CALIFORNIA OCEAN
PROTECTION COUNCIL

Staff Recommendation
June 8, 2006

Engineering and Operations Study of
Coastal Power Plants with Once-through Cooling

Developed By: **Christine Blackburn**

RECOMMENDED ACTION: Consideration of an engineering study of coastal power plants using once-through cooling technology, and possible 1) determination that it is a high priority study and 2) authorization for the Council's Secretary to take actions needed to provide up to $300,000 for its implementation.

OCEAN or COASTAL LOCATION: Statewide

AGENCY OR ENTITY RECOMMENDING PROJECT: Ocean Protection Council

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EXHIBITS

Exhibit 1: OPC Resolution on Once-through Cooling at Coastal Power Plants

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RESOLUTION

"The Ocean Protection Council finds pursuant to Sections 35600, *et seq.* of the Public Resources Code that obtaining information about possible engineering and operational changes at coastal power plants that may reduce the negative environmental impacts of once-through cooling technologies, as herein described, is of high priority for ocean conservation and authorizes the Secretary of the Council to take actions necessary for its planning or implementation, including the allocation of up to $300,000 for the purposes of this project."

PROJECT DESCRIPTION

At the April 2006 meeting, the Ocean Protection Council (OPC) approved a resolution related to once-through cooling at coastal power plants in California. Part of this resolution called for the OPC to fund a study to examine whether these plants could implement alternative technologies to reduce impingement and entrainment caused by once-through cooling.

The State Water Resources Control Board (SWRCB) staff is currently drafting a recommended rule for state requirements for once-through cooling structures at existing power plants. This

proposed study will ideally provide objective information about each of the existing plants, which the SWRCB can use to inform the rule-making process.

While the desire to assist the State and Regional Water Boards is the impetus for the study and the need for the six-month timeline, many other state agencies will benefit from the information generated. In fact, some of the data that will be included in this report have already been collected to various degrees by the U.S. EPA or state agencies. The first task for the contractor or staff will be to collect these data. This study will consolidate and analyze these data, identify gaps in the existing data, and then collect new data to fill these needs. The result will be the full set of information, readily accessible to all agencies, the plant operators, and other interested parties.

It is envisioned that the report will provide a yardstick to begin assessing existing conditions in terms of cost and operation/site constraints at individual plants. It will not contain all the data that individual plants will need to provide when seeking a new permit. The data contained in the report will not be enough to determine "feasibility" of complying with the yet-to-be-adopted state implementation of the Clean Water Act §316(b) rule. Instead, it will provide a reference point for those looking at engineering limitations to adopting alternative technologies or operational procedures at each plant and the range of costs associated with possible new technologies or procedures.

Outside the regulatory process, the information generated could help the OPC and others design non-regulatory approaches for reducing or eliminating impingement and entrainment of marine organisms. Possible options include incentives for implementing more environmentally favorable technologies, revolving loans that can be used to implement alternative cooling technologies, and possible cap-and-trade systems. Policy makers and legislators may also find this report a useful reference when formulating new approaches for reducing these impacts. However, for each of these possible actions, the data provided in this report will only be a starting point. Additional information gathering and coordination among the state agencies will be necessary.

In the long-term, the information contained in the report can be used in conjunction with possible future studies to analyze future energy needs and the state goals regarding plants that use once-through cooling (see last section "Proposal for Future Action").

Scope of Work

Staff is recommending that the Council authorize up to $300,000 to hire consultants to examine each of the 21 existing coastal power plants that use once-through cooling and determine whether different cooling methods can be used or if structural or operational modifications can be made to reduce impingement and entrainment mortality.

The final report will include several major categories, listed below. It may be possible that staff is able to provide the contractor with some of these data or analyses, leaving the remaining topics for the contractor to complete. The final scope will be based on input we receive from stakeholders and the public, as well as constraints based on the timeline (six months) and the budget allowed.

The report will not analyze the baseline impingement and entrainment levels at each plant nor will it try to assess the possible decrease in impingement and entrainment achieved by the installation of each alternative cooling technology or alternative structure. The report will provide an explicit discussion of the assumptions necessary to complete the project on time and within budget, and will also discuss possible limitations of the data provided.

Proposed Report Categories

Background Information

The report will begin with a review of the literature including the U.S. EPA's 316(b) rulemaking record (phase I and II), the Energy Commission's report: *Environmental Performance Report of California's Electrical Generation System* (2005), other California Energy Commission (CEC) reports, and other relevant publications.

General Statewide Information

The report will compile some non-plant specific data, such as changes in efficiency between once-through cooling and wet- and dry-cycle cooling, and differences in operating costs. If there is a substantial range of values within published data, the contractors will provide a discussion as to why a range of values exist.

Plant-specific Information

The contractor will evaluate the options for structural changes at each plant along with potential operational changes. Data will be collected on a plant-by-plant basis in cooperation with the plant owners, CEC staff, and other experienced parties. General sub-categories of data for this section will include: 1) the operational history of the plant, 2) the current generation and cooling technologies used, 3) possible engineering or operational changes that can be made to reduce impingement and entrainment, 4) site constraints for installing new cooling structures or associated structures (e.g., desalination facilities), and 5) any scheduled or proposed changes to the plant. This section will also enumerate the capital and operational costs that may be associated with any change made at the plant.

