PROPOSED AMENDMENT TO THE WATER QUALITY CONTROL POLICY ON THE USE OF COASTAL AND ESTUARINE WATERS FOR POWER PLANT COOLING

Draft Staff Report

State Water Resources Control Board
California Environmental Protection Agency

September 29, 2010

1. SUMMARY OF THE POLICY AMENDMENT

This Draft Staff Report serves as the environmental document for a proposed amendment to the statewide *Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling* ("Policy").

The Policy establishes uniform, technology-based standards to implement federal Clean Water Act (CWA) section 316(b) and reduce the harmful effects associated with cooling water intake structures on marine and estuarine life. The Policy was adopted by the State Water Resources Control Board (State Water Board) on May 4, 2010, under Resolution No. 2010-0020. The Policy was approved by the Office of Administrative Law on September 27, 2010.

The proposed amendment language is included as Appendix A of this document, and consists of changes to Sections 2.A (2)(d), 2.C(3) and 3.A (1) of the Policy.

Section 2.A (2)(d) of the Policy established alternative requirements for power plants with previously installed combined-cycle power-generating units. The affected facilities with combined-cycle power-generating units are Haynes Generating Station (Units 9 and 10), Harbor Generating Station (Unit 8) and Moss Landing Power Plant (Units 1 and 2). The amendment would, as an additional option if certain conditions are fulfilled, allow an owner or operator to continue to use once-through cooling at combined-cycle units until the unit reaches the end of its useful life. Under this proposal, the owner or operator must specify the expected remaining useful life of the combined-cycle unit(s), and this end-date must be included as a final compliance date for eliminating OTC in the facility's NPDES permit. The owner or operator must also study the feasibility of employing fine mesh screens or equivalent measures for these units. For units continuing to operate without fine mesh screens or equivalent measures, the owner or operator must submit mitigation funds in the amount of three dollars ($3.00) per million gallons of water withdrawn, payable annually.

Section 3.A of the Policy requires the owner or operator of a fossil-fueled power plant subject to the Policy to submit an implementation plan to the State Water Board within six months of the Policy's effective date. Section 3.A (1) of the Policy specifies what needs to be included in this implementation plan. The amendment states conditions for submittal of any implementation plan that extends beyond December 31, 2020. The owner or operator would need to commit to eliminating the use of OTC upon repowering each unit and specify the date of repowering each unit. The owner or operator must conduct feasibility studies of employing fine mesh screens or equivalent controls for these units. For units operating without control measures, the owner or operator must submit mitigation funds in the amount of three dollars ($3.00) per million gallons of water withdrawn, payable annually.

Section 2.C sets forth immediate and interim requirements for power plants subject to the Policy. Under the proposed amendment, a minor change to Section 2.C(3) clarifies that the new mitigation provisions in Sections 2.A.(2)(d) and 3.A(1) apply in place of the general requirement that commences five years after the effective date of the Policy.

2. BACKGROUND

In 1972, Congress enacted the federal Clean Water Act (CWA) to restore and maintain the

chemical, physical, and biological integrity of the Nation's waters[1]. CWA Section 316(b) requires that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available (BTA) for minimizing adverse environmental impact. In 2001, the U.S. Environmental Protection Agency (USEPA) adopted a rule for ***new*** facilities that established a performance standard based on closed-cycle wet cooling. No ***nationwide*** standards implementing Section 316(b) for ***existing*** power plants that use once-through cooling are in effect.

The State Water Board is designated as the state water pollution control agency for all purposes under the CWA. The state Porter-Cologne Water Quality Control Act[2] of 1969 authorizes the State Water Board to adopt statewide water quality control plans and Policies, which are implemented through National Pollutant Discharge Elimination System (NPDES) permits and waste discharge requirements (WDR)[3]. The Policy adopted by the State Water Board on May 4, 2010, under Resolution No. 2010-0020, established requirements for the implementation of Section 316(b) for ***existing*** power plants in California, using best professional judgment in determining BTA for cooling water intake structures. The Policy is implemented through NPDES permits, issued pursuant to CWA Section 402, which authorizes the point source discharge of pollutants to navigable waters.

