling water systems on numerous species in California, including salmon, whales, and sea turtles. The Biological Opinion found that the Pittsburg and Contra Costa Plants in the San Francisco Bay Delta, for example, impinge and entrain more than 300,000 endangered and threatened species per year, including Delta smelt, Sacramento splittail, Chinook salmon, and steelhead trout. NMFS also concluded that EPA's Rule impacts designated critical habitats. For example, NMFS identified 170 instances in which a cooling water intake is located in the designated critical habitat of particular salmonid species (EPA had only identified 115 such instances in its Biological Evaluation). NMFS noted that all of the endangered and threatened salmonids that it protects are vulnerable to cooling water intakes in their breeding habitat because intake and discharge of cooling water from open-ocean intakes are likely to disrupt habitat and water flow rates in ways that "reduc[e] the viability of eggs and fry." NMFS also identified other key features of salmonid designated critical habitats, including: "sites for spawning, rearing, and migration;" "safe passage conditions;" and "water quality, quantity, temperature, and velocity." Importantly, salmonids are anadromous species that spend some portion of their lives in the ocean and in freshwater. While salmon are mostly found in the northern regions of the State, steelhead once thrived in large number in freshwater sources statewide. And both have suffered population declines that threatened their extinction, steelhead have been extirpated to the point where it is difficult to find surviving individuals in many southern California streams – and the potential loss of a single individual in a desalination intake would be cause for extreme measures. NMFS also details cases of indirect harm in which ESA-listed species are harmed because EPA's OTC Rule allows intakes to continue operating in a manner that reduces their food availability or habitat. Regarding marine mammals, the definition of "take" includes "harm,", and "harm" includes "significant habitat modification or degradation that actually kills or injures wildlife." According to NMFS's Biological Opinion, certain species of whales are injured by intake structures	intake near a river mouth due to the potential for high suspended solids at river mouths that can increase the need for water treatment. Tidewater goby habitat is primarily limited to coastal lagoons and estuaries. Few tidewater gobies have been reported in ocean waters of California. See link to 50 CFR Part 17 Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Tidewater Goby; Final Rule - http://www.gpo.gov/fdsys/pkg/FR-2013-02-06/pdf/2013-02057.pdf With regard to Loggerhead turtles, the Water Board is not aware of any Loggerhead Turtle being entrained through a 1 mm slot screen. Values obtained from open intakes are not relevant in consideration of the proposed amendment that would require a low intake velocity in combination with 1 mm screens for surface water intakes only when subsurface intakes are determined to be not feasible. http://www.nmfs.noaa.gov/pr/pdfs/species/petition_north_pacific_loggerhead.pdf

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	inasmuch as primary constituent elements of their critical habitat are adversely impacted - constituting a "take." For example, NMFS discusses how the loss of endangered salmon populations to open-ocean intakes – significant in itself – has adverse effects for endangered whales. The endangered Southern resident killer whale population off the West Coast has collapsed to half of its historic population size. NMFS notes that the killer whales' recovery may be limited by prey availability because the whales have a highly specialized diet: they are heavily dependent on Chinook salmon for 80 percent of total caloric intake. Seawater water intakes kill about 77,000 Chinook salmon yearly, including "many from endangered or threatened Chinook populations in California." For Loggerhead sea turtles, another California species, NMFS expects that more than 2,386 turtles will continue to be taken by seawater water intakes ever year, and even more of these endangered turtles may be "harmed by *loss of prey to intakes* and other impacts." NMFS explains that "[t]he North Pacific Ocean DPS [Distinct Population Segment of Loggerheads] has a small nesting population of a few thousand females that produces 7,000 to 8,000 nests annually…a small population size that is not resilient to further perturbation." Threatened and endangered species harmed by seawater intakes are also subject to many other environmental stresses. For example, the U.S. EPA reports that many of the organisms affected by the 316(b) Rule already reside in impaired [heavily polluted] waterbodies. Other stresses affecting threatened and endangered species harmed by the Rule include degraded water and sediment quality, low dissolved oxygen levels, eutrophication, temperature, fishing, channel or shoreline (habitat) modification, hydrologic regime changes, invasive species, infrastructure development, construction and operation of dams along major waterways, and expansion of agricultural or grazing activities, among others. Together, these impacts have a compounding effect on the health of individual endangered animals and a cumulative effect on the likelihood of survival and recovery of the species as a whole.	

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	The Tidewater Goby is another listed ESA species that is highly at risk from the intake of an open-ocean desalination facility. The Tidewater Goby, a small fish that inhabits brackish waters along the west coast of California, is highly likely to be harmed by the intake of seawater desalination. In 2013, the U.S. Fish and Wildlife Service announced designation of 12,157 acres of revised critical habitat for the tidewater goby. The proposed critical habitat includes land in portions of Del Norte, Humboldt, Mendocino, Sonoma, Marin, San Mateo, Santa Cruz, Monterey, San Luis Obispo, Santa Barbara, Ventura, and Los Angeles, Orange, and San Diego counties. Approximately 53 percent of the proposed revised critical habitat is on state lands. Under the ESA, critical habitat identifies geographic areas that contain features essential to the conservation of a threatened or endangered species and which may require special management considerations. The Tidewater Goby exists in coastal wetlands – like those found around Carlsbad and Morro Bay – and it is foreseeable that the Goby would be entrained through the use of open- ocean intakes.	
12.16	*Case Law dictates that state regulations – like the desalination amendment – can constitute an illegal take.* Case law emphasizes that a state regulation can be responsible for the take of ESA listed species. The ESA prohibits any person – whether a private or governmental entity – from "taking" any listed endangered species of fish or wildlife. "Take" is defined to mean harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in such conduct. Along with the potential for the Desalination Amendment to directly kill listed ESA species, the Amendment will also result in the harm of ESA species. "Harm" is defined to include "significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding or sheltering." Courts have held that state regulations can constitute an illegal take if the regulation is the proximate cause. In *Strahan v. Coxe*, the challenger claimed that by licensing gillnet and lobster pot fishing in	Commenter cites *Strahan v. Coxe (*1997) 127 F.3d 155 for the proposition that state regulation can constitute an illegal take. *Strahan,* a First Circuit Court of Appeals decision, involved a suit for injunctive relief under the ESA for alleged violations based upon state issuance of licenses and permits that authorized use of specific types of commercial fishing gear that had been documented as entangling an identified species of endangered whale. 127 F.3d at 158-159. The Court stated that "a governmental third party pursuant to whose authority an actor directly exacts a taking of an endangered species may be deemed to have violated the provisions of the ESA." 127 F.3d at 163, [emph. added]. In that case, a species identified as endangered had been subject to actions that the Court found to have constituted a taking, and the state had issued a permit or license authorizing the activity. In more recent case law, the Fifth Circuit has noted that: "[a]mong the federal appellate courts, only the First Circuit has held that a state licensure can constitute an ESA take. Strahan v. Coxe, 127 F.3d 155 (1st Cir.1997). The First Circuit's reasoning, however, is challenged by other appellate opinions maintaining that the state governments may not be commandeered into enforcing

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	state waters, Massachusetts was liable for illegal take of endangered northern right whales that drowned after becoming entangled in fishing gear. Massachusetts asserted that merely granting a fishing license did not result in right whale takes; rather, the intervening acts of the fisherman themselves were responsible for the takes. The court rejected the state's position. Instead, the court found that the state's sanctioning of fishing gear was a proximate cause of the right whale takes; and therefore, a violation of Section 9's prohibition against take of listed species. The state also argued that it could not be responsible for protecting right whales because that was the responsibility of the federal government. The court rejected this argument holding the state's liability for illegal take resulted from its action, and is different from a requirement that the state act affirmatively to conserve right whales. The *Strahan* court affirmed the district court's reasoning, in finding that Massachusetts' commercial fishing regulatory scheme likely exacted a taking in violation of the ESA, by reading two ESA provisions in conjunction. The first relates to the definition of the prohibited activity of a "taking," and the second relates to the solicitation or causation by a third party of a prohibited activity, such as a taking. The court viewed these provisions, when read together, "to apply to acts by third parties that allow or authorize acts that exact a taking and that, but for the permitting process, could not take place." The state attempted to argue that it was not the direct cause of the take, nor was it responsible for enforcing the provisions of the ESA. However, the court ruled that the state was not being compelled to enforce the provisions of the ESA, but rather "to end the Commonwealth's continuing *violation* of the Act." The ESA not only prohibits the acts of those parties that directly exact the taking, but as *Strahan* held, "*bans those acts of a third party that bring about the acts exacting a taking*." *Strahan* affirmed the court's ruling "that a governmental third party pursuant to whose authority an actor directly exacts a taking of an endangered species may be deemed to have violated the provisions of the ESA."	federal prohibitions. [CITATIONS]" *Aransas Project v. Shaw* (2014) 775 F.3d 641, 656, fn 9. The Fifth Circuit did not reach the specific issue in question in *Strahan,* instead finding that neither proximate cause nor foreseeability had been demonstrated for a claim that state water permitting and regulatory practices had combined with other factors that led to deaths of an endangered species. The question of whether a state agency permitting scheme can constitute a taking under the ESA, a question not applicable or relevant here for the reasons noted above and in responses 12.13 through 12.15 above, is not settled law. Cases discussed above and provided by the commenter provide, at best, persuasive authority. Even if the ESA is applicable, and even if binding authority existed to find such a permitting scheme in violation of the ESA, nothing in the Desalination Amendment authorizes any seawater intake, much less authorizes an act that may constitute a taking or otherwise violate the ESA.

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	There are additional court decisions that have made similar holdings. In *Sierra Club v. Yeutter*, the court found that the Forest Service's management of timber stands was a taking of the red-cockaded woodpecker in violation of the ESA. In *Defenders of Wildlife v. EPA*, the court held that the EPA's registration of pesticides containing strychnine violated the ESA, both because endangered species had died from ingesting strychnine bait and because that strychnine could only be distributed pursuant to the EPA's registration scheme. In *Palila v. Hawaii Dep't of Land and Nat. Res.*, the court held that Hawaii's practice of maintaining feral goats and sheep in Palila's habitat constituted a taking and ordering state to remove goats and sheep. *Loggerhead Turtle v. County Council of Volusia County*, held that county's authorization of vehicular beach access during turtle mating season exacted a taking of the turtles in violation of the ESA. As discussed above, the State Water Board will adopt a regulation – the Desalination Amendment – that will foreseeably lead to the take of endangered and threatened species. Similar to *Strahan*, the Desalination Amendment will be the proximate cause of an illegal take because it is foreseeable that desalination facilities will be permitted to use a 1 mm open-ocean intake, resulting in the inevitable take of ESA listed species.	
12.17	*The Desalination Amendment will be the proximate cause of endangered and threatened species take.* The Desalination Amendment will be the proximate cause of endangered and threatened species take because the State Water Board acknowledges the foreseeable harm through the use of open-ocean screened intakes. On page 217 of the SED, the State Water Board admits that "[s]maller planktonic organisms including early life stages of black abalone a federally listed Threatened and Endangered species may not be protected from entrainment by [open-ocean screens]." Moreover, studies conclude that open water intakes and brine discharges have the potential to increase mortality of larval marine organisms. As mentioned above, gametes, and larval and juvenile organisms are at the highest risk of entrainment because	See response to comments 12.13 through and 12.16 above.

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	few have developed sufficiently to swim and avoid entrainment, even when the intake is protected with small slot sized intake or mesh screens. The Desalination Amendment will be the proximate cause of a take of endangered and threatened species because the State Water Board provides a broad interpretation of "feasible," allowing project proponents to easily move from subsurface intakes to a 1 mm screened intake. Moreover, Section II above details the inefficiency of a 1 mm screened intake. Studies have found that a 1 mm screened intake will result in a zero reduction of entrainment for small and younger species. The State Water Board's Expert Panel has concluded that the net benefit of a 1 mm screened is only one percent. And the State Water Board has decided that a 1 mm screened intake will only result in a 1 percent reduction of entrainment – resulting in a 99 percent mortality rate. That 99 percent mortality rate includes California's federal and state endangered and threatened species. As the State Water Board acknowledges, "critical habitat designated for federally listed species and Essential Fish Habitat designated for fisheries management *encompass significant portions* of California's nearshore marine waters". With a 1 mm screened intake's 99 percent mortality rate, combined with the State Water Board's finding that critical habitat encompasses significant portions of California's nearshore marine waters, it is evident that the Desalination Amendment will be the proximate cause of a take of endangered and threatened federal and state listed species.	
12.18	*The significant harm to endangered and threatened species is avoidable.* The State Water Board incorrectly asserts that the take of endangered and threatened species is unavoidable. On page 174 of the SED, the State Water Board acknowledges that impacts to ESA listed species "could be significant and unavoidable." Yet on the same page, the State Water Board also admits that alternatives exist to completely avoid impacts to endangered and threatened species. On page 217 of the SED, the State Water Board acknowledges the Desalination Amendment will lead to "moreimpingement and entrainment impacts	See response to comments 12.13, 12.14, 12.15, 12.16, 12.17 above. The rationale supporting the slot size and intake velocity are described in sections 8.3.1.2.2 and 8.3.1.2.3 of the Staff Report with SED. See also Appendix H of the Staff Report with SED Responses to comments 13.19, 21.61 and 27.2. As stated previously, there is no evidence to show that the proposed amendments will result in take of threatened or endangered species, and neither did the existing CEQA evaluations reviewed in Section 12 of the Staff Report identify significant impacts. To the extent that the commenter raises ESA claims on the basis of the NMFS 2014 comment letter, please note also that the NMFS letter specifically stated: "NMFS anticipates

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	compared to [the subsurface intake Alternative] because [the subsurface intake Alternative] *completely eliminates* impingement and entrainment by use of subsurface intakes. The National Marine Fisheries Service (NMFS), also known as NOAA Fisheries, is an agency of the United States Department of Commerce responsible for provisions of the Endangered Species Act with regard to threatened and endangered marine species. The NMFS 2014 comment letter explains to the State Water Board that the subsurface intake alternative (Alternative 1) is the only option that will prevent the take of listed federal and endangered species. After years of following the State Water Board's process to develop the Desalination Amendment, NMFS believes "Alternative 1 in the proposed Desalination Policy best avoids and minimizes impacts to NMFS trust resources" and "would result in reduced impacts to NMFS trust resources from facility operations due to the elimination of entrainment and impingement impacts." "Alternative 1 provides a greater assurance of minimized long term impacts to NMFS trust resources." Alternatively, NMFS believes the screened open-ocean intake alternative (Alternative 2) may prevent the take of endangered species, but only if the State Water Board requires additional protections. NMFS recommended a "0.33 fps as a maximum through-screen velocity in order to minimize potential entrainment and impingement impacts." In addition to a slower intake velocity, NMFS asserts that a "slot opening no greater than 0.5mm is necessary to minimize the entrainment of fish eggs and larvae of many different species including several important commercial species managed under the MSA such as northern anchovy, Dover sole, English sole, and sanddabs." NMFS explains that species of recreational importance would "experience a greater impact from a 1.0mm slot opening include California halibut, queenfish, California sheephead and various croakers and turbots." Most importantly, NMFS admits that even "a slot size opening of 0.5mm would not prevent the entrainment of abalone larvae, which are typically smaller than this during their pelagic phases." Rather than make changes to the Desalination Amendment based on NMFS recommendations, the State Water Board declined to strengthen	commenting on these facilities individually as they go through permitting processes." NMFS 2014, at p. 1. The NMFS letter in no way supports the contention that the Desalination Amendments themselves authorize any activity or would result in a taking or otherwise constitute acts in violation of the ESA.

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	the Amendment to reduce the illegal take of endangered and threatened species. Instead, the State Water Board ignores NMFS's concerns for entrainment by justifying a maximum intake velocity of 0.5 feet per second "because it has been shown to preclude [the impingement of] most small fish." Again, the State Water Board is required to minimize the marine life mortality of all marine life – and that mortality includes both impingement and entrainment. And it is logical to conclude from the several studies of small mesh screens that, while they may reduce entrainment of larger organisms by some minimal amount, they may also increase impingement of those larger organisms. It is unclear in the SED why entrainment of larger organisms would slightly decrease as the mesh size gets smaller, but there wouldn't be any associated increase of those larger organisms contacting the screens in a way that results in "harm" and possible mortality impingement). Secondly, the State Water Board completely ignores the entrainment impacts to endangered and threatened species from using a .5 feet per second flow-through velocity combined with a 1 mm screened intake. As both the State Water Board and NMFS admit, the significant take of listed endangered and threatened species is avoidable through Alternative 1 - the use of subsurface intakes. On page 204 of the SED, the State Water Board admits that Alternative 1 (subsurface intakes) is feasible. Yet the State Water Board rejects using Alternative 1 because it would constrain water agencies from developing alternative water supplies. The development of alternative water supplies is not an excuse to avoid the illegal take of endangered species – and certainly does not make take unavoidable. The Desalination Amendment will be the proximate cause of a take of endangered and threatened species because the State Water Board provides a broad interpretation of "feasible," which allows project proponents to use a 1 mm screened intake rather than a subsurface intake. The inefficiency of 1 mm screened intakes will result in the entrainment of 99 percent of all endangered species existing in the area. The State Water Board acknowledges that critical habitat designated for federally listed species and Essential Fish Habitat designated for fisheries management *encompass significant portions* of	

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	California's nearshore marine waters. The take of listed species will be significant, and are avoidable if the Desalination Amendment required subsurface intakes to be required as the best available technology.	
12.19	The State Water Board has a responsibility under the public trust doctrine to limit the intake of seawater to avoid harms to public resources – the seawater itself and the marine organisms living in the water. By adopting the Desalination Amendment, the State Water Board is essentially providing public and private entities with the privilege of using public trust resources. The intake of seawater is not a right – it is a privilege that comes with restrictions. Private entities should not be allowed to self-select the amount of seawater they wish to consume. In the alternative, the State Water Board has a responsibility to protect the public's interest over public trust resources by limiting the amount of seawater a particular desalination facility can take possession over. The State Water Board should limit the amount of seawater used by a desalination facility based on the quantity feasible through the use of subsurface intakes.	The Public Trust doctrine does not stretch to support the contention that the State Water Board should limit construction of seawater intakes to the capacity afforded by a subsurface intake. Even if the Public Trust doctrine did apply in such a case, it represents a balancing of issues and concerns. The record amply demonstrates extensive efforts to consider and balance the statutory requirement to minimize the intake and mortality of all forms of marine life while preserving options for developing alternative water supplies.
12.20	*Case law demands the public trust doctrine places a duty upon the government to protect natural resources – including marine life.* The public trust doctrine dates back to Roman times and the Code of Justinian, which proclaimed that the shores are not understood to be property of any man. Each state acquired ownership of the navigable waters, including the tidelands and submerged lands within its jurisdiction, when it joined the Union, and developed its own public trust doctrine and public trust uses. The California Constitution explicitly protects the public's right to navigation; while case law expands the public trust to encompass commerce, fishing, the right to hunt, bathe or swim, and the right to preserve tidelands. The geographic scope of the public trust doctrine traditionally extends to lands under navigable waters, including rivers, streams, and lakes, as well as submerged lands and tidelands. The public trust doctrine generally guarantees public rights to navigable waters, tidelands, and submerged lands for traditional uses of fishing, navigation, and commerce. The public trust doctrine has evolved from permitting	See, Response 12.19 above.

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	certain uses to protecting trust values and therefore may support affirmative action to prevent harm to public trust lands and waters in a manner similar to abating a public nuisance. The public trust doctrine protects marine life. Courts have found a "growing public recognition that one of the most important public uses of the tidelands is the "preservation of those lands in their natural state, so that they may serve as ecological units for scientific study, as open space, and as environments which provide food area and habitat for birds and marine life, and which favorably affect the scenery and climate of the area."	
12.21	*Case law prioritizes the protection of public trust resources over water agencies' water rights.* Desalination proponents have no right to divert seawater; but if they did, the State Water Board still has a responsibility to protect public trust interests before allowing a diversion. In *National Audubon Society v. City of Los Angeles*, the Supreme Court has explained that doctrine, the state holds the navigable waterways in "public trust" for the benefit of state residents. In *Audubon Society*, the plaintiffs challenged long-standing water use permits issued by the Board that, by allowing the diversion of water from streams feeding Lake Mono, had resulted in an environmentally destructive decrease in the lake's level. In declining to reconsider the permits, the Board concluded it was required to allocate all available water for beneficial use by appropriators, notwithstanding the potential environmental harm such diversions would cause. The *Audubon Society* court required the Board to reconsider the permits, taking into account the public trust doctrine. The Supreme Court of California held that before state agencies "approve water diversions they should consider the effect of such diversions upon interests protected by public trust, and attempt, so far as feasible, to avoid or minimize any harm to those interests." The Court found that the Water Board "has an affirmative duty to take public trust into account in planning and allocating of water resources, and to protect public trust uses whenever feasible." The state as sovereign retains continuing supervisory control over its navigable waters and that	*National Audubon Society v. Superior Court* (1983) 33 Cal.3d 419 noted that "[t]he core of the public trust doctrine is the state's authority as sovereign to exercise a continuous supervision and control over the navigable waters of the state and the lands underlying those waters." 33 Cal.3d at 425. The Court went on to state: "The prosperity and habitability of much of this state requires the diversion of great quantities of water from its streams for purposes unconnected to any navigation, commerce, fishing, recreation, or ecological use relating to the source stream. The state must have the power to grant nonvested usufructuary rights to appropriate water even if diversions harm public trust uses. Approval of such diversion without considering public trust values, however, may result in needless destruction of those values. Accordingly, we believe that before state courts and agencies approve water diversions they should consider the effect of such diversions upon interests protected by the public trust, and attempt, so far as feasible, to avoid or minimize any harm to those interests." Id. at 426. Thus, to the extent it were found applicable, the public trust doctrine would require an inquiry regarding feasibility of minimizing harm to Public Trust resources. As noted, the Desalination Amendment represents an extensive effort to consider all competing interests and to require the best available site, design, technology and mitigation measures feasible to minimize the intake and mortality of all forms of marine life. The *National Audubon Society* Court addressed a scenario in which "no responsible body has ever determined the impact of diverting the

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	principle, fundamental to the concept of public trust, applies to rights in tidelands; it prevents any party from acquiring a vested right to appropriate water in a manner harmful to interests protected by public trust. *Audubon Society* is instructive to the State Water Board's affirmative duty to take the public trust into account when considering the need for desalination. Regardless of a potential need for desalinated water, the State Water Board has an obligation to put public trust resources before water allocations. Here, however, the State Water Board is putting the need for desalinated water ahead of public trust resources. The State Board justifies its broad definition of "feasible" by claiming that all communities should be allowed to take as much seawater as they deem appropriate due to need. This result is in direct conflict with Audubon, which dictates that public trust resources should be prioritized over the need for a community to develop a water supply that had a detrimental impact on public trust resources. By not limiting the intake capacity to that which a subsurface can accommodate, the State Water Board is allowing a private entity – with no right to the seawater – to impact public trust resources owned in trust by the state. The State Water Board has an affirmative duty to protect the public's marine resources from seawater intakes. In defining the role of the public trust doctrine in water rights policy, *Audubon Society* recognized that "the public trust doctrine and the appropriative water rights system administered by the Water Board developed independently of each other. Each developed comprehensive rules and principles which, if applied to the full extent of their scope, would occupy the field of allocation of stream waters to the exclusion of any competing system of legal thought." In bringing the two together, the court held the doctrine (1) prevents any party from acquiring a vested right to appropriated water in a manner harmful to the interests protected by the public trust; (2) "the Legislature, acting directly or through an authorized agency such as the Water Board, has the power to grant usufructuary licenses that will permit an appropriator to take water . . . , even though this taking does not promote, and may unavoidably harm, the trust uses at the source stream"; and (3) "[t]he state has an affirmative duty to take the public trust into account in the	entire flow of the Mono Lake tributaries into the Los Angeles Aqueduct. This is not a case in which the Legislature, the Water Board, or any judicial body has determined that the needs of Los Angeles outweigh the needs of the Mono Basin, that the benefit gained is worth the price. Neither has any responsible body determined whether some lesser taking would better balance the diverse interests." 33 Cal.3d at 447. In stark contrast, the Desalination Amendment addresses itself to precisely the required issues presented by the commenter, that of identifying and avoiding or minimizing harm.

