CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION
81 South Higuera Street, Suite 200
San Luis Obispo, California 93401-5427

WASTE DISCHARGE REQUIREMENTS ORDER NO. 00-041
NPDES NO. CA0006254
For

DUKE ENERGY NORTH AMERICA
MOSS LANDING POWER PLANT, UNITS 1, 2, 6 AND 7
Monterey County

The California Regional Water Quality Control Board, Central Coast Region (hereafter Board), finds that:

SITE OWNER AND LOCATION

1. Duke Energy Moss Landing LLC, located Highway 1 and Dolan Road, P. O. Box 690 Moss Landing, California, 95039-0690, (hereafter Discharger) owns and operates a Fossil Fuel Power Plant located near Moss Landing as shown on Figure 1, attached.

PURPOSE OF ORDER

2. The purpose of Order No. 00-041 is to: a) Permit the discharge of industrial process wastewater, uncontaminated cooling water and storm water from the plant; b) Review and revise current discharge limits to protect present and anticipated beneficial uses of Monterey Bay; c) Review and revise the monitoring and reporting program to evaluate water quality impacts.

FACILITY DESCRIPTION

Discharge Category

3. The United States Environmental Protection Agency and Board classify this discharge as a major discharge.

Design Capacity

4. The **Existing Power Plant** consists of two generating units (Units 6 & 7) with a total net power generating capacity of 1,530 Megawatts (MWs). In 1995, the power plant retired the five older permitted power-generating units (old Units 1-5) which were constructed in the 1950's.

5. The **Modernized Power Plant** will consist of four generating units (Units 1, 2, 6, and 7) with a total net power generating capacity of 2,590 Megawatts (MWs). The two new generating units (Units 1 & 2), with a combined power generating capacity of 1,060 MWs, is scheduled to begin operating in 2002. The Discharger has proposed to modernized the power plant, as is described in the Application for Certification filed with the California Energy Commission for the Moss Landing Power Plant Modernization (1999). The power plant modernization will produce additional electric power more efficiently and reduce environmental impacts, including the existing permitted impacts on water resources.

Adjacent Properties and Land Use

6. Moss Landing Harbor lies to the west of the plant and is for recreational marine sports and commercial fisheries. California Highway 1 runs north south between the plant and the harbor. National Refractories lies to the south of the plant. Pacific Gas & Electric operates a power switchyard north of the plant. Land use in the area is mainly agricultural, industrial and commercial.

Geology

7. The plant comprises 236 acres of flat to gently sloping terrain. Plant elevations range from zero feet mean lower low water (MLLW) at Moss Landing Harbor to 54 feet MLLW. The

plant lies at the northwestern end of Salinas Valley. Soil types at the plant consist of artificial fill (silty and clayey sand) varying from 1 to 6.5 feet, clayey sand varying from 2 to 31 feet, and clay varying from 3 to 17.5 feet.

Ground Water

8. Due to location at the northwestern end of the Salinas River Basin, the plant lies within the "Salinas Sub-Basin", over the Lower Salinas Valley deposits. There are three major aquifers in the area: the 900-foot aquifer, the 400-foot aquifer, and the 180-foot aquifer. Ground water flows generally toward the west. Most of the water production wells in the area withdraw water from the 400-foot and 180-foot aquifers. Recharge to the Salinas Sub-Basin occurs by infiltration from precipitation, seepage from the Salinas River, lateral flow from outcropping formations along the valley margins, and irrigation return flow. Over pumping of the 400-foot and 180 foot aquifers since the 1940's has lowered the pressure surface of the water bearing zones, resulting in seawater intrusion. There are approximately 64 water production wells located within three-mile radius.

Surface Water

9. Surface water drainage begins approximately eight miles east of the plant where land elevation surface is at 600 feet. The streams drain westward into the Pacific Ocean through Elkhorn Slough, which borders the northern perimeter of the plant, and through Moro Cojo Slough, which is one mile south of the plant. The Pacific Ocean is the largest nearby surface water body.

Facility Cooling Water Intake System

10. The Plant has two cooling water intake stations, both located on Moss Landing Harbor (Figure 1 and 2). Currently, only the intake station used for Units 6 & 7 is in operation. The intake station used by the retired Units 1-5 will be modified and used by the new Units 1 & 2 in 2002.