Discussion of Overlapping Regulatory Authorities

If time and budget allow, the report will include a general discussion about the other (non-NPDES) regulatory authorities that possibly affect the installation of alternative technologies and will discuss possible regulatory conflicts in installing changes at these coastal plants. The different laws and regulations that may be examined are the Coastal Commission constraints/regulations (including Local Coastal Program provisions), existing State and Regional Water Board constraints (e.g., Porter-Cologne Act Section 13142.5), the Clean Air Act, and others.

Assessment of Data Gaps

The report will conclude with an assessment about data that are missing either statewide or for an individual plant. This analysis will lead to recommendations concerning what other data collection would be beneficial in the future and will provide the limitations under which the current data should be used.

PROPOSAL FOR FUTURE ACTION

This study will provide current data about each of the existing coastal plants and the available options for each plant to reduce environmental impacts associated with once-through cooling technologies. In addition to this type of information, the staff will pursue a companion study, in possible cooperation with the CEC, that would evaluate the life-cycle of these plants and their contribution to grid reliability, both now and in the projected future. Taken together, the information from the two studies could provide a roadmap for California—creating long-term, coordinated goals for eliminating once-through cooling environmental impacts and ensuring reliable, clean energy production.

PROJECT FINANCING

Funding Sources:

Ocean Protection Council	$300,000
Total Project Cost	**$300,000**

Funding for the proposed project would come from the Ocean Protection Council's Tidelands Oil funds, appropriated to the Secretary of Resources in the FY 04/05 for projects authorized pursuant to the Ocean Protection Act. The Resources Agency has entered into an interagency agreement with the Conservancy to administer these funds on behalf of the Council and recommend projects for funding.

CONSISTENCY WITH CALIFORNIA'S OCEAN ACTION STRATEGY:

This action is consistent with Action Item 13 of the Governor's Ocean Action Plan: "Identify and prioritize issues that may benefit from additional coordination by the California Ocean Protection Council. The OPC is uniquely situated to coordinate with the state agencies, environmental organizations, and the concerned public to address once-through cooling issues. The OPC is taking a leading role in collecting and organizing a range of data that will be useful for the State and Regional Water Boards, as well as the Energy Commission, State Lands Commission, and Coastal Commission."

This study is part of a priority action in the OPC draft strategic plan, along with other OPC actions that will continue to coordinate agencies actions with the goal of reducing or eliminating environmental impacts of once-through cooling at coastal power plants.

CONSISTENCY WITH OCEAN PROTECTION COUNCIL'S INTERIM PROJECT SELECTION CRITERIA & GUIDELINES:

Mandatory Criteria

1. Furthers the following statutory purposes and policies of the Ocean Protection Act:

- Improves management, conservation, and protection of coastal waters and ocean ecosystems: *This study will provide unbiased information to numerous state agencies, which they can use while proceeding in rule making and regulatory processes related to once-through cooling at coastal power plants. This information will ideally inform the decisions made at these agencies that will lead to the protection of our coastal resources.*
- Encourages those activities and uses that are consistent with sustainable, long-term protection and conservation of ocean and coastal resources: *The report will provide information that will promote sustainable practices and will help to eliminate or reduce environmental impacts of once-through cooling.*
- Helps to integrate and coordinate the state's laws and institutions responsible for protecting and conserving ocean and coastal resources: *The report will collect, organize, and analyze data that currently exist with several different agencies and the plant owners. Organizing these data into one document will help several different agencies as they continue to examine this issue and will help to coordinate agency actions.*
- Helps to coordinate the collection and sharing of scientific data: *The report will stimulate data sharing between the agencies that have regulatory or policy responsibilities regarding once-through cooling by providing a common set of data relevant to their responsibilities.*
- Benefits or furthers existing state programs or legislative mandates: *The report informs an existing regulatory process and may help to generate new state or agency policies regarding the long-term use of once-through cooling.*

2. Consistent with the purposes of the funding source: *See Project Financing Section above*.

3. Has demonstrable support from the public: *There has been demonstrated public support for the adopted resolution that calls for this study.*

4. Relates directly to the ocean, coast, associated estuaries, and coastal-draining watersheds: *All 21 plants are located along California's coast or are in estuarine areas.*

5. Has greater-than-local interest: *The information provided in the report will include all power plants coastwise that use once-through cooling and will be of use to numerous state and regional agencies.*

Additional Criteria

1. Helps implement the California Ocean and Coastal Information, Research, and Outreach Strategy and other priorities of local, state or federal advisory groups, or scientific or policy reports, adopted by the council: *The report addresses one of the priority goals in the draft OPC Strategic Plan*.

2. The project would not occur without Council participation: *The OPC is uniquely situated to provide inter-agency assistance to the State Water Board and other concerned agencies with the proposed in this study.*

3. The project has an element of urgency (there is an immediate threat to a coastal/ ocean resource from development or natural or economic conditions, a pressing need, or a fleeting

opportunity): *There is a need to complete this study within six months so that applicable information can be used to inform the rule making process or subsequent regulatory actions. The State Water Board staff is projected to propose a new rule by the end of the year. This study will also be useful to the Regional Boards as they begin to review individual NPDES permits.*

4. The project helps with conflict resolution: *The report will provide an unbiased source of information regarding the options available to different plants concerning retrofits or upgrades that may be necessary to comply with the Clean Water Act. This information may be useful to plant operators, state agencies, and the public as future policies are formed.*