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	planning and allocation of water resources, and to protect public trust uses whenever feasible." Although the doctrine originally protected navigable waterways for the purposes of navigation, commerce, and fishing, *Audubon Society* extended the geographic scope of the doctrine to non-navigable streams that feed navigable waterways, and it expanded the purpose of the doctrine to the preservation of water's function as natural habitat. In a more recent case, *Light v. State Water Board*, the court held that in general terms, the Board has the authority to find unreasonable a diversion of water for frost protection if that diversion is inconsistent with the public trust by creating a significant risk of salmonid mortality. Although the *Audubon Society* court considered the public trust doctrine only in relation to permitted appropriative water rights, subsequent decisions have assumed the doctrine applies as well in the context of riparian and pre-1914 appropriator rights. *Light* reaffirmed the decision in *El Dorado* that "when the public trust doctrine clashes with the rule of priority, the rule of priority must yield."	
12.22	*Desalination proponents have no right to divert seawater – it is a privilege – that comes with restrictions to avoid harms to public trust resources.* The Desalination Policy is not restricting Poseidon's use of its own property – but rather restricting the use of the people's property under the public trust doctrine. It is well established law that a taking claim cannot arise from a property right that an owner never had. This principle is known as the Background Principles Doctrine. Background principles are restrictions on property (and the use of property) recognized by state law. While not precisely defined, these restrictions derive from nuisance law, public safety needs, preservation of navigable waterways, and other important public interests. The logic of the "background principles" doctrine is that property owners cannot lose a property right that they never had. Property ownership is confined by limitations on the use of land that "inhere in the title itself." Such uses (like a use that constitutes a public nuisance) are not	It is unclear why the comment addresses a hypothetical property right or takings claim by Poseidon. The issue is out of the scope of the Desalination Amendments as well as outside the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf). To the extent that the commenter raises issues regarding the Public Trust doctrine as compared with the State Water Board's statutory requirement to ensure that new seawater intakes used for desalination use the best available site, design technology and mitigation measures feasible to minimize the intake and mortality of all forms of marine life, see responses 12.19 and 12.21 above.

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	considered to be part of the owner's "bundle of sticks." Thus, even a "background principle" of state property law supports it. The public trust doctrine provides that tidelands, the beds of navigable waterways and other natural resources are held in trust for the public by the state. Land in California located beneath navigable and tidal waterways are subject to certain public access and navigation rights. The state holds these rights in trust for the public. Thus, private property restrictions relating to these public trust rights cannot constitute a compensable taking; the owner never had the right to use the property for non-public trust uses. The Desalination Policy is only placing restrictions on Poseidon's use of public trust resources – a property right never owned by Poseidon. Thus, Poseidon does not have a viable takings claim based on the Desalination Policy restricting Poseidon's operations.	
12.23	*Since screened open-ocean intakes do not minimize marine life mortality, the State Water Board should limit the intake of seawater to that feasible with subsurface intakes.* As discussed above, screened intakes do little to nothing to reduce marine life mortality of all forms of marine life as required by the Water Code. To prevent impacts to public trust resources, the State Water Board has an affirmative duty to prevent impacts to public trust resources. To do this, the State Water Board should narrowly interpret "feasible" under Water Code Section 13142.5(b) to be defined as "capable of being accomplished." The State Water Board should also ensure public trust resources are protected by allowing seawater intakes that can only be accommodated by subsurface intakes. This will allow desalination proponents the ability to still use the privilege of the public trust resource of seawater, while still ensuring protection of marine life public trust resources. Any intake beyond which subsurface intakes can accommodate would be a violation of the public trust doctrine. The National Marine Fisheries Service agrees that subsurface intakes should be the only option provided project proponents wishing to use	The reference to "trust resources" in the 2014 NMFS letters refers not the state Public Trust Doctrine, but to NMFS stewardship under the Endangered Species Act and Magnuson-Stevens Fishery Conservation and Management Act. Thus, the assertion that NMFS "agrees that subsurface intakes should be the only option provided project proponents wishing to use the public trust privilege the state is bestowing" is misleading. For a discussion of the Public Trust Doctrine, see Responses 12.19 and 12.21 above. For a discussion of commenter's ESA claims, see Responses 12.13 through 12.16 and 12.18 above. For a discussion of how to interpret "feasible" as used in Water Code section 13142.5(b), see Responses 12.3, 12.4, and 12.6 through 12.9. For a discussion of screen slot size selection for surface water intakes where a subsurface intake has been found infeasible, see Response 12.11 above.

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	the public trust privilege the state is bestowing upon private entities. In NMFS comment letter, they state they have "been following this SWRCB process for many years and believes Alternative 1 in the proposed Desalination Policy best avoids and minimizes impacts to NMFS trust resources." Alternative 1, which requires the use of subsurface intakes for water supply, would result in reduced impacts to NMFS trust resources from facility operations due to the elimination of entrainment and impingement impacts. "Alternative 1 provides a greater assurance of minimized long term impacts to NMFS trust resources." However, the State Water Board's Response to Comments rebuffs NMFS's recommendation160 and justifies not requiring subsurface intakes because Alternative 1 would not meet the project goals of "providing desalination as an alternative to traditional water supplies. As explained in Audubon, and reinforced in Light, the protection of public trust resources should come before the need to develop alternative water supplies. It is the State Water Board's affirmative duty to protect public trust resources above and beyond any interest in developing new water supplies. The State Water Board should ensure public trust resources are protected by only allowing seawater intakes up to the feasible quantity accommodated by subsurface intakes.	
12.24	The State Water Board has a legal obligation to require the best available mitigation that minimizes marine life mortality for all forms of marine life. We reiterate our objection to defining "mitigation" as "after-the-fact" restorative measures. The flaws in the Amendment on mitigation serve to highlight that not only has the State Water Board misinterpreted the law, after the fact restorative measures are flawed in practice. Nonetheless, assuming mitigation is determined to include restorative measures, we agree that defining "mitigation" as "replacement" is the proper context and goal for the Amendment. However, we disagree with the application of the definition, as well as the over-reliance on mitigation to minimize the intake and mortality of all forms of marine life in the first place.	For a discussion of the claim that mitigation should not or may not include "after-the-fact" restoration measures, see Appendix H, Responses 21.86, 21.87 and 21.88. See also, Response 12.12 above. In the case of conditionally approved facilities, the Desalination Amendment allows the regional water board to account for previously-approved mitigation projects in determining mitigation requirements for any additional mortality of all forms of marine life resulting from the occurrence of the conditional event or expansion of the facility. Additional mitigation must be to compensate for any additional construction, discharge or other increases in intake or impacts or an increase in intake and mortality of all forms of marine life. The commenter's claim that the Desalination Amendment "allows the project proponents to avoid full enforcement of the conditions in the temporary permits" appears to be premised on an

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	Moreover, the treatment of "conditionally approved" facilities is not adequate to ensure full replacement once those facilities are required to come into compliance with the Amendment. In fact, ironically, the Amendment allows the project proponents to avoid full enforcement of the conditions in the temporary permits requiring a new and thorough 13142.5(b) analysis when the event occurs. Finally, we think the mitigation provisions need clarity to ensure full replacement from both the intake and discharge, both individually and in combination. To the extent future improvements to discharge alternatives may require modifications to the intake, they are not precluded by the narrow application of section 13142.5(b) to only new or expanded facilities. In other words, should a project proposal include some use of the intake for brine dilution and/or discharge, the intake should be considered part of a discharge under the Clean Water Act and Porter-Cologne Act.	assumption that mitigation imposed pursuant to the original, conditional determination pursuant to Water Code 13142.5(b) is insufficient. However, the Desalination Amendment does not propose to revisit earlier determinations by regional water boards. The Desalination Amendment requires full mitigation of intake and discharge impacts. While the commenter seeks to impose Clean Water Act discharge requirements or authority upon an intake that may be used for dilution as part of a discharge technology, no authority for this approach is provided.
12.25	*The State Water Board should not define "mitigation" as "after-the-fact restorative measures.* The Amendment states that: "Mitigation… [i]s the *replacement of all forms of marine life* or habitat that is lost due to the construction and operation of a desalination facility…" We agree that, assuming after-the-fact restorative measures are allowed – which we continue to oppose – "mitigation" should be defined as full "replacement" of marine life lost due to construction and operation of a facility. However, that is the last time the term "replacement of all forms of marine life" is found in the Amendment, and the rule is constructed in a way that provides no assurances that all forms of marine life will actually be "replaced" by the "mitigation" measures. In fact, the Amendment allows out-of-kind restorative measures that have little to no relationship with the habitat and species impacted. The State Board seems to be narrowly distinguishing the Clean Water Act from Porter-Cologne by highlighting that Porter-Cologne includes the term "mitigation" and consequently allows attempted restorative measures. We disagree. The term "mitigation" in the context of Water	See, Response 12.24 above. The commenter's attempt to apply the federal Clean Water Act section 316(b) case law to interpretation of Water Code section 13142.5(b) has been thoroughly discussed in the previous responses to comments (Appendix H.) Nonetheless, while the commenter notes that the previous responses fail to address the idea that Clean Water Act Section 316(b) protects against "adverse environmental impacts", where the Porter-Cologne Act more clearly protects "all forms of marine life," it is nonetheless plain that Water Code section 13142.5(b) includes a requirement for mitigation, whereas Clean Water Act section 316(b) does not. Moreover, California case law interpreting Water Code section 13142.5(b) has clearly approved the interpretation set forth herein. *Surfrider Foundation v. California Regional Water Quality Control Board* (2012) 211 Cal.App.4th 557, 577-581. The court stated that: "[A]lthough *Riverkeeper I* and *Riverkeeper II* conclude that the statutory reference to 'minimiz[ing]' an environmental impact does not include the concept of after-the-fact compensation, those comments are inapposite here because they were made in a wholly different statutory context." *Id.* at 580.

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	Code Section 13142.5(b) should be interpreted to mean "any other means beyond 'best site, design and technology' that minimizes the intake and mortality of marine life." Also, the argument that the *Riverkeeper I* decision is inapplicable is too narrow a read of that holding. The Court went beyond a narrow interpretation of the language in Section 316(b) and included a practical concern over whether or not restorative measures should be allowed to replace the clear intent to minimize intake and mortality of marine life in the first place. The Court found that: *Restoration measures resemble the pre-1972 approach to water pollution, which regulated point sources based on their effect on the surrounding water and allowed sources to discharge pollutants provided the discharge did not cause water quality to dip below an acceptable level. See CPC Int'l, Inc. v. Train, 515 F.2d 1032, 1034-35 (8th Cir.1975). Similarly, restoration measures would allow a facility, at least in theory, to impinge and entrain unlimited numbers of organisms provided that other steps maintained acceptable water quality, here measured by wildlife levels as opposed to pollutant concentration. But "[i]t was ... dissatisfaction with water quality standards as a method of pollution control that led to the proposal that they be replaced or supplemented with `effluent limitations.'" Bethlehem Steel Corp. v. EPA, 538 F.2d 513, 515 (2d Cir.1976). A plaintiff attempting to prove a violation of the Clean Water Act faced "a virtually unbridgeable causal gap," CPC, 515 F.2d. at 1035, for "the burden of proving that a particular polluter had caused the water quality to dip below the standards was all but impossible to satisfy," Bethlehem Steel, 538 F.2d at 515. Allowing compliance through restoration measures would involve exactly the same hurdles. As the EPA itself recognized in the preamble to the Rule,* [B]ecause of the complexity of biological studies, it is very difficult to assess the cause and effect of cooling water intake structures on ecosystems or on important species within an ecosystem.... [U]nlike in the laboratory, where conditions are controlled, a multitude of confounding factors make biological studies very difficult to perform *and make causation, in particular, difficult to determine.* In brief, the court's opinion verified what marine scientists know – the	

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	marine ecological system is inherently complex, and the notion that restoration of out-of-kind habitat will "mitigate" the intake and mortality of all forms of marine life is, at best, oversimplified and unsupported in the Amendment. More importantly, the notion that wetlands restoration will "[replace] all forms of marine life lost in the construction and operation of a desalination facility" – as identified in the Amendment as the goal of mitigation – has even less support. Without more explanation of the nexus between wetland restoration and the replacement value to all forms of marine organisms lost in the construction and operation of a desalination facility, the Amendment is fundamentally flawed. Similarly, another important distinction not mentioned in the State's argument against applying the logic in the *Riverkeeper* decision is that the Clean Water Act Section 316(b) protects against "adverse environmental impacts", where the Porter-Cologne Act more clearly protects "all forms of marine life." As stated above, the State Water Board and our organizations read Water Code Section 13142.5(b) to be more restrictive that Water Code Section 316(b). Restorative measures that simply improve "biomass" productivity have no inherent relation to protection of all forms of marine life. "Marine life" means species that inhabit the marine environment, and is distinct from the broader category of "aquatic life." And "biomass" is simply the weight or quantity of all organisms in a particular habitat. For example, the increase of biomass in a wetland resulting from a restoration project may include numerous aquatic organisms, avian species, reptiles and mammals which provide little to no benefit for restoring the marine organisms lost to the construction and operation of desalination facilities. Even if the weight or quantity of "biomass" was limited to aquatic species, the Amendment fails to identify how the increased productivity of those freshwater or estuarine species benefits, or "replaces" the intake and mortality of all forms of marine life. Unless the State can show some replacement value for marine species, whether through in-kind or out-of-kind restoration projects, the Amendment fails to enforce the clear intent of the law to minimize the intake and mortality of all forms of marine life.	

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	The Amendment must document how alternative out-of-kind restoration projects, like creation of artificial reefs to replace the loss of marine life residing in sandy habitat, has any relation to replacing the loss of "all forms of marine life." The Amendment should identify how these "out-of-kind" restorative measures in the marine environment can result in ecological complications. For example, if rocky reef creation is used to mitigate the loss of species inhabiting the water column or sandy habitat, the Amendment should clarify that this measure will further reduce sandy bottom habitat and compound the loss of those species impacted by the intake and mortality of those species.	
12.26	*The State Water Board should not rely on the Surfrider decision when interpreting available mitigation.* The State Water Board should not selectively and arbitrarily rely on parts of the *Surfrider v. SD Regional Board* decision to justify provisions of the Amendment that clearly undermine the intent of the Porter-Cologne Act. The *Surfrider* case was decided in the context of a temporary permit issued for operation of the Poseidon-Carlsbad facility while the co-located power plant discharge continued supplying source water for the desalination facility. The court was careful to note that once the power plant ceased withdrawing seawater, the permit and decision would be reconsidered under present day circumstances. That time is now and those present day circumstances give reason for modifying the Carlsbad permit, or at very least, modifying the draft Amendment. If the Amendment is not modified, the rationale for approving the Carlsbad permit will be codified and the opportunity for clarification lost. The court decision relied heavily on the discretion allowed the agency in interpreting the law. As we have noted in past comments, that very same discretion allows the State Water Board to change course. And a change in course is necessary if the State is to successfully enforce the letter and intent of the Porter- Cologne Act. The facts relied on in *Surfrider* have clearly changed. Nothing in the Amendment, or SED, supports the conclusion in *Surfrider* that "scrubbing balls" will minimize the intake and mortality of all forms of	See, Response 12.25 above. The State Water Board's reliance on *Surfrider* is neither selective nor arbitrary, nor does it represent an unwarranted focus on specific facts at issue before the San Diego Regional Water Quality Control Board and reviewing courts. Rather than undermining the intent of the Porter-Cologne Water Quality Control Act, as contended by the commenter, the decision of the California Court of Appeals interprets specifically terms used in Water Code section 13142.5(b). While the Court considered the discretion of the agency in interpreting the statute, reasonable interpretations of the statutory terminology are used in the proposed Desalination Amendments, as set forth in the earlier case, and are not dependent upon the facts and circumstances underlying the *Surfrider* decision. The proposed Desalination Amendment interprets Water Code section 13142.5(b) in accordance with applicable case law as well as the extensive record supporting the proposed actions. Although the commenter finds it difficult to see how the Poseidon facility will not be the standard for all future desalination facilities, the plant in question is a conditionally permitted facility co-located with a power plant now covered by the OTC Policy, with a near-term compliance date. As the proposed Desalination Amendment requires any future co-location condition the Water Code section 13142.5(b) determination upon the power plant remaining in compliance with the OTC Policy, the possible repetition of the circumstances of the earlier Poseidon permit is necessarily limited. The prior San Diego Water Quality Control Board permitting action for the Poseidon facility took place prior to development of the proposed Desalination Amendment, and while interpretation of the statutory

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	marine life. In fact, there is nothing in the Amendment that contemplates marine life mortality resulting from cleaning the conduits for an open ocean intake. That is a technological disadvantage of open ocean intakes that was not addressed at all in the Amendment. Likewise, the use of variable speed intake pumps is not considered in the Amendment as a technology for minimizing intake and mortality, and rightly so. Variable speed pumps do nothing to minimize the intake and mortality of marine life from a given volume of water. Finally, the Amendment's contradictions regarding the purpose of mitigation to "replace marine life", and reliance on the increased biomass in out-of-kind habitat to meet that goal, require a modification of the rule that may not be consistent with the *Surfrider* decision. These factual and legal findings in the *Surfrider* case are cause for the State Water Board to distinguish the decision and change course here. And the State Water Board has the discretion to change course from the argument made in *Surfrider* so long as it is based on a reasoned analysis. And modifying the rule to ensure enforcement of the letter and intent of the Porter-Cologne Act is clearly needed and is clearly based on a reasoned analysis. Based on the draft Amendment, the mitigation required in the Poseidon-Carlsbad decision was inadequate because of flaws in converting the APF to wetlands restoration acreage (eg, it was not based on a 95 percent confidence interval) and the fact the wetlands restoration did not "replace" marine organisms. While the State argued in *Surfrider* that the mitigation plan was adequate to replace the marine life lost to the operation of the facility, and not "in lieu" of best available site, design and technology, it is clear now that the State's defense was factually and legally flawed. By not distinguishing the *Surfrider* decision, and changing the Amendment to fully enforce the Porter- Cologne mandates, the State Water Board will be codifying the decision and precluding future enforcement powers delegated to regional water boards. While it appears the Amendment is intended to strengthen enforcement to ensure future facilities are not permitted using the legal standards and logic used in a temporary permit for Poseidon-Carlsbad, it is difficult to see how the Carlsbad permit will not be the standard for all future seawater desalination facilities.	language follows from its subsequent judicial review, the analytical framework proposed would require a new and different evaluation.

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	The State Water Board has a critical decision to make. It is, in effect, a decision whether the Poseidon- Carlsbad facility constitutes the best available site, design, technology and mitigation feasible to minimize the intake and mortality of marine life. There are only 2 distinctions between the Poseidon-Carlsbad permit and what is allowed in the Amendment: the weak requirement to implement 1mm screens and the change in the APF confidence interval, accompanied by a provision to offset the mitigation by 1 percent to account for the unsupported value of the screens to minimize intake and mortality. Adopting the Amendment as currently drafted, with documented reliance on the *Surfider* decision, will effectively preclude the discretion the Amendment purports to grant regional water boards in future decisions.	
12.27	*The State Water Board's application of best available mitigation does not replace all forms of marine life* **(A)** The mitigation application is inadequate for both the impacts resulting from inferior intake site, design and technology, as well as for avoidable impacts from the chosen discharge technology. In both the intake and discharge, the Amendment inadequately explains the "replacement" value of out-of-kind mitigation projects. As noted above, there is no evidence in the SED that restoring freshwater or estuarine wetlands will result in replacement of benthic marine habitat or habitat values in the water column. And the Amendment compounds this error by allowing a 1:10 "mitigation ratio" based on production of wetland biomass. As discussed above, the volume or weight of biomass production in wetlands habitat, and its nexus to "replacement" of marine organisms or habitat, is not adequately explained in the Amendment or the supporting SED. Allowing a project proponent "replacement" credit that discounts the APF for marine species through restoration of out-of-kind habitat not only lacks any connection to the loss of habitat values and species that are affected, it exacerbates the problem. For example, anchovies are a species that spends much of its life migrating in the water column, and squid spend their lives in the benthos. Both anchovies and squid are commercially valuable species	**(A)** Avoidance of impacts is overall beneficial because it may prevent having to assess or mitigate for marine life mortality. However, in some cases, impacts will be unavoidable even after the best available site, design, and technology feasible are used. Even if a facility uses a subsurface intake (e.g. horizontal directionally drilled wells) and commingles the brine waste, there may be a need to mitigate for construction-related mortality. Section 8.5.2 of the Staff Report with SED explains that, "In general, in-kind mitigation to replace the lost resources with the same type of resource is typically preferred over out-of-kind mitigation. (Ambrose 1994)" However, it may not be possible, practical, or feasible to conduct a mitigation project for open water or soft-bottom habitats. For this reason, the proposed Desalination Amendment provides the regional water boards the discretion to approve out-of-kind mitigation. When a desalination facility entrains open water or soft-bottom species, creating, restoring, or enhancing a more productive habitat such as coastal estuarine habitat may result in a better overall mitigation project. Even though the organisms replaced would not necessarily be the same species as the organisms that were entrained, this approach would result in no net loss of biological productivity if the mitigation project is successful. Section 8.5.4.2 of the Staff Report with SED describes in detail the necessity for out-of-kind mitigation in some instances and how in some cases, out-of-kind mitigation can result in an overall better mitigation project.

