

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

**FOR
ENCINA POWER STATION**

DRAFT STAFF REPORT

**State Water Resources Control Board
May 22, 2017**

1. SUMMARY OF THE POLICY AMENDMENT

This Draft Staff Report supports the 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 State Water Resources Control Board (State Water Board) adopted the Policy on May 4, 2010, under [Resolution No. 2010-0020](#). The Policy was approved by the Office of Administrative Law on September 27, 2010. The Policy became effective on October 1, 2010, and was last amended on April 7, 2015.

The Policy applies to eleven¹ 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 (OTC). Cooling water withdrawals cause adverse impacts when larger aquatic organisms, such as fish and mammals, are trapped against a facility's intake screens (impingement) and when smaller life forms, such as larvae and eggs, are killed by being drawn through the cooling system (entrainment).

The Policy is implemented through National Pollutant Discharge Elimination System (NPDES) permits. Section 3.A of the Policy required the owner or operator of an affected fossil-fueled power plant to submit an implementation plan to the State Water Board by April 1, 2011. The implementation plan must identify the selected compliance alternative; describe the general design, construction, or operational measures that will be undertaken to implement the alternative; and propose a realistic schedule (including any requested changes to the default final compliance dates identified in the Policy) for implementing these measures that is as short as possible.

The State Water Board received implementation plans from all owners and/or operators as requested, including implementation plans for the four OTC power plants that are owned and operated by NRG Energy Inc. (NRG): Encina Power Station (Encina), Ormond Beach Generating Station, Pittsburg Generation Station and Mandalay Generating Station. NRG submitted the Encina Implementation Plan outlining on a unit-by-unit basis how they intended to achieve compliance with the Policy by their compliance deadline of December 31, 2017.

While NRG had expected to achieve compliance at Encina by December 31, 2017, two major events impacted this plan. First, the unexpected closure in 2013 of the San Onofre Nuclear Generating Station (SONGS) reduced power reliability in Southern California and created the need for additional power generation within the region. The second event was a litigation delay that prevented the timely start of construction of the Carlsbad Energy Center, which is needed to replace the Encina plant to ensure grid reliability. These events have caused the need to defer the closure of the Encina plant for an additional year.

¹ There were originally 19 OTC facilities covered by the Policy but eight of them have closed and met their planned compliance deadlines.

The multi-agency Statewide Advisory Committee on Cooling Water Intake Structures (SACCWIS)² was created to advise the State Water Board annually on whether the compliance schedule for retiring OTC technology at the state's power plants would threaten reliability of California's electricity supply, including local area reliability, statewide grid reliability, and permitting constraints.

As part of the SACCWIS process, the California Independent System Operator (CAISO) completed an interim study assessing the impact of the delay in constructing the Carlsbad Energy Center on Southern California grid reliability. These results were incorporated into the February 2017 SACCWIS Encina Power Station 2018 Reliability Study Report (SACCWIS 2017a). The report provides the technical basis for SACCWIS to recommend to the State Water Board that it consider an amendment for extension of the Encina compliance date to December 31, 2018. The SACCWIS finds this extension is necessary to maintain grid reliability in the Southern California area in 2018.

The SACCWIS agencies completed their annual grid reliability studies with regard to the entire OTC implementation schedule and presented their findings of the 2017 SACCWIS Draft Annual Report to the SACCWIS members on May 4, 2017 (SACCWIS 2017b). These studies included the CAISO Final 2018 Local Capacity Technical Analysis (LCTA) which is part of CAISO's annual resource requirements cycle (CAISO 2017). None of these studies changed the February SACCWIS recommendation for the Encina compliance extension.

Therefore, based upon the recommendation of SACCWIS to insure grid reliability, the proposed amendment will extend the OTC compliance deadline for the Encina plant from December 31, 2017, to December 31, 2018. The extension will apply to Encina Units 2 to 5, since Unit 1 was shut down on March 1, 2017, to allow construction of the Carlsbad Energy Center to begin.

The OTC Policy includes a provision that existing power plants must implement measures to mitigate the interim impingement and entrainment impacts resulting from cooling water intakes during operation prior to final compliance with the Policy (section 2 C (3)). Accordingly, the continuing OTC production from Encina will be subject to continued interim mitigation requirements as detailed in State Water Board [Resolution No. 2015-0057](#) until the plant comes into compliance.

2. REGULATORY BACKGROUND

In 1972, Congress enacted the federal CWA to restore and maintain the chemical, physical, and biological integrity of the nation's waters. 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 (U.S. EPA) adopted regulations for new power plants (Phase I) that established a performance standard for cooling water intakes based on closed-cycle wet cooling. In 2004, U.S. EPA published the Phase II rule applicable to existing power plants with a design intake flow greater than or equal to 50 million gallons per day (MGD), which was remanded following legal challenge. On

² SACCWIS includes representatives from the California Energy Commission, California Public Utilities Commission, California Coastal Commission, California State Lands Commission, California Air Resources Board, the CAISO, and the State Water Board.

May 19, 2014, U.S EPA finalized regulations covering existing facilities that withdraw at least 2 MGD of cooling water. Facilities have options to select for meeting BTA requirements for reducing impingement. Facilities that withdraw at least 125 MGD are required to conduct studies to investigate site-specific controls to reduce entrainment impacts. Finally, new units added to existing facilities are subject to similar requirements for new facilities. The new regulation was published in the Federal Register on August 15, 2014, and became effective on October 14, 2014 (U.S. EPA 2014).

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 of 1969 authorizes the State Water Board to adopt statewide water quality control plans and policies, which are implemented through NPDES permits and waste discharge requirements. 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 BTA was determined to be closed-cycle wet cooling, or equivalent. The Policy is implemented through NPDES permits, issued pursuant to CWA section 402, which authorize the point source discharge of pollutants to navigable waters.

Because the Policy requirements are equivalent to, if not more stringent than those contained in applicable U.S. EPA regulations, it continues to govern those existing coastal power plants in California. The U.S. EPA rule explicitly states that it is within the States' authority to implement requirements that are more stringent than the federal requirements.

3. OVERVIEW OF NRG'S ENCINA POWER STATION

The Encina Power Plant is located near the City of Carlsbad in San Diego County adjacent to the Aqua Hedionda Lagoon on the Pacific Ocean, approximately 30 miles north of the City of San Diego. Please see the "Environmental Setting" of section 2.1.7 of the Policy's 2010 Final Supplemental Environmental Documentation (SED) (SWRCB 2010) for more information.

The Encina facility consists of five steam boiler generating units using once-through cooling with an aggregate capacity of 950 megawatts (MW). In its original April 1, 2011, implementation plan, NRG proposed different approaches for the five units. For Units 1-3 (an aggregate of 318 MW capacity), NRG proposed repowering with a new flexible combined cycle facility, the Carlsbad Energy Center, consisting of two combined cycle units with an aggregate capacity of 550 MW. In 2013, NRG informed the State Water Board that it plans to replace Units 1-3 with the Carlsbad Energy Center but no longer intends to pursue Track 2 compliance options and will retire Units 4 and 5 no later than the final compliance date for Encina of December 31, 2017. NRG announced that it will redesign the Carlsbad Energy Center as a set of peaking units, pursuant to an agreement reached among the company, the City of Carlsbad, and San Diego Gas and Electric (SDG&E).

