

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

**FACT SHEET FOR REGULAR MEETING OF DECEMBER 2, 2004**

Prepared on September 6, 2004

**ITEM NUMBER:**

**SUBJECT: Duke Energy, Modernized Morro Bay Power Plant NPDES Permit**

**KEY INFORMATION**

**Location:** ..... Morro Bay, San Luis Obispo County  
**Discharge Type:** ..... Cooling Water, Industrial Process Wastewater  
**Flow Limit:** ..... 475 MGD (maximum for all discharges)  
**Disposal:** ..... Estero Bay  
**Recycling:** ..... None  
**Existing Order:** ..... None for the modernized Power Plant, Order No. 95-28 for the existing Power Plant

**SUMMARY**

This item proposes a draft NPDES permit for Duke Energy's modernized Power Plant in Morro Bay. The draft Order includes detailed information that is not repeated here (to reduce repetitive language). This fact sheet is only intended to provide a brief overview of the proposed Order. Testimony by staff and other designated parties in this hearing will be submitted separately for Regional Board review.

Duke Energy (hereafter Discharger) will replace the four existing power generation units with two new, more efficient units. The proposed project will replace most of the existing infrastructure, except that the existing intake and discharge structures will continue to be used as they currently are.

The existing Power Plant is regulated under a separate Order (Order No. 95-28), which will be presented to the Regional Board for renewal during 2005.

A major consideration in this case is the California Energy Commission's 3rd Revised Presiding Member's Proposed Decision (PMPD) for the Morro Bay project. The PMPD is a comprehensive, functional equivalent draft document per the California Environmental Quality Act (CEQA), and includes all aspects of the proposed project, including evaluation of alternatives to the once-through cooling water system. The PMPD concludes that there are no CEQA defined impacts on aquatic resources for the proposed project, and therefore no mitigation for impacts is required (such as closed cooling or habitat mitigation) under CEQA. Moreover, the PMPD concludes that closed cooling systems are not feasible at the Morro Bay site for the proposed project.

The proposed Regional Board Order includes tentative findings regarding thermal effects, impingement, and entrainment issues associated with the once-through cooling water system. Regarding thermal effects, the biological changes due to the thermal discharge will be essentially the same as with the existing Power Plant. The proposed Order finds that the available options for reducing thermal effects (such as an offshore discharge) are not reasonable pursuant to the State Thermal Plan and State Board decisions.

Entrainment losses at MBPP are significant for purposes of Section 316(b). However, the technologies that may reduce entrainment at MBPP (fine mesh screens and filters) are experimental and/or are not available for use at this site. The costs of these technologies (\$10 million + range) are also significantly greater than USEPA's national average technology costs (\$4.34 million) for a like facility. This conclusion is based costs and performance; since fine mesh screens and filter systems are not established as effective technologies for reducing entrainment mortality. Under these circumstances, site-specific Best Technology Available (BTA) requirements are justified.

Impingement of adult and juvenile fish and invertebrates on the traveling screens within the intake structure at the existing MBPP is not ecologically significant. The costs of technologies to reduce impingement at MBPP would be significantly greater than the value of the benefits to be gained by installing the technologies. The technology costs are in the millions of dollars and the value of the impingement losses are in the thousands of dollars. Therefore, additional design and construction technologies, operational measures and/or restoration measures to address impingement losses are not justified under Section 316(b). The Discharger may also demonstrate that the through-screen intake velocity is 0.5 feet per second or less.<sup>1</sup> If so, the cooling water intake structure meets the BTA performance standard for impingement. (40 CFR §125.94(a)(1)(ii).)

The proposed Order finds that the existing intake structure and proposed design, operational, and restoration measures comply with both the previous and current Section 316(b) regulations. Closed cooling systems (dry cooling or wet towers) are infeasible at MBPP, and their costs are significantly greater than USEPA's technology cost limit for MBPP and/or are "wholly disproportionate" to the benefit to be gained. Intake structure technologies (screens, filters) either infeasible or experimental (or both) or have costs that significantly greater than USEPA's technology cost limit for MBPP.