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	– and both play a key role in the marine ecosystem. Anchovies are exposed to harm from the intake, and squid are exposed to harm from brine accumulating on or near the seafloor. But neither directly benefits from restoration of wetlands habitat. Whatever indirect benefits they may experience from wetlands restoration are certainly not sufficient to discount the APF calculation. Any "indirect benefits" of wetlands restoration projects (eg, water quality benefits to marine environments, improved prey species populations that enter the marine environment, etc) would argue for a multiplier in the wetlands area, not a discount. Further, once a determination is made for the intake, there is not enough on-going authority to ensure that the restoration project meets the productivity goals of "replacement" of marine species. The Amendment's definitions of "existing", "new" or "expanded" seem to suggest that any adopted mitigation plan for a defined intake volume is no longer open to improvements – including the Carlsbad and Huntington facilities, which were clearly miscalculated.	Neither the Staff Report with SED nor the proposed desalination Amendment includes "freshwater wetlands" in the list of acceptable mitigation habitats. Section 8.5.2 of the Staff Report with SED described appropriate kinds of out-of-kind mitigation and describes why mitigation of freshwater wetlands and other upstream mitigation strategies are not appropriate mitigation for impacts from seawater desalination facilities. See chapter III.M.2.e.(3)(b) of the proposed Desalination Amendment for a list of potential mitigation habitats. Coastal estuaries and wetlands are included as potential mitigation habitats because some of the entrained species may utilize these habitats at some point in their life. Many soft-bottom species use estuaries during part of their life, so estuary mitigation may be appropriate and not entirely out-of-kind. Appropriate mitigation options will be assessed by the regional water boards on a facility-specific basis to ensure an owner or operator fully mitigates for marine life mortality associated with the construction and operation of a facility. The proposed Desalination Amendment provides the regional water boards discretion to apply a mitigation ratio. The mitigation ratio is not based on the relative production of wetland biomass or automatically set at 1:10. But rather, chapter III.M.2.e.(3)(b)vi of the proposed Desalination Amendment requires an evaluation of the relative biological productivity of the impacted open water or soft-bottom habitat calculated in the Marine Life Mortality Report and the proposed mitigation habitat. The proposed mitigation habitat may be something other than coastal wetland habitat. The regional water board will assess the best available mitigation measures feasible including the types of mitigation projects and appropriate mitigation ratios if they determine out-of-kind mitigation is appropriate. The proposed Desalination Amendment also includes a requirement that "the mitigation ratio shall not be less than one acre of mitigation habitat for every ten acres of impacted open water or soft-bottom habitat." (e.g.1:20) However, nothing in the proposed Desalination Amendment prevents the regional water boards from establishing a mitigation ratio higher than 1:10, e.g. 1:1, 2:1 for out-of-kind

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		mitigation. The mitigation ratios cannot be arbitrarily established and the rationale must be documented in the administrative record for the permit action. Furthermore, the permits will undergo a public process where the mitigation ratios can be discussed and evaluated. The figure 8-7 in the Staff Report with SED was provided as an example. Impacts to soft-bottom and open ocean species will not automatically be mitigated through wetland mitigation projects. The regional water board will assess the best available mitigation measures feasible including the types of mitigation projects that are most appropriate for the species impacted. As mentioned above, conducting mitigation for open-ocean and soft-bottom species may be challenging, impractical, or not feasible. For this reason, the proposed Desalination Amendment allows consideration of out-of-kind mitigation to ensure that the best available mitigation measures feasible are used to mitigate for marine life mortality. The proposed Desalination Amendment does not require an owner or operator to mitigate for impacts that have already been mitigated. But, the proposed Desalination Amendment requires that, "The regional water board shall ensure an owner or operator fully mitigates for the operational lifetime of the facility and uses the best available mitigation measures feasible* to minimize intake and mortality of all forms of marine life.*" and "California Department of Fish and Wildlife, the regional water board, and State Water Board may perform audits or site inspections of any mitigation project." If a mitigation project is not meeting the performance standards, the regional water board can request corrective action and take enforcement action.
12.27	**(B)** Further, the Amendment does not ensure that the 2ppt limit at the edge of the mixing zone will not result in brine deposition on or near the seafloor, and migration beyond the zone of initial dilution (ZID) or "near field." The SED on page 85 explains: *"A facility's mitigation plan should capture the effects of Table 1 constituents. Additionally, brine discharges can result in anoxic or hypoxic zones, resulting in additional marine life mortality. Although the proposed Desalination Amendment requires consideration that brine discharges re designed to*	**(B)** These comments are addressed in Appendix I of the staff Report with SED. However, we have provided the responses here as well for your convenience. With regard to salinity, studies reviewed by the Expert Review Panel on Impacts and Effects of Brine Discharges (ERP I) described in the report titled "Management of Brine Discharges to Coastal Waters Recommendations of a Science Advisory Panel" SCCWRP Technical Report 694, March 2012 (http://www.waterboards.ca.gov/water_issues/programs/ocean/desalination/docs/dpr.pdf) coupled with the Hyper-Salinity Toxicity Thresholds for Nine California Ocean Plan Toxicity Test Protocols

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	prevent the formation of dense outfalls that cause anoxia or hypoxia when feasible, careful monitoring should be done to determine whether such anoxic or hypoxic events occur; any deaths resulting from anoxia should be fully compensated for to comply with Water Code sections 13142.5(b) and 13142.5(d)". There is no explanation why the SED was modified to strike the language that the Desal Amendment would "specifically prohibit" seafloor deposition. It is reasonable to assume that, because the 2ppt salinity limit at the edge of the mixing zone is still denser than ambient water salinity, it will continue to settle on the seafloor. Worse, if this seafloor deposition migrates beyond the area of initial dilution and the "near field" and goes unmonitored, it is almost certain that the mitigation project will be insufficient to replace the permanent habitat and species losses. Marine benthic habitat cannot be replaced by wetlands restoration. The expert panel recommended monitoring in the "near field" and the "far field" in recognition of this potential impact. Yet, the Amendment does not contain sufficient protections, nor mitigation, to ensure against on-going habitat degradation and cumulative losses of benthic species and migratory species inhabiting the water column outside the mixing zone. In contrast to the Amendment, the SED shows numerous examples of other countries requiring strict discharge limits. The SED cites countries that limit the discharge to 1 ppt at the edge of the mixing zone.164 Further review of the regulations in these other countries highlights strict monitoring of brine accumulation and requirements to immediately remedy the problem – not weak attempts to "mitigate" the impact through unproven and clearly inadequate out-of-kind mitigation. California should employ the "best" approach to minimize the intake and mortality of marine life, as well as impacts from inadequate brine dilution, rather than relying on restorative measures without any clear replacement value.	performed by the University of California, Davis (http://www.waterboards.ca.gov/water_issues/programs/ocean/desalination/docs/saltoxfr08012.pdf) suggest that 2 ppt would protect most organisms from salinity related effects. Properly designed multiport diffusers can rapidly mix brine with ambient waters within a relatively small area. Rapid mixing and dilution in the near-field environment reduces potential for far-field impacts. Note that a desalination facility will also have to meet all existing applicable requirements of the California Ocean Plan (Ocean Plan) in addition to those proposed in this amendment. The Ocean Plan includes a narrative objective that prevents degradation of marine communities and as a result, any change to biological communities caused by a brine plume *outside* the brine mixing zone will represent a violation of this narrative objective. These combined requirements are expected to limit any impacts to marine life outside the brine mixing zone. The Marine Life Mortality Report requires an assessment of all mortality associated with the intake of seawater, discharge of brine, construction of a facility, and any other marine life mortality associated with a desalination facility. Chapter III.M.2.a(1) of the proposed Desalination Amendment was revised to include that "The regional water board in consultation with the State Water Board staff may require an owner or operator to provide additional studies or information needed, including any information necessary to identify and assess other potential sources of mortality to all forms of marine life." Furthermore, there is a requirement that an owner or operator fully mitigate for mortality of all forms of marine life, which would include any far-field impacts. If there are impacts outside the brine mixing zone caused by the discharge of brine, the facility operators will have to implement corrective actions to ensure that those impacts are eliminated or minimized and mitigated. Please see response to comment SAS2 from Appendix I of the Staff Report with SED regarding the revision in section 8.5.1.2: "COMMENT SAS2 This comment also pertains to the text on p. 73 of the Staff Report

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		where “dense outfalls that cause anoxia” are not permitted. Revise this section to state that anoxic conditions are not permitted in the region influenced by a brine discharge outside of the mixing zone. Allow, however, for the plume to be negatively buoyant from the discharge to the far-field as would be the case for any discharge of elevated salinity (see, again, Figure 1 of the ERP III report). Several other parts of the Staff Report also refer to “near ambient” salinity, and on page 82, they characterize the discharged plume as non-buoyant outside the regulatory mixing zone. I point out that, without adding water with salinity below that of the intake, a brine discharge will remain with elevated salinity and negative buoyancy until achieving infinite dilution. Water can be added with salinity below that of the intake either through commingling or by discharging the brine in a coastal region with vertical salinity stratification such that upper layers of the water column have salinity below the intake value (see comments in the next section). However, neither of these conditions are required of all plumes; hence, the report should assume the plume may remain negatively buoyant and with elevated salinity (above background, but less than 2 ppt above background) outside the regulatory mixing zone for a long distance into the far field of the plume. Please see Figure 1 in the ERP III report for an experimental result showing the dense bottom plume exiting the near field. Throughout the ERP III report it is clear that the authors acknowledge that the final stage of the discharge will be a dense plume traveling along the bottom. The goal of the design should be that the dilution is adequate to prevent this plume from becoming a barrier between the benthos and the upper water column. This is achieved by requiring the plume to remain oxygenated throughout its trajectory. <u>RESPONSE SAS2</u> Section 8.5.1.2 of the Staff Report with SED was revised to clarify that the proposed Desalination Amendment requires consideration that the brine discharges should be designed to prevent the formation of dense plumes that result in hypoxia or anoxia when

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		feasible. We recognize that the plume may remain negatively buoyant and with elevated salinity (above background, but less than 2 ppt above background) outside the regulatory mixing zone for a long distance into the far field of the plume. Any adverse impacts associated with the dense plume that meets the receiving water limitation are addressed through existing provisions in the California Ocean Plan (Ocean Plan). The Ocean Plan includes a narrative objective that prevents degradation of marine communities and as a result, any change to biological communities caused by a brine plume outside the brine mixing zone will represent a violation of this narrative objective. In regards to hypoxia, chapters III.M2.c (4) and III.M.4.a of the proposed Desalination Amendment were amended to address this comment by adding requirement to consider the effects of hypoxia in the design and to monitor for potential impacts associated with hypoxia. Associated monitoring would consist of dissolved oxygen and benthic community health."
12.27	**(C)** As noted in our 2014 comments on "site, design and technology", the discretion allowed the regional water boards in determining the best combination of "site, design and technology" available, coupled with the broad and unacceptable definition of "feasible", allow project proponents to easily argue for screened open water intakes at a given site and capacity – and reliance on mitigation for all but one percent of the ETM/APF calculation. That is illegal "in lieu" mitigation. Decreasing the acreage of mitigation by one percent to compensate for any questionable benefits from intake screens is simply limiting the restoration area and replacement value in a way that undermines the increase in the confidence interval proposed in the Amendment. One percent is well within the margin of error in the APF calculation – which means the reduction of intake and mortality from employing screens is statistically insignificant, and meaningless in practice. More importantly, an adjustment to the APF of one percent, especially given the combination of habitat types in calculating the APF, effectively ensures no replacement of some species and habitats. This is	**(C)** Please see response to comment 7.24.

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	especially true when the mitigation is "out-of-kind" for the habitat and species affected.	
12.27	**(D)** The "APF" referred to in the mitigation section is the result of calculating several "species specific" APFs in the source water body, and then combining them to arrive at an "average" APF for all species and habitats. Averaging has the effect of discounting some species-specific habitats and increasing other species-specific habitats. The Amendment makes a distinction of what habitats should be mitigated by "in-kind" or "out-of-kind" restoration. However, it is not clear whether those will be based on the "species-specific APFs" or some other way to define and calculate the distinct habitats affected and the preferred restorative measures. It should be noted that "creating" in-kind habitat in the marine environment has the perverse effect of eliminating other habitats. For example, if a project proponent offers to build artificial reefs to replace the species lost from that habitat type, they will bury soft sandy habitat and compound the loss of species residing or recruiting into adulthood from that habitat type. If artificial reefs are created to replace any marine species, the creation of wetlands habitat would arguably have to increase beyond what is calculated in the APF if it is to fully compensate for the additional loss of soft habitat for mitigating the impacts inherent in creating artificial reefs. Again, if the wetlands acreage is discounted for increased biomass production (rather than multiplied to account for minimal indirect benefits), then the restorative measures fail to replace "all forms of marine life." These complicated and inexact calculations for restorative measures highlight the reasoning behind the *Riverkeeper* court's decision that after-the-fact restorative measures are not only legally flawed, they are unreliable and ineffective in practice.	**(D)** The 95th percent confidence level is included to significantly address concerns associated with using the average APF. For more information please see section 8.5.4.1 of the Staff Report with SED. The regional water board will look at the list of species in the Marine Life Mortality Report and determine the habitat-type that would provide the best available mitigation feasible for those species. Table 8-4 of the Staff Report with SED includes an example mitigation calculation of how the APF could be broken down by habitat-type; however, this is an example only and the regional water boards will determine what is best for a facility's impacts. The applicability of *Riverkeeper* and after the fact mitigation is also discussed extensively in Appendix H, responses to comments 21.32, 21.35, 21.54, 21.74, 21.75, 21.86 and 21.87. While the State Water Board has discretion to consider issues and information used and considered in regulating power plants and in developing the OTC Policy, California case law is clear that Water Code section 13142.5(b) is not controlled by federal case law interpreting Clean Water Act section 316(b). *Surfrider*, 211 Cal.App.4th 557, 578 – 581. Restorative measures have specifically been found consistent with the meaning of "mitigation" as set forth in Water Code section 13142.5(b). 211 Cal.App.4th at 581. The record amply supports the analytical framework developed to consider the best collective set of measures to minimize intake and mortality of all forms of marine life.
12.28	*The State Water Board must ensure mitigation applies to Conditionally Approved Permits* It is our understanding that currently there are two conditionally approved permits; each is proposed to be co-located with coastal power	Chapter III.M.2.e.(7) of the proposed Desalination Amendment allows the regional water board to use their discretion when making a new 13142.5(b) determination and determine whether or not mitigation requirements have been met for an expanded or conditionally-permitted desalination facility, or if additional mitigation

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	plants. And both are permitted to withdraw specific volumes of water (approximately 300mgd and 127mgd respectively) for "source water" and "in-plant dilution" -- regardless of the volume withdrawn or discharged by the co-located power plant. Both permits require the owner- operator to submit an application for a new permit, requiring a new 13142.5(b) analysis, when the power plant quits withdrawing seawater. The Carlsbad permit included mitigation that was calculated for the entire 300mgd and that wetland restoration project is, at least, in the planning process. The Huntington Beach permit includes mitigation allowances granted to the co-located power plant by the California Energy Commission. Neither of these mitigation projects meet the standards in the Amendment. In regards to the mitigation provisions, the draft rule, at section 2 (e)(7), provides that: *For conditionally permitted facilities or expanded facilities, the regional water boards may:* a) *Account for previously-approved mitigation projects associated with a facility when making a new Water Code section 13142.5(b) determination.* b) *Require additional mitigation when making a new Water Code section 13142.5(b) determination for any additional mortality of all forms of marine life resulting from the occurrence of the conditional event or the expansion of the facility. The additional mitigation must be to compensate for any additional construction, discharge, or other increases in intake or impacts or an increase in intake and mortality of all forms of marine life.* Therefore, the Amendment carves out an exemption for expanded facilities in the mitigation requirements. That exemption allows that: the Regional Board "may …account for previously-approved mitigation projects." In the two Poseidon permits, that previously-approved mitigation would cover the total volume of product water and additional water withdrawn for in-plant dilution – regardless of any power plant withdrawal of seawater.	is required. Disagree with the contention that chapter III.M.2.e.(7) of the proposed Desalination Amendment carves out an exemption for expanded facilities in the mitigation requirements. That amendment language requires the regional water board's discretion as to whether or not additional mitigation is required to account for new impacts. An owner or operator does not have to mitigate for impacts that have already been mitigated for. However, if the regional water board determines the initial mitigation project did not fully mitigate for mortality of all forms of marine life (e.g. unsuccessful mitigation project) or will not fully mitigate for the increased intake and mortality resulting from the expansion or new operating conditions, it can decide that an existing mitigation project does not meet the mitigation requirements in the new Water Code 13142.5(b) determination or that additional mitigation is needed. Disagree with the contention that the proposed Desalination Amendment eliminates the conditions in the permit requiring a new and thorough Water Code 13142.5(b) determination once a triggering event occurs, such as a power plant ceasing to withdraw seawater. Nothing in the proposed Desalination Amendment limits the scope of a new Water Code 13142.5(b) determination for expanded or conditionally permitted seawater desalination facilities (i.e. nothing in the proposed Desalination Amendment limits evaluating the best available site, design, technology, and mitigation measures feasible for an expanded or conditionally permitted facility). In some cases, it may be not feasible to move the entire facility to a new site. But we cannot assume moving a facility to a new best available site will be not feasible in all future cases. Furthermore, in the case of expansions, a facility may need to explore other siting opportunities if the facility is space limited. In the new 13142.5(b) determination, the regional water boards may determine there are design and technology upgrades for an expanded or conditionally permitted facility. For example, the regional water board may find a facility needs to upgrade their intake technology or evaluate the feasibility of subsurface intakes. In some

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	Or, the Regional Board "may" add to the mitigation for additional intake and mortality resulting from the occurrence of the conditional event or from expansion. But the additional mitigation "must be to compensate for any additional construction, discharge or other increases in intake or impacts or an increase in intake and mortality of marine life." Certainly in the case of Carlsbad, the Regional Water Board would arguably be precluded from requiring additional mitigation because at the time of the occurrence of the conditional event, the construction impacts will have already occurred and the volume of seawater withdrawn will not increase from what was already contemplated and approved in the NPDES permit. Similarly, the Huntington Beach mitigation provisions in the conditional permit would already cover all but the construction impacts. The State Water Board defines these facilities as "conditionally-approved and expanded", but then eliminates the conditions in the permit requiring a new and through 13142.5 review and approval once the power plant ceases withdrawing seawater. That is, if there is no possible review of alternative sites and designs because of the already completed construction, and review of alternative intake technologies at that site, and with that design capacity, have already been determined to be not feasible under the *Surfrider* decision, then the only thing left to review in accord with the permit conditions is the mitigation provision – and that is not required in the draft Amendment provisions for mitigation.	cases, desalination facilities were built more than 20 years ago and an expansion of a facility is one of the few opportunities for the regional water boards to require upgrades for intake technology for previously-approved desalination facilities with appropriate statutory determinations because of the limiting scope of Water Code section 13142.5(b). Finally, please see the first two paragraphs of this response regarding mitigation at an expanded or conditionally permitted seawater desalination facility.
12.29	*The State Water Board must clarify the connection of mitigation and the Intake/Discharge connection.* Amendment Section III.M.2.e is written to describe mitigation in the context of one of the elements to minimize the intake and mortality of all forms of marine life enumerated in Water Code 13142.5(b). However, it includes provisions for mitigating or replacing loss of marine life or habitat from poorly functioning brine disposal. Water Code 13142.5(b) has been read to apply only to "new and expanded facilities" withdrawing seawater for cooling and other industrial facilities, and is therefore not enforceable for facilities that are	This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf). Nevertheless, the proposed Desalination Amendment does not conflict with requirements in the Clean Water Act or other sections of the Water Code. While the "technology-forcing" aspects of the Clean Water Act apply to discharge limitations affecting water quality, the commenter seeks to apply "technology-forcing" requirements to intakes, on the basis that use of flow augmentation uses the intake as part of the discharge. The theory appears to be that use of the intake for dilution of brine prior to disposal should be either subject to broader Clean Water Act

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	"existing" – that is, facilities that have been permitted and constructed without conditions. However, the discharge is regulated under separate and distinct provisions in the Clean Water Act and Porter-Cologne Act. The State Water Board confirms that the term "best technology available" in the Clean Water Act is read to implement a "technology forcing" policy. That is, as technologies are developed to improve the goal of protecting the environment, the facilities must be modified to include those technologies. However, the State Water Board argues that the Water Code cannot be read to implement a "technology forcing" policy because enforcement is limited to "new" facilities (the implication is that "expanded" facilities can be required to update technology when it is available). However, the Amendment contemplates "augmented intake for in-plant dilution" – a provision that blurs the distinction between when a facility must be updated to comply with the "technology forcing" policy in the law, and when it is not required to update because it is not "new or expanded." The Amendment needs to clearly state that any site, design and technology determinations for a project that employs the intake as part of the discharge technology is subject to regulation under the relevant authority in the Clean Water Act and Porter-Cologne Act for protecting the marine environment from water quality degradation.	authority or should be interpreted to extend Water Board authority beyond the "new or expanded" limitations set forth in the Water Code provision. While the argument is somewhat unclear, it is unnecessary to resolve it. The proposed Desalination Amendment addresses alternative brine disposal technologies, including flow augmentation, as part of a Water Code section 13142.5(b) determination, requiring that an owner or operator demonstrate that the alternative technology provides a comparable level of intake and mortality of all forms of marine life as wastewater dilution if wastewater dilution is available, or multiport diffusers if wastewater is unavailable. That requirement will apply for any new or expanded seawater intake when a request for a Water Code section 13142.5(b) determination is made. An existing, conditionally permitted facility is governed by the Water Code section 13142.5(b) determination and conditions set forth in the prior permit until such time as any triggering condition requires re-evaluation.
12.30	*The best available mitigation should reflect the proper guidance for calculating a desalination facility's impacts.* It is critical that the mitigation fee calculation be done accurately given the State Water Board's over- reliance on the use of a mitigation. The Amendment states that: *Mitigation shall be accomplished through expansion, restoration or creation of one or more of the following: kelp beds, estuaries, coastal wetlands, natural reefs, MPAs, or other projects approved by the regional water board that will mitigate for intake and mortality of all forms of marine life* associated with the facility.* The State Water Board goes on to state that the mitigation acreage	This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf). Nevertheless, comment noted.