In agreement with the City of Carlsbad and SDG&E, NRG submitted a Petition of Amend to the California Energy Commission (CEC) on May 2, 2014, to replace all five units plus a small combustion turbine at Encina with a 600 MW Simple Cycle Gas Turbine power plant at the Carlsbad Energy Center. The CEC approved the Amendment on July 30, 2015. SDG&E submitted an application to the California Public Utilities Commission (CPUC) for approval of a Power Purchase Agreement (PPA) with NRG. On May 21, 2015, the CPUC

adopted a Decision (D 15-05-051) which approved 500 MW of the 600 MW originally requested and allocated the remaining 100 MW to preferred resources or energy storage. The Decision ordered SDG&E to file the revised contract within 30 days. Pursuant to this Decision, SDG&E filed an advice letter seeking approval of a Power Purchase Tolling Agreement (PPTA) with Carlsbad Energy Center in June 2015. That advice letter was approved by the CPUC in July 2015, but six intervenors filed applications for rehearing with the appellate section. In November of 2015, the CPUC re-affirmed their approval of the Carlsbad Energy Center PPTA. In response to this, petitioners requested that the Court of Appeal overturn the CPUC's decision. The Court of Appeal accepted the petition for consideration and ordered final briefings from the petitioner and respondents.

The Court of Appeal ruled on December 1, 2016, affirming the CPUC's decision granting the PPTA to SDG&E and NRG for the 500 MW Carlsbad Energy Center project. The petitioner did not appeal the decision by the January 9, 2017 deadline.

Given the delays in resolution of the intervenors' petition to the courts, NRG notified the financial community of delays in Carlsbad Energy Center start up dates numerous times during 2016. With the recent litigation resolved, NRG can move forward with the project and it is now assured that Carlsbad Energy Center will not be available by summer of 2018. NRG's construction of Carlsbad Energy Center began April 1, 2017, and is expected to require 21 months to complete. NRG confirmed that Carlsbad Energy Center will be online in the fourth quarter of 2018 (NRG 2017a).

4. RATIONALE FOR THE AMENDMENT TO THE POLICY

California Energy Commission's Integrated Energy Policy Report (IEPR):

The CEC's 2016 IEPR Update (Update) examined the consequences of the Carlsbad Energy Center delay on San Diego local reliability (CEC 2016a). Figure 1 reproduces a chart from a presentation package for the Update (slide 19) (CEC 2016b) that illustrates the results of the analysis of two scenarios – one using baseline assumptions about Carlsbad Energy Center being online by summer 2018, and a second case with Carlsbad Energy Center delayed to 2019.

Figure 1: Comparing Impact of Alternative Assumptions on Local Capacity Surplus/Deficit in San Diego

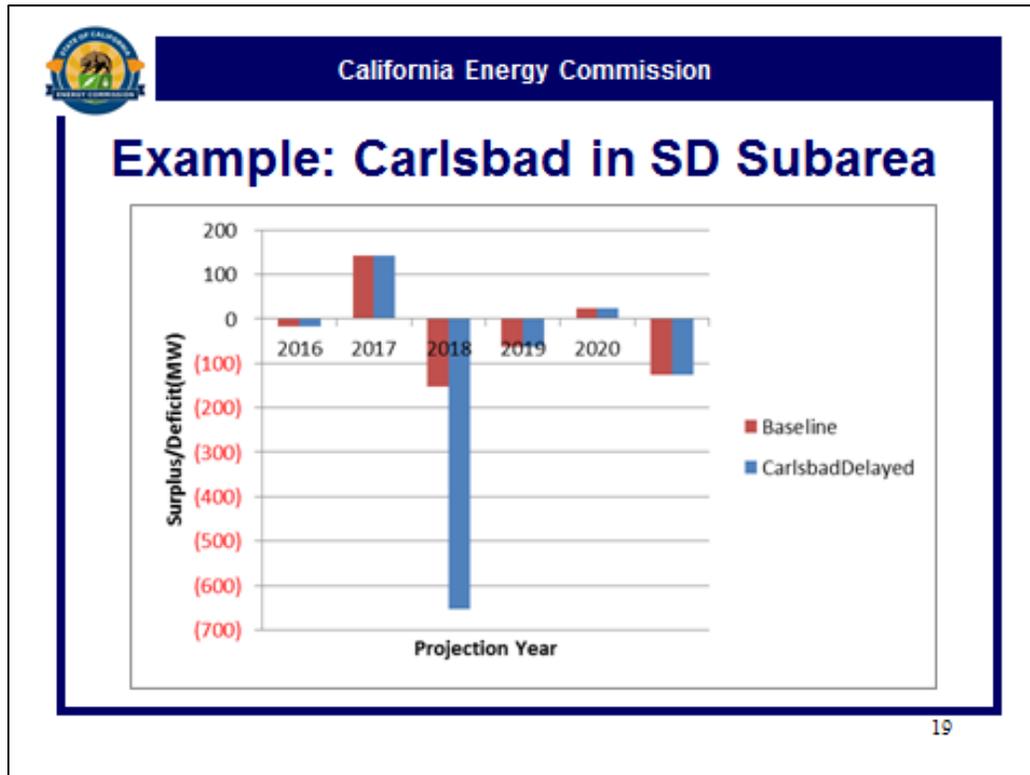


Figure 1 shows a small capacity deficit in 2018 using baseline assumptions, but this deficit is worse in 2018 if Carlsbad Energy Center is not available until 2019. Based on this analysis, the CEC staff recommended that the inter-agency team initiate studies of Carlsbad Energy Center delays on the need to defer Encina OTC compliance date. The CEC endorsed this staff recommendation and has included the following language in the draft Update report released for comment (CEC 2016c).

- **“Assuring Local Reliability in San Diego.** Inter-agency staff (staff from the Energy Commission, CPUC, California ISO, and ARB) should prepare a draft report for consideration by Statewide Advisory Committee on Cooling Water Intake Structures (SACCWIS) that recommends deferral of Encina’s once-through cooling compliance dates until Carlsbad Energy Center comes on-line. The interagency staff should identify specific units at Encina for which to request deferral based on studies by the California ISO, with the study results and inputs agreed upon by the joint agency team.”

SACCWIS Encina Reliability Report:

The energy agencies (CAISO, CEC, CPUC) agreed that a separate earlier study was needed for the energy year 2018 to substantiate the need to extend Encina’s OTC compliance date. The usual report on CAISO’s annual reliability requirements cycle for 2018 local capacity studies would not be completed until May 1, 2017, which was too late to start the State Water Board amendment deferral process. As an interim step, the CAISO

conducted an interim Encina study between their annual 2017 and 2018 LCTA (SACCWIS 2017a).

The CAISO, in consultation with the CEC and CPUC, developed study assumptions and scenarios for the interim CAISO Encina 2018 study³. The CAISO started with the 2017 LCTA study for the Los Angeles Basin (LA Basin) and San Diego local capacity areas (LCA) and made revisions based on study assumptions agreed to by the CEC and CPUC technical staff. The CAISO performed its studies by applying the methodologies employed in the 2017 analysis with modeling the proposed Carlsbad Energy Center and other resources identified by SDG&E in response to CPUC authorizations.

Two important issues deserve mention, as they provide additional context for the modeling CAISO performed that reflect current realities. The first is the unscheduled and ultimately permanent shutdown of the SONGS in 2013, and the second is the current limitation on the Aliso Canyon natural gas storage facility that began in 2015. With the unscheduled shutdown of the SONGS, the energy agencies and Air Resources Board formed an ongoing inter-agency team to make plans and recommend actions to assure reliability for the Southern California region as a whole. It quickly became apparent that without SONGS the previously independent San Diego and LA Basin LCA were, in fact, one single region with a common vulnerability to contingencies.

The detection of a leak at the Aliso Canyon natural gas storage field in October 2015 has created uncertainty around the use of Aliso Canyon, which directly affects the delivery of natural gas to generating facilities located in the western area of the LA Basin during summer peak load conditions. With the limitation on reinjection at Aliso Canyon and uncertainty over its long-term status, the CAISO analyzed the impact that the absence of Aliso Canyon has on the reliability of the electric transmission system in the LA Basin and San Diego area as a reduction in generation capacity in the LA Basin and a corresponding increase in the San Diego subarea.