The proposed Order includes effluent limitations for physical parameters, metals, and chemical constituents pursuant to the 2001 Ocean Plan and other applicable Plans and regulations. All discharges covered by this proposed Order are to the Pacific Ocean.

## DISCUSSION

The proposed Order includes five main sections: findings, discharge prohibitions, effluent limitations, receiving water limitations, and provisions. A Monitoring and Reporting Program is attached to the proposed Order, as well as figures or maps illustrating the facility. Attachments 2 and 3 to the proposed Order provide a detailed discussion of thermal issues and entrainment/impingement issue, respectively.

### Findings

The Order includes findings regarding the proposed Morro Bay Power Plant (MBPP) and its surroundings, including local geology, ground water, and surface waters, discharges, and beneficial uses.

Findings are also included regarding applicable laws and regulations, impacts caused by the once-through cooling water system, and alternatives to address the impacts.

**The Discharger:** Discharger has owned and operated the Morro Bay Power Plant since approximately 1998, when it purchased the Power Plant from PG&E. Morro Bay Power Plant began operation in the

---

<sup>1</sup> As of the date these findings were prepared, the Discharger has only demonstrated that the *approach* velocity is 0.5 fps or less.

1950's, and additional generation units were added in the 1960's. The Power Plant is located immediately northwest of the City of Morro Bay, just north of the Morro Bay Embarcadero. As part of the modernization project, the existing Power Plant will be removed, along with most of the infrastructure.

**The Proposed Morro Bay Power Plant:** The modernized Power Plant will consist of two new power generation units capable of producing 600 MW each. Upon completion of the project, the modernized Power Plant will be capable of producing a total of 1,200 MW, and the existing Power Plant units will be removed along with most of the existing facility, however, the existing intake and outfall structures will be retained. A comparison of the existing versus modernized Power Plants is shown on Table 1.

The design (or maximum) cooling water flow through the modernized Power Plant is 475 MGD. The Discharger predicts an annual daily-average cooling water flow of 370 MGD. The design (475 MGD) and annual daily-average (370 MGD) flows are established limits in the proposed Order and the Energy Commission Decision.

The existing Morro Bay Power Plant (MBPP) has four power generation units, capable of generating a total of about 1060 MW. The total cooling water flow capacity of these units is 668 MGD. These units will be removed from service before the new units come on-line.

**Discharge Locations:** There will be one discharge location covered under the proposed Order, consisting of cooling water flow and various internal discharges to the cooling water flow. The modernized Power Plant has not yet been built, so a detailed description of all internal discharges is not available at this time. The proposed Order requires submittal of a detailed description of all internal discharges twelve months prior to the start of the discharge. The Executive Officer may

**Table 1: Comparison of Existing and Proposed Modernized Power Plant Parameters. Duke Energy, 2001, 2002.**

Parameter	Existing Power Plant	Modernized Power Plant
Number of Units	Four	Two
Net Power Output	1002 MW	1200 MW
Design Maximum Cooling Water Flow	707 MGD <sup>1</sup> 668 MGD <sup>2</sup>	475 MGD <sup>3</sup>
Average Annual Cooling Water Flow	260 to 567 MGD <sup>4</sup>	370 MGD <sup>5</sup>
Permitted Discharge Temperature Delta	30 <sup>0</sup> F	20 <sup>0</sup> F <sup>6</sup>
Average Discharge Temperature Delta	16.4 <sup>0</sup> F <sup>7</sup> 19.3 <sup>0</sup> F <sup>8</sup>	17.6 <sup>0</sup> F <sup>9</sup>
Discharge Location	Shoreline, North Morro Rock	Shoreline, North Moro Rock
Intake Location	Morro Bay Harbor	Morro Bay Harbor
Intake Screen Approach Velocity	0.5 fps current limit due to pump wear	0.3 feet per second design
Note: Data is from Duke Energy, <i>Application for Certification</i> (AFC), October 2000, and the <i>Thermal Discharge Assessment Report</i> (TDAR), May 2001. <sup>1</sup> Original design maximum. AFC p. 6.5-67. <sup>2</sup> Current maximum is less than design due to pump wear. AFC page 6.5-9. <sup>3</sup> Based on 20 <sup>0</sup> F delta T limit measured as intake versus discharge. More strict temperature limits would necessitate increased cooling water flow volume to maintain the same power output. <sup>4</sup> Average flows varied over the past fifteen years depending on plant operation. <sup>5</sup> Duke Energy's proposed annual average permit limit for the new units. May 2002. <sup>6</sup> The proposed power units are designed for a delta T limit of 22 <sup>0</sup> F <sup>7</sup> Average monthly temperature differential for the year 2000. TDAR, p. 2-2 <sup>8</sup> Average temperature differential for the last six months of the year 2000. TDAR, p. 2-2 <sup>9</sup> Average temperature differential predicted by Duke Energy. TDAR P. 2-2.		

