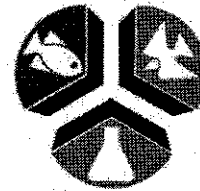
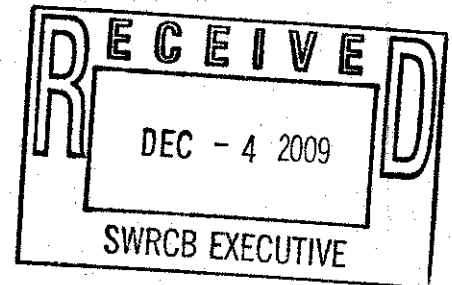


December 4, 2009

Ms. Jeanine Townsend  
Clerk to the Board  
State Water Resources Control Board  
1001 "I" Street, 24<sup>th</sup> Floor  
Sacramento, CA 95814



MBC



**Comment Letter – OTC Policy**

Dear Ms. Townsend:

MBC *Applied Environmental Sciences* (MBC) appreciates the opportunity to participate in the scoping process for the State Water Resource Control Board's (SWRCB's) proposed once-through cooling (OTC) policy. MBC is an environmental consulting firm that recently assisted with 316(b) entrainment/impingement compliance activities for eight coastal generating stations in southern California. Our recent 316(b) experience includes design and implementation of Impingement Mortality and Entrainment (IM&E) Characterization Studies, data analysis, document preparation, and compliance planning and support. Our experience with 316(b) spans three decades, as MBC biologists worked with representatives from state and federal resource agencies to design and conduct 316(b) demonstrations at California's coastal generating stations in the late 1970s.

The following are our comments on the recent revisions to the proposed power plant cooling policy (Nov. 23, 2009 Draft).

**Wholly Disproportionate Demonstration**

The Wholly Disproportionate compliance option (Section 4 of the previous version of the policy) has been removed. Therefore, it is now unclear how a facility could be in compliance if (1) closed-cycle cooling were not feasible per Track 1, and (2) operational and/or structural controls could not achieve the 83.7% IM&E reduction as required by Track 2.

**Use of HPF (Section 2.C.3.d)**

The definition of HPF in the revised policy is misleading. The application of HPF in California has not been consistent from site to site. This is due to a variety of reasons, but the correct application of HPF should take into account variations in habitat.

The definition indicates that HPF is the area of production "*lost to all entrained species.*" The proportional mortality estimates, which are used as input to HPF, cannot be calculated for all entrained species. Therefore, at present, HPF can only be used for (1) those species with sufficient abundance in both entrainment and source water samples, and (2) species with sufficient life history information for calculation of larval duration (exposure to entrainment).

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In addition, there must also be some level of confidence in estimates of the size and extent of the source water.

The correct application should also take into account variations in habitat in the source waters. The example listed in the definition assumes the habitat is homogenous, and the affected species all utilize this same habitat. This is unlikely to ever be the case, and we recommend deleting the example. The HPF, if used appropriately, can be one of many methods used in scaling restoration projects to offset IM&E losses. However, like all other scaling methods, it has limitations on its use.

While HPF is a valuable method for calculation of habitat restoration, it is only appropriate when the actual adult habitat can be identified and estimated. Similar to the limitations with any restoration project, it will only be successful for species that are dependent on the specific habitat being restored.

Lastly, any restoration scaling application, such as the HPF, is limited by the state of science with regards to relevant knowledge of the life history parameters of affected species. This problem was further identified by the Water Intake Structure Environmental Research program (WISER) administered by the California Energy Commission. Characteristics such as mortality, growth, fecundity, and more general concepts of population regulation and stressors are still unknown for the majority of fish species occurring along the California coastline.

#### **Track 2 Impingement Compliance (Sections 4.A.1 and 4.A.2)**

It is unclear how Track 2 compliance for impingement mortality could be measured. Compliance with Track 1 is achieved by (1) a 93% reduction in design intake flow rate, and (2) a through-screen velocity less than or equal to 0.5 feet per second. Compliance with Track 2 requires *"...90 percent of the reduction in impingement mortality and entrainment required under Track 1."*

Since there is not a linear relationship between intake flow rate and impingement, it is not possible to determine what impingement mortality would result from a 93% reduction in intake flow rate. MBC has performed impingement studies at most of southern California's coastal power plants for decades, and the relationship between intake flow and impingement is both weak and variable. For example, during the year-long impingement study at the Huntington Beach Generating Station, the  $R^2$  value for intake flow rate and fish impingement was only 0.0876, and for flow and macroinvertebrate impingement it was even less ( $R^2 = 0.0183$ ) (MBC and Tenera 2005). Ultimately, absolute impingement abundance is contingent on the population dynamics of the communities encountering the intake structure and flow rather than the intake flow itself.

Compliance for Track 2 impingement can be determined *"by monthly verification of through-screen intake velocity not to exceed 0.5 foot per second, or (2) by monitoring required in Section 4.A, below."* The velocity monitoring is straightforward. However, it is not clear how monitoring could demonstrate compliance when it is not understood what impingement mortality would result from a 93% reduction in flow.

#### **Definition of Meroplankton is Incorrect (Section 5)**

The policy requires *"sampling for all ichthyoplankton and meroplankton species"* (Section 4.B.1.a). The definition of "meroplankton" in Section 5 is incorrect. It is currently defined as:

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*"Meroplankton - Refers to that component of the zooplankton community composed of the pelagic larvae of benthic invertebrates."*

Meroplankton are those organisms that only spend part of their life cycles in the planktonic phase, and is not limited to benthic invertebrates (e.g., fishes and barnacle nauplii are considered meroplanktonic) (see for example: Nybakken, J. 1988, 1997. Marine Biology: An Ecological Approach).

#### **Entrainment Sampling Requirements are Unclear (Section 4.B.1.a)**

The previous version of the policy (June 2009) required sampling of zooplankton, which was described as planktonic invertebrates larger than 200 microns. The definition of zooplankton is still considered to be planktonic invertebrates larger than 200 microns; however, only meroplankton are now required to be sampled, and presumably protected since *"Entrainment impacts shall be based on sampling for all ichthyoplankton and meroplankton species."*

We reiterate there are currently no known technologies that could screen or exclude zooplankton to comply with the proposed policy.

MBC performed some of the original 316(b) demonstrations in California in the 1970s, and designed and performed studies in southern California from 2004 to 2008 for multiple power plants. All of these studies utilized 333- or 335-micron mesh plankton nets. Recent 316(b) IM&E Studies utilized 333- or 335-micron mesh for sampling, and target invertebrates included spiny lobster phyllosoma, market squid paralarvae, and crab megalopae. The language in the current policy implies that new studies would have to be performed.

There is still no justification or reasoning for the 200 micron requirement. Sampling with finer mesh, could affect study results; the finer mesh clogs faster, reducing sampling efficiency of the plankton net(s). Finer mesh has been used in some surveys targeting specific invertebrate larvae on in Northern California; this could still be performed without the requirement to sample and analyze all meroplankton for a 12-month period.

#### **Conclusion**

Thank you again for the opportunity to comment. If you have any questions regarding this letter please feel free to contact me at (714) 850-4830 or [sbeck@mbcnet.net](mailto:sbeck@mbcnet.net).

Respectfully,

**MBC Applied Environmental Sciences**



Shane Beck  
President