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	should be determined using a ETM/APF analysis. It is important that the mitigation requirements: • Provide incentives to reduce impingement and entrainment; • Pursue scaled compensation to address losses; • Provide a clear compensation story; • Define the nature of the impingement and entrainment losses over time; • Define the benefits of different restoration actions; • Scale so benefits offset losses; and • Require additional restoration for uncertainty. There are multiple potential sources of uncertainty in the ETM-APF approach including: • Information used to calculate APF • Knowledge of habitat composition in the Source Water Body • Performance of restored habitats to complete scaling There are some options for responding to uncertainty including: Evaluating the confidence limits in selecting ETM/APF data inputs; establishing a limited number of consistent habitat categories to help characterize for source water bodies and restoration opportunities; Ensuring monitoring is sufficient to provide the information needed to better inform decisions; considering cumulative uncertainty adjustments (e.g., a APF scaling factor from 1-5) and incorporating the nature, extent, and timing of impacts from impingement and entrainment measured as APF; and restoration performance to determine required the restoration scale. In practice, even with well-defined habitat categories, it is possible that restoring habitats could produce a mix of species that is different from those originally lost. Multiple factors could affect how closely production from a restored habitat matches estimated I&E losses (e.g., proximity of restored and affected habitats). Monitoring of the restored habitat would provide the information needed to inform such comparisons. Habitat Equivalency Analyses (HEA) or Resource Equivalency Analyses (REAs) needs to be done for proposed mitigation analysis. Project proponents should be required to develop restoration scaling scenarios	

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	using the results of the Habitat Equivalency Analysis framework based on the impact of the impingement and entrainment and the impact of the proposed restoration. The scaling should assume differences in periods for restorations to meet maturity and that benefits will accrue over different periods. Different combinations of service ramp ups, final service levels, and years assumed for the benefits accrual from a typical unit of effort for a restoration project (e.g. a restored acre) can result in very different estimates of the required restoration acreage to address calculated impacts. Restoration costs need to be comprehensive and account for: • Design • Permitting • Land acquisition • Construction • Operations and Maintenance • Supervision and Oversight Available cost estimates rarely cover all these areas. Adjusting costs to a common base year is standard economic practice. Results are then adjusted to form the base using annual values from the Consumer Price Index. Alternative indices are available that provide a more local/regional assessment of general price trends or trends for specific markets or goods and services. Depending on the year of the original estimates, this adjustment to a common year can have a significant impact on results. Amendment Section III.M.2 (e) is clearly flawed and needs significant modification to meet the goal of ensuring minimization of all forms of marine life. However, more importantly, these flaws highlight the importance of minimizing the harm in the first place before resorting to nearly impossible attempts to replace species in a complex and poorly understood marine ecosystem. Unfortunately, we now know from experience that if the elements of site, design and technology are not combined with the very strict intent to minimize intake and mortality, facilities will continue to be permitted with nearly complete reliance on unreliable mitigation projects that fail to restore “all forms of marine life” lost to poorly sited and designed facilities using far “less than best”	

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	intake and discharge technologies. Inexplicably, with the benefit of experience from flawed conditional approvals for the Poseidon-Carlsbad and Poseidon-Huntington project proposals, the Amendment has not corrected the mistakes of the past, but nearly ensured those mistakes will be repeated.	
12.31	The Amendment provides guidance on how an agency shows "need" for the volume of water produced by the proposed facility. We disagree with the placement of this guidance in the sub-section on "site." Further, we disagree with the reliance on the list of water planning documents that are used to show "consistency" with the proposed desalination production capacity. Finally, we offer a seawater desalination project currently under consideration as an example of how "need" is used to ensure a desalination facility is designed to minimize the intake and mortality of marine life.	This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts. The demonstration of need under the siting section was in the chapter III.M.2.b (site) of the July 3rd, 2014 draft of the proposed Desalination Amendment. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf) and the Staff Report with SED. However, the specific comments regarding need are addressed in subsequent comments below.
12.32	*A design capacity in excess of the identified regional water need for desalinated water shall not be used by itself to declare subsurface intakes as infeasible.* In the initial Desalination Amendment, the policy stated in Section M.2(c) that a "design capacity in excess of the identified regional water need for desalinated water shall not be used by itself to declare subsurface intakes as infeasible." There is no legitimate reason for deleting that language, and without inclusion of that language, the entire consideration of "need" in determining how best to minimize the intake and mortality of marine life is undermined. The language should be re-inserted in the Amendment Section M.2(c) ["design']. We appreciate that the State Board feels constrained from dictating water supply management decisions made by local agencies. However, as discussed above in Section V, the State Board cannot sacrifice the duty to ensure proposed facilities are "designed" to minimize the intake and mortality of marine life. Unfortunately, the definition of "need" in the Amendment fails to clearly link water supply alternatives in a way that ensures desalination facilities are the best site, design and technology to minimize intake and mortality. The flawed logic in allowing need to	This comment was previously addressed in the responses to comments in in Appendix H of the Staff Report with SED. Nevertheless, the double green strikeout denoted that the language was moved, not deleted. The language was moved to chapter III.M.2.d.(1)(a). Please see response to comment 15.26 in Appendix H of the Staff Report with SED. As stated in response to comment 18.14, the need for desalinated water must be considered in the context of minimizing intake and mortality of all forms of marine life per Water Code section 13142.5(b). Please see response to comment 18.14 in Appendix H of the Staff Report with SED for a more detailed explanation of the inclusion of need for desalinated water in the siting and design section.

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	dictate feasibility is: neither has anything to do with Water Code enforcement; and, need can be easily manipulated to meet a project proponent's "wants" not their "needs." The Amendment places the consideration of "need" in the sub-section on best "site" available to minimize the intake and mortality of all forms of marine life. It is unclear how the need for a facility has anything to do with the site chosen. In fact, given the abundance of infrastructure for moving potable water around regions of the State, and the abundance of law allowing transfer of water from jurisdiction to jurisdiction, the "site" of a desalination facility to provide water supply benefits to a local area can be well beyond the boundaries of that service area. But more importantly, the Amendment has been amended to clarify that the "design" of a facility includes the size and intake capacity. We thank and applaud the State Water Board for the change. The Amendment and SED clearly identify subsurface intakes as the best technology, the remaining questions only require determining the best site and design capacity that are consistent with the output of sub- surface intakes.	
12.33	*Adopted Water management plans are inadequate for defining "need" under Water Code 13142.5(b).* County general plans, urban water management plans and integrated regional water management plans are adopted without any consideration of minimizing the intake and mortality of all forms of marine life. The revised Amendment's allowance of "other water planning documents" if these plans are unavailable just exacerbates the problem and allows project proponents to create some nondescript planning document to justify unlimited reliance on desalination facilities. These planning documents are inadequate for consideration of alternative desalination design production capacities that, in combination with best site and best technology, will minimize the intake and mortality of marine life. As briefly noted above, to the extent a local planning document may identify a "need" for a desalination facility, it is not necessarily determinative of a site that is best for minimizing intake and mortality of marine life – sites for desalination facilities outside the	Please see response to comment 12.32 above why the need for desalinated water is considered in the proposed Desalination Amendment. Please see comment and response to comment 14.8 regarding why an owner or operator must use an urban water management plan if available, or other planning document if an urban water management plan is unavailable.

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	jurisdiction of a local agency may be feasible for supplementing a local water supply portfolio. Describing the "need" for a desalination facility by consistency with an adopted water supply planning document is resorting to an analysis that has little or nothing to do with minimizing the intake and mortality of marine life. The Amendment effectively delegates the State Water Board's duty to enforce the Porter-Cologne Act to local water agencies.	
12.34	*The State Water Board should look at California examples of how best to determine need for a desalination facility that is consistent with Water Code section 13142.5 (b).* It is not necessary for the State Water Board to consider the Amendment in the abstract. The California Public Utilities Commission is currently considering certification of the CalAm Monterey desalination facility proposal. In contrast to the consideration of "need" in the Poseidon-Carlsbad proposal, the CPUC is weighing different design capacities for the desalination proposal in consideration of whether part of the "need" can be met with expanded recycled wastewater. And this consideration is independent of a county general plan or any water planning document. In Carlsbad, the Regional Board approved a project that resulted in construction of a facility reliant on a surface intake of 300 million gallons of seawater for combined "source water" and augmented intake for in-plant dilution. That the decision was allowed by the courts because the Regional Board was allowed broad discretion to enforce Water Code section 13142.5(b). The Amendment not only allows similar decisions in the future, it makes the decision a likely outcome of other desalination projects on the horizon. In contrast, the CPUC is awaiting confirmation of whether recycled water will be added to the water supply portfolio before certifying a production capacity. And the design capacity is limited to relatively strict projections of future demand – in fact it is the result of down-sizing the local portfolio in order to restore flow volume in the Carmel River.	Comment noted.

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	In brief, the Poseidon-Carlsbad facility was permitted to use the worst possible technology for minimizing the intake and mortality of all forms of marine life based in large part on reliance on the "need" identified in the goals of water planning documents. In contrast, the CalAm Monterey project will likely be approved for a design capacity and site that are consistent with subsurface intakes and a co-mingled wastewater discharge of brine diffusers if the wastewater is used for recycling. It is ironic that the result of planning and certification of the CalAm Monterey project to ensure against unnecessary rate increases is resulting in a project that fully enforces the Water Code, while a decision by a regional water quality control board resulted in approval of a project that clearly doesn't minimize intake and mortality of marine life – all based in how the supposed "need" precludes otherwise feasible alternatives. We request the State Water Board use the CalAm example as a model for putting limits on the use of "need", to ensure project proponents do not evade the requirements of best available site, design, and technology.	
12.35	*The best available site is one that accommodates subsurface intakes.* The Amendment should state that the "site" of a facility is "best" if it is compatible with the installation of a subsurface intake. Infiltration galleries can be sited in areas where there is enough open sandy-bottom habitat to accommodate the size of a gallery or multiple galleries. And while some places are preferable for reducing potential maintenance and repairs, areas where a gallery can be constructed are readily available statewide, and any gallery (regardless of maintenance and repairs) is the "best" for minimizing the intake and mortality of all forms of marine life. What is optimally "feasible" is the best for minimizing the intake and mortality of all forms of marine life, and any unavoidable maintenance and repairs does not render a site infeasible. To be consistent with the Amendment's directive that the elements of section 13142.5(b) be considered individually and in combination, the best technology needs to be considered in combination with the best available site. And if that combination is to collectively achieve the goal	This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf). This comment is addressed in the response to comments in Appendix H of the Staff Report with SED.

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	of minimizing the intake and mortality of all marine life, these elements need to be compatible – they must work together to achieve the goal.	
12.36	*The best available site should ensure no subsurface intake associated impacts to Marine Protected Areas or Areas of Special Biological Significance.* In 2012, California finalized the nation's first science-based network of marine protected areas (MPAs). These areas, which cover 16 percent of state waters, were created to safeguard marine life and habitats, improve educational and recreational opportunities, and preserve California's natural marine heritage for generations to come. The state's MPA network is a result of significant social and financial investment by a broad and diverse constituency including state agencies, local communities, fishermen, researchers, tribes, philanthropic foundations and environmental organizations. Lasting success of these protected areas depends on successful implementation and management, including an ongoing commitment by state agencies to protect MPA resources in their policy and decision-making. The goals of the MPA network are closely aligned with the State Water Board's mandate to protect beneficial uses of ocean waters, including recreation, aesthetic enjoyment, preservation and enhancement of designated Areas of Biological Significance (ASBS), marine habitat and fish spawning. Adopting a Desalination Amendment that protects important marine ecosystems within MPAs and State Water Quality Protected Areas (SWQPAs) will have a dual benefit of helping realize the full potential of the state's MPA network and assisting the State Water Board in better meeting its mission to preserve, enhance and restore California's water quality for present and future generations. To that end, we were generally pleased with the protective language in the previous version of the initial Amendment as it related to siting intake and discharge structures in or near MPAs. However, we have several concerns about the revisions made to Section M.2.b.7 regarding siting of subsurface intake structures in MPAs and discharge impacts to MPAs, as described below.	Chapter III.E.5.(d)(2) of the Ocean Plan includes Implementation Provisions for New Discharges and guidance for new seawater intakes. This section of the Ocean Plan prevents any new surface water seawater intakes from being established in a State Water Quality Protection Area-General Protection(SWQPA-GP), with the exception of subsurface intakes with no predictable operational or construction-related mortality: *"No new surface water seawater* intakes shall be established within an SWQPA-GP. This does not apply to subsurface* ~~seafloor~~ intakes where studies are prepared showing there is no predictable entrainment, ~~or~~ impingement, or construction-related ~~of~~ marine life mortality."* It is highly unlikely that an open-ocean intake would be suspended above the seafloor because such a design would present significant engineering challenges and a significant navigational hazard. However, chapter III.M.2.b.(7) was revised as follows in order to make clear that the only seawater intakes that should be permitted in a Marine Protected Area (MPA) or SWQPA should present no operational, maintenance, or construction-related marine life mortality: *"Ensure that the intake and discharge structures are not located within a MPA or SWQPA* with the exception of intake structures ~~without~~ that do not have marine life mortality associated with the construction, operation, and maintenance of the intake structures ~~-related marine life mortality~~ (e.g. slant wells)."*

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	The revised Amendment includes new language that allows the installation of intake structures within MPAs or SWQPAs if such structures will not result in any "associated construction-related marine life mortality (e.g. slant wells)." We understand the intent of this language and believe that MPA/SWQPA designations should not preclude the use of subsurface technologies that will avoid *all* impacts to marine life and habitats, such as slant wells, if there are no other feasible locations for subsurface intakes available. However, the language as written, does not prohibit construction-related impacts to marine *habitats* in MPAs or SWQPA, nor does it prohibit the use of surface technology that could impact marine life as a result of ongoing *operation* (versus construction). The Amendment requires projects to "[e]nsure that the intake and discharge structures are not located within a MPA or SWQPA.* with the exception of *intake structures* without associated construction-related marine life mortality (e.g. slant wells)." The State Water Board needs to be explicit that the exception only relates to subsurface intakes. As written, the Amendment could theoretically allow for an open-ocean intake to be lowered into the water column and suspended above the seafloor, avoiding all construction-related marine life mortality while causing significant *operational* impacts to marine life through impingement and entrainment. Future technology may also have the potential to meet the criteria of avoiding construction-related impacts but still result in adverse effects to MPA resources from continued intake operation. To avoid what we believe are unintended consequences of the language as written and to ensure protection of marine habitats within MPAs, we suggest the first portion of section M.2.b.7 be revised to read: "Ensure that the intake and discharge structures are not located within an MPA or SWQPA. *Subsurface* intake structures shall only be allowed within an MPA or SWQPA if no other locations are feasible for subsurface intakes and all construction, operation, and maintenance-related marine life mortality and marine habitat impacts are avoided."	
12.37	*The best available site should ensure no discharge associated impacts*	The scope of the proposed Desalination Amendment is limited to the

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	to Marine Protected Areas or Areas of Special Biological Significance. The initial Amendment included precautionary language requiring that discharges be sited at "a sufficient distance from an MPA or SWQPA *so that there are no impacts from the discharge on an MPA or SWQPA* and so that salinity within the boundaries of an MPA or SWQPA does not exceed natural background salinity (*emphasis added*)." The revised policy language removes the prohibition of *any* discharge impacts on MPAs or SWQPAs and limits the criteria for avoiding impacts from discharges to salinity only. While salinity and brine dilution levels are a primary concern, impacts of chemicals used in the desalination process as well as thermal effects from co-located discharges also need to be evaluated and harmful impacts to MPA resources avoided. As noted on pages 137 – 139 of the SED, a variety of chemicals including coagulants, biocides, and cleaning in place (CIP) liquids, are used to pretreat seawater and de-foul reverse osmosis membranes as part of the desalination process. When discharged to the ocean, these chemicals can be toxic to marine organisms, even at low concentrations. Furthermore, the temperature of discharge waters may result in thermal impacts, with brine that is warmer *or* cooler than receiving waters depending on the method of salt extraction and water source for brine dilution. We understand that the State Water Board believes the Ocean Plan's toxicity requirements are sufficient to adequately address impacts of chemical discharges from desalination facilities. However, given the toxicity of desalination chemicals to marine life and potential effects from thermal differences between discharge and source waters, we believe the desalination amendment should explicitly prohibit *any* discharge-related impacts in protected areas, not just those resulting from changes in salinity. We urge the State Water Board to <u>revert to the originally proposed language in section M.2.b.7</u> that states: "Discharges shall be sited at a sufficient distance from a MPA or SWQPA <u>so that there are no impacts from the discharge on an MPA or SWQPA</u> and so the salinity within the	receiving water limitation for salinity. However, if the proposed Desalination Amendment is adopted, it would not negate other portions of the Ocean Plan (e.g. chapter III.E Implementation Provisions for Marine Managed Areas) or other potentially applicable plans and policies (e.g. Thermal Plan). Please see response to comment 26.2 in Appendix H and section 8.8 of the Staff Report with SED regarding the decision to have the regional water boards continue to regulate chemicals associated with the desalination process (e.g. antiscalants, biocides) in individual NPDES permits rather than address them on a statewide level. The original "no impact' standard was revised to require that brine discharges do not result in salinity within the boundary of a MPA or SWQPA from exceeding natural background salinity. Again, the scope of the proposed Desalination Amendment is limited to addressing the prevention of negative impacts to beneficial uses associated with elevated salinity. Please also see response to comment 6.4 in Appendix H of the Staff Report with SED regarding the language change in chapter III.M.2.b.(7). The current language in the proposed Desalination Amendment includes clear requirements for avoiding intake and discharge-related impacts in MPAs and SWQPAs. Applicable portions of other sections of the Ocean Plan and other plans and policies will still apply to seawater desalination facilities and be incorporated in their NPDES permits.

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	boundaries of a MPA or SWQPA does not exceed natural background salinity." Furthermore, the State Water Board should establish thresholds for temperature and chemicals such as coagulants and anti-foulants, which can be used to determine whether discharges are having any impact on protected areas. Long before the passage of the Marine Life Protection Act, the State Water Board took a leadership role to safeguard areas in the ocean that required special protection through the designation and management of ASBSs. Many of the state's ASBSs overlap with or are adjacent to MPAs and will soon be complimented by new designations of State Water Quality Protected Areas (General Protection). Because degraded water quality has the potential to threaten marine life and impede the recovery of ecosystems in areas set aside for protection, we urge the State Water Board to adopt a Desalination Amendment that includes clear requirements for avoiding intake and discharge-related impacts in MPAs and SWQPAs.	
12.38	*The Best Available Site should prevent waste discharge impacts to marine habitat and marine life.* Reverse osmosis is the only seawater desalination technology being considered in California at this time. It uses high pressure to force water across a semi-permeable membrane to separate seawater into two parts; potable water and hypersaline brine. Because brine retains all the salt from both parts, elevated salinity levels result. Desalination plants are tasked with managing brine, which can be expensive and burdensome - it is common for plants to discharge it back into the sea. When brine is poorly managed and discharged offshore into conditions unsuitable for oceanic mixing, it sinks and settles over the bottom. There, it can persist over long periods of time. Nowhere in the Desalination Amendment are site-specific conditions suitable for mixing referenced or even mentioned. Conditions which influence oceanic mixing need to be identified in the Desalination Amendment. Large volumes of brine discharged into coastal waters with poor circulation will create a worst-case scenario in the marine environment; these scenarios need to be identified and eliminated.	This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf) and the Staff Report with SED. Nevertheless, chapter III.M.2.b requires an owner or operator to analyze site-specific conditions (e.g., chapter III.M.2.b.(5), oceanographic, geologic, hydrogeologic, sea floor topographic conditions) and the feasibility of avoiding impacts to sensitive habitats and species. Regarding the statement that "For the Desalination Amendment to be most protective of marine organisms while simultaneously creating water supply benefits, collaboration between all stakeholders and agencies on site location needs to take place," the proposed Desalination Amendment serves as the framework and provides general statements and direction for protecting beneficial uses. The regional water boards will analyze and consider site-specific conditions in the implementation of the amendment, if adopted. The Water Boards intend to work collaboratively with other agencies having the authority to condition approval of the projects as stated in

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	Site selection for desalination facilities and their brine discharge locations are influenced heavily by existing infrastructure, such as co-locating with wastewater treatment facilities. Currently constructed offshore discharge locations once used by coastal power plants and wastewater treatment plants are believed to be adequate sites for brine disposal, even though oceanic conditions are not known to be suitable for brine mixing and dispersal. For example, in Monterey Bay a single wastewater treatment facilities discharge location, 2 miles offshore, is being considered by at least two competing desalination facilities. According to one project's environmental impact report, "[n]o ocean current velocity data have been identified in the immediate vicinity of the diffuser."172 Thus brine behavior upon discharge cannot be realistically modeled. Furthermore, suggestions during public meetings that the outfall be modified by adding high velocity diffusers has been strongly challenged by those who voice great concern against any further added costs. When siting desalination facilities, it is important to consider all facility impacts. Co-locating with existing infrastructure should not overlook sound scientific justification for facility location. As identified above, further study is necessary to identify in sites with existing infrastructure are capable of supporting desalination facilities intakes and discharges. The Desalination Amendment states that "[f]or each potential site, in order to determine whether a proposed facility site is the best available site feasible to minimize intake and mortality of all forms of marine life, the regional water board shall require the owner or operator to…". Although the Desalination Amendment requires owners or operators to analyze seven conditions to identify sites most suitable for desalination facilities, it fails to identify how facilities will make these determinations. In addition, it fails to identify resources to aid facilities in making these decisions. The State Water Board and regional water boards need to work with desalination facilities and stakeholders to help identify locations that will minimize marine impacts. For example, the Desalination Amendment includes: "Consider whether subsurface intakes are feasible" and "analyze the feasibility of placing intake, discharge, and other facility infrastructure in a location that avoid impacts to sensitive habitats and sensitive species". The State	the third project goal. Finally, the project level CEQA analyses and NPDES permits for the facilities undergo a public process where stakeholders can engage and provide feedback to ensure beneficial uses are adequately protected.