The results of the interim CAISO Encina 2018 study for the two Aliso Canyon scenarios show a range of need for Encina. Regardless of scenario, Encina is needed to mitigate reliability concerns on the electric transmission system. In the study, consistent with the 2017 analysis and the CAISO's tariff, the CAISO evaluated multiple critical contingencies from thermal overloads to voltage instability on the electric transmission system in the LA Basin and San Diego areas. In Scenario 1, with Aliso Canyon unconstrained, the greatest local capacity requirements were found to be 7,383 MW in LA Basin and 2,886 MW in San Diego, which resulted in a need of 560 MW of Encina. In Scenario 2, with Aliso Canyon constrained, the local capacity requirements were found to be 7,079 MW in the LA Basin and 3,185 MW in the San Diego subarea, which resulted in a need of 859 MW of Encina. The unexpected constraints at the Aliso Canyon gas storage facility contribute to the higher need for Encina. In summary, the study found the reliability need for Encina capacity under the assumptions employed to range from 560 MW to 859 MW depending on the assumed impact of the Aliso Canyon uncertainty.

As part of the SACCWIS process, the CAISO interim study was incorporated into the February 2017 SACCWIS Encina Power Station 2018 Reliability Study Report and approved by CAISO, CPUC, and CEC. On February 23, 2017, the study and accompanying report

³ Attached as Appendix A, *Encina Power Station 2018 Once-Through Cooling Compliance Date Deferral Study Report, January 16, 2017 within the SACCWIS Encina Report (2017a)*

were presented to the SACCWIS members (SACCWIS 2017c). The report provided the technical basis for SACCWIS to recommend the extension of the Encina compliance date for Units 2-5 from December 31, 2017, to December 31, 2018. The SACCWIS found this extension is necessary to maintain grid reliability in the Southern California area in 2018. Upon this SACCWIS review and recommendation, the State Water Board staff recommends that the State Water Board amend the compliance deadline of the Policy for Encina Power Station Units 2-5 for one year from December 31, 2017, to December 31, 2018.

Encina Interim Mitigation Measures and Mitigation Payment:

The OTC Policy includes a provision that existing power plants must implement measures to mitigate the interim impingement and entrainment impacts resulting from cooling water intakes during operation prior to final compliance with the Policy (Appendix A section 2 C (3)). Accordingly, the continuing OTC production from Encina will be subject to an Interim mitigation payment as detailed in State Water Board [Resolution No. 2015-0057](#) (SWRCB 2015).

The mitigation requirements may include a site-specific charge that is calculated based on actual production data provided by NRG each year. The calculation of the mitigation payment will occur outside of this amendment process. Encina will be subject to the payment until the OTC production is finally ceased. This amendment would continue these payments until final extended compliance date of December 31, 2018.

5. 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) and is responsible for preparing environmental documentation for the amendment. The California Secretary of Resources has certified the State Water Board's water quality planning process as exempt from certain CEQA requirements when adopting plans, policies, and guidelines, including preparation of an Initial Study, Negative Declaration, and Environmental Impact Report.

The California Code of Regulations, Title 23, section 3777(a) provides that a Staff Report consists of a written report containing an environmental analysis of the project, an Environmental Checklist, and other documentation. Section 3777(b) directs that the environmental analysis must include a brief description of the project; identification of any significant or potentially significant adverse environmental impacts of the project; an analysis of reasonable alternatives to the project, mitigation measures to avoid or reduce any significant or potentially significant adverse environmental impacts, and an environmental analysis of the reasonably foreseeable methods of compliance.

In addition, CEQA imposes specific obligations on the State Water Board when it establishes performance standards. Public Resources Code section 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, reasonably foreseeable alternatives, and mitigation measures. In order to comply with CEQA, an addendum to the May 4, 2010 Final Substitute Environmental Documentation (SED) has been prepared and is further described below.

6. PROJECT DESCRIPTION

The amendment language is shown in Appendix A of this document, and consists of changes to the “Implementation Schedule” in Table 1 in section 3.E of the Policy.

The facility affected by the amendment is the Encina Power Station, which currently has a compliance deadline of December 31, 2017. The amendment would allow an extension for the Encina Power Station, changing the compliance deadline from December 31, 2017, to December 31, 2018.

7. ENVIRONMENTAL SETTING

The Encina Power Plant is located near the City of Carlsbad in San Diego County adjacent to the Aqua Hedionda Lagoon on the Pacific Ocean, approximately 30 miles north of the City of San Diego. Please see the “Environmental Setting” of section 2.1.7 of the Policy’s 2010 Final SED (SWRCB 2010) for more information.

8. PEER REVIEW

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. However, because this amendment is not based on any scientific data, peer review requirements do not apply.

9. ANALYSIS OF ALTERNATIVES

The Policy to implement CWA section 316(b) has been adopted and approved, but not yet implemented through NPDES permits for all the individual facilities, including Encina. The environmental baseline for this amendment is therefore the same as described in the 2010 Final SED for the Policy.

As allowed by the Policy, SACCWIS has considered the following options to an Encina compliance date extension:

Option 1: Do nothing – This option poses significant reliability risk to the Southern California area as the delay caused by the Court of Appeal and NRG’s obligations under the interconnection agreement would leave a gap in generating capability.

Option 2: Fast-track preferred resources (energy efficiency, storage, demand response) in-service - It may be possible to require SDG&E to pursue procurement for the 100 MW of preferred resources faster but that alone would not address the reliability issues without Carlsbad Energy Center and Encina.

Option 3: Stop-gap additional power generation option - Given the current timeframe, it would not be possible to construct alternative generation resources within the San Diego subarea that can provide the needed voltage support as well as capacity for thermal loading mitigations. The only possibility would be bringing in diesel generators with similar capacity. However, challenges in siting and interconnection, as well as the emissions from these resources would likely make this an unworkable option.

Option 4: Construct or connect additional Transmission lines – No transmission alternatives would meet the reliability needs in the timeline.

Considering these four options as not viable or suitable, SACCWIS recommends extending Encina's OTC compliance date until December 31, 2018, as the most prudent option at this time to maintain grid reliability.

Alternatives and Discussion for the State Water Board:

Alternative 1: No Action.

The State Water Board would not adopt the proposed Amendment to the Policy. Under this alternative, the compliance deadline for NRG's Encina facility would remain as currently stated in the policy. This may cause significant grid reliability problems in 2018.

Alternative 2: Adopt the Amendment as described

The State Water Board would adopt the proposed Amendment to extend Encina's OTC compliance date for an additional year to December 31, 2018, as recommended by SACCWIS.

Staff Recommendation: Alternative 2

Considering the other four options considered by SACCWIS, extending Encina's OTC for an additional year would be the most appropriate and reliable alternative at this juncture. This alternative should support grid reliability in 2018 and provide sufficient time to accommodate the construction of the Carlsbad Energy Center.

10. ADDENDUM TO THE FINAL SED ADOPTED MAY 4, 2010

Title 23, Cal. Code Reg., sections 3720-3782 requires the State Water Board to evaluate potential environmental impacts that may be caused by complying with the amendment with one or more of the reasonably foreseeable compliance methods. The 2010 Final SED for the Policy also describes and evaluates potential environmental impacts associated with these technologies, and potential mitigation measures for these impacts.

The amendment would not affect the identified reasonably foreseeable means of compliance with the Policy. Nor would the amendment cause any additional environmental impacts beyond what was identified in the 2010 Final SED adopted with the Policy. Continued operation of the Encina under its current operational configuration does not constitute an increase in impacts relative to the baseline identified in the 2010 Final SED. The extension will not result in additional significant or potentially significant environmental impacts.

11. ECONOMIC ANALYSIS

The 2010 Final SED for the OTC Policy provides information on the costs of compliance with the Policy. The costs for the amendment are consistent with those costs in the 2010 Final SED for the Policy (SWRCB 2010).

