

**STATE OF CALIFORNIA  
REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL COAST REGION**

**STAFF REPORT FOR REGULAR MEETING OF JULY 12, 2012**

Prepared on May 25, 2012

**ITEM NUMBER: 13**

**SUBJECT: Status Report on Once-Through Cooling and Desalination Permitting**

**STAFF CONTACT: Dr. Peter von Langen 805/549-3688 or [pvonlangen@waterboards.ca.gov](mailto:pvonlangen@waterboards.ca.gov)**

**This Action: Opportunity for Board Discussion and Direction to Staff**

**SUMMARY**

State Water Resources Control Board (State Water Board) staff proposes to address desalination facilities and brine disposal in amendments to the *Water Quality Control Plan for Ocean Waters of California* (Ocean Plan) and the *Water Quality Control Plan for Enclosed Bays and Estuaries of California* (Enclosed Bays and Estuaries Plan). The planned amendments are scheduled to be considered for adoption by the State Water Board in January 2013.

State Water Board staff recently held a scoping meeting for the draft substitute environmental documentation, which needs to be prepared to support the amendments. The State Water Board has also initiated two other science projects to support development of the amendments to address desalination facilities and brine discharges; these include a brine toxicity study and the Science Advisory Panel for Brine Discharges. Dr. Carol Reeb from Hopkins Marine Station of Stanford University is on the Science Advisory Panel for Brine Discharges. Dr. Reeb will give a presentation to the Central Coast Water Board regarding seawater desalination and the impacts brine discharges could have on marine life at the July 12, 2012 meeting in Watsonville.

This is an information item only; no action is recommended.

**DISCUSSION**

**Background**

The National Pollutant Discharge Elimination System (NPDES) is the federal permitting system Water Boards implement to control point source discharges of pollutants to surface water bodies. The intake and use of surface waters for once-through cooling (OTC) by power plants and other industrial uses, such as for desalination facilities, is also regulated by NPDES permitting. NPDES permits are adopted in waste discharge requirements orders (WDRs) and are guided by both federal and State regulations and policies. Clear State policy and guidance can help make requirements in NPDES permits relatively straight-forward to implement in regards to ensuring safe levels of

pollutants in the discharge. Until recently State policy or guidance has been lacking in regards to impacts caused by the intake of surface-water by industrial facilities. Likewise, dense-brine discharges from desalination facilities are not yet addressed in State policy, which makes permitting more controversial and difficult to implement.

Section 316(b) of the federal Clean Water Act requires that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impacts from the intake of surface waters. The trapping of organisms against screens is called impingement and the larger issue of killing larvae due to their passing through the OTC system is called entrainment. The intake of seawater for industrial uses (such as desalination) also results in impingement and entrainment, although impacts are typically on a much smaller scale, commensurate with the much smaller volume of water used. Fully operating power plants normally each use hundreds of millions of gallons per day (MGD) while desalination plants normally use less than 1 MGD (although there are some proposals for large-scale desalination plants to use up to 100 MGD of ocean water).

Uncertainty and resulting litigation related to OTC and Section 316(b) regulations have delayed statewide NPDES permitting of existing power plants, including the three power plants in the Central Coast Region (Moss Landing, Diablo Canyon, and Morro Bay). For example, the existing permit for the Moss Landing Power Plant adopted by the Central Coast Water Board in 2000 (WDR Order No. 00-041) was litigated (Voices of the Wetlands) until an August 15, 2011 California Supreme Court decision upheld the Water Board's adoption of the permit. Also, Section 316(b) Phase II regulations were adopted in 2004 by the USEPA to address impingement and entrainment impacts resulting from the intake of large volumes of OTC water by existing power plants and other industrial uses. Much of the delays of power plant permitting are related to the Phase II Section 316(b) regulations litigated in a U.S. Supreme Court case known as Riverkeeper II. Although the Second Circuit Court issued its Riverkeeper II decision on January 25, 2007, rather than clarifying permitting of existing power plants, the decision provided more uncertainty in the Section 316(b) regulations. The Riverkeeper II decision invalidated mitigation for entrainment and impingement as a compliance option and required technology standards to comply with Section 316(b) regulations while not allowing cost to be considered. Energy companies appealed the decision and on April 1, 2009, the U.S. Supreme Court overturned the lower court ruling and upheld EPA's decision to allow a Cost Benefit Analysis when determining technological standards to maintain compliance with Section 316(b). In 2011 EPA proposed new Section 316(b) regulations that must be implemented by July 27, 2012, as per a settlement agreement with Riverkeeper. Essentially, the new Section 316(b) rules have technology standards for impingement but the rules leave the much more important and complex issue of entrainment to the states.