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	Water Board and/or regional water boards with the help of resource protection agencies, stakeholders, and academia need to collaborate to identify locations throughout the state that are suitable for subsurface intakes as well as locations that are not suitable because of sensitive habitats and species. Without collaboration between State Water Board, regional water boards, stakeholders, etc., determination of sites which minimize intake and mortality of all forms of marine life are interpreted differently at each site and subjective to facility interpretations. Furthermore, most information required for site-specific limitations, geology, habitat, and species composition, is readily available and would not require extensive resource requirements to create. For the Desalination Amendment to be most protective of marine organisms while simultaneously creating water supply benefits, collaboration between all stakeholders and agencies on site location needs to take place.	
12.39	*The State Water Board should protect economically valuable species from brine toxicity.* California's market squid, *Doryteuthus opalescens*, are an economically valuable species for fishers and are ecologically important to the ocean ecosystem. Not only is this species one of California's most valuable fisheries, it is also a foundation species in the offshore food chain. Market squid use the sandy seafloor for egg nurseries. Thus, the potential for brine to settle over these nurseries is of great concern. In the Monterey Bay, squid comprise a commercial fishery. It is known that elevated salinity has its greatest effect on embryos and early life stages. Unfortunately, brine toxicity studies on growth, development, and reproduction of *D. opalescens* have not been done. In addition, baseline spatial surveys of squid nurseries near proposed brine outfalls have not been completed. Brine discharges from desalination facilities have the potential to significantly alter squid nurseries not only the initial zone of dilution, but also near- and far-fields. However, these significant environmental and economic impacts are not being addressed and desalination facilities are moving forward towards construction. Proper siting of desalination facilities is essential to protect not only the coastal ecosystems, but also industries which rely upon	Comment noted. The proposed Desalination Amendment includes requirements to avoid impacts to sensitive species and sensitive habitats, including market squid and market squid nurseries.

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	them.	
12.40	*The State Water Board should consider policy implications when regulating brine disposal.* Clearly the best method for dilution of the brine discharge to ensure against impacts to marine life, marine habitat and water quality degradation is to commingle the desalination waste with wastewater treatment plant effluent prior to discharge. However, from a policy perspective, it makes little sense to use wastewater to dilute brine prior to discharge. Recycled water is a precious resource that needs to be exploited whenever feasible – using treated wastewater to mix with brine does not offset regional potable water supplies. In fact, mixing treated wastewater with brine may actually decrease potable water supplies if indirect potable re-use or direct potable re-use planning is taking place. Desalination facilities which use treated wastewater may disincentive future direct and in-direct potable re-use opportunities and implementation. If the intent of seawater desalination is to create a new, reliable source of potable water, using treated wastewater to dilute brine should be avoided. Water Code Section 13142.5 (e)(1) clearly identifies recycled water as an important resource to supplement potable water supplies. Brine mixing should not rely on freshwater supplies, no matter what the freshwater chemistry. Thus, using treated wastewater to mix with desalination brine is not an appropriate use for recycled water, and we request that it not be identified as a discharge option in the Desalination Amendment. As discussed in the Desalination Amendment, augmented intake flow for in-plant dilution may be a feasible option for brine dilution to meet salinity effluent limitations. However, this approach should be pursued with extreme caution. Relying on increased intake volumes to meet effluent limitations can significantly increase entrainment and impinge of marine life when surface intakes are used. In addition, the shock to species that remain in seawater mixing influent once brine is introduced further exacerbated marine life impacts. If the intent of the Desalination Amendment is to create new potable water supplies while simultaneously taking precautionary measures to protect and preserve coastal marine communities, augmented intake flow for in-plant dilution	This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf). Nevertheless, the State Water Board supports recycled water projects. As stated in the proposed desalination Amendment in chapter III.M.2.d.(2)(a), the wastewater used for commingling must be "wastewater (e.g., agricultural, municipal, industrial, power plant cooling water, etc.) that would otherwise be discharged to the ocean… Nothing in this section shall preclude future recycling of the wastewater." Flow augmentation systems using subsurface intakes are an environmentally preferable option because there is no additional operational mortality associated with the intake or discharge. Please see response to comment 14.4 regarding the use of flow augmentation systems using surface water intakes.

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	should only occur when subsurface intakes are being used and no marine life impacts are observed during dilution. Spray brine diffusers are shown to be effective at rapid dilution after discharge. Although diffusers can reduce marine life impacts in areas of discharge, their use does not eliminate acute and chronic toxicity impacts to marine in the zone of dilution as discussed by the Brine Expert Panel. In addition, the use of diffusers does not eliminate the potential for brine accumulation and migration to near- and far-fields resulting in permanent and ever-growing loss of benthic habitat and species reliant on these habitats. In short, there are clear benefits of both high-pressure diffuser and freshwater dilution of brine prior to discharge. However, each dilution alternative has the potential to negate these benefits over time. We believe that dilution alternatives can be regulated in a way that can avoid negating the benefits. In addition, while spray diffusers have some unavoidable adverse impacts in the zone of initial dilution, stricter provisions for their implementation may minimize the water column impacts and ensure against adverse impacts to benthic habitat. With this in mind, we recommend the following modification to the Desalination Amendment to ensure brine disposal protects water quality, marine life and marine habitat while taking into consideration policy implications. <u>Preference One: Co-location with wastewater treatment facilities</u> Brine will be mixed with treated wastewater effluent, with appropriate water chemistries, to meet ambient water salinities prior to discharge. Seawater desalination plants may only be co-located with wastewater treatment plants, or designed, constructed and connected to off-site locations, with the understanding that once indirect and direct potable re-use opportunities are identified and available, the desalination plant shall be retrofitted to meet the goals of Water Code section 13142.5(e) and the State Water Board's "Recycled Water Policy." In no event shall desalination facilities' use of treated wastewater replace or supplement the use of recycled water for water supply augmentation projects. <u>Preference Two: In-plant dilution using subsurface intake</u>	

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	Augmented intake for in-plant dilution shall only be allowed for facilities which rely solely upon subsurface intakes for source water volumes. Augmented intake volumes for in-plant dilution are prohibited unless the applicant can prove, prior to issuance of the permit, the adverse impact of diffusers is greater than the adverse impacts of augmented intake volumes. Third Preference: Zone of initial dilution If in-plant dilution cannot be accomplished through Preferences One and/or Two (above), diffusers will be designed to ensure no greater than 1ppt of salinity above ambient at the edge of the zone of dilution. In addition, adequate monitoring in the near-field and far-field are necessary to detect any accumulation of brine. In the event that ambient salinity levels and/or accumulation of brine thresholds are exceeded, the NPDES permit must include strict provisions requiring immediate cessation of discharge until remedial action is identified which will eliminate water quality, marine life and marine habitat impacts.	
12.41	*The Receiving Water Limitation for Salinity should ensure protection of all forms of marine life.* The Desalination Amendment outlines steps to establish a receiving water limitation for salinity based upon site specific conditions. The equation in the Desalination Amendment Ce = (2ppt + Cs) + Dm(2 ppt), in which Ce-effluent concentration limit, Cs-natural background salinity, and Dm-dilution factor will be used to develop salinity effluent limitations within the brine mixing zone using applicable water quality models that have been approved by regional water boards in consultation with State Water Board. In this equation, it is unclear how site specific conditions that influence mixing such as water depth, currents, wave activity, etc. influence salinity effluent limits. Are these conditions being accounted for in the Desalination Amendment? In addition it is unclear how the Dm relates to what the Expert Brine Panel suggested in their report. For example, using Monterey Bay (see below) as an example with a typical brine salinity requirements of 62ppt for the area, the equation shows a 12 parts seawater to 1 part brine dilution ratio. According to the Expert Brine Panel's report (Jenkins et al. 2010, pg 45), salinity	This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf) and the Staff Report with SED. Nevertheless, site-specific conditions that influence mixing will be addressed by the regional water boards when developing an effluent limitation for salinity. There are many factors that affect mixing and dilution such as: the density of the effluent and receiving water, receiving water stratification, the depth of the discharge, the height of the ports relative to the seafloor, the trajectory of the plume, the diameter of the ports, and the velocity of the discharge. These site conditions and design features are inputted into computer models with the corresponding effluent and receiving water conditions to calculate the dilution as well as other aspects of the plume behavior. All of these factors relate to both design and siting of the outfall and other components of a desalination facility. The report from the Expert Panel on Impacts and Effects of Brine Discharges (Roberts et al. 2012) includes an Appendix titled "*Discharge Design Considerations*" that describes these issues in significant detail and

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	reductions that met water quality objectives at the edge of the regulatory mixing zone could be achieved with an overall dilution of no less than 20 parts seawater : 1 brine. It appears that the equation may be relaxing the dilution ratios that were recommended by the Expert Brine Panel's recommendations. Mixing conditions will vary significantly based upon site specifics, however the equation does not account for site variability. A 12:1 dilution ratio may be a protective salinity effluent limits in some areas, but not others. More explanation regarding Brine Expert Panel's dilution ratio recommendation and what will be permitted for desalination facilities needs to be included in the Desalination Amendment. For Monterey Bay: Cs = 34ppt. A typical desalination brine salinity for this region is 62ppt. Therefore, the equation for Monterey Bay can be solved as follows: 62 = (2ppt + 34) + Dm(2 ppt); 62-36 = Dm(2ppt); 24/2 = Dm Dm = 12 parts seawater: 1 part brine.	can be found here: http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/dpr.pdf. A summary of how dilution occurs and a description of initial dilution is provided here for your convenience. Rapid dilution is initiated when the effluent (brine or commingled discharge) is discharged at a high velocity relative to the receiving water creating turbulence that results in entrainment of the receiving water that dilutes the effluent. The momentum of the discharge is a result of both discharge velocity and density differential with the receiving water. For buoyant plumes, the momentum is caused by the discharge velocity and the buoyancy or positive density differential that carries the plume upwards to some trapping level. For a non-buoyant plumes discharged upwards, the discharge ascends to a terminal height and begins to descend as described in the Expert Brine Panel's report (Roberts et al. 2012). As long as significant momentum exists relative to the receiving water, turbulent mixing and entrainment of receiving water occurs whether the plume is rising from buoyant forces or descending. When turbulent mixing ceases, that represents the point where initial dilution is calculated. Chapter III.M.3.b does not provide an opportunity to "relax" dilution ratios or the protectiveness of the receiving water limitation for salinity. Roberts et al. (2012) did not state that a 20:1 dilution ration was necessary for *every* discharge to achieve the limit, but rather that a 20:1 dilution ratio would achieve the limit for *most* discharges. For some discharges, discharging brine with lower salinity levels or will require less dilution to meet an effluent limitation developed to meet the receiving water limitation. Furthermore, the correct calculation for the example would be as follows: 62 = (2ppt + 34) + Dm(2 ppt); 62-36 = Dm(2ppt); 26/2 = Dm Dm = 13 parts seawater: 1 part brine.

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12.42	*The State Water Board should consider species sensitivity, brine toxicity and hypoxia when adopting a receiving water limitation for salinity.* Salinity is known to be one of the main environmental factors exerting a selective pressure on aquatic organisms.176 Therefore, it is vital that brine discharges are located in areas capable of dispersing salt loading. Some species sensitivities to elevated salts can result in immediate and prolonged signs of toxic responses resulting in acute and chronic impacts. In addition to toxicity, rising ambient salt concentrations can cause organisms to lose water to their saltier environment. In effect, animals in a world of water can ironically begin to dehydrate. Unlike most fish, marine invertebrates (e.g. squid) cannot osmoregulate177 to maintain cellular water balance. Thus, invertebrates are considered to be most vulnerable (sensitive) to brine concentration fluctuations, yet it is unclear if they have been identified in the Desalination Amendment as species most vulnerable to brine discharges. In terms of community impacts, overcoming dehydration forces organisms to spend energy. This leaves less energy left for growth, development, and reproduction. Overtime, this may result in a decline in species abundance. Benthic community structure could also shift178 and biodiversity could be altered. In addition, salt-tolerant species transported to California from other parts of the world on the hulls of ships or in ballast water may have the ability to colonize and out-compete native species in brine outfall zones, especially if brine is discharged in areas with poor water circulation. Brine discharges can also result in extensive oxygen depletion in the discharge zone as well as surrounding areas. It is well known that the layering of brine, even a few units (ppt) above natural levels, can create hypoxia on the seafloor.179 Given ocean desalination facilities lifespans will likely extend several decades, brine outfalls located in areas incapable of properly mixing brine loads have a great potential to grow and severely impact and even change community structures. Thus, brine discharges not only have the capacity to degrade ocean water quality and damage marine habitats but also can jeopardize the benefits these waters provide to people and the coastal ecosystem.	This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf) and the Staff Report with SED. Nevertheless, the receiving water limitation was based on the results from the Expert Review Panel on Brine Discharges (Roberts et al. 2012) and the Granite Canyon study (Phillips et al. 2012). Both of these reports evaluated the effects elevated salinity on invertebrates. While Roberts et al. (2012) reported that benthic infaunal communities and sea grasses are typically most sensitive to elevated salinity, Phillips et al. (2012) reported that some invertebrate species including red abalone were most sensitive to elevated salinity.

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12.43	*The State Water Board should require toxicity testing in areas with proposed alternative salinity receiving water limitations.* In the event that plant operators wish to obtain alternative salinity effluent limitations, baseline biological conditions and toxicity studies need to be conducted to show proposed facility specific salinity limits are adequately protective of beneficial uses. Whole Effluent Toxicity (WET) tests are required to be conducted for a variety of organisms and the facility-specific alternative receiving water limitation shall be based upon the lowest observed effect concentration (LOEC) observed in WET tests. It is unclear why the Desalination Amendment changed the facility-specific alternative receiving water limitation from no observed effects concentration (NOEC) to LOEC. What is the reasoning for this change? The LOEC approach is less stringent than the NOEC and the LOEC allows for marine life impacts. This approach is not protective of marine organisms and essentially allows degradation to occur outside of the initial zone of dilution. At no point should the Desalination Amendment allow for toxic effects to marine communities aside from what cannot be avoided in the initial zone of dilution. In addition to allowing some degradation outside the initial zone of dilution, NOEC and LOEC statistical approaches are heavily criticized due to their misleading nature and validity of statistical methods. The Los Angeles Regional Water Quality Control Board began replacing the NOEC/LOEC statistic approach with a more robust USEPA approved statistical method, Test of Significant Toxicity (TST)181. The TST method is superior to previous WET methods as it is a more powerful statistical approach resulting in greater confidence for WET conclusions. The USEPA TST approach does not result in any changes to the USEPA's WET test methods. Already these new approaches have proven more sensitive at detecting toxic effects in a wider range of species.182 Thus, the Desalination Amendment should include the TST statistical method instead of LOEC when deriving facility-specific alternative receiving water limitations for salinity. In addition, we believe the Desalination Amendment should include language that allows for the expansions of WET test species, not only	No observable effect level (NOEL) was included in the initial draft Desalination Amendment to ensure the standard would be adequately protective of marine life. However, the language was revised to the lowest observable effect level to provide a standard that is consistent with the approach from Roberts et al. 2012 and data from Phillips et al. (2012). The receiving water limitation of 2.0 parts per thousand (ppt) above natural background salinity measured no further than 100 meters (328 ft) horizontally from the discharge was developed using the recommendations from the Expert Panel I on Impacts and Effects of Brine Discharges (Roberts et al. 2012) and from salinity toxicity studies done by Granite Canyon (Philips et al. 2012). Roberts et al. (2012) stated, "Based on the studies of effects of brine discharges we recommend an incremental salinity limit at the mixing zone boundary of no more than 5% of that occurring naturally in the waters around the discharge…For most California open coastal waters this increment will be about 1.7 ppt;" The results from the Granite Canyon study also showed that red abalone were developmentally sensitive to changes as low as 1.6 ppt above background salinity. The alternative receiving water limitation for salinity provides an owner or operator the opportunity to establish a facility-specific salinity limit (other than 2 ppt). The flexibility in the alternative salinity receiving water limit will be granted if the project proponents demonstrate protectiveness of marine life and beneficial uses of ocean waters. The appropriate regional water board will evaluate the information received using specific criteria laid out in the amendment and will have discretion to approve the alternate salinity limit. This flexibility will determine whether specific discharge criteria within specific discharge locations are more appropriate than the established baseline condition, considering that the results may lead to the requirement of a more or less restrictive limit compared to the 2.0 ppt above natural background salinity limit. In order to establish an alternative receiving water limitation for salinity an owner or operator must conduct WET tests on species selected from Table III-1 of the Ocean Plan. The revised language

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	species listed in Section 3.c.1.b, but also market squid, Dungeness crabs, protected rockfish species, and other vulnerable and important species, which are valuable to the ocean waters of California. Ecotoxicology testing methods are growing and becoming more robust; the State Desalination Policy needs to include these methods to ensure that beneficial uses are being protected at all times.	(LOEC) provides the owner or operator the opportunity to develop a receiving water limitation consistent with the results from Roberts et al. 2012 and data from Phillips et al. (2012). Using the NOEC would not provide a consistent approach, and an owner or operator would only be able to develop a receiving water limitation more restrictive than the existing receiving water limitation, which would not provide the intended flexibility. Please see response to comment 6.10 in Appendix H of the Staff Report with SED regarding why the list of species were selected and why they are representative of other species, including market squid, Dungeness crabs, protected rockfish species, and other vulnerable and important species. Additionally, it is not advisable to collect vulnerable and important species for salinity toxicity exposure studies if the populations are already in peril and model species are available. Similarly, it is not advisable to collect commercially valuable species for salinity toxicity exposure studies if model species are available. The alternative receiving water limitation is designed to provide flexibility while ensuring that beneficial uses are adequately protective. As written, the proposed Desalination Amendment requires that the salinity be reduced to the alternative receiving water limitation within 100 meters in all directions from the point(s) of discharge. Aquatic life degradation cannot occur beyond that distance. Ongoing monitoring and reporting is required for all desalination facilities. Receiving water monitoring of water quality/ demonstration of compliance with an effluent limitation for salinity and biota is used in conjunction with narrative and numeric objectives to ensure that beneficial uses of the receiving water are not degraded by pollutants in the discharge. In the event that monitoring of the receiving water indicates that the receiving water limit is exceeded or aquatic life is degraded beyond the brine mixing zone, the applicable regional water board would take the appropriate enforcement action. If an owner or operator is unwilling to take the necessary corrective action, the regional water board has the authority to issue a cease and desist order for a non-compliant facility.
12.44	*The State Water Board should be explicit that "expanded" facilities*	This comment is out of the scope of the clarifying edits to the March

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	cannot be "existing" facilities. The State Water Board needs to be explicit that a facility that is "expanded" cannot be an existing facility. The State Water Board proposes to define an "expanded" facility to mean a facility that either: *Increase[s] intake or mortality of all forms of marine life beyond that which was originally approved in any NPDES permit or Water Code section 13142.5(b) determination: 1) increases the amount of seawater used either exclusively by the facility or used by the facility in conjunction with other facilities or uses, or 2) changes the design or operation of the facility. To the extent that the desalination facility is co-located with another facility that withdraws water for a different purpose and that other facility reduces the volume of water withdrawn to a level less than the desalination facility's volume of water withdrawn, the desalination facility is considered to be an expanded facility."* We agree with the State Water Board's definition of an "expanded" facility, and believe it is an appropriate interpretation under the California Water Code. The State Water Board also defines an "existing" facility, which may have the potential to conflict with an expanded facility. The Desalination Amendment defines an existing facility to be a: *Desalination facilities that have been issued an NPDES permit and all building permits and other governmental approvals necessary to commence construction for which the owner or operator has relied in good faith on those previously-issued permits and approvals and commenced construction of the facility beyond site grading prior to [effective date of this Plan]. Existing facilities do not include a facility for which permits and approvals were issued and construction commenced after January 1, 1977, but for which a regional water board did not make a determination of the best site, design, technology, and mitigations measures feasible, pursuant to Water Code section 13142.5, subdivision (b) (hereafter Water Code section 13142.5(b)).* While we agree with the intended language defining existing, we believe	20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf) and the Staff Report with SED. Nevertheless, The language is clear as written where the categories are mutually exclusive. It is possible for an existing facility to become an expanded facility if the facility 1) increases the amount of seawater* used either exclusively by the facility or used by the facility in conjunction with other facilities or uses, or 2) changes the design or operation of the facility. The Carlsbad desalination facility is a conditionally permitted facility and will be required to acquire a new Water Code section 13142.5(b) determination from the regional water board for the stand-alone operating conditions once the Encina powerplant ceases to provide the intake water for the Carlsbad desalination facility, as expressly provided in the previously-issued facility permit and Water Code section 13142.5(b) determination.