The Policy applies to the 19 existing power plants located along the California coast that withdraw coastal and estuarine waters for cooling purposes, using a single-pass system known as once-through cooling. Cooling water withdrawals cause adverse impacts when larger aquatic organisms, such as fish and mammals, are trapped against a facility's intake screens (impinged) and when smaller life forms, such as larvae and eggs, are killed by being drawn through the cooling system (entrained).

"Track 1" of the Policy requires that intake flow rates at each power-generating unit be reduced to a level commensurate with that which can be attained by a closed-cycle wet cooling system (see Section 2.A.(1) of the Policy). A minimum 93 percent reduction in intake flow rate for each unit is required for compliance, compared to the facility's design intake flow rate. In addition, the through-screen intake velocity must not exceed 0.5 feet per second.

However, if the owner or operator of a facility can demonstrate that compliance with Track 1 is not feasible, the owner or operator may comply by reducing environmental impacts to marine and estuarine life comparably through other means, using operational or structural controls, or both, as described under the "Track 2" requirements in the Policy (see Section 2.A. (2) of the Policy). Prior reductions in impingement and entrainment resulting from prior technology-based improvements or the installation of combined-cycle units may be counted towards meeting these alternate requirements.

Combined-cycle units are a newer technology, which generally use less cooling water than the older steam boiler units to produce the same amount of energy. Combined-cycle systems can use less water for cooling than steam boilers, because they apply a two-stage process to generate electricity that recovers waste heat. The waste heat from a combustion turbine's exhaust is used to drive a steam turbine. Figure 11 in the Final Substitute Environmental Document (SED) for the Policy shows that the combined cycle units at Haynes Generating Station, Moss Landing Power Plant, and Harbor Generating Station have the lowest ratios of

[1] See 33 United States Code (U.S.C.) §1251 *et seq.*
[2] See Wat. Code §13000 *et seq.*
[3] See Wat. Code §13263.

cooling water flow to generated electricity compared to the other power plants using once-through cooling. Because they are more effective, combined-cycle units also produce lower air emissions for most pollutants and carbon dioxide than the older steam boiler units relative to the electricity generated. Table 9 in the SED supporting the Policy shows how the difference in efficiency affects carbon dioxide emissions between traditional steam boiler units and combined-cycle units. For the reasons given above, the State Water Board recognized existing combined-cycle units as special cases in the Policy provisions, allowing alternative requirements for these units, if compliance with Track 1 is not feasible.

The Policy includes an implementation schedule with compliance dates for each facility. Section 3.A of the Policy requires the owner or operator of a fossil-fueled power plant subject to the Policy to submit an implementation plan to the State Water Board within six months of the Policy's effective date. Section 3.A (1) of the Policy specifies what needs to be included in this implementation plan. The implementation plan must identify the compliance alternative and measures selected and propose a realistic schedule for implementing these measures that is as short as possible. A Statewide Advisory Committee on Cooling Water Intake Structures (SACCWIS) comprised of representatives from relevant state agencies will review the plans and schedules submitted by dischargers and ensure that the overall implementation schedule is realistic and will not jeopardize the reliability of the electrical grid system. The SACCWIS will present its recommendations to the State Water Board within a year, and the State Water Board will amend the Policy as appropriate based on these recommendations. The schedule may also be temporarily suspended, if determined necessary for electrical grid reliability purposes.

The Policy also includes immediate and interim requirements, which all facilities must comply with. No later than one year after the effective date, all facilities must install large organism exclusion devices and cease intake flows if not engaging in power-generating activities or critical system maintenance. The owner or operator must further mitigate any interim impacts beginning five years after the effective date until final compliance is achieved.

3. RATIONALE FOR THE PROPOSED AMENDMENT TO THE POLICY

State Water Board staff proposes an amendment to the Policy that would provide additional flexibility to owners or operators of facilities complying with Track 2 Policy requirements, with special considerations given to facilities with combined-cycle units. As discussed above, combined-cycle units are a newer technology, which generally use less cooling water and generate less greenhouse gases than the older steam boiler units to produce the same amount of energy.