### **State Water Board OTC Policy**

Intake of marine water for OTC (and other industrial uses) is also regulated by California through Porter Cologne 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.”

In response to this limited Porter Cologne language and the uncertainty and delays in statewide power plant permitting brought about by Section 316(b) Phase II regulations, the State Water Board developed its *Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling* (Policy). The State Water Board adopted the Policy on May 4, 2010, and the Policy became effective on October 1, 2010. The Policy establishes technology-based standards to implement Section 316(b) and reduce the harmful effects associated with cooling water intake structures on marine and estuarine life. The Policy applies to the 19 existing power plants (including two nuclear plants) that currently have the ability to withdraw over 15 billion gallons per day from the State's coastal and estuarine waters. Closed-cycle wet cooling has been selected as best technology available (BTA) in the Policy and permittees must either reduce intake flow and velocity by committing to closed-cycle cooling (Track 1) or, if Track 1 is not feasible, reduce impacts to aquatic life comparably by operational and/or structural controls (Track 2).

#### Statewide Advisory Committee on Cooling Water Intake Structures (SACCWIS)

The Policy is implemented through an adaptive management strategy by which the standards can be achieved without disrupting the critical needs of the State's electrical generation and transmission system. SACCWIS has been established to review implementation plans and schedules and provide recommendations to the State Water Board at least annually. SACCWIS includes representatives from the California Energy Commission, California Public Utilities Commission, California Coastal Commission, California State Lands Commission, California Air Resources Board, California Independent System Operator, and the State Water Board. The State Water Board will consider SACCWIS's recommendations and make modifications to the Policy as appropriate and NPDES permits will be reissued or modified to conform with the Policy.

#### Review Committee for Nuclear Fueled Power Plants

The Review Committee was established to oversee the special studies that will investigate ability, alternatives, and cost for the two nuclear-fueled power plants (Diablo Canyon and San Onofre) to meet Policy requirements. The special studies will be conducted by an independent third party (Bechtel) with engineering experience with nuclear power plants, selected by the Executive Director of the State Water Board, and paid for by the two nuclear-fueled power plants subject to the Policy (Pacific Gas and Electricity and Southern California Edison). The Review Committee includes representatives from the SACCWIS agencies, the nuclear power companies, the environmental community, and staff of the State Water Board, Central Coast Water Board, and San Diego Water Board. By October 1, 2013, the Review Committee will provide the final report and the Review Committee's comments for public comment detailing the results of the special studies and will present the report to the State Water Board.

#### Permitting of Power Plants in the Central Coast Region

Although NPDES permits for the three power plants in the Central Coast Region are expired and on administrative extension, they are in full regulatory force. The State Water Board's OTC Policy states that the State Water Board (not the Regional Board) will reissue or, as appropriate, modify NPDES permits for power plants at hearings in the Central Coast Region, to ensure that the permits conform to the provisions of the Policy. The State Water Board will reopen, if necessary, the relevant permits and modify the final compliance schedules, if appropriate, based on modifications to the OTC Policy (see Attachments 1 and 2).