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	the language needs to be clear that an existing facility cannot also be an expanded facility. For example, the owner or operator of the Carlsbad facility should be considered an expanded facility under the Desalination Amendment when the Encina Power Facility comes into compliance with the OTC Policy. At that point, the Carlsbad facility will be increasing the mortality of all forms of marine life beyond that which was originally approved in its NPDES permit. Also, because the Carlsbad facility is co-located with Encina, when Encina reduces the volume of water withdrawn to a level less than Carlsbad's volume of water withdrawn, the facility will be considered "expanded." However, the case can be made, under the proposed Desalination Amendment, that the Carlsbad facility may be interpreted as an "existing" facility – something we do not believe the State Water Board intends. The Carlsbad facility – at the point where it would be considered expanded – would also be a facility with an NPDES permit and all other permits and approvals necessary to commence construction, and has relied on those permits to commence construction beyond site grading. Therefore, we believe a conflict exists between the two definitions of "expanded" and "existing." To clear up any ambiguity between the two definitions of "expanded" and "existing", we request the State Water Board add a clause to the definition of "existing" as follows: "A desalination facility is only an existing facility if it does not meet the definitions of new or expanded."	
12.45	*The State Water Board should not allow an expanded facility an additional five years to comply with the Desalination Amendment once it has expanded.* The State Water Board should not allow an expanded facility to have an additional five years to comply with the Desalination Amendment unless there is truly just cause. The Desalination Amendment originally allowed an owner or operator up to five years to come into compliance if the region water board found that "any water supply interruption resulting from the facility modifications requires additional time for water users to obtain a *temporary* replacement supply." In our August 2014 comments, we did not object to this provision because of the usage of	This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf). Nevertheless, the compliance schedules are included to account for future events that the Water Boards and owner/operators cannot anticipate that may require more time to complete facility upgrades. We are currently in the fourth year of drought and are unable to anticipate when the drought will end. There may be other extenuating circumstances similar to drought conditions where a 5-year compliance timeline may be necessary. The 5-year compliance timeline is not automatic. Chapters III.M.2.a(5)(b) and III.M.3.e of the proposed Desalination

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	the term "temporary." It should not take five years to find a temporary replacement of water. Only in a drought situation could it possibly take a full five years to come up with replacement water, which we realized in 2014 was the current situation. However, that should be the limit to why a five year extension is granted. The revised Desalination Amendment provides an additional reason to allow an expanded facility an additional five years to comply. The revised Amendment now allows an extension of time if it is "in the public interest and reasonably required for modification of the facility to comply with the determination." The term "in the public interest" has no definition, no guidelines, or boundaries. It is a nebulous open- ended term that will allow any project proponent to receive an extension. Extensions should not be given to facilities that are "expanded" because a co-located OTC facility is reducing its seawater intake. Owners or operators of desalination facilities have been on notice for years – if not a decade – that OTC facilities would be required to stop the intake of seawater. Such facilities that ignored the State Water Board's OTC Policy and continued to co-locate with OTC facilities should not be given a windfall. The OTC Policy was adopted in 2010. If a desalination project proponent wasn't on notice during the development of the OTC Policy, it certainly was put on notice in May 2010 when the OTC Policy was adopted with an implementation schedule. This implementation schedule clearly outlined when each OTC power facility would have to stop its seawater intake. Therefore, co-located desalination facilities have been on notice for five years that they would not be able to use OTC water for their desalination process. They should not be given an additional five years if and when the OTC facilities stop their intake. Moreover, it takes several years for an OTC facility to construct cooling towers, re-power, and come into compliance with the OTC Policy. Given the co-located desalination facility is located in close proximity to the OTC facility, the owner or operator should be well aware that the OTC facility is coming into compliance with the OTC Policy, and will shortly be stopping its seawater intake.	Amendment state, the regional water board *may* grant compliance schedules. An owner or operator must state their case for the need of up to 5 years, and then the regional water board must find in the case of a new 13142.5(b) determination that: *"1) any water supply interruption resulting from the facility modifications requires additional time for water users to obtain a temporary replacement supply or 2) such a compliance period is otherwise in the public interest and reasonably required for modification of the facility to comply with the determination".* For discharge upgrades, *"All compliance schedules shall be in accordance with the State Water Board's Compliance Schedule Policy, except that the salinity* receiving water limitation set forth in chapters III.M.3.b and III.M.3.c. shall be considered to be a "new water quality objective" as used in the Compliance Schedule Policy."* Again, the extended compliance schedules will only be granted if an owner or operator applies for one and if the regional water board approves one. Finally, an owner or operator is not legally obligated to upgrade a facility before regulations are adopted and implemented. Even though the OTC Policy was adopted in 2010, the OTC Policy did not include any requirements regarding putting desalination facilities using the cooling water effluent on notice. The co-location of desalination facilities and power plants is beneficial because there is no additional intake-related mortality at the desalination facility if their source water comes entirely from the cooling water effluent. While an owner or operator would be wise to design their facility in anticipation of power plants coming into compliance with the OTC Policy, they are not obligated to. Furthermore, since the draft documents of the proposed Desalination Amendment have only recently been released, and have not been adopted, it is

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	A regional water board should begin the extension at the point where a desalination owner or operator is put on notice. For desalination facilities co-located with an OTC facility, that notice should have begun in May 2010. At the very least, desalination facilities that are co-located with an OTC facility should be put on notice the date the Desalination Amendment is adopted, and only be given a maximum extension of five years past that date. For any facility that becomes an expanded facility after the five year extension window has elapsed, regional water boards should only be allowed to provide a one year extension to comply with the new NPDES Permit.	unreasonable to assume an owner or operator of a desalination facility should design their facility in anticipation of regulations that may or may not be adopted.
12.46	*Expanded facilities should not be given an additional eight years to comply with the Desalination Amendment for proposing to use "alternative technologies."* The State Water Board should not allow expanded facilities to have eight years to comply with the Desalination Amendment when they are proposing to use an "alternative technology." As discussed above, an expanded facility can be given an additional five years to comply with the policy simply for the extension being "in the public interest" – whatever that means. Additionally, the State Water Board has allowed project proponents to develop "alternative technologies" from the preferred technologies in the Amendment. The Amendment requires these alternative technologies be studied, with a report due to the Regional Board in three years, to determine whether the technology reduces marine life mortality to the equivalent of the second best available technology – screened intakes with augmented flows for in-plant dilution. As discussed in our 2014 comment letter, we disagree with the ability to use an "alternative technology" to meet the inappropriate standard of a screened open-intake. In the revised Amendment, that alternative technology will now be allowed for eight years after the facility becomes expanded. There is nowhere in the record that justifies why an eight year extension is warranted. While we disagree with a five year extension for expanded facilities, at least, the facility should be required to conduct its study during the five year extension.	This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf). However, to clarify, the years to meet the various compliance requirements are not additive as the commenter suggests. Each applies independently. The proposed Desalination Amendment provision states "up to five years," but no longer. Additionally, it was an oversight during the last round of revisions that the three year timeframe to submit the report was not reduced along with the duration of studies from 36 months to 12 months. The three year timeframe was assuming a three year study duration. Chapter III.M.2.d.(2)(d)iii of the proposed Desalination Amendment was revised as follows: *"Within ~~three years~~18 months of beginning operation, submit to the regional water board an empirical study that evaluates intake and mortality of all forms of marine life* associated with flow augmentation.* The study must evaluate impacts caused by augmented intake volume, intake and pump technology, water conveyance, waste brine* mixing, and effluent discharge. Unless demonstrated otherwise, organisms entrained by flow augmentation* are assumed to have a mortality rate of 100 percent. The study period shall be at least 12 consecutive months. If the regional water board requires a study period longer than 12 months, the final report must be submitted to the regional water board within 6*

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	We oppose the option to use alternative technologies that are only required to minimize marine life mortality to the level of open-ocean screens, which as we discuss above, could mean zero reduction of entrainment for some species and a net reduction of only one percent. But if the State Water Board continues to allow for alternative technologies that only meet a sub-par standard, then facilities that already have their NPDES permit, but will likely be defined as "expanded" in the future, should be required to begin studies immediately. An 8-year delay to require any technology for minimizing marine life mortality cannot constitute the best available technology.	*months of the completion of the empirical study."* An 18 month timeframe allows an owner or operator 12 months to conduct the study and an additional 6 months total to prepare the report. An owner or operator can parse the 6-month time however they decide. For example, an owner or operator could use 2 months before the empirical study to prepare for the study, conduct the 12 month study, and then would have four months to submit the final report regional water board, or an owner or operator plan in advance and start the study as soon as the facility is operational, conduct the 12 month study, and then would have six months to submit the final report to the regional water board. The extra 6 months is a reasonable amount of time for an owner or operator to prepare the report. The language was further clarified that if the regional water board requires a study longer than 12 months that the final report must be submitted to the regional water board within 6 months of the completion of the study. Also, please see response to comment 12.45 above.
12.47	The State Water Board should require an owner or operator to hire a neutral third party to conduct any studies regarding feasibility of the best available site, design, and technology – including both intake and discharge. In the revised Amendment, the State Water Board provides the regional water boards with the ability to "require an owner or operator to hire a neutral third party entity to review studies and models and make recommendations to the regional water board." Without a neutral third party to evaluate feasibility studies, how will regional water boards be able to evaluate project proposals accurately? Desalination proponents are already given a broad definition of "feasible" to evade using subsurface intakes as the best available technology. Furthermore, the State Water Board provides proponents a "second bite at the apple" of arguing subsurface intakes are infeasible within the best available technology's feasibility criteria. And now, the State Water Board is not requiring a neutral third party to evaluate the feasibility study. There comes a point where project proponents must be held to a standard, and truly required to show a subsurface intake is infeasible. Regional water boards do not have the technical expertise	Disagree with the proposed language change. The State and Regional Water Boards are capable of determining when something is beyond their technical expertise or professional judgment. The intent is that a neutral third party would be required only if needed and would merely provide information to the Water Boards. Ultimately, the Water Boards possess the regulatory authority to make feasibility determinations, Water Code 13142.5(b) determinations, and establish permit requirements for desalination facilities. Moreover, delegating these authorities may have unintended consequences.

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	to evaluate whether a feasibility study was done properly and transparently. We understand that regional water boards will consult with the State Water Board regarding the approval of a project, but we question whether the State Water Board has the technical expertise to determine whether a feasibility study was properly done. The State Water Board contracted out several "expert panels" to help guide the Desalination Amendment. And yet, in numerous instances, the State Water Board did not hold true to the expert panels' recommendations on how to properly minimize marine life mortality, reduce brine impacts, analyze the true impact from a facility, or how to calculate the mitigation fee. Throughout the Desalination Amendment process, the State Water Board has been presented with questionable science.183 Yet rather than dismiss these questionable studies, the State Water Board has allowed loopholes and exceptions to accommodate them. Why now does that State Water Board believe it will reject improperly done feasibility studies done by the project proponents themselves? To ensure a more transparent process to determine feasibility under the Desalination Amendment, we request the State Water Board make the following change to Chapter M.2.a.1: "The regional water board may shall require an owner or operator to hire a neutral third party entity to review studies and models and make recommendations to the regional water board."	
12.48	*Allowing flow augmentation as an alternative discharge technology is illegal.* As discussed above, flow augmentation, is illegal and should not be an allowable technology or practice for discharging brine. As the State Water Board admits, withdrawing "additional seawater through surface intakes for the purpose of diluting brine effluent to meet water quality standards (referred to as "flow augmentation") can significantly increase entrainment and impingement." Moreover, even if a technology can reduce entrainment through "low turbulence intakes" "[a]dditional mortality may occur through brine exposure in the mixing process and through predation in conveyance pipes."	This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf). Nevertheless, please see response to comment 12.46 regarding the reduction in the amount of time allowed to perform the study and submit the report from three years to 18 months and also response to comment 14.4.

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	Experts in the field of brine discharges have found flow augmentation leads to significant increases in marine life mortality. Studies have demonstrated that 100 percent of entrained organisms die, and that entrainment impacts on individual populations and the ecosystem can be significant. Withdrawing additional source water with traditional pumps to dilute brine would result in significantly increased marine life mortality compared to discharging through multiport diffusers. Flow augmentation with open-ocean intakes does not prevent marine life mortality at the mixing zone. The State Board acknowledges that "[o]rganisms entrained in the flow augmented dilution water may experience turbulence and shearing stress, osmotic stress or shock, or thermal stress as brine and dilution water are mixed prior to discharge." Flow augmentation results in a net loss of marine life mortality, and no data exists to prove that low-turbulence screw pumps reduce entrainment. There is nothing to suggest that flow augmentation can demonstrate equivalent protections as that of dilution with wastewater. Despite the lack of evidence, the State Water Board is allowing a project proponent to invest in "alternative technologies" and operate them for up to three years before demonstrating equivalent protections as dilution with wastewater. This is bad public policy, and allows regional boards to kick the proverbial compliance can down the road. Regulatory flexibility is important, but perverting regulations to "accommodate" every project is inappropriate. At some point, California needs to stand up for its marine environment – and the laws intended to protect it – by requiring facilities to meet their legal requirements. Allowing three years to build and then try to demonstrate compliance with self-assessed studies is unjustifiable. How will regional boards have the resources or expertise to know whether the empirical studies were done correctly? The proponent of low-turbulence pumps has already submitted questionable studies disputed by industry experts. Does anyone believe a regional board will require a facility to shut down a water supply facility once it is in the local portfolio, rip-out their low-turbulence pumps, and install the proper discharge technologies once they fail to meet the performance standard? It's untenable and unworkable from a practical perspective.	

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	In order to prevent flow augmentation from undermining the best available intake and discharge technologies, we request the State Board *explicitly prohibit flow augmentation under Chapter III.M.2.d.2. by deleting all of Chapter III.M.2.d.2.(e).*	
12.49	*Proponents of flow augmentation failing to demonstrate equivalent protections as the preferred discharge technology should not be given additional opportunities to re-design their system.* Project proponents that install low-turbulence intakes and fail to meet the required intake and discharge performance standards should not be allowed to continue operations. Instead, the State Board allows project proponents that are not meeting the required performance standards "re-design the flow augmentation system to minimize intake and mortality of marine life to a level that is comparable with wastewater dilution or multiport diffusers…" As discussed above, it is already inappropriate to allow a project proponent to operate for three years with flow augmentation technology that is assumed to increase marine life mortality rather than minimizing it. Allowing proponents to continue using flow augmentation after failing to demonstrate compliance just perpetuates the impacts to marine life. How many opportunities does a project proponent get at re-designing their flow augmentation technology? How many years after a re-design does the proponent get to prove the new design is in compliance? In order to minimize the damage of allowing flow augmentation as an alternative discharge technology, we request the State Water Board *delete the option for project proponents to re-design their low-turbulence intakes after failing to demonstrate such technology meets the required performance standards*. We offer the following revisions to Chapter M.2.d.2.d.iii.: *If the empirical study shows that flow augmentation* is less protective of marine life than a facility using wastewater dilution or multiport diffusers,* then the facility must ~~either (1)~~ cease using flow augmentation* technology and install and use wastewater dilution or multiport diffusers* to discharge brine waste, ~~or (2) re-design the flow~~	This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts. The option to re-design the flow augmentation system was in the July 4, 2014 drafts. The revisions to this section pertain only to the clarification of all forms of marine life, and to clarify that the flow augmentation system must be redesigned to meet comparable levels of intake and mortality as wastewater dilution if wastewater is available, or multiport diffusers of wastewater is unavailable. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf). Nevertheless, the last words of chapter III.M.2.d.2.d.iii are "subject to regional water board approval." This section of the amendment provides flexibility for instances where an owner or operator can identify the design flaw and easily remedy it. Since the regional water boards are responsible for protecting beneficial uses of ocean waters it is highly unlikely that there would be multiple opportunities for re-design if a system is clearly flawed. Please see response to comment 12.46 regarding the reduction in the amount of time allowed to perform the study and submit the report from three years to 18 months. Also, please see response to comment 14.4.

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	~~*augmentation system to minimize intake and mortality of marine life to a level that is comparable with wastewater dilution or multiport diffusers, subject to regional water board approval.*~~	
13.1	The Board should and we believe does recognize desalination as an important local and regional sustainable water supply and reliability option in order to improve water supply reliability, to help reduce reliance on imported water and in the face of climate change, to better meet future regional and local needs. We appreciate the SWRCB staff considering and addressing several of the water industries' concerns on key issues in the proposed final draft regulations. CalDesal supports and would like to express its appreciation for many of the revisions to the proposed regulations, including those where water agency studies and research are recognized.	Comment noted.
13.2	We agree with and support the SWRCB establishing a screen slot size of no greater than 1.0 mm for surface water intakes if subsurface are not feasible (M.2.d.(1)(c)ii.), which is supported by studies performed by West Basin MWD and other water agencies. West Basin's study demonstrated how slot sizes less the 1.0 mm faced problematic fouling and related operational issues. CalDesal also supports revising the study period for entrainment mitigation estimates and related studies from 36 months to 12 months (M.2.(1)(a)). As recognized in staff's response to comments in Appendix H, page H-180, a properly designed one-year study should provide sufficient information. The potential costs and permitting delay of 36 month studies would have presented a major barrier to several projects in California.	Comment noted.
13.3	Another revision we support is the ability to use "out-of-kind" mitigation in developing mitigation projects, as it adds flexibility to the proposed regulations and improves the ability of water agencies to mitigate marine life impacts. CalDesal is particularly supportive of the inclusion of the California Environmental Quality Act definition for 'feasibility'	Comment noted.
13.4	We wish to reiterate that CalDesal is open to a mitigation fee, but we believe it is critical that the fee have a direct nexus to the potential	Comment noted.

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	impacts of a project and that it should be calculated and applied one time to cover all marine organism mitigation requirements for a project, inclusive of all state permitting agencies. Assuming the Board is able to develop a mitigation fee that CalDesal and other stakeholders can support, CalDesal submits that each desalination project proponent should have the option of paying the mitigation fee or building their own mitigation project or utilizing an existing restoration project. Moreover, CalDesal is ready to work with the appropriate state agencies to pass legislation to set up the mechanics for the mitigation fee.	
13.5	CalDesal supports the protection of larval, juvenile, and adult stages of marine life through the use of marine protective technologies (e.g., wedge wire screens) to avoid impingement and minimize entrainment losses. Project applicants should be credited more than just one percent for using such marine protective technologies when calculating Empirical Transport Model (ETM) for mitigation purposes since the ETM methodology assumes open intakes. Industry experts working for West Basin Municipal Water District believe the credit should be much larger, around 50%, by applying a 1.00mm wedge wire screen. When comparing the ETM/APF analysis of a large open pipe compared to a wedge wire screen with a 1.00mm opening the 1% credit does not take into account all of the juvenile and reproductive adult marine life that will be protected. The 1% that is cited from the Intake Expert Panel report is only referencing 1% of larvae being protected with the screen, but does not take into account all of the juvenile and adult organisms that will be 100% protected.. Therefore, CalDesal joins West Basin recommending a larger ETM/APF credit of 50% to account for the protection of juvenile and adult organisms that are being 100% protected and not being accounted for in the ETM calculation.	The mitigation credit for a 1.0 mm screen should be no more than one percent. Please see responses to comments 7.24 in this document and 18.8 and 29.2 in Appendix H of the Staff Report with SED for more information including why an owner or operator should not be allowed to calculate their own mitigation credit.
13.6	The proposed final Amendment also provides that brine discharges from desalination facilities shall not exceed 2.0 parts per thousand (ppt) above the “Natural Background Salinity.” Natural background salinity is defined as the 20-year mean monthly salinity at the project location. Given that the natural background salinity can and does fluctuate, the definition of Natural Background Salinity should be modified to account for this natural salinity range.	The definition of Natural Background Salinity does account for seasonal variation in salinity. Please see response to comment 2.4.

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	To address this problem, CalDesal recommends that the proposed final Amendment be revised such that the Natural Background Salinity is defined as the 20-year mean monthly salinity at the project location unless the actual salinity measured at the facility intake, absent any influence from the discharge, is greater than the 20 year mean monthly salinity, in which case, the Natural Background Salinity shall be the actual salinity measured at the intake, absent any influence from the discharge.	
14.1	Interest in seawater desalination has increased recently with the current statewide drought, and although desalination is generally not considered as providing an immediate response to the current drought, it may play a more significant role in the state's long-term water supply portfolio. The proposed desalination amendment therefore has an important role to play in both helping to establish an appropriate role for desalination in coastal water supplies and to ensure that it is done in an environmentally sustainable manner that protects the full range of coastal resources important to California.	Agree. Seawater desalination may increasingly become an important water supply option in coastal water areas. It is important that desalination is done in an environmentally sustainable manner that protects the full range of coastal resources important to California.
14.2	The proposed amendments (hereafter referred to as the "desalination policy" or "policy") are based primarily on the requirements of Porter-Cologne Act Section 13142.5(b), which states: *For each new or expanded coastal powerplant or other industrial installation using seawater for cooling, heating, or industrial processing, the best available site, design, technology, and mitigation measures feasible shall be used to minimize the intake and mortality of all forms of marine life.* We are largely in support of the proposed amendments, though we do have several concerns and recommended changes, as detailed below. Our comments are primarily meant to allow the proposed amendments to be consistent with, and to complement, other relevant policies and requirements, particular the California Coastal Act and its accompanying regulations. Areas of support:	Comment noted and the support for these issues is appreciated.

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	We generally support the following components of the proposed policy as being largely consistent with Coastal Act requirements and the Coastal Commission's practice in reviewing desalination projects. Our areas of support include the following: Regarding intakes - • *Preference for subsurface intakes:* We concur with the policy's conclusion that subsurface intakes are the preferred alternative and that surface intakes are to be permitted only where subsurface intakes are determined to be infeasible. This approach is consistent with the requirement of Porter-Cologne Act Section 13142.5(b) to use all feasible means to minimize the intake and mortality of marine life and is also consistent with the approach the Coastal Commission has taken to implement Coastal Act Section 30231, which requires that the adverse effects of entrainment be minimized to the extent feasible. As noted below, however, we have concerns about how the policy addresses certain components of determining feasibility. • *Requirement for screens on open intakes:* We concur with the policy's requirement to screen surface intakes. From the data presented in the Staff Environmental Document ("SED"), we recognize that screens are not likely to reduce the overall entrainment rate as much as initial studies suggested; however, they continue to have a necessary role in helping to "minimize the intake and mortality of marine life." Regarding mitigation - • *Full mitigation:* We concur with the policy generally requiring full mitigation for all marine life mortality resulting from desalination facility construction and operation. We also recognize that, in some cases, construction-related effects are temporary and the affected habitat is restored naturally. • *Using the Empirical Transport Model (ETM) and Area of Production Foregone (APF) to determine the type and extent of a facility's adverse effects on marine life:* We concur with the use of ETM and APF to identify marine life impacts and to	

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	determine the type and extent of necessary mitigation. • *Using a 95% certainty level:* We concur with the policy's use of the 95% certainty level to establish the amount of mitigation needed. This is particularly important given that the policy would require mitigation only at a 1:1 ratio or lower (i.e., to as low as 1 acre of mitigation for every 10 acres of APF). The 95% certainty level will provide the necessary high degree of confidence that the required mitigation will adequately compensate for the expected losses. • *Acceptable methods of mitigation:* We concur with the policy allowing two main options for compensatory mitigation- either creation, restoration, or expansion projects in certain types of habitat that include appropriate performance standards, monitoring requirements, financial assurance measures, and other standard mitigation components, or full payment to an approved agency to implement these same types of mitigation projects. However, we have a strong preference for the first approach and several concerns about the latter. As we noted in our previous comments from August 2014, there is currently no mechanism available to ensure that the payment option provides the accountability needed to ensure that a permit condition requiring a particular mitigation outcome is actually implemented, or that any shortcomings in the implementation can be corrected. For example, if a facility operator pays a fee to a public agency to implement a project that is not completed or is unsuccessful, it is not clear who would hold the responsibility to complete the project successfully. We also understand there are currently no agencies able to implement this second mitigation option, and therefore expect these concerns to be addressed through interagency collaboration before this mitigation option is available. We would be happy to work with the Board, other agencies, and stakeholders to develop the appropriate mechanisms to allow this mitigation option. Regarding discharges -	

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	• *Requiring a protective discharge salinity limit:* We concur with the policy's proposed discharge limit of no more than a two parts per thousand salinity increase compared to natural background levels. The data and studies cited in the SED suggest this limit would be adequately protective of marine species. • *Requiring a limited Zone of Initial Dilution (ZID):* We concur with the ZID being limited to no more than 100 meters from the point of discharge. This appears to be both reasonable and achievable, particularly when combined with the preferred methods of a facility discharging with a combined wastewater discharge or using diffusers.	
14.3	The policy should include required interagency coordination and a required or recommended order for permit review. We appreciate that the policy includes several references to the need for coordination and consultation among the Regional Boards and involved agencies; however, as currently proposed, it does not ensure that the necessary level of coordination will occur or that permit review will be done in an efficient and comprehensive manner. State agencies and stakeholders have long recommended implementation of a coordinated permit review process, and including a coordination requirement in the policy is particularly important given the shared jurisdiction of the Regional Boards, Coastal Commission, State Lands Commission, local jurisdictions, and others over particular aspects of seawater desalination. For example, the Coastal Commission's review determines a project's consistency with Coastal Act policies on marine life protection, placing fill in coastal waters, and others. It also often includes determining a project's conformity with a Local Coastal Program, which usually establishes requirements related to land use, zoning, or similar provisions that are not considered in the review conducted by the Regional Boards or State Lands Commission. We recommend the policy include additional guidance regarding the type and level of coordination required and that it include a recommended order of review and permitting. Although the standard	There is a need for interagency collaboration and coordination during the development, permitting, and ongoing regulation of desalination facilities. The State Water Board staff is an active participant in the Seawater Desalination State Interagency Working Group (IAWG). One of the three project goals of the proposed desalination Amendment is to promote interagency collaboration for siting, design, and permitting of desalination facilities and assist the Water Boards in regulating such facilities. At this time, including additional language in the proposed Desalination Amendment outlining the details of permit coordination or a comprehensive coordination plan would be premature since the agencies have not yet come together to develop the details of such coordination. Developing a Memorandum of Agreement among the involved agencies would provide a mechanism that allows for efficient and comprehensive coordination of permitting and regulating seawater desalination facilities.