12. REFERENCES

- CAISO (California Independent System Operator) 2015-2016 Transmission Plan: APPENDIX D: 2025 Local Capacity Technical Analysis for the Los Angeles Basin (LA Basin), Big Creek/Ventura and San Diego Local Capacity Requirement Areas February 1, 2016 <http://www.caiso.com/Documents/AppendixD-Draft2015-2016TransmissionPlan.pdf>
- CAISO 2018 Local Capacity Technical Analysis. Draft Report and Study Results. May 1, 2017 <http://www.caiso.com/Documents/Final2018LocalCapacityTechnicalReport.pdf>
- CEC (California Energy Commission), Staff Report Assessing Local Reliability in Southern California. August, 2016a. CEC-200-2016-011 http://docketpublic.energy.ca.gov/PublicDocuments/16-IEPR-06/TN212966_20160826T093802_Staff_Report_Assessing_Local_Reliability_in_Southern_California.pdf
- CEC Presentation, Contingency Mitigation Option Development and Triggering. 2016 Integrated Energy Policy Report update proceeding workshop August 29, 2016b. http://docketpublic.energy.ca.gov/PublicDocuments/16-IEPR-06/TN212996_20160826T143044_Presentation_Contingency_Mitigation_Option_Development_and_Trig.pdf
- CEC Draft 2016 IEPR (Integrated Energy Policy Report Update), October 2016c. CEC-100-2016-003-CMD. http://docketpublic.energy.ca.gov/PublicDocuments/16-IEPR-01/TN213930_20161007T134148_Draft_2016_Integrated_Energy_Policy_Report_Update.pdf
- COPC (California Ocean Protection Council). California's Coastal Power Plants: Alternative Cooling System Analysis. Prepared by Tetra Tech, Inc. February 2008. http://www.opc.ca.gov/webmaster/ftp/project_pages/OTC/engineering%20study/CA_Power_Plant_Analysis_Complete.pdf
- NRG Encina 2017 Information Request Submittal. 2017a http://www.waterboards.ca.gov/water_issues/programs/ocean/cwa316/powerplants/encina/docs/information_letter_nrg_encina.pdf
- NRG Energy Inc. U.S. Securities and Exchange Commission Form 10-K, p. 98, filed on 2/29/2016.
- SACCWIS (Statewide Advisory Committee on Cooling Water Intake Structures): Encina Power Station 2018 Reliability Study. February, 2017a. http://www.waterboards.ca.gov/water_issues/programs/ocean/cwa316/sacccwis/docs/sacccwis_encina_2018rpt.pdf
- SACCWIS 2017 Final Annual Report May 2017b http://www.waterboards.ca.gov/water_issues/programs/ocean/cwa316/sacccwis/
- SACCWIS Meeting February 23, 2017c. http://www.waterboards.ca.gov/water_issues/programs/ocean/cwa316/sacccwis/

Settlement Agreement and Release Regarding Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling Between State Water Resources Control Board and NRG. October 9, 2014.

http://www.waterboards.ca.gov/water_issues/programs/ocean/cwa316/docs/energy_com_p/settlement_nrg%20_2014.pdf

SWRCB (State Water Resources Control Board). Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling: Final Substitute Environmental Document. May 4, 2010.

http://www.waterboards.ca.gov/water_issues/programs/ocean/cwa316/docs/final_sed_ot_c.pdf

SWRCB Delegates Authority to the Executive Director of the SWRCB to Approve Measures that Owners or Operators of OTC Facilities Shall Undertake to Comply with Interim Mitigation on a Case-by-Case Basis. Resolution No. 2015-0057. 2015.

https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2015/rs2015_0057.pdf

U.S. EPA (United States Environmental Protection Agency). Cooling Water Intakes. August 15, 2014.

http://www.waterboards.ca.gov/water_issues/programs/ocean/cwa316/docs/final_sed_ot_c.pdf

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

[Added language is blue-double-underlined. Deleted language is ~~red-strikeout~~]

1. Introduction

- A. Clean Water Act 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. Section 316(b) is implemented through National Pollutant Discharge Elimination System (NPDES) permits, issued pursuant to Clean Water Act Section 402, which authorize the point source discharge of pollutants to navigable waters.
- B. The State Water Resources Control Board (State Water Board) is designated as the state water pollution control agency for all purposes stated in the Clean Water Act.
- C. The State Water Board and Regional Water Quality Control Boards (Regional Water Boards) (collectively Water Boards) are authorized to issue NPDES permits to point source dischargers in California.
- D. Currently, there are no applicable nationwide standards implementing Section 316(b) for *existing power plants*^{*1}. Consequently, the Water Boards must implement Section 316(b) on a case-by-case basis, using best professional judgment.
- E. The State Water Board is responsible for adopting state policy for water quality control, which may consist of water quality principles, guidelines, and objectives deemed essential for water quality control.
- F. This Policy establishes requirements for the implementation of Section 316(b), using best professional judgment in determining BTA for cooling water intake structures at existing coastal and estuarine power plants that must be implemented in NPDES permits.
- G. The intent of this Policy is to ensure that the beneficial uses of the State's coastal and estuarine waters are protected while also ensuring that the electrical power needs essential for the welfare of the citizens of the State are met. The State Water Board recognizes it is necessary to develop replacement infrastructure to maintain electric reliability in order to implement this Policy and in developing this policy considered costs, including costs of compliance, consistent with state and federal law.

¹ An asterisk indicates that the term is defined in Section 5 of the Policy.

- H. During the development of this Policy, State Water Board staff has met regularly with representatives from the California Energy Commission (CEC), California Public Utilities Commission (CPUC), California Coastal Commission (CCC), California State Lands Commission (SLC), California Air Resources Board (ARB), and California Independent System Operator (CAISO) to develop realistic implementation plans and schedules for this Policy that will not cause disruption in the State's electrical power supply. The compliance dates for this Policy were developed considering a report produced by the energy agencies (CEC, CPUC, and CAISO), titled "Implementation of OTC Mitigation Through Energy Infrastructure Planning and Procurement Changes," and the accompanying table, titled "Draft Infrastructure Replacement Milestones and Compliance Dates for Existing Power Plants in California Using Once Through Cooling (OTC)," included in the Substitute Environmental Document for this Policy. The energy agencies' approach seeks to address the replacement, repowering, or retirement of power plants currently using OTC that (1) maintains reliability of the electric system; (2) meets California's environmental policy goals; and (3) achieves these goals through effective long-term planning for transmission, generation and demand resources. The energy agencies have stated that the dates specified in their report may require periodic updates.
- I. To prevent disruption in the State's electrical power supply when the Policy is implemented, the State Water Board will convene a Statewide Advisory Committee on Cooling Water Intake Structures (SACCWIS), which will include representatives from the CEC, CPUC, CAISO, CCC, SLC, ARB, and State Water Board. SACCWIS will review implementation plans and schedules submitted by dischargers pursuant to this Policy, and advise the State Water Board on the implementation of this Policy to ensure that the implementation schedule takes into account local area and grid reliability, including permitting constraints. The State Water Board recognizes the compliance dates in this Policy may require amendment based on, among other factors, the need to maintain reliability of the electric system as determined by the energy agencies included in the SACCWIS, acting according to their individual or shared responsibilities. The State Water Board retains the final authority over changes to the adopted policy.
- J. While the CEC, CPUC and CAISO each have various planning or permitting responsibilities important to this effort, the approach relies upon use of competitive procurement and forward contracting mechanisms implemented by the CPUC in order to identify low cost solutions for most OTC power plants. The CPUC has authority to order the investor-owned utilities (IOUs) to procure new or repowered fossil-fueled generation for system and/or local reliability in the Long-Term Procurement Plan (LTPP) proceeding. In response to the Policy, the CPUC anticipates modifying its LTPP proceeding and procurement processes to require the IOUs to assess replacement infrastructure needs and conduct targeted requests for offers (RFOs) to acquire replacement, repowered or otherwise compliant generation capacity. LTPP proceedings are conducted on a biennial cycle and plans are normally approved in odd-numbered years. The next cycle, the 2010 LTPP, is estimated to result in a decision by 2011. The

subsequent cycle, the 2012 LTPP, would in turn result in a decision by 2013. Once authorized to procure by a CPUC LTPP decision, the IOUs need approximately 18 months to issue an RFO, sign contracts, and submit applications to the CPUC for approval. Approval by the CPUC takes approximately nine months. If the contract involves a facility already licensed through the CEC generation permitting process, then financing and construction can begin. A typical generation permitting timeline is 12 months, but specific issues such as ability to obtain air permits can delay the process. IOUs often give preference to RFO bids with permits already (or nearly) in place. From contract approval, construction usually takes three years, if generation permits are approved, or approximately five years, if generation permits are pending or other barriers present delays. In total, starting from the initiation of an LTPP proceeding (2010 LTPP or 2012 LTPP), seven years are expected to elapse, before replacement infrastructure is operational. Due to the number of plants affected, efforts to replace or repower OTC power plants would need to be phased.