11. Cooling water flow for the upgraded power plant will range from a low of 180 MGD to a maximum of 1224 MGD at peak power demand. The typical or average cooling water flow rate for the future conditions is unknown due to the deregulated energy market. Cooling water flow rates will depend on energy demand and the available power at any given point in time.

Discharge Locations

12. The power plant has four discharge outfalls (Discharge Outfall No. 001 – 004 on Figure 1 and 2). The four discharge outfall locations remain the same for both the existing and modernized power plant.

The existing power plant (Table 1 and Figure 3)

a) Discharge Outfall No. 001 (36°48'39" N. Latitude, 121°46'43" W. Longitude) receives storm water runoff from part of the plant and discharges to Elkhorn Slough. This outfall no longer receives cooling water from the retired units 1-5, and will not be used to discharge thermal wastes in the future (No thermal discharges from this outfall in Elkhorn Slough are permitted).

b) Discharge Outfall No. 002 (600 feet offshore in Monterey Bay, in approximately 30 feet of water, at 36°48'14" N. Latitude, 121°47'23" W. Longitude) receives cooling water from Units 6 & 7, storm water runoff and industrial wastewater and discharges to Monterey Bay.

c) Discharge Outfall No. 003 (36°48'05" N. Latitude, 121°46'13" W. Longitude) receives storm water runoff and discharges to Moro Cojo Slough.

d) Discharge Outfall No. 004 (I) and (II) (36°48'17" N. Latitude, 121°47'01" W. Longitude and 36° 48' 24" N. Latitude, 121° 47' 068' W. Longitude) receives storm water runoff and intake system discharges from operation and maintenance activities and discharges to Moss Landing Harbor through two separate pipelines located at the two intake stations.

The Modernized Power Plant (Table 2 and Figure 4)

a) Discharge Outfall No. 001 to Elkhorn Slough receives only storm water runoff from parts of the plant. (No thermal discharges from this outfall in Elkhorn Slough are permitted.)

b) Monterey Bay receives cooling water from all power generating units 1, 2, 6 & 7, storm water runoff and industrial wastewater. The volume of this discharge will increase.

c) Discharge Outfall No. 003 to Moro Cojo Slough receives only storm water runoff.

d) Discharge Outfall No. 004 to Moss Landing Harbor receives storm water runoff and intermittent intake system discharge from operation and maintenance activities.

Table 1. The Existing Power Plant Discharge Outfalls

Outfall No.	Discharge No.	Discharge Description	Avg. Flow (gpd)
001 (Elkhorn Slough)	001	Storm water run-off, Yard Drains	6.0×10^4
002 (Monterey Bay)	002	Once Through Cooling, (Units 6 & 7)	7.5×10^8
	002A	Intake Screen Wash	6.5×10^5
	002B	Seawater Evaporator Blowdown	5.5×10^5
	002C	Yard Drains/Storm Runoff, Retired Units 1-5	2.1×10^4
	002D	Condensate Polisher Neutralization Tank	3.6×10^4
	002E	Treated Wastewater Sump	1.6×10^5
	002E1*	Oil Water Separator	3.3×10^4
	002E2*	Fuel Oil Tank Area Runoff	1.1×10^5
	002E3*	Filter Press Filtrate	4.1×10^2
	002E4*	Boiler Blowdown, Package Boiler	4.0×10^2
	002E5*	Air Preheater/Fireside Stack Wash Water	2.8×10^3
	002E6*	Chemical Cleaning Wastewater	1.1×10^3
	002E7*	Bearing Cooling Water	2.5×10^2
	002E8*	Boiler Lay-up Water	7.0×10^2
	002E9*	Ammonia Storage System Storm Water	3.0×10^3
	002E10*	Seawater Evaporator Cleaning Waste	2.0×10^3
	002 E11*	Floor Drains, Retired Units 1-5	1.1×10^2
	002E12*	Drains from Oil Handling Areas-Retired Units 1-5; Units 6-7	3.0×10^4
003 (Moro Cojo Slough)	003	Storm Water Runoff	1.3×10^5
004 (Moss Landing Harbor)	004A	Yard Drains and Storm Water Run-off (Units 6 & 7)	1.2×10^4
	004B	Intakes Screen Trash Basket Over-flow for Units 6 &7	3.3×10^3
	004C	Intakes Cleaning Wastewater for Units 6 &7	1.5×10^3
	004D	Intakes Heat Treatment to Normal Operation	2.8×10^4
	004E	Intakes Yard Drain and Storm Water Run-off for Retired Units 1-5 and Units 6 & 7	2.0×10^3

*wastewater is treated and conveyed to the treated wastewater sump 002E before discharging to Discharge Outfall No. 002.