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	review process will vary to some degree by a facility's design or location, the following order generally lays out a review path that results in an applicant addressing each of the involved agencies' requirements in a coordinated and comprehensive manner: 1) Conduct required environmental review (CEQA and/or NEPA). 2) Obtain local permits and landowner approvals. 3) Obtain Coastal Commission approval. 4) Obtain Waste Discharge Permit/NPDES Permit from Regional Boards. We understand from Board staff that the necessary level of coordination might be addressed instead through development of a Memorandum of Agreement among the involved agencies. While we support development of such an agreement, we also recommend the policy more strongly address the need for interagency coordination. We recommend the policy acknowledge the role of the state's Seawater Desalination State Interagency Working Group (IAWG), which includes representation from involved state agencies and provides an appropriate forum for the required or recommended coordination. Requiring or recommending that coordination occur through this group would provide a mechanism in the policy that allows for efficient and comprehensive coordination.	
14.4	The policy should not allow the use of flow augmentation from surface intakes. We recommend the policy not allow for flow augmentation from surface intakes. We have four main areas of concern about this aspect of the proposed policy, as described below: *a) Inconsistency with Water Code Section 13142.5(b).* Section 13142.5(b) requires facilities to use the best feasible measures available to "minimize the intake and mortality" of marine life. However, flow augmentation, by definition, results in an increase in the intake and mortality of marine life. Because entrainment levels are directly correlated to intake volumes, the higher the intake volume of a given intake, the higher its entrainment levels. Drawing in additional	This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf) and the Staff Report with SED. Nevertheless, regarding the statement that the policy proposes an inappropriate standard to measure the effectiveness of flow augmentation, chapter III.M.2.d.(2)(c) states, *"Brine* disposal technologies other than wastewater dilution and multiport diffusers,* such as flow augmentation,* may be used if an owner or operator owner or operator can demonstrate to the regional water board that the technology provides a comparable level of intake and mortality of all forms of marine life* as wastewater dilution if wastewater is*

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	water solely for flow augmentation represents an increase in intake and mortality that goes against the language of this Water Code section. This would be the case even if flow augmentation resulted in something less than 100% mortality. As an example, if source water contained one organism per gallon, a facility pulling in 50 mgd for processing would entrain 50 million organisms per day. If that facility pulled in an additional 20 mgd for flow augmentation and that additional flow resulted in only 50% mortality, the facility would still increase its entrainment by 10 million organisms per day. Only in the highly unlikely event that flow augmentation could be accomplished with zero percent mortality would this not be the case. Accordingly, allowing flow augmentation from an open intake is not consistent with a provision of the Water Code that requires minimization of intake and mortality. ***b) The policy's proposed basis for allowing flow augmentation is entirely speculative.*** The amendment would allow a facility operator to submit data and studies to show that flow augmentation is as protective of marine life as combining a discharge with wastewater or discharging through diffusers. This contention that flow augmentation can result in less than 100% mortality- has been around for more than a decade. However, and as stated in the SED and the Response to Comments, there are no data to support this contention and no accepted studies showing this to be the case. The few available data and studies conducted thus far primarily apply to laboratory settings or to inland riverine or lake settings, not the marine environment. This lack of studies and conclusive data appears to be due largely to the difficulty of conducting such a study in the marine environment A definitive study would have to include identifying and counting organisms as they enter an intake, as they pass through an intake system (where they may be subject to predation within the conveyance pipes), as they are subjected to high salinity levels where the augmentation flows combine with a facility discharge, and as they are discharged out the end of an outfall and beyond to determine comparative survivorship in the receiving waters. Not only would it be difficult to implement such a study, it would also be difficult for the study	*available, or multiport diffusers if wastewater is unavailable."* This sets the standard consistent with Water Code section 13142.5(b) language. The last sentence of the paragraph was revised as follows to make the standard consistent with the statutory language: *"When determining the ~~level of protection provided by~~ intake and mortality associated with a brine* disposal technology or combination of technologies, the regional water board shall require the owner or operator to use empirical studies or modeling to…"* Currently, flow augmentation is being proposed for use at one location, the conditionally permitted Carlsbad Desalination Project. The owner or operator has asserted that its proposed flow augmentation system is the environmentally preferred option. However, to date, there are no studies or data to support that flow augmentation provides a comparable level of intake and mortality of all forms of marine life as multiport diffusers. Therefore, an owner or operator must first estimate through modeling and other available studies that flow augmentation provides a comparable level of intake and mortality of all forms of marine life as multiport diffusers before the regional water board approves the NPDES permit. If approved, an owner or operator would then empirically demonstrate the equivalent intake and mortality of marine life per chapter III.M.2.d.(2)(d)iii. Chapter III.M.2.d.(2)(d)iv of the proposed Desalination Amendment includes provisions for if the empirical studies show the flow augmentation system does not result in equivalent intake and mortality of all forms of marine life. Please see response to comment 12.46 regarding the reduction in the amount of time allowed to perform the study and submit the report from three years to 18 months. Regarding contention d), while the State Water Board seeks to coordinate with and consider the findings of other agencies, an identical set of measures satisfying all regulatory agencies with varying authorities is not within the power of any single agency. The State Water Board lacks authority to establish any framework that

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	to determine what particular components of the intake/discharge system were responsible for mortality and which of those components should be modified to improve survivorship. Further, and as noted in the SED and Response to Comments, not only are there no accepted studies, there are no technologies that have been proven to reduce the mortality of organisms entrained in a seawater intake. While some methods have been proposed - e.g., low velocity pumps, low turbulence intake pipes, etc.- the studies and tests needed to determine whether those methods might reduce intake mortality in California's marine environment have not yet started and may take many years to provide conclusive results. We therefore recommend the policy not allow for flow augmentation from surface intakes unless and until there are studies proposed and implemented that can provide the necessary levels of certainty and until there are proven methods that might be applied to provide a particular level of survivorship. Once those occur, the policy can be amended as needed. *c)* ***The policy proposes an inappropriate standard to measure the effectiveness of flow augmentation.*** The policy would require a Regional Board to consider whether a study shows that flow augmentation is "less protective" of marine life, compared to wastewater dilution or multiport diffusers. Pursuant to Section 13142.5(b), the correct standard should be whether flow augmentation "minimizes the intake and mortality" of marine life as compared to those other methods. While "less protective" may be a suitable standard to compare wastewater dilution with diffusers, it is not an appropriate standard to apply to flow augmentation. The two other methods are solely discharge-related, whereas flow augmentation and its effects are primarily intake-related and result from an intake's site, design, and technologies, which are the subject of Section 13142.5(b) and its requirement to minimize the intake and mortality of marine life. ***d) The policy's mechanism to allow flow augmentation from surface intakes would create inconsistencies among regulatory requirements.*** The policy would allow a facility operator to use flow augmentation for up to three years while developing and implementing a study to characterize the resulting intake and mortality. At the end of	directs other agency action, and does not propose deferring to other agencies' determinations that may not constitute best available site, design, technology and mitigation measures as set forth in the statutory directive. Each agency (e.g. lead agency for CEQA, Coastal Commission) is responsible for implementing requirements based on their individual authorities. The proposed Desalination Amendment encourages interagency collaboration and the Water Boards will consider findings made by other agencies when making their determinations. However, the determinations made by the regional water boards must be consistent with their authorities. Requiring the regional water boards to make their findings consistent with other agencies could constitute an unacceptable delegation of authority to other agencies with different mandates. Unless otherwise directed, the State and regional water boards may not defer to other agencies in requiring protection of beneficial uses of waters of the state. In context of mitigation, each agency is responsible for requiring mitigation for impacts that are under their jurisdiction. A new or expanded seawater desalination facility is required to fully mitigate for mortality of marine life. Therefore, mitigation must occur throughout the operational lifetime of the facility. Ideally a mitigation project would be functional as a facility commences operation. However, if this is not feasible, then a facility would extend the maintenance of the mitigation project beyond the point when a facility is decommissioned to make up for the time when a facility was operating but not mitigating for impacts.

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	that period, the Regional Board would determine the resulting level of mortality and determine what facility changes or compensatory mitigation measures might be required. This approach would create at least two inconsistencies with applicable requirements of CEQA and the Coastal Act. Pursuant to CEQA requirements, the mitigation needed to address a recognized impact must be identified during environmental and permit review, not put off until later. A lead or responsible agency cannot issue a permit with a requirement that the permittee come back later for consideration of what mitigation measures or compensatory mitigation may be needed. The proposed desalination policy would allow just that issuance of a permit with up to three years of operation before making a determination of the impacts of the operations or what mitigation might be required. Additionally, it is unclear from the proposed policy how long a permittee would have to implement the necessary mitigation, so actual mitigation might not start until long after the adverse effects that require mitigating have already impacted the environment. This component of the proposed policy is also inconsistent with coastal development permitting requirements, as the Coastal Commission cannot approve a permit with unknown adverse environmental impacts or where the determination of required mitigation is deferred until after approval of the permit, much less for several years after adverse impacts have occurred.	
14.5	In regard to flow augmentation, you may know that the Coastal Commission and Poseidon Water have convened an independent expert panel to characterize the feasibility of different subsurface intake alternatives for Poseidon's proposed facility in Huntington Beach. As part of that review, we have asked the panel to evaluate alternative intakes both with and without Poseidon's proposed flow augmentation-e.g., at Poseidon's proposed 127 mgd intake volume, which includes about 27 mgd for flow augmentation as well as a 100 mgd volume that does not include flow augmentation. This review may result in substantial improvement of the project's ability to minimize the intake and mortality of marine life and may also result in significant cost reductions.	Comment noted.

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	Based on the above, we therefore recommend the policy not allow flow augmentation from surface intakes as an acceptable component of a desalination facility.	
14.6	**The policy should not yet allow mitigation through Marine Protected Area modifications.** The policy would allow compensatory mitigation in the form of expansion, restoration, or creation of Marine Protected Areas. Although this approach might, at some point, represent appropriate mitigation for the adverse effects of a desalination facility, it currently cannot be implemented. For example, there are currently no methods available for translating ETM/APF calculations into MPA improvements, and no mechanisms to identify the performance standards, contingency measures, financial assurances, or other standard mitigation requirements using this mitigation approach. Additionally, there is little certainty provided using this process, as developing or modifying an MPA requires extensive public involvement and outreach that would likely result in significant changes to a particular mitigation proposal, thereby reducing the certainty that it would provide the expected type and level of necessary mitigation. We therefore recommend the policy not provide for this type of mitigation until the involved agencies and stakeholders develop the methods and mechanisms needed to ensure that this approach can provide the necessary level of mitigation. At that point, the policy could be amended as necessary, and we would be happy to coordinate with the Board and other agencies and stakeholders to develop both the necessary mechanisms and policy amendments.	Comment noted and appreciated. However, there are other sections in the proposed Desalination Amendment that may not be implemented immediately, if adopted, but were included in anticipation of the future. For example, the proposed Desalination Amendment includes Mitigation Option 2 that would allow an owner or operator to pay into an in-lieu fee program. However, at this time, no such program exists, but there has been an ongoing discussion of developing one in the future. It is unlikely a MPA would be restored, but the expansion or creation of a MPA would be beneficial to California's MPA network and could potentially serve as mitigation for impacts associated with desalination facilities. Even though there may be issues to resolve before expansion or creation of a MPA could be used as a mitigation option (e.g., developing methods for translating ETM/APF calculations into MPA improvements/ expansions), these issues may be resolved in the future and this could be an opportunity to support California's MPAs. Additionally, if an owner or operator decides to mitigate by expanding or creating a MPA, it would still be required to demonstrate to the regional water board that the project fully mitigates for all marine life mortality associated with the desalination facility.
14.7	**The policy should acknowledge that the assessment of the economic feasibility of a proposed project requires consideration of factors that are beyond the scope of the policy.** We understand and concur with the policy's inclusion of the CEQA definition of feasibility, which is the same as the Coastal Act definition. However, we recommend the policy acknowledge that assessment of economic feasibility requires consideration of factors that are outside of the scope of policy. As described below, the Boards and other involved agencies will need to evaluate factors other than those within	Determining the economic feasibility of the best available site, design, technology, and mitigation measures will be an important part of the overall Water Code section 13142.5(b) determination, although it is not the only aspect of determining feasibility. At this time, including additional policy guidance requiring a more comprehensive economic evaluation would be premature. Since economic feasibility will be determined on a project-specific basis and the effects of a project's costs on the overall average portfolio costs and on an area's water rates are outside the purview of the Boards, including language in the

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	the purview of the policy as part of any economic feasibility determination. The policy establishes guidance as to how the Boards are to evaluate the feasibility of alternative intake and discharge methods e.g., consider different sites, designs, technologies, etc., for their technical feasibility, economic feasibility, etc. The policy requires consideration of a project's life cycle costs, which will allow a Board to develop a common "currency" among alternatives- for instance, a comparison of the costs per acre-foot of water produced from each alternative. It appears that the policy assumes that the result will allow the Board to determine whether a more expensive alternative is economically feasible or infeasible, but it would not. The comparative costs of different alternatives have very little to do with determining their economic feasibility. The economic feasibility of a particular water project or alternative is based primarily on its role in the local or regional water supply portfolio and on how it will affect water rates in that area, both of which are outside of the policy's purview. The two examples provided in the comment letter show how the cost per acre-foot of a particular facility or alternative have little to do with its economic feasibility [**SEE COMMENT LETTER EXAMPLES**] These examples illustrate that significantly higher costs per acre-foot among different water sources, or among alternative versions of a proposed desalination facility do not determine whether the more expensive ones are economically feasible or infeasible. It is far more important to consider the effects of a project's costs on the overall average portfolio costs and on an area's water rates, both of which are outside the purview of the Boards. We recommend the policy provide additional direction on this issue. For example, the policy states that the Boards "may evaluate other site- and facility-specific factors," but we recommend it include specific guidance directing the Boards to consider a more comprehensive set of considerations when characterizing a project's economic feasibility, including the effects of a project and its alternatives on average portfolio	proposed Desalination Amendment would not be appropriate. However, the issue is an important one. The Water Boards look forward to working with the other agencies involved in the project level CEQA for new and expanded desalination facilities, but ultimately must rely on the other agencies to address issues that are within their respective jurisdictions and not within the Water Boards'.

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	costs and water rates, on the role of potentially higher rates in providing a "local reliability premium," etc. We expect that additional policy guidance requiring a more comprehensive evaluation will better characterize the economic feasibility of projects and their alternatives.	
14.8	**The policy's "needs" test should be based on a more detailed description of expected reliance on a proposed desalination facility.** The policy's Section M.2.b.(l) includes as part of its site considerations a "needs" test, which would require that the identified need for water to be provided by a proposed desalination facility be consistent with any of several plans, including a county general plan, an integrated water resource management plan, or an urban water management plan. We concur with the concept of the proposed changes to base an identified need for desalinated water on a focused group of documents. However, most of these plans are very general in nature and express no more than general support for desalination or for local water sources- for example, they often identify a target volume for future local water supplies or from local reliability projects, such as groundwater, seawater desalination, conservation, etc. However, they do not provide an adequate level of detail to determine whether a particular proposed desalination facility is consistent with identified local or regional water needs. We recommend instead that this list be further focused to require that the identified need be consistent with the projects and amounts of water identified in a current Urban Water Management Plan (UWMP) pursuant to Section 10631(h). This section of the Water Code requires that UWMPs identify the specific projects and water volumes that water districts expect to rely on to serve an area's water needs under normal, dry, and multiple dry years for the upcoming twenty years of projected water demands. This section of a UWMP usually describes the planning and budget needed to allow those projects to become part of the local water portfolio, and the degree of forethought and planning needed to develop these projections provides a far more appropriate basis for the desalination policy's needs test than the general statements contained in the other planning documents. Additionally,	Comment noted. Chapter III.M.2.b.(2) of the proposed Desalination Amendment was revised to, *"Consider whether the identified need for desalinated* water is consistent with an applicable adopted ~~county general plans, integrated regional water management plans, or~~ urban water management plan~~s~~, or if no urban water management plan is available, other water planning documents such as a county general plan or integrated regional water management plan ~~if these plans are unavailable.~~"* Urban water management planning documents are best suited to identify the need for desalinated water. However, urban water management planning documents are not available in all areas, which is why the proposed revision will allow flexibility for the regional water boards to accept other water planning documents to demonstrate need if an urban water management plan is unavailable. Ideally, the other water planning documents would be specific enough to identify the need for desalinated water and would have undergone a public process.

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	incorporating a desalination facility into an area's water portfolio generally requires a great deal of up front design and planning related to system hydraulics, chemical compatibility of different water sources, etc. The projects identified in a UWMP pursuant to this section of the Water Code reflect a degree of commitment, planning, and engineering by a water district that Regional Boards can rely upon with greater certainty as compared to proposed project descriptions in the other more general planning documents listed above. Further, because UWMPs are updated every five years, they reflect a water district's relatively current design and planning considerations. We therefore recommend that Section M.2.b.(l) of the amendment be further modified as follows: *"Consider whether the identified regional need for desalinated* water identified is consistent with the Section 10631(h) provisions of an applicable adopted general or coordinated plan for the development, utilization or conservation of the water resources of the state, such as a county general plans, an integrated regional water management plans, or an urban water management plans, or other water planning documents if these plans are unavailable or equivalent planning document if an urban water management plan is not available."*	
14.9	Additionally, and as an example of the coordination necessary in reviewing proposed desalination facilities, most coastal projects will be subject to Local Coastal Program ("LCP") requirements that address expected levels of development, the need to support coastal-dependent uses, coastal-related uses, visitor-serving uses, and other considerations. The policy need not reference LCPs in the above section, but, as noted previously, should acknowledge the need for interagency coordination for these projects.	Comment noted. Please see response to comment 14.3.
15.1	**Wedge Wire Screen Entrainment Credit (1%)** West Basin appreciates the extent of study and investigation that has	Please see responses to comments 7.24 in this document and 18.8 and 29.2 in Appendix H of the Staff Report with SED for more information regarding the one percent mitigation credit for a screened

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	already been performed to date by the Staff and the Expert Panel on wedge wire screen and appreciate that screens are deemed the best available technology after subsurface intakes. We have been studying wedge wire screens for 4 years and have completed very intensive and exploratory testing on the entrainment effectiveness of the screens. West Basin feels the 1% entrainment credit for applying a 1.00mm wedge wire screen is far too low being that the ETM/APF entrainment analysis assumes a large, unscreened open pipe intake with no marine protection to calculate the entrainment impact from a desalination plant. It appears the 1% credit only may only account for the absolute levels of entrainment reduction to fish larvae and not the actual effects on the populations. West Basin has consulted with industry experts and believes the credit should be much larger, around 50%, for a 1.00mm wedge wire screen. When comparing the ETM/APF analysis of a large open pipe compared to a wedge wire screen with a 1.00mm opening the 1% credit does not take into account the protection of larger larvae that have greater chance of surviving to become adult fish. Basically, the 1.0% value ignores the fact that there are different age larvae in the population subject to entrainment. West Basin recommends that the Amendment allow for a demonstration of the credit for use of 1.00mm wedge wire screens since the actual credit will be subject to the species of fish larvae subject to entrainment at a site. Currently, there are no existing studies proving the biological level of significance of the organisms not accounted for in the ETM calculation (i.e. holoplankton, diatoms, etc.) is the same as a juvenile or reproductive adult species. While no studies exist West Basin has received an expert opinion from Tenera, expert marine biologists, who state the impacts from entraining smaller species not identified in the ETM are not the same, and less, than the impacts of entraining a juvenile or reproductive adult species. West Basin also agrees with the new optional language inserted allowing project proponents to utilize other assessments for determining entrainment impacts. CODAR and travel times have been used in existing reports to calculate time of travel for larvae and West Basin would like to utilize this method to determine the habitats that would be impacted by a proposed desalination plant based on the head capsule size data. This data would be utilized to show which habitats are	surface intake. Comment noted regarding the inclusion of the optional additional language. The State Water Board members will discuss and deliberate as to whether or not to include the optional additional mitigation language at the May 5th, 2015 board meeting. If the optional additional language is included, the mitigation assessment method proposed by West Basin would need to be further developed, peer reviewed by a neutral third party expert review panel, and then approved by the regional water board in consultation with the State Water Board staff.