- K. Because the Los Angeles region presents a more complex and challenging set of issues, it is anticipated that more time would be needed to study and implement replacement infrastructure solutions. Therefore, total elapsed time is expected to begin in 2010 and end in 2017 for the Greater Bay Area and San Diego regions, which would be addressed beginning in the 2010 LTPP. For the Los Angeles region, which would be addressed beginning in the 2012 LTPP, total elapsed time is expected to begin in 2012 and end in 2020. A transmission solution is expected to have approximately the same timeframe, but could be delayed by greater potential for significant local opposition. In order to assure that repowering or *new power plant** development in the Los Angeles basin addresses unique permitting challenges, the SACCWIS will assist the State Water Board in evaluating schedules for power plants not under the jurisdiction of the CPUC or operating within the CAISO Balancing Authority Area.
- L. The Global Warming Solutions Act of 2006 requires California to reduce greenhouse gas emissions to 1990 levels by 2020 and then to maintain those reductions. California presently has two *nuclear-fueled power plants** that provide approximately 4,600 megawatts of baseload electricity and do not emit greenhouse gases during energy generation. Energy generation by facilities that do not emit greenhouse gases will be critical to meeting the mandates of the Global Warming Solutions Act and emerging national and international greenhouse gas reduction requirements. The *nuclear-fueled power plants** are entering into United States Nuclear Regulatory Commission (Commission) license renewal proceedings unique to the nuclear power industry and relicensing may extend the plants operating lives to approximately 2045. Unlike older era fossil-fueled plants, if the *nuclear-fueled power plants** undergo modernization as part of relicensing or cooling structure upgrades, that modernization will not reduce greenhouse gas emissions, and in fact, extended downtime during modernization may result in short-term increases in greenhouse gases as other greenhouse gas emitting facilities provide makeup power. In

recognition of these considerations and others, this Policy requires special studies for the *nuclear-fueled power plants** to address their unique issues, and to evaluate appropriate requirements for those plants.

- M. To conserve the State's scarce water resources, the State Water Board encourages the use of recycled water for cooling water in lieu of marine, estuarine or fresh water.
- N. The Regional Water Boards are responsible for all NPDES permit actions for *existing power plants** subject to this Policy, including without limitation actions to issue, modify, reissue, revoke, and terminate NPDES permits after October 1, 2010. In order to ensure a high level of statewide consistency in implementing Section 316(b), the State Water Board Division of Water Quality (DWQ) staff will provide technical support in all issues related to implementation of the OTC Policy.
- O. Nothing in this Policy precludes the authority of the State Water Board and the Regional Water Board to regulate discharges from *existing power plants** through NPDES permits, consistent with water quality standards.

2. Requirements for *Existing Power Plants**

- A. Compliance Alternatives. An owner or operator of an *existing power plant** must comply with either Track 1 or Track 2, below.
 - (1) Track 1. An owner or operator of an *existing power plant** must reduce *intake flow rate** at each unit, at a minimum, to a level commensurate with that which can be attained by a *closed-cycle wet cooling system**. A minimum 93 percent reduction in *intake flow rate** for each unit is required for Track 1 compliance, compared to the unit's design *intake flow rate**. The through-screen intake velocity must not exceed 0.5 foot per second. The installation of closed cycle dry cooling systems meets the intent and minimum reduction requirements of this compliance alternative.
 - (2) Track 2. If an owner or operator of an *existing power plant** demonstrates to the State Water Board's satisfaction that compliance with Track 1 is *not feasible**, the owner or operator of an *existing power plant** must reduce impingement mortality and entrainment of marine life for the facility, on a unit-by-unit basis, to a comparable level to that which would be achieved under Track 1, using operational or structural controls, or both.
 - (a) Compliance for impingement mortality shall be determined either:
 - (i) For plants relying solely on reductions in velocity, by monthly verification of through-screen intake velocity not to exceed 0.5 foot per second, or

- (ii) By monitoring required in Section 4.A, below. For measured reductions determined by monitoring, the owner or operator must reduce impingement mortality to a comparable level to that which would be achieved under Track 1. A “comparable level” is a level that achieves at least 90 percent of the reduction in impingement mortality required under Track 1.
- (b) Compliance for entrainment shall be determined either:
- (i) For plants relying solely on reductions in flow, by recording and reporting reductions in terms of monthly flow, in which case a minimum of 93% reduction in flow, as compared to the average actual flow for the corresponding months from 2000 – 2005, must be met, or
 - (ii) For plants relying in whole or in part on other control technologies (e.g., including but not limited to screens or re-location of intake structures), by measured reductions in entrainment determined by monitoring required in Section 4.B, below. The owner or operator must reduce entrainment to a comparable level to that which would be achieved under Track 1. A “comparable level” is a level that achieves at least 90 percent of the reduction in entrainment required under Track 1. If screens are employed to reduce entrainment, compliance shall be determined based on *ichthyoplankton**, and on the crustacean phyllosoma and megalops larvae, and squid paralarvae fractions of *meroplankton**.
- (c) Technology-based improvements that are specifically designed to reduce impingement mortality and/or entrainment and were implemented prior to October 1, 2010 may be counted towards meeting Track 2 requirements.
- (d) The owner or operator of an *existing power plant** with *combined-cycle power-generating units** installed prior to October 1, 2010 may achieve compliance in accordance with this paragraph.

The owner or operator may count prior reductions in impingement mortality and entrainment resulting from the replacement of steam turbine power-generating units with *combined-cycle power-generating units**, towards meeting Track 2 requirements. Reductions shall be based on reductions in intake flows, calculated as the difference between:

- (i) the maximum permitted discharge (expressed as million gallons per day (MGD)) for the entire power plant as identified in the plant’s prior NPDES permit that authorized the steam turbine power-generating units which were subsequently replaced with the *combined-cycle power-generating units** and

- (ii) the maximum permitted discharge (expressed as MGD) for the entire power plant, including the combined cycle units, as identified in the plant's NPDES permit authorizing the *combined-cycle power-generating units*.*.