4. REQUIREMENTS WHEN AMENDING THE POLICY

The State Water Board must comply with all state and federal public participation requirements and state laws governing environmental and peer review when amending the Policy.

The State Water Board is the lead agency for this project under the California Environmental Quality Act (CEQA)[4] and is responsible for preparing environmental documentation for the proposed amendment. The California Secretary of Resources has certified the State Water Board's water quality planning process as exempt from certain CEQA requirements[5] when adopting plans, policies, and guidelines, including preparation of an initial study, negative declaration, and environmental impact report. This Draft Staff Report serves as a substitute for

[4] Public Resources Code, §21000 *et seq*.
[5] Cal. Code Regs, tit. 14, §15251(g); see Public Resources Code, §21080.5.

these documents. Nonetheless, the State Water Board must still comply with CEQA's overall objectives, which are to: 1) inform the decision makers and public about the potential significant environmental effects of a proposed project; 2) identify ways that environmental damage may be mitigated; 3) prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternative or mitigation measures when feasible; and 4) disclose to the public why an agency approved a project if significant effects are involved.[6] The California Code of Regulations, Title 23, Section 3777(a) requires that a Staff Report includes a description of the proposed activity, an alternatives analysis, an identification of mitigation measures to minimize any significant adverse impact and an "Environmental Checklist" (See Appendix B).

In addition, CEQA imposes specific obligations on the State Water Board when it establishes performance standards. Public Resources Code §21159 requires that an environmental analysis of the reasonably foreseeable methods of compliance be conducted. The environmental analysis must address the reasonably foreseeable environmental impacts of the methods of compliance and reasonably foreseeable alternatives and mitigation measures.

The State Water Board is not required to prepare a "project level analysis". Rather, the State Water Board must prepare a program-level analysis, i.e. a Tier 1 analysis, that takes into account a reasonable range of environmental, economic, and technical factors, population and geographic areas, and specific sites. Site-specific or project-level impacts will be considered by the appropriate public agency that is ultimately responsible for approving or implementing individual projects.

The Health and Safety Code section 57004 requires external scientific peer review of the scientific basis for any rule proposed by any board, office, or department within the California Environmental Protection Agency (Cal/EPA). However, because this amendment is not based on any scientific data, peer review requirements do not apply.

5. PROJECT DESCRIPTION

The amendment language is included as Appendix A of this document, and consists of additions to Sections 2.A (d), 2.C(3) and 3.A (1) of the Policy.

The proposed changes to Section 2.A (2)(d) of the Policy would apply only to combined-cycle units. The proposed amendment would allow an owner or operator of a facility with an existing combined-cycle unit to use once-through cooling at this unit until the unit reaches the end of its useful life, as long as fine-mesh screens or equivalent measures are employed to mitigate harmful effects, or - if mitigation measures are shown to not be feasible - interim mitigation funds are paid annually in the amount of three dollars ($3.00) per million gallons of water withdrawn.

Under Track 2 of the current Policy, all facilities may also continue to use once-through cooling if impingement mortality and entrainment is reduced to a level comparable to Track 1. The amendment would allow an additional compliance alternative for combined-cycle units, removing the Track 2 requirement to show that Track 1 is not feasible. Under the proposed compliance alternative, the owner or operator must commit to eliminating the use of OTC upon repowering the unit. The owner or operator must further conduct pilot scale feasibility studies of

[6] Cal. Code Regs., tit. 14, § 15002(a).

fine mesh screen or equivalent measures to maximize the reduction of impingement and entrainment and implement these measures unless they are shown to be not feasible. If the studies show that it is infeasible to install screens or equivalent measures, the owner or operator must pay the specified annual mitigation funds for the useful life of the unit (instead of the interim mitigation funds specified under Section 2.C. Also, the mitigation funds required under the Policy amendment would be due immediately, rather than 5 years after the Policy's effective date. The proposed change to Section 2.C(3) clarifies that these more specific mitigation provisions apply instead of the those set forth in Section 2.C.3, not in addition to them.