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	capable of producing larvae that would travel, by current, to the location of the proposed desalination intake and be too large (i.e. head capsule size above 1.00mm) to entrain. See Shanks, A. L. 2009. Pelagic larval duration and dispersal distance revisited. Biological Bulletin 216:373-385, and Siegel, D. A., B. P. Kinlan, B. Gaylord, and S. D. Gaines. 2003. Lagrangian descriptions of marine larval dispersion. Marine Ecology Progress Series 260:83-96. West Basin's recommendation for Board consideration: a) Project proponents who utilize a 1.00 mm wedge wire screen should be able to provide data in support of a site-specific credit for a project to account for the protection of juvenile and adult marine life that is not accounted for in the existing ETM/APF calculation. b) Continue to allow optional entrainment impact calculations by a peer reviewed expert panel as stated in 2.e.1.a.	
15.2	**Clarification of Diffuser Impacts** West Basin agrees with the Board's recommendation to utilize brine diffusers to minimize discharge impacts to local marine life. In the draft amendments it's not clear how to calculate the salinity based operational marine life impacts from the brine within the area of the discharge that exceeds 2.0 parts per thousand over ambient salinity. There is also discussion about the operational impacts due to shearing, yet how to calculate and quantify the total shearing impact due is unclear. West Basin would appreciate some guidance on how to calculate operational impacts due to shearing and impacts within the volume of water with salinity above 2.0ppt over ambient. These two points reflect the policy currently outlined in section 2.E.1.b. West Basin's recommendation for Board consideration: Staff to provide a methodology for calculating diffuser operation impacts due to: a) The volume of water with a salinity of 2.0ppt over ambient background salinity b) The shearing impacts from the diffuser's mechanical impacts	This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf) and the Staff Report with SED. However, methods for estimating mortality associated with multiport diffusers are described in section 8.5.1.2 (Discharge-related Mortality) of the Staff Report with SED. Additionally, Foster et al. (2013) found here http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/erp_final.pdf includes a study estimating shearing-related mortality.

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15.3	**Clarification on Reporting** West Basin agrees with reporting and monitoring to maintain an accurate representation of the impacts of an operational ocean water desalination facility. We have even completed many studies on a demonstration scale to identify the key impacts. In the draft amendments it remains unclear of the total number of monitoring reports and studies and what is expected in those reports to be completed before a project can get permitted and operational reporting. Reporting should be required, but if the types of reports and parameters are not defined they may end up taking several years and become very costly. We acknowledge the Board proposes a Marine Life Mortality Report that will encompass all impacts from the desalination facility and West Basin would suggest having a "How To" guide for the reporting to clarify expectations from local regulators and project proponents. An outline with the types of testing and reporting for each impact that should be addressed would be very helpful for all involved parties. West Basin's recommendation for Board consideration: A "How-To", or similar guide be provided with all the tests/studies to be performed prior to building a desalination facility as well as operational reporting.	The total number or monitoring and reporting reports will depend on how an owner or operator designs and operates the facility. For example, facilities using subsurface intakes would not need to conduct and ETM/APF analysis and the Marine Life Mortality Report will be truncated to only mitigation for mortality associated with the construction and discharge aspects of the facility. Those seeking alternative intake or discharge technologies will be required to conduct additional studies and potentially monitoring. The details in the report will also depend largely on site-specific consideration (e.g., habitat type, species present). For these reasons, the monitoring and reporting requirements will be developed and included in a facility's NPDES permit by the regional water boards.
16.1 LATE	We appreciate the staff work and time put in to developing the proposed policy. In its current form, this Desalination Amendment is not ready for adoption by the State Water Resources Control Board without further amendment.	This comment letter was received after the close of the April 9, 2015 at noon comment deadline. Nevertheless, comment noted.
16.2 LATE	Subsurface Intake Requirement is Wrong While modifications have been made to the Desalination Amendment, the current amendment language continues to have an explicit subsurface requirement/preference that needs to be addressed. We strongly believe that the existing Desalination Amendment needs to be modified to change the requirement to an alternative that must be thoroughly analyzed using the feasibility standards in the existing amendment language in the consideration of any proposed desalination project.	This comment letter was received after the close of the April 9, 2015 at noon comment deadline. This comment is also out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf). Nevertheless, the justification for preferring subsurface intakes is provided in response to comment 15.2 in Appendix H and section 8.3 of the Staff Report with SED.

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16.3 LATE	No Recognition of Differences in Ocean Intakes Not all ocean intakes are the same. Deepwater Desal has developed a project proposal that locates our ocean intake below the photic zone in the near shore Monterey submarine canyon in order to minimize the impact to marine life. This locationing approach was determined and informed by oceanographic research and marine species monitoring to determine a location that was optimized for the project and minimizes the impacts to marine species. The currently policy does not adequately recognize that ocean intakes can substantially mitigate marine species impact with sound locationing considerations informed by science. Our approach is entirely different than other ocean intake approaches that leverage pre-existing shallow or estuary intakes from energy generation facilities. The Desalination Amendment must recognize science-based approaches intake design and siting that are not only subsurface.	This comment letter was received after the close of the April 9, 2015 at noon comment deadline. This comment is also out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf). Nevertheless, the justification for preferring subsurface intakes is provided in response to comment 15.2 in Appendix H and section 8.3 of the Staff Report with SED. To date, DeepWater Desal has provided the State Water Board no information regarding its proposed desalination facility design. Therefore, their approach cannot be evaluated and no changes have been made to the proposed Desalination Amendment language. There are no studies or data to support the assertion that an offshore open intake can provide equivalent intake and mortality of all forms of marine life as a subsurface intake. An offshore intake may result in a reduction of entrainment of marine life relative to an intake near a highly-productive habitat (e.g. kelp bed). But, there is no scientific basis to support the claim that there is no marine life beyond the photic zone. In fact there are a number of studies that have investigated life in the deep sea and in submarine canyons (Goffredi et al. 2004; Gooday and Rathburn 1999; Lundsten et al. 2009; Paull et al. 2013; Robison et al. 2010; also please see Deep Sea Research Journals I and II). Life history information is unavailable for most deep water species and scientists are still identifying new species on research cruises. This makes performing a mitigation assessment and creating an appropriate mitigation project for these species extremely challenging, if not impossible.
16.4 LATE	Lack of Operational Experience to Justify Subsurface Intake Requirement The subsurface intake requirement is inconsistent with the world-wide operational experience with desalination facilities. There is not enough successful operational experience to justify an explicit technology preference for subsurface intakes. Actually, the experience has predominately demonstrated that subsurface intakes have not been successful, are limited in their application and scale, and alternative subsurface approaches like infiltration galleries can have substantial coastal and marines species impacts. In light of the overwhelming	This comment letter was received after the close of the April 9, 2015 at noon comment deadline. This comment is also out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf). Nevertheless, this comment was previously addressed in responses to comments 15.90, 20.6, and 21.7 in Appendix H and section 8.3 of the Staff Report with SED.

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	science and operational experience, a "subsurface intake technology requirement" is ill-advised.	
16.5 LATE	CEQA is the Optimal Review Mechanism The explicit requirement for a subsurface intake is a single criteria preference that trumps a thorough analysis under the California Environmental Quality Act (CEQA). Desalination projects will have numerous impact considerations that must be considered with a series of project alternatives. The feasibility standards in the proposed desal amendment provide useful policy guidance for analyzing a subsurface intake alternatives in comparison to other types of ocean intakes. However, the desal amendment starts with a subsurface requirement first and does not enable the CEQA review process to consider all environmental impacts associated with project alternatives in order to determine the preferred project alternative. Impacts such air quality, green-house gas emissions, subsurface disturbance, land based impacts, impacts to benthic marine organisms, maintenance impacts are just a few that will be analyzed in conjunction with the impacts associated with marine that will be considered in CEQA analysis in considering alternatives for any proposed project in an effort to determine the preferred alternative.	This comment letter was received after the close of the April 9, 2015 at noon comment deadline. This comment is also out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf). Nevertheless, disagree with the contention that subsurface intake is a single criteria preference that trumps a thorough analysis under the California Environmental Quality Act (CEQA). The interpretation of Water Code section 13142.5(b) is not governed by CEQA. In addition, each facility will undergo a project-level CEQA analysis to evaluate impacts such air quality, green-house gas emissions, etc. However, a new or expanded seawater desalination facility must also have a determination under Water Code section 13142.5(b) to determine the best available site, design, technology, and mitigation measures feasible to minimize intake and mortality of all forms of marine life.
16.6 LATE	Drought Conditions are a Reminder of the Need for Policy Flexibility The current drought experience is a[n] important reminder for the need for flexibility when developing public policy. The SWRCB has made some important contributions to the development of policy to determine feasibility of subsurface intakes. These feasibility standards will guide future project alternative analysis under CEQA. The explicit subsurface intake requirement first does not meet the critically important public policy need to have all options and consideration available to water resource planners and public officials in considering solution for drought, replacing impaired water sources, and adapting our water resource infrastructure to address global climate change.	This comment letter was received after the close of the April 9, 2015 at noon comment deadline. Nevertheless, seawater desalination may increasingly become an important water supply option in coastal water areas. It is important that desalination is done in an environmentally sustainable manner that protects the full range of coastal resources important to California. One of the goals of the proposed Desalination Amendment is to support the use of ocean water as a reliable supplement to traditional water supplies while protecting beneficial uses. While the requirement to evaluate feasibility of a subsurface intake will be implemented in future project development and further inform any site-specific CEQA analysis for a future desalination project, it is unclear how this would fail to meet public policy goals for considering all options available to water resource planners, especially in light of the statutory directive to use the best available site, design, technology and mitigation measures feasible to minimize the intake and mortality of all forms of marine life.

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		Note that chapter III.M.1.a allows for the Executive Director of the State Water Board to temporarily waive the application of the proposed Desalination Amendment to serve as a critical short term water supply during a state of emergency as declared by the Governor, including an emergency drought declaration.
16.7 LATE	Proposed Amendment to the final Desalination Amendment Draft 1) M.2.c.(2): "If the regional water board determines that surface water intakes are the best available technology under the analysis described below, analyze potential designs for those intakes in order to minimize the intake and mortality of all forms of marine life." 2) M.2.d.(1)(a): "Subject to Section M.2.a.(2), the regional water board in consultation with State Water Board staff shall conduct a comparative analysis of the factors listed below for surface and subsurface intakes to determine which intake technology is feasible for the proposed desalination facility. The analysis shall also determine which feasible intake technology is the environmentally superior alternative for the proposed desalination facility. A design capacity in excess of the need for desalinated water as defined in chapter III.M.2.b.(2) shall not be used by itself to declare subsurface intakes as not feasible." 3) M.2.d.(1)(a)i: "The comparative analysis shall consider the following factors in determining the feasibility of alternative intakes for the proposed desalination facility:" 4) M.2.d.(1)(c): "If the regional water board determines that a surface water intake is the best feasible technology for the proposed desalination facility, its approval of the surface water intake shall be made subject to the following conditions:"	This comment letter was received after the close of the April 9, 2015 at noon comment deadline. Nevertheless, the specific revision requests are addressed below: 1) This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf). 2) Disagree. Under the proposed Desalination Amendment, subsurface intakes are the preferred technology. Water Code section 13142.5(b) requires that the best available site, design, technology, and mitigation measures feasible shall be used to minimize the intake and mortality of all forms of marine life. Subsurface intakes are preferred and represent available best technology; however, it is important to recognize that the term "best available technology" is not used as equivalent to any specific standards set forth in the Clean Water Act for best available technology. The proposed Desalination Amendment recognizes that there are site-specific variables that will influence the best available site, design, technology, and mitigation measures feasible for each desalination facility. Consequently, the proposed Desalination Amendment provides flexibility when subsurface intakes are infeasible. Please see section 8.3 of the Staff Report with SED regarding the selection of a preferred intake technology. 3) This comment is out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf). Please see 2) above regarding the preferred intake technology (subsurface intakes). 4) This comment is out of the scope of the clarifying edits to the March

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		20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf). Please see 2) above regarding the preferred intake technology (subsurface intakes).
17.1 LATE	I strongly object to any form of desalination plants being built or placed back into service along the California coast. This is doubly true of Desal. plants in the National Marine Sanctuary, Monterey Bay. Any type of brine/waste being sent into the Bay is likely to upset the already fragile balance for the marine mammals and other sealife. This area is supposed to be a SANCTUARY, not a money-making scheme for the extremely lucrative desalination cartel. Keystone species like threatened Southern Sea Otters are struggling for survival in the area as well as many other marine creatures. Don't let us and them down by letting the Desalination advocates pressure for plants here. I have been a long-time supporter of Friends of the Sea Otter and am a member of a group looking at viable alternatives to desalination.	This comment letter was received after the close of the April 9, 2015 at noon comment deadline. This comment is also out of the scope of the clarifying edits to the March 20, 2015 drafts. Please see the March 20, 2015 Public Notice (http://www.swrcb.ca.gov/water_issues/programs/ocean/desalination/docs/amendment/notice_desal.pdf) and the Staff Report with SED. Nevertheless, comment noted. As described in the proposed Desalination Amendment and Staff Report with SED, new and expanded seawater desalination facilities will be required to use the best available site, design, technology, and mitigation measures feasible to minimize intake and mortality of all forms of marine life. Furthermore, each permit undergoes a public process where interested parties can comment on the permit.

Attachment 1

Response to letter from Nautilus Environmental dated March 15, 2015 (see next page) associated with responses to comments 2.6 and 11.8.

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DEPARTMENT OF ENVIRONMENTAL TOXICOLOGY

March 31, 2015

To: Claire Waggoner, Vicky Whitney and Paul Hann, State Water Resources Control Board

Subject: Response to letter from Nautilus Environmental dated March 15, 2015

These comments were prepared in response to data reviewed by Nautilus Environmental, representing Poseidon Water Inc. Nautilus Environmental recently asked to review UC Davis - Granite Canyon (UCD) raw data for the Salinity Project conducted in 2012, and noted two data entry errors in the analysis of the second definitive abalone test. We corrected the errors and re-analyzed the data, and there were no differences in the results for the NOEC, LOEC or EC50. In a letter to Poseidon dated March 15, 2015 Nautilus argued that a slight change in the statistical method using the corrected data would yield different results, with an overall shift in the NOEC and LOEC by one test concentration. Nautilus noted that there was minor heterogeneity in variance in the Granite Canyon data and selected the parametric statistical option to determine the LOEC and NOEC. The data originally submitted by UCD used a non-parametric approach, following the default option in the statistical program used to determine the LOEC and NOEC. This followed the flow chart and procedures provided in the U.S. EPA methods manual (U.S. EPA, 1995), which requires use of a non-parametric statistic, if the criterion for homogeneous variance is not met (as was the case for these data). Nautilus also independently conducted two abalone salinity tolerance tests, and their results showed the LOECs were moderately higher than those presented in the Final UCD Report.

Nautilus noted that the results of the first definitive abalone test presented in the UCD 2012 report did not meet test acceptability criteria for the brine control. Because the brine control was significantly different from the dilution water control (laboratory seawater), the statistical analysis were conducted by comparing the test concentrations to the brine control. This fact is noted in the UCD 2012 report on page 4.

Gravid abalone were very difficult to obtain during the contract period. The brood stocks used for the abalone tests were obtained from two different suppliers, and represented some of the last gravid red abalone available in California at the time. Although the first definitive test did not meet test acceptability criteria for the brine control, the final statistical results were identical to the second definitive test, therefore we concluded that the data were representative of hyper-saline brine impacts on abalone development, and included the data in the report. Recommendations should have been made for re-conducting the first definitive test, but State Water Board deadlines for using these data to develop policy would have made this difficult, especially considering the lack of additional gravid abalone during this period.

Based on the results of the two UCD abalone tests, we verified that the original test results were valid and accurate.

Attachments: raw data from abalone definitive tests and accompanying reference toxicant tests, and water quality results.

Reference

U.S. EPA, 1995. Short-term methods for estimating the chronic toxicity of effluents and receiving waters to west coast marine and estuarine organisms. EPA/600/R-95/136. Office of Research and Development. Washington DC, USA.

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		Brine Salinity	70	‰								
	Volume per Treatment		175	mL								
Treatment	Salinity	Vol. SeaH2O	Vol. Brine	Vol. Nano	Vial	Replicate	Total	Normal	Abnormal	% Normal	Mean	SD
35‰	35	175	0		1	1	67	57	10	85	80	5.3
					2	2	58	45	13	78		
					3	3	68	59	9	87		
					4	4	88	68	20	77		
					5	5	83	62	21	75		
36‰	36	170	5		6	1	67	54	13	81	68	7.8
					7	2	78	50	28	64		
					8	3	82	57	25	70		
					9	4	66	44	22	67		
					10	5	75	45	30	60		
37‰	37	165	10		11	1	80	42	38	53	53	2.1
					12	2	55	30	25	55		
					13	3	82	44	38	54		
					14	4	85	42	43	49		
					15	5	88	48	40	55		
38‰	38	160	15		16	1	69	24	45	35	34	5.3
					17	2	88	23	65	26		
					18	3	71	29	42	41		
					19	4	77	25	52	32		
					20	5	66	23	43	35		
39‰	39	155	20		21	1	50	1	49	2	2	2.0
					22	2	65	0	65	0		
					23	3	66	1	65	2		
					24	4	82	0	82	0		
					25	5	81	4	77	5		
40‰	40	150	25		26	1	70	0	70	0	0	0.0
					27	2	81	0	81	0		
					28	3	79	0	79	0		
					29	4	96	0	96	0		
					30	5	69	0	69	0		
41‰	41	145	30		31	1	64	0	64	0	0	0.0
					32	2	77	0	77	0		
					33	3	81	0	81	0		
					34	4	67	0	67	0		
					35	5	58	0	58	0		
42‰	42	140	35		36	1	65	0	65	0	0	0.0
					37	2	81	0	81	0		
					38	3	93	0	93	0		
					39	4	72	0	72	0		
					40	5	62	0	62	0		
BC 52	35	105	35	35	41	1	62	42	20	68	67	7.4
					42	2	82	50	32	61		
					43	3	75	46	29	61		
					44	4	87	57	30	66		
					45	5	72	57	15	79		
	Total Brine Needed		175									

Concentration (ug/L)	Zinc Reference Toxicant				Vial	Replicate	Total	Normal	Abnormal	% Normal	Mean	SD
0					1	1	68	55	13	81	77	3.9
					2	2	75	61	14	81		
					3	3	87	65	22	75		
					4	4	72	53	19	74		
					5	5	84	62	22	74		
18					6	1	86	57	29	66	74	6.4
					7	2	73	53	20	73		
					8	3	69	53	16	77		
					9	4	75	53	22	71		
					10	5	71	59	12	83		
32					11	1	77	52	25	68	75	6.9
					12	2	86	71	15	83		
					13	3	92	73	19	79		
					14	4	68	46	22	68		
					15	5	76	59	17	78		
56					16	1	72	20	52	28	28	5.1
					17	2	68	25	43	37		
					18	3	83	24	59	29		
					19	4	86	20	66	23		
					20	5	70	18	52	26		

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		Brine Salinity	70	‰								
	Volume per Treatment		175	mL								
Treatment	Salinity	Vol. SeaH2O	Vol. Brine	Vol. Nano	Vial	Replicate	Total	Normal	Abnormal	% Normal	Mean	SD
35‰	35	175	0		1	1	100	95	5	95	95	1.0
					2	2	81	77	4	95		
					3	3	85	79	6	93		
					4	4	97	92	5	95		
					5	5	92	88	4	96		
36‰	36	170	5		6	1	90	85	5	94	94	3.0
					7	2	96	91	5	95		
					8	3	75	67	8	89		
					9	4	78	75	3	96		
					10	5	71	69	2	97		
37‰	37	165	10		11	1	101	91	10	90	91	1.2
					12	2	100	90	10	90		
					13	3	86	80	6	93		
					14	4	95	86	9	91		
					15	5	97	88	9	91		
38‰	38	160	15		16	1	102	85	17	83	81	4.5
					17	2	89	74	15	83		
					18	3	89	69	20	78		
					19	4	101	86	15	85		
					20	5	47	35	12	74		
39‰	39	155	20		21	1	76	5	71	7	18	8.5
					22	2	71	8	63	11		
					23	3	77	19	58	25		
					24	4	61	16	45	26		
					25	5	69	13	56	19		
40‰	40	150	25		26	1	85	0	85	0	0	0.0
					27	2	100	0	100	0		
					28	3	100	0	100	0		
					29	4	100	0	100	0		
					30	5	100	0	100	0		
41‰	41	145	30		31	1	100	0	100	0	0	0.0
					32	2	100	0	100	0		
					33	3	100	0	100	0		
					34	4	100	0	100	0		
					35	5	100	0	100	0		
42‰	42	140	35		36	1	100	0	100	0	0	0.0
					37	2	100	0	100	0		
					38	3	100	0	100	0		
					39	4	100	0	100	0		
					40	5	100	0	100	0		
BC 52	35	105	35	35	41	1	101	100	1	99	96	2.7
					42	2	103	99	4	96		
					43	3	108	100	8	93		
					44	4	98	97	1	99		
					45	5	104	99	5	95		
	Total Brine Needed		175									

Concentration (ug/L)	Zinc Reference Toxicant				Vial	Replicate	Total	Normal	Abnormal	% Normal	Mean	SD
0					1	1	60	56	4	93	94	1.8
					2	2	96	91	5	95		
					3	3	118	114	4	97		
					4	4	88	83	5	94		
					5	5	96	88	8	92		
18					6	1	120	114	6	95	96	2.2
					7	2	107	101	6	94		
					8	3	90	90		100		
					9	4	124	120	4	97		
					10	5	97	93	4	96		
32					11	1	88	82	6	93	86	13.8
					12	2	13	8	5	62		
					13	3	81	75	6	93		
					14	4	99	87	12	88		
					15	5	104	98	6	94		
56					16	1	100	11	89	11	9	3.2
					17	2	93	6	87	6		
					18	3	125	16	109	13		
					19	4	100	5	95	5		
					20	5	98	9	89	9		

Marine Pollution Studies Laboratory
Water Quality Data Sheet

Start Date/Time: 7/18/12

End Date/Time: 7/20/12

Project: Salinity

Species Lot #: HR071712

Sample Type: HSB

Test Temperature: 15.6

Date: 7/18/12

Sample	pH	Dissolved Oxygen (0 ppt)	Dissolved Oxygen Multiplier	Dissolved Oxygen (mg/L)	Salinity (ppt)	Total Ammonia (mg/l NH3)	Notes
SW	7.71	9.18	0.824	7.56	33.69	0.4	34
36	7.85	9.24	0.819	7.57	34.85		35
37	7.85	9.31	0.814	7.58	35.63		37
38	7.85	9.34	0.810	7.57	36.66		38
39	7.85	9.35	0.810	7.57	37.48		39
40	7.83	9.27	0.805	7.46	38.43		40
41	7.83	9.38	0.801	7.51	39.37		41
42	7.81	9.46	0.796	7.53	40.20		41
HSB	7.88	9.31	0.824	7.67	34.26		35
Control	7.83	9.15	0.824	7.54	33.87		
18	7.85	9.11	"	7.51	33.87		
32	7.87	9.27	"	7.64	33.78		
50	7.87	9.20	"	7.58	33.78		
Initials							

Water Quality Precision and Accuracy				
pH 7	DO 100%	Salinity (uS/cm)		Ammonia (mg/L N)
7.08	101.2	35	35.00	11.0
7.15	97.3		34.96	10.7
Initials				

pH slope: 49.9 DO temp: 19.7