B. Final Compliance Dates

- (1) *Existing power plants** shall comply with Section 2.A, above, as soon as possible, but no later than, the dates shown in Table 1, contained in Section 3.E, below.
- (2) Based on the need for continued operation of an *existing power plant** to maintain the reliability of the electric system, a final compliance date may be suspended under the following circumstances:
 - (a) **Suspension of Final Compliance Date for Less Than 90 Days for *Existing Power Plants** Within CAISO Jurisdiction.** If CAISO determines that continued operation of an *existing power plant** is necessary to maintain the reliability of the electric system in the short-term, CAISO shall provide written notification to the State Water Board, the Regional Water Board with jurisdiction over the *existing power plant**, and the SACCWIS. If the Executive Directors of the CEC and CPUC do not object in writing within 10 days to CAISO's written notification, the notification provided pursuant to this paragraph will suspend the final compliance date for the shorter of 90 days or the time CAISO determines necessary to maintain reliability. In the event either CEC or CPUC objects as provided in this paragraph, then the State Water Board shall hold a hearing as expeditiously as possible to determine whether to suspend the compliance date in accordance with paragraph (d).
 - (b) **Suspension of Final Compliance Date for Longer Than 90 Days, or consecutive less than 90 day suspensions, for *Existing Power Plants** Within CAISO Jurisdiction.** If CAISO determines that continued operation of an *existing power plant** is necessary to maintain the reliability of the electric system, CAISO shall provide written notification to the State Water Board, the Regional Water Board with jurisdiction over the *existing power plant**, and the SACCWIS. If the Executive Directors of the CEC and CPUC do not object in writing within 10 days to CAISO's determination, the notification provided pursuant to this paragraph will suspend the final compliance date for 90 days. During the 90-day time suspension or within 90 days of receiving a written notification from CAISO, the State Water Board shall conduct a hearing in accordance with paragraph (d) to determine whether to suspend the final compliance date for more than the original 90 days pending, if necessary, full evaluation of amendments to final compliance dates contained in the policy.

- (c) **Suspension of Final Compliance Date for *Existing Power Plants** Within Los Angeles Department of Water and Power (LADWP) Service Area.** If the LADWP Commission determines, through a public process, that continued operation of an *existing power plant** operated by LADWP is necessary to maintain the reliability of the electric system in the short-term, LADWP shall provide written notification to the State Water Board, the Regional Water Board with jurisdiction over the *existing power plant**, and the SACCWIS. Within 45 days of receiving a written notice from LADWP, the State Water Board shall conduct a hearing in accordance with paragraph (d) to determine whether to suspend the final compliance date. In considering whether to suspend or amend the final compliance dates the State Board shall consult with the CAISO.
- (d) **State Water Board Hearings on Suspension of Final Compliance Dates.** In considering whether to suspend or amend the final compliance dates, the State Water Board shall afford significant weight to the recommendations of the CAISO.

C. Immediate and Interim Requirements

- (1) No later than October 1, 2011, the owner or operator of an *existing power plant** with an *offshore intake** shall install large organism exclusion devices having a distance between exclusion bars of no greater than nine inches, or install other exclusion devices, deemed equivalent by the State Water Board.
- (2) No later than October 1, 2011, the owner or operator of an *existing power plant** unit that is not directly engaging in *power-generating activities**, or *critical system maintenance**, shall cease intake flows, unless the owner or operator demonstrates to the State Water Board that a reduced minimum flow is necessary for operations.
- (3) The owner or operator of an *existing power plant** must implement measures to mitigate the interim impingement and entrainment impacts resulting from the cooling water intake structure(s), commencing October 1, 2015 and continuing up to and until the owner or operator achieves final compliance. The owner or operator must include in the implementation plan, described in Section 3.A below, the specific measures that will be undertaken to comply with this requirement. An owner or operator may comply with this requirement by:
- (a) Demonstrating to the State Water Board's satisfaction that the owner or operator is compensating for the interim impingement and entrainment impacts through existing mitigation efforts, including any projects that are required by state or federal permits as of October 1, 2010; or

- (b) Demonstrating to the State Water Board's satisfaction that the interim impacts are compensated for by the owner or operator providing funding to the California Coastal Conservancy which will work with the California Ocean Protection Council to fund an appropriate *mitigation project**; or
 - (c) Developing and implementing a *mitigation project** for the facility, approved by the State Water Board, which will compensate for the interim impingement and entrainment impacts. Such a project must be overseen by an advisory panel of experts convened by the State Water Board.
 - (d) The *habitat production foregone** method, or a comparable alternate method approved by the State Water Board, shall be used to determine the habitat and area, based on replacement of the annual entrainment, for funding a *mitigation project**.
 - (e) It is the preference of the State Water Board that funding is provided to the California Coastal Conservancy, working with the California Ocean Protection Council, for mitigation projects directed toward increases in marine life associated with the State's Marine Protected Areas in the geographic region of the facility.
- (4) Owners or operators of fossil fueled units that have submitted implementation plans to comply with this Policy under Section 2.A(1) and have requested compliance dates after December 31, 2022 that are approved by the State Water Board as provided in Section 3.E shall:
- (a) Commit to eliminate OTC and seawater use for cooling water purposes for all units at the facility.
 - (b) Conduct a study or studies, singularly or jointly with other facilities, to evaluate new technologies or improve existing technologies to reduce impingement and entrainment.
 - (c) Submit the results of the study and a proposal to minimize entrainment and impingement to the Chief Deputy Director no later than December 31, 2015.
 - (d) Upon approval of the proposal by the Chief Deputy Director, complete implementation of the proposal no later than December 31, 2020.

D. *Nuclear-Fueled Power Plants**

If the owner or operator of an existing *nuclear-fueled power plant** demonstrates that compliance with the requirements for *existing power plants** in Section 2.A, above, of this Policy would result in a conflict with any safety requirement established by the Commission, with appropriate documentation or other substantiation from the Commission, the State Water Board will make a site-specific determination of best technology available for minimizing adverse

environmental impact that would not result in a conflict with the Commission's safety requirements. The State Water Board may also establish alternative, site-specific requirements in accordance with Section 3.D (8).

3. Implementation Provisions

A. With the exception of *nuclear-fueled power plants**, which are covered under 3.D, below, no later than April 1, 2011, the owner or operator of an *existing power plant** shall submit an implementation plan to the State Water Board.

(1) The implementation plan shall identify the compliance alternative selected by the owner or operator, describe the general design, construction, or operational measures that will be undertaken to implement the alternative, and propose a realistic schedule for implementing these measures that is as short as possible. If the owner or operator chooses to repower the facility to reduce or eliminate reliance upon OTC, or to retrofit the facility to implement either Track 1 or Track 2 alternatives, the implementation plan shall identify the time period when generating power is infeasible and describe measures taken to coordinate this activity through the appropriate electrical system balancing authority's maintenance scheduling process.

(2) If the owner or operator selects *closed-cycle wet cooling** as a compliance alternative, the owner or operator shall address in the implementation plan whether recycled water of suitable quality is available for use as makeup water.

B. The SACCWIS shall be impaneled no later than January 1, 2011, by the Executive Director of the State Water Board, to advise the State Water Board on the implementation of this Policy to ensure that the implementation schedule takes into account local area and grid reliability, including permitting constraints. SACCWIS shall include representatives from the CEC, CPUC, CAISO, CCC, SLC, ARB, and State Water Board.

(1) SACCWIS meetings shall be scheduled regularly and as needed. Meetings shall be open to the public and shall be noticed at least 10 days in advance of the meeting. All SACCWIS products shall be made available to the public.

(2) The SACCWIS shall review the owner or operator's proposed implementation schedule and report to the State Water Board with recommendations no later than October 1, 2011. The SACCWIS may consult with other appropriate agencies, including but not limited to the Regional Water Boards, air quality districts, and the LADWP, in the process of reviewing implementation schedules and providing recommendations to the State Water Board.