Regarding Central Coast power plants, Morro Bay has until December 31, 2015, and Moss Landing has until December 31, 2017, to be in compliance with the Policy. Diablo Canyon has until December 31, 2024, to be in compliance with implementation provisions resulting from State Water Board action on special studies. The period between October 1, 2015, and the dates that each plant individually has to be in full compliance with Track 1 or Track 2 will require interim mitigation. The owner or operator of a power plant must send an implementation plan for interim mitigation to the State Water Board that demonstrates to the State Water Board's satisfaction that the interim entrainment and impingement impacts are mitigated. Currently, interim mitigation is planned as either working on a local mitigation project or paying an annual fee based on the amount of OTC water used during the year. The State Water Board Policy is supportive of mitigation fees going to the California Coastal Conservancy, which will work with the California Ocean Protection Council to fund marine mitigation projects that have a nexus to impacts caused by OTC. An interim mitigation fee has not yet been adopted but marine scientists involved in previous mitigation projects are recommending a mitigation fee of approximately \$3 per million gallons of OTC water used annually. Each facility's interim mitigation plan may be amended in the future and final interim mitigation will be decided by the State Water Board for each facility at later dates to be determined.

For Morro Bay Power Plant, the interim mitigation fee based on \$3 per million gallons would be very small because the power plant rarely operates and the interim mitigation fee only covers the approximately three months between October 1, 2015, and the full compliance deadline of December 31, 2015. For example, even if the Morro Bay Power Plant were to run much more frequently than it currently is and utilize 300 MGD and operate for 50 days from October 1, 2015, to December 31, 2015, the interim mitigation fee based on \$3 per million gallons would only be \$45,000 (300x\$3x50). Morro Bay Power Plant staff notified Central Coast Water Board staff that Dynegy is no longer looking into putting a new power plant at the facility and is looking at the possibilities of complying with the OTC Policy by implementing operational or structural controls (Track 2). Moss Landing Power Plant also plans on implementing operational or structural controls to comply with Track 2 of the OTC Policy. Specifics regarding which controls will be used are dependent on future information that will be gained before the final compliance dates. Likewise, changes to interim mitigation plans may be proposed by the power plant owners in the future and the mitigation plans will ultimately be decided by the State Water Board.

The status of potential fees and other compliance options for Diablo Canyon Power Plant depends on the outcome of the special studies overseen by the Review Committee and planned permit adoption by the State Water Board by October 1, 2013. Because Diablo Canyon Power Plant utilizes almost 2.5 billion gallons of seawater per day (BGD) and operates continuously, potential interim mitigation fees could be high if the \$3 per million gallon guidance recommended by the expert review panel is approved by State Water Board (approximately \$2.7 million per year). Like the other power plants, the final decision regarding final compliance with the OTC Policy and interim mitigation will be decided by the State Water Board in the future. The State Water Board is scheduled to adopt the new permits for the Central Coast Region in 2013. However, State Water Board staff recently relayed to Central Coast Water Board staff that the State Water Board may be interested in reverting power plant permitting decisions back to the Regional Boards in 2013. More information regarding the Policy can be found at:

[http://www.waterboards.ca.gov/water\\_issues/programs/ocean/cwa316/](http://www.waterboards.ca.gov/water_issues/programs/ocean/cwa316/)

**State Water Board Desalination Policy**

Power plants may be able to utilize a closed system that minimizes the intake of seawater for cooling; however, ocean desalination facilities require the intake of seawater and discharge of brine in order to make potable freshwater. During the process of ocean desalination, salt and minerals are removed from salt water to produce fresh water and the remaining salt, minerals, and other compounds are discharged as hyper-saline brine. Because brine is denser than the ocean water it could settle on the ocean bottom and potentially harm marine organisms. Water Board NPDES permits for brine discharges contain conditions protective of aquatic life but the Ocean Plan currently does not have objectives for elevated salinity levels, or describe how brine discharges are to be regulated and controlled, nor address possible impacts to marine life from intakes for desalination facilities. Many desalination facilities are proposed along the California coast, including several along the Central Coast. The State Water Board has identified development of a desalination policy by 2013 as one of its top three priority projects.