require revisions to the Monitoring and Reporting Program attached to the proposed Order following review of the detailed description.

All storm water discharges from the facility will be regulated under NPDES General Permit No. CAS000001, Water Discharge Requirements for Discharges of Storm Water Associated with Industrial Activities, Excluding Construction Activities, issued by the State Water Resources Control Board (General Industrial Storm Water Permit) and any renewed General Storm Water Permits issued by the State Water Resources Control Board. Discharger has applied for coverage under the General Permit by filing a Notice of Intent with the State Water Resources Control Board and has received confirmation of coverage.

**Effluent Limitations:** Effluent limitations in the proposed Order are based on the Ocean Plan, Thermal Plan, Central Coast Region's Basin Plan, 40 CFR 423.12 (applies to in-plant waste streams), and this Region's Standard Provisions & Reporting Requirements. The draft Order includes all necessary explanation of the derivation of specific effluent limitations and citations to the legal authorities on which they are based.

**Beneficial Uses of Surface Waters:** MBPP discharges to Estero Bay (Pacific Ocean). The proposed Order lists all beneficial uses contained in the Ocean Plan and the Basin Plan for Estero Bay and Morro Bay. Beneficial uses for Morro Bay are listed because the intake structure is located in Morro Bay near the mouth of the Estuary. Beneficial uses for Estero Bay are the same as those listed for the Pacific Ocean

**Anti-Backsliding:** Anti-backsliding regulations do not apply to this permit because there is no backsliding. The effluent limitations in the proposed Order are no less stringent than the existing Order for the existing facility.

**Anti-Degradation:** The discharge authorized by the proposed Order adds no additional volume or concentration of waste and therefore will not cause degradation within the meaning of State Water Resource Control Board Resolution No. 68-16 or 40 CFR section 131.12.

#### **Applicable Laws and Regulations**

The laws and regulations discussed in the proposed Order include the Porter-Cologne Water Quality Control Act, Regional Board Basin Plan, California Ocean Plan (Ocean Plan), Clean Water Act, the Clean Water Enforcement and Pollution Prevention Act of 1999, the Thermal Plan, and the California Environmental Quality Act.

**Basin Plan:** The Water Quality Control Plan, Central Coastal Basin (Basin Plan) was adopted by the Regional Board on November 19, 1989 and approved by the State Board on August 16, 1990. The Regional Board approved amendments to the Basin Plan on February 11, 2004, and September 8, 1994. The Basin Plan incorporates statewide plans and policies by reference and contains a strategy for protecting beneficial uses of State waters. It designates beneficial uses of water bodies in the Central Coast Region and specifies numeric and narrative water quality objectives to protect designated and existing beneficial uses. The Basin Plan includes two Total Maximum Daily Load (TMDL) amendments for the Morro Bay watershed (sediment and pathogens). The sedimentation TMDL sets a goal of reducing sedimentation in Morro Bay by fifty percent over fifty years.

**Ocean Plan:** The Ocean Plan (2001) contains objectives and requirements governing discharges to the Pacific Ocean. The appropriate and relevant objectives and requirements have been incorporated into the proposed Order

**Thermal Plan:** The State Board adopted the "Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California" (Thermal Plan) on September 18, 1975. The Thermal Plan provides specific numeric and narrative water quality objectives for "new" and "existing" discharges of heat.