(3) The CAISO and the LADWP shall each submit to the SACCWIS by December 31, each year a grid reliability study, for their respective jurisdictions, that has been developed pursuant to a public process and

- approved by their governing bodies. In order to assure that SACCWIS can provide annual reports to the State Water Board by March 31, the SACCWIS shall promptly meet to consider the reliability studies submitted by CAISO and the LADWP.
- (4) The SACCWIS will report to the State Water Board with recommendations on modifications to the implementation schedule every year starting in 2012. If members of SACCWIS do not believe the full committee recommendations reflect their concerns they may issue minority recommendations that the State Water Board shall consider as part of the SACCWIS recommendations.
 - (5) The State Water Board shall consider the SACCWIS' recommendations and direct staff to make modifications, if appropriate, for the State Water Board's consideration. In the event that the SACCWIS energy agencies (CAISO, CPUC, and CEC) make a unanimous recommendation for implementation schedule modification based on grid reliability, the State Water Board shall afford significant weight to the recommendation.
- C. The Regional Water Board shall reissue or, as appropriate, modify NPDES permits issued to owners or operators of *existing power plants**, after a hearing in the affected region, to ensure that the permits conform to the provisions of this Policy.
- (1) The permits shall incorporate a final compliance schedule that requires compliance no later than the due dates contained in Table 1, contained in Section 3.E, below. If the State Water Board determines that a longer compliance schedule is necessary to maintain reliability of the electric system per SACCWIS recommendations while other OTC power plants are retrofitted, repowered, or retired or transmission upgrades take place, this delay shall be incorporated into the compliance schedule and stated in the permit findings.
 - (2) The Regional Water Board shall reopen, if necessary, the relevant permits and modify the final compliance schedules, if appropriate, based on modifications to the policy approved by the State Water Board or the suspension of final compliance dates pursuant to this policy.
 - (3) If an owner or operator selects Track 2 as the compliance alternative, the NPDES permit shall include a monitoring program that complies with Section 4 of this Policy.
 - (4) NPDES permits issued by the Regional Water Board shall include appropriate permit provisions to implement suspensions of final compliance dates authorized in Section 2.B (2) and modifications to final compliance dates specified in this policy, without reopening the permits.

- D. No later than January 1, 2011 the Executive Director of the State Water Board, using the authority under section 13267(f) of the Water Code, shall request that Southern California Edison (SCE) and Pacific Gas & Electric Company (PG&E) conduct special studies for submission to the State Water Board.
- (1) The special studies shall investigate alternatives for the *nuclear-fueled power plants** to meet the requirements of this Policy, including the costs for these alternatives.
 - (2) The special studies shall be conducted by an independent third party with engineering experience with nuclear power plants, selected by the Executive Director of the State Water Board.
 - (3) The special studies shall be overseen by a Review Committee, established by the Executive Director of the State Water Board no later than January 1, 2011, which shall include, at a minimum, representatives of SCE, PG&E, SACCWIS, the environmental community, and staffs of the State Water Board, Central Coast Regional Water Board, and the San Diego Regional Water Board.
 - (4) No later than October 1, 2011, the Review Committee, described above, shall provide a report for public comment detailing the scope of the special studies, including the degree to which existing, completed studies can be relied upon.
 - (5) No later than October 1, 2013 the Review Committee shall provide the final report and the Review Committee's comments for public comment detailing the results of the special studies and shall present the report to the State Water Board.
 - (6) Meetings of the Review Committee shall be open to the public and shall be noticed at least 10 days in advance of the meeting. All products of the Review Committee shall be made available to the public.
 - (7) The State Water Board shall consider the results of the special studies, and shall evaluate the need to modify this Policy with respect to the *nuclear-fueled power plants**. In evaluating the need to modify this Policy, the State Water Board shall base its decision to modify this Policy with respect to the *nuclear-fueled power plants** on the following factors:
 - (a) Costs of compliance in terms of total dollars and dollars per megawatt hour of electrical energy produced over an amortization period of 20 years;
 - (b) Ability to achieve compliance with Track 1 considering factors including, but not limited to, engineering constraints, space constraints, permitting constraints, and public safety considerations;

- (c) Potential environmental impacts of compliance with Track 1, including, but not limited to, air emissions.
- (8) If the State Water Board finds that for a specific *nuclear-fueled power plant** to implement Track 1, either (1) the costs are wholly out of proportion to the costs identified in Tetra Tech, Inc., California’s Coastal Power Plants: Alternative Cooling System Analysis, February 2008 (see pages ES-10 [summary], C-1 - C-2 and C-23 - C-40 [Diablo Canyon Power Plant] and N-1 - N-2 and N-25 - N-42 [San Onofre Nuclear Generating Station]) and considered by the State Water Board in establishing Track 1, or (2) that compliance is wholly unreasonable based on the factors in paragraphs 7(b) and (c), then the State Water Board shall establish alternate requirements for that *nuclear-fueled power plant**. The State Water Board shall establish alternative requirements no less stringent than justified by the wholly out of proportion (i) cost and (ii) factor(s) of paragraph (7). The burden is on the person requesting the alternative requirement to demonstrate that alternative requirements should be authorized.
- (9) In the event the State Water Board establishes alternate requirements for *nuclear-fueled power plants**, the difference in impacts to marine life resulting from any alternative, less stringent requirements shall be fully mitigated. Mitigation required pursuant to this paragraph shall be a *mitigation project** directed toward the increase in marine life associated with the State’s Marine Protected Areas in the geographic region of the facility. Funding for the *mitigation project** shall be provided to the California Coastal Conservancy, working with the Ocean Protection Council to fund an appropriate *mitigation project**.

E. Table 1. Implementation Schedule

Milestone		Responsible Entity/Party	Due Date ²
1	Request SCE and PG&E to conduct special studies to investigate compliance options for <i>nuclear-fueled power plants*</i> [Section 3.D]	State Water Board Executive Director	01/01/2011
2	Establish Review Committee [Section 3.D(3)]	State Water Board Executive Director	01/01/2011
3	Establish SACCWIS [Section 3.B]	State Water Board Executive Director	01/01/2011

² These compliance dates were developed considering information provided by the CEC, CPUC, CAISO, and LADWP.

Milestone		Responsible Entity/Party	Due Date ²
4	Submit a proposed implementation plan to the State and Regional Water Boards [Section 3.A]	Owner/operators of existing fossil-fueled power plants	04/01/2011
5	Provide a report for public comment, detailing the scope of the special studies on compliance options for <i>nuclear-fueled power plants*</i> [Section 3.D(4)]	Review Committee	10/01/2011
6	Review the owners or operators' proposed implementation schedules and report to the State Water Board with recommendations [Section 3.B(2)]	SACCWIS	10/01/2011
7	Humboldt Bay Power Plant in compliance	Owner/operator	12/31/2010
8	Potrero Power Plant in compliance	Owner/operator	10/01/2011
9	Install large organism exclusion devices with a distance between exclusion bars of no greater than nine inches, or equivalent device [Section 2.C(1)]	Owner/operators of <i>existing power plants*</i> with <i>offshore intakes*</i>	10/01/2011
10	Cease intake flows for units not directly engaging in <i>power-generating activities*</i> or <i>critical system maintenance*</i> , or demonstrate to the State Water Board that a reduced minimum flow is necessary for operations [Section 2.C(2)]	Owner/operators of <i>existing power plants*</i>	10/01/2011
11	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2012
12	South Bay Power Plant in compliance	Owner/operator	12/31/2011
13	Report to State Water Board on results of special studies on compliance options for <i>nuclear-fueled power plants*</i> [Section 3.D(5)]	Review Committee	10/01/2013
14	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2013
15	Haynes units 5 & 6 in compliance, repowered without OTC	LADWP	12/31/2013
16	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2014

Milestone		Responsible Entity/Party	Due Date ²
17	Commence to implement measures to mitigate the interim impingement and entrainment impacts due to the cooling water intake structure(s) [Section 2.C(3)]	Owners/operators of <i>existing power plants</i> *	10/01/2015
18	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2015
19	El Segundo and Morro Bay power plants in compliance	Owner/operator	12/31/2015
20	Scattergood unit 3 in compliance, repowered without OTC	LADWP	12/31/2015
21	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2016
22	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2017
23	Power plants in CPUC 2010 LTPP Cycle in compliance: Encina Unit 1 , Contra Costa, Pittsburg [Section 1.J]	Owner/Operator	12/31/2017
24	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2018
25	Encina Power Station Units 2-5 in compliance [Section 1.J]	Owner/Operator-	12/31/2018
25 26	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2019
26 27	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2020
27 28	Power plants in CPUC 2012 LTPP Procurement Cycle in compliance: Huntington Beach, Redondo, Alamitos, Mandalay, Ormond Beach [Section 1.J] generating stations in compliance. Moss Landing in Compliance	Owner/operator	12/31/2020
28 29	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2021
29 30	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2022