The proposed changes to Section 3.A of the Policy would apply to any fossil-fueled power plant that submits an approved implementation plan that extends beyond December 31, 2020. The owner or operator would need to commit to eliminating the use of OTC upon repowering each unit and specify the date for repowering each unit. The owner or operator must conduct feasibility studies of employing fine mesh screens or equivalent controls for these units. For units operating without control measures, the owner or operator must submit mitigation funds in the amount of three dollars ($3.00) per million gallons of water withdrawn, payable annually and starting immediately. As with the proposed amendment governing combined-cycle units, the proposed amendment to Section 2.C(3) clarifies that the more specific mitigation provisions apply.

6. ENVIRONMENTAL SETTING

Please see the "Environmental Setting" section and the other sections in the "Background" chapter of the SED for the Policy.

7. ANALYSIS OF ALTERNATIVES AND ISSUES

The statewide Policy to implement CWA Section 316(b) has been adopted and approved, but not yet implemented through NPDES permits for the individual facilities. The environmental baseline for this amendment is therefore the same as described in the SED for the Policy.

Alternatives and Discussion:

***Alternative 1*: No Action.**
The State Water Board would not adopt the proposed amendment to the Policy. Under this alternative, fewer compliance options would be available to facilities with combined-cycle units. These facilities would be allowed under the current Policy to continue to operate with once-through cooling, but would need to show that Track 1 was not feasible, and that impingement and entrainment impacts had been reduced to a level comparable with Track 1.

***Alternative 2*: Delay Action.**
Consider the amendment only after the Statewide Advisory Committee on Cooling Water Intake Structures (SACCWIS) has submitted their first report to the State Water Board (which is required within one year of the Policy's effective date). This would allow the State Water Board the opportunity to consider the amendment's overall effect on the electrical grid in relation to the need for reducing impacts of impingement and entrainment.

***Alternative 3:* Adopt the Proposed Amendment as described.**
This alternative would provide more compliance options for facilities with combined-cycle units, while providing immediate funds to mitigate impacts if the additional option is selected. This alternative would also provide immediate mitigation funds from facilities with compliance

schedules stretching beyond December 31, 2020 if longer compliance schedules are subsequently approved by the State Water Board. However, this alternative is less stringent than the current Policy. Under the proposed amendment, facilities could be allowed longer time to reach compliance with Track 1 of the Policy, and this alternative may therefore generate more entrainment and impingement impacts than the current Policy.

Staff Recommendation: **Alternative 3.**

8. ENVIRONMENTAL EFFECTS AND MITIGATION

Title 23, Cal. Code Reg., §§ 3720-3782 require the State Water Board to evaluate potential environmental impacts that may be caused by complying with the proposed amendment with one or more of the reasonably foreseeable compliance methods. The SED for the Policy describes various technologies to minimize impingement mortality and/or entrainment at the affected facilities in order to comply with the Policy. The SED for the Policy also describes and evaluates potential environmental impacts associated with these technologies, and potential mitigation measures for these impacts. The proposed amendment would not affect the identified reasonable foreseeable means of compliance with the Policy.

Nor would the amendment in itself cause any additional environmental impacts beyond what has been identified in the SED for the Policy. The attached Environmental Checklist (see Appendix B) reflects these findings of no additional impact to the environment beyond those identified in the SED for the Policy. The existing policy allows an adaptive management approach for implementation of BTA while maintaining electrical grid reliability. It is understood that impacts will continue until BTA implementation occurs. The policy provides a compliance schedule and the necessary flexibility to meet the goal of final compliance while ensuring grid reliability. The amendment would provide an approach to addressing interim mitigation measures and the testing and implementation of fine mesh screening devices for combined cycle plants and for other fossil fuel power plants whose ultimate BTA implementation extends beyond December 31, 2020, but only if those compliance dates are changed by the State Water Board.

9. ECONOMIC ANALYSIS

The SED for the Policy provided information on the costs of previous mitigation or restoration projects funded by certain power plants associated with their once-through cooling related permits. The cost estimates provided in the proposed amendment are generally consistent with those costs in the SED for the Policy.