On March 1, 2012, Central Coast Water Board staff geologist Dr. Peter von Langen attended a public meeting at Moss Landing Marine Laboratories with an expert review panel that was established to address issues associated with minimizing and mitigating intake impacts from power plants and desalination facilities. As discussed at the meeting, the proposed desalination policy would reflect a strategy similar to that of the OTC Policy and incorporate Porter Cologne Section 13142.5(b) by requiring the best site, design, and technology for a desalination intake structure and then require mitigation for environmental impacts that still occur at an annual rate of approximately \$3/million gallons of water used by each desalination plant. For a large desalination plant that uses 100 MGD running 365 days a year, the annual fee would be approximately \$110,000. Likewise, a small 1 MGD desalination facility running 365 days per year would have an annual seawater use mitigation fee of only \$1100. A report of the expert review panel's recommendations for mitigation and fees for the intake of seawater by desalination and power plants and more information regarding the proposed desalination policy can be found at the State Water Board's website at [http://www.waterboards.ca.gov/water\\_issues/programs/ocean/desalination/](http://www.waterboards.ca.gov/water_issues/programs/ocean/desalination/)

State Water Board staff proposes to address desalination facilities and brine disposal in amendments to the Ocean Plan and the Enclosed Bays and Estuaries Plan. State Water Board staff held a March 30, 2012, California Environmental Quality Act (CEQA) public scoping meeting for the desalination policy. The purpose of the scoping meeting was to seek input on the scope and content of the environmental information that should be included in the draft substitute environmental documentation prepared to support the amendments. The planned amendments are currently envisioned to have the following components: 1) a "narrative" objective for salinity, 2) provisions to minimize impacts to marine life from desalination plant intakes, and 3) implementation provisions.

The State Water Board has initiated two other science projects to support development of the amendments to address desalination facilities and brine discharges; these include a brine toxicity study and the Science Advisory Panel for Brine Discharges. The State Water Board planned an informational Workshop on June 6, 2012, to discuss the results of the expert panel on brine discharges, the expert panel on intake impacts and mitigation, and a scientific study to determine the tolerance of Ocean Plan test species to various concentrations of hyper-saline brine. The workshop was postponed because

a stakeholder requested more time to review the various reports and the workshop will be rescheduled soon when the draft brine toxicity study is ready for public review. Dr. Carol Reeb from Hopkins Marine Station of Stanford University is on the Science Advisory Panel for Brine Discharges. Dr. Reeb will give a presentation to the Central Coast Water Board regarding seawater desalination and the impacts brine discharge could have on marine life at the July 12, 2012 meeting in Watsonville.

The planned amendments, including mitigation and fees for the intake of seawater, are scheduled to be considered for adoption by the State Water Board in January of 2013. Regulatory provisions of amendments must be approved by the State Office of Administrative Law (OAL) and by the U.S. Environmental Protection Agency (USEPA) in order to be effective. The amendments would be implemented through individual NPDES permits. Of further note, Assembly Bill 2595 proposed by Assembly Member Hall could impact desalination facility permitting. This bill would require the Ocean Protection Council (OPC) to report to the Legislature, by December 31, 2014, on opportunities for improving the statewide permitting processes for seawater desalination facilities while maintaining current regulatory protections. The bill also would require the OPC to convene a Seawater Desalination Permit Improvement Task Force for this purpose and would specify the membership of the Task Force to include a representative of the State Water Board, as well as many other agencies. The assembly bill would appropriate \$250,000 from Proposition 84 funds to the Department of Water Resources to pay for the costs of preparing the report. Central Coast Water Board staff will continue to update the Central Coast Water Board regarding power plant and desalination issues as they develop.

### **RECOMMENDATION**

This report is for information only. The Board may give direction to staff.

### **ATTACHMENTS**

1. Central Coast Water Board Letter to the State Water Board dated September 9, 2009.
2. Central Coast Water Board Letter to the State Water Board dated April 12, 2010.