Milestone		Responsible Entity/Party	Due Date ²
30 <u>31</u>	San Onofre Nuclear Generating Station in compliance with implementation provisions resulting from State Water Board action on special studies from Section 3.D	Owner/operator	12/31/2022
31 <u>32</u>	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2023
32 <u>33</u>	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2024
33 <u>34</u>	Diablo Canyon Power Plant in compliance with implementation provisions resulting from State Water Board action on special studies from Section 3.D	Owner/operator	12/31/2024
34 <u>35</u>	Scattergood units 1 & 2 in compliance, repowered without OTC	LADWP	12/31/2024
35 <u>36</u>	Haynes units 1 & 2 in compliance, repowered without OTC	LADWP	12/31/2029 ³
36 <u>37</u>	Harbor unit 5 in compliance, repowered without OTC	LADWP	12/31/2029 ³
37 <u>38</u>	Haynes unit 8 in compliance, repowered without OTC	LADWP	12/31/2029 ³

4. Track 2 Monitoring Provisions

A. Impingement Impacts: The following impingement studies are required to comply with Section 2.A.(2)(a)(ii):

(1) A baseline impingement study shall be performed, unless the discharger demonstrates, to the Regional Water Board's satisfaction, that prior studies accurately reflect current impacts. Baseline impingement shall be measured on-site and shall include sampling for all species impinged. The impingement study shall be designed to accurately characterize the species currently impinged and their seasonal abundance to the satisfaction of the Regional Water Board.

(a) The study period shall be at least 36 consecutive months.

³ ~~The State Water Board will consider further modifications to the compliance date for these units when LADWP submits information responsive to the SACCWIS resolved clauses in its July 5, 2011 resolution and any subsequent information requests SACCWIS makes to LADWP by January 1, 2012. The State Water Board will consider amendments for these units no later than December 31, 2013.~~

- (b) Impingement shall be measured during different seasons when the cooling system is in operation and over 24-hour sampling periods.
 - (c) When applicable, impingement shall be sampled under differing representative operational conditions (e.g., differing levels of power production, heat treatments, etc.).
 - (d) The study shall not result in any additional mortality above typical operating conditions.
- (2) After the Track 2 controls are implemented, to confirm the level of impingement controls, another impingement study, consistent with Section 4.A(1)(a) to (d), above, shall be performed and reported to the Regional Water Board.
 - (3) The need for additional impingement studies shall be evaluated at the end of each permit period. Impingement studies shall be required when changing operational or environmental conditions indicate that new studies are needed, at the discretion of the Regional Water Board.
- B. Entrainment Impacts: The following entrainment studies are required to comply with Section 2.A.(2)(b)(ii):
- (1) A baseline entrainment study shall be performed, unless the discharger demonstrates, to the Regional Water Board's satisfaction, that prior studies accurately reflect current impacts. Prior studies that may have used a mesh size of 333 or 335 microns for sampling are acceptable for compliance with the review and approval of the Regional Water Board. If the Regional Water Board determines that a new baseline entrainment study shall be performed to determine larval composition and abundance in the source water, representative of water that is being entrained, then samples must be collected using a mesh size no larger than 335 microns. Additional samples shall also be collected using a 200 micron mesh to provide a broader characterization of other *meroplankton** entrained. The source water shall be determined based on oceanographic conditions reasonably expected after Track 2 controls are implemented. Baseline entrainment sampling shall provide an unbiased estimate of larvae entrained at the intake prior to the implementation of Track 2 controls.
 - (a) Entrainment impacts shall be based on sampling for all *ichthyoplankton** and invertebrate *meroplankton** species. Individuals collected shall be identified to the lowest taxonomical level practicable. When practicable, genetic identification through molecular biological techniques may be used to assist in compliance with this requirement. Samples shall be preserved and archived such that genetic identification is possible at a later date.

- (b) The study period shall be at least 36 consecutive months, and shall occur during different seasons, including periods of peak use when the cooling system is in operation (such as the summer months when energy is in high demand). Sampling shall be designed to account for variation in oceanographic conditions and larval abundance and behavior such that abundance estimates are reasonably accurate.
- (2) After the Track 2 controls are implemented, to confirm the level of entrainment controls, another entrainment study (with a study design to the Regional Water Board's satisfaction, with samples collected using a mesh size no larger than 335 microns, and with additional samples also collected using a 200 micron mesh) shall be performed and reported to the Regional Water Board.
- (3) The need for additional entrainment studies shall be evaluated at the end of each permit period. Entrainment studies shall be required when changing operational or environmental conditions indicate that new studies are needed, at the discretion of the Regional Water Board.

5. Definition of Terms

Closed-cycle wet cooling system – Refers to a cooling system, which functions by transferring waste heat to the surrounding air through the evaporation of water, thus enabling the reuse of a smaller amount of water several times to achieve the desired cooling effect. The only discharge of wastewater is from periodic blowdown for the purpose of limiting the buildup of concentrations of materials in excess of desirable limits established by best engineering practice.

Combined-cycle power-generating units - Refers to units within a power plant which combined generate electricity through a two-stage process involving combustion and steam. Hot exhaust gas from combustion turbines is passed through a heat recovery steam generator to produce steam for a steam turbine. The turbine exhaust steam is condensed in the cooling system and may or may not be returned to the power cycle. Combined cycle power-generating units are generally more fuel-efficient and use less cooling water than steam boiler units with the same generating capacity.

Critical system maintenance – are activities that are critical for maintenance of a plant's physical machinery and absolutely cannot be postponed until the unit is operating to generate electricity.

Existing power plant(s) – Refers to any power plant that is not a *new power plant**.

Habitat production foregone – Refers to the product of the average annual *proportional mortality** and the estimated area of the water body that is habitat for the species' source population. Habitat production foregone is an estimate of habitat area production that is lost to all entrained species on an annual basis.

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Ichthyoplankton – Refers to the planktonic early life stages of fish (i.e., the pelagic eggs and larval forms of fishes).

Intake flow rate – Refers to the instantaneous rate at which water is withdrawn through the intake structure, expressed as gallons per minute.

Meroplankton – For purposes of this Policy, refers to that component of the *zooplankton** community composed of squid paralarvae and the pelagic larvae of benthic invertebrates.

Mitigation project – Projects to restore marine life lost through impingement mortality and entrainment. Restoration of marine life may include projects to restore and/or enhance coastal marine or estuarine habitat, and may also include protection of marine life in existing marine habitat, for example through the funding of implementation and/or management of Marine Protected Areas.

New power plant – Refers to any plant that is a “new facility”, as defined in 40 C.F.R. § 125.83 (revised as of July 1, 2007), and that is subject to Subpart I, Part 125 of the Code of Federal Regulations (revised as of July 1, 2007) (referred to as “Phase I regulations”).

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.

Nuclear-fueled power plant(s) – Refers to Diablo Canyon Power Plant and/or San Onofre Nuclear Generating Station.

Offshore intake –refers to any submerged intake structure that is not located at the shoreline, and includes such intakes that are located in ocean, bay and estuary environments.

Power-generating activities – Refers to activities directly related the generation of electrical power, including start-up and shut-down procedures, contractual obligations (hot stand-by), hot bypasses, and *critical system maintenance** regulated by the Nuclear Regulatory Commission. Activities that are not considered directly related to the generation of electricity include (but are not limited to) dilution for in-plant wastes, maintenance of source-and receiving water quality strictly for monitoring purposes, and running pumps strictly to prevent fouling of condensers and other power plant equipment.

Proportional mortality – the proportion of larvae killed from entrainment to the larvae in the source population, as determined by an Empirical Transport Model.

Zooplankton – For purposes of this Policy, refers to those planktonic invertebrates larger than 200 microns.