The State Water Resources Control Board's Office of the Chief Counsel provided guidance to the Regional Boards regarding "new" versus "existing" thermal discharges on April 4, 2001. The guidance states that a discharge should be considered "new" if there is a material change in the discharge, otherwise the discharge is considered "existing" within the meaning of the Thermal Plan. A material change is an increase in volume, pollution, or a change in location of the discharge. Based on this guidance, the thermal discharge from the modernized Power Plant is "existing" within meaning of the Thermal Plan. The permitted volume of cooling water for the modernized power plant and the permitted effluent temperature limits are reduced compared to the permit for the existing power plant.

Discharges defined as "existing" are subject only to a general narrative water quality objective. That is, existing discharges of heat to the Pacific Ocean must "comply with limitations necessary to assure protection of beneficial uses and areas of special biological significance." The Regional Board determines what constitutes reasonable protection of beneficial uses.

A detailed analysis of the thermal effects and potential alternatives for addressing the effects are included in Attachment 2 to the proposed Order.

**Clean Water Act Section 316(b):** The power plant's cooling water intake system must comply with Clean Water Act section 316(b) (33 U.S.C. § 1326), which provides:

"Any standard established pursuant to section 1311 [CWA §301] ... or section 1316 [CWA §306] ... and applicable to a point source shall require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact."

A detailed analysis of the impingement and entrainment impacts, and the alternatives analysis required by Section 316(b) of the Clean Water Act, are included in Attachment 3 to the proposed Order.

**Porter Cologne Water Quality Control Act:** The power plant's cooling water intake system must comply with California Water Code Section 13142.5(b), which provides:

"For each *new or expanded* coastal power plant ... using seawater for cooling ..., the best available site, design, technology, and mitigation measures feasible shall be used to minimize the intake and mortality of all forms of marine life."

As noted above, a detailed analysis of the impingement and entrainment impacts, an alternatives analysis, and a discussion of feasible mitigation measures, is included Attachment 3 to the proposed Order. The analysis in Attachment 3 to the draft proposed Order is pertinent to both Clean Water Section 316(b) and the Porter Cologne Water Quality Control Act.

**Pollution Control and Prevention Act of 1999:** The Clean Water Enforcement and Pollution Prevention Act of 1999 (amendments to Water Code section 13385) became effective January 1, 2000. The Act requires the Regional Board to impose mandatory penalties for certain violations. Failure to comply with NPDES Permit effluent limitations and certain other requirements and conditions may result in significant enforcement action by the Regional Board.

**Compliance History:** The proposed Power Plant has no compliance history because the plant has not been built. The compliance history for the existing Power Plant will be discussed when the NPDES permit for that facility is renewed later this year.

**California Environmental Quality Act:** Since the modernized facility will be a “new source,” the California Environmental Quality Act (Public Resources Code, Section 21100, et seq.) applies to this discharge. The California Energy Commission (CEC) has adopted a Final Commission Decision (FCD) and a functional equivalent CEQA document. The Regional Board is required to rely on the CEC’s functional equivalent document. The proposed Order includes draft CEQA findings pursuant to the Commission Decision, which incorporates the 3<sup>rd</sup> Revised PMPD.

### **Hearing Notice**

The procedures for this hearing are described in the Public Notice, included here as Attachment A.

### **RECOMMENDATION**

Staff recommends tentative approval of proposed Order No. RB3-2003-009.

### **ATTACHMENTS:**

- A. Hearing Notice
- B. Proposed Order No. RB3-2004-0028, which includes thermal effects findings as Attachment 2 to the proposed Order and 316 (b) findings as Attachment 3 to the proposed Order, and Monitoring and Reporting Program RB3-2004-0028

S:\NPDES\NPDES Facilities\San Luis Obispo Co\Duke Energy Morro Bay Power Plant\Modernized PP Permit\12-3-04 Hearing Files\Final Mailing Documents\12-03-04 MBPP Fact Sheet final.doc