Table 2. The Modernized Power Plant Discharge Outfalls

Outfall No.	Discharge No.	Discharge Description	Avg Flow (gpd)
001 (Elkhorn Slough)	001	Storm water run-off, Yard Drains	6.0×10^4
002 (Monterey Bay)	002	Once Through Cooling, (Units 1, 2, 6 & 7)	12.24×10^8
	002A	Intake Screen Wash	1.3×10^6
	002B	Seawater Evaporator Blowdown	5.5×10^5
	002C	Yard Drains/Storm Water Runoff (Retired Units 1 -5)	2.1×10^4
	002D	Condensate Polisher Neutralization Tank	3.6×10^4
	002E	Treated Wastewater Sump	1.6×10^5
	002E1*	Oil Water Separator	7.0×10^4
	002E2*	Ex-Fuel Oil Tank Area Runoff	4.0×10^4
	002E3*	Filter Press Filtrate	4.1×10^2
	002E4*	Boiler Blowdown (Units 1& 2) & Package Boiler	4.0×10^4
	002E5*	Air Preheater/Fireside Stack Wash Water	3.0×10^4
	002E6*	Chemical Cleaning Wastewater	1.1×10^3
	002E7*	Bearing Cooling Water	2.5×10^2
	002E8*	Boiler Lay-up Water	7.0×10^2
	002E9*	Ammonia Storage System Storm Water	3.0×10^3
	002E10*	Seawater Evaporator Cleaning Waste	2.0×10^3
	002E11*	Floor Drains, Retired Units 1-5	1.1×10^2
	002E12*	Drains from Oil Handling Areas-Retired Units 1-5, and Units 1, 2, 6 and 7	3.0×10^4
003 (Moro Cojo Slough)	003	Storm Water Runoff	1.3×10^5
004 (Moss Landing Harbor)	004A	Yard Drains & Storm Water Run-off (Units 6&7)	1.2×10^4
	004B	Intakes Screen Trash Basket Over-flow for Units 1, 2, 6 &7	6.5×10^3
	004C	Intakes Cleaning Wastewater for Units 1, 2, 6 &7	6.0×10^3
	004D	Intakes Heat Treatment to Normal Operation	5.5×10^4
	004E	Intakes Yard Drain and Storm Water Run-off for Units 1, 2, 6 & 7	2.0×10^3

*wastewater is treated and conveyed to the treated wastewater sump 002E before discharging to Discharge Outfall No. 002

13. Effluent through Outfall No. 002 is discharged to Monterey Bay adjacent to the designated Monterey Bay National Marine Sanctuary. Most of Monterey Bay was officially designated as a National Marine Sanctuary on September 15, 1992. The National Marine Sanctuaries Program is mandated by Title III of the Marine Protection, Research, and Sanctuaries Act of 1972. The Program protects areas of the marine environment, which possess conservation, recreational, ecological, historical, research, educational, or aesthetic qualities of special national significance. The first priority of the Program is the long-term protection of resources within a sanctuary. The Monterey Bay Sanctuary has been recognized for its unique and diverse biological and physical characteristics. The Discharger will fund $425,000 to the Monterey Bay Sanctuary Foundation for a Coastal Waters Evaluation Program. The Program will be developed by the Monterey Bay National

Marine Sanctuary and it will address issues raised by the Sanctuary.

Storm Water Discharge

14. Federal Regulations for storm water discharges were promulgated by the USEPA on November 19, 1990. The regulations [40 Code of Federal Regulations (CFR) Parts 122, 123, and 124] require specific categories of industrial activities which discharge storm water associated with industrial activity (industrial storm water) and construction activity to obtain NPDES permits and to implement Best Available Technology Economically Achievable (BAT) and Best Conventional Pollutant Control Technology (BCT) to control pollutants in industrial storm water discharges.

15. Most of the storm water flows from the plant operations areas are directed to Discharge Outfall No. 001, 003 and 004. Some storm water is also discharged through Discharge Outfall No. 002. These storm water flows constitute all industrial storm water at the plant and are regulated under this Order. Yard drains and storm runoffs are intermittent discharges. Storm water discharges from the power plant are in accordance with the Duke Energy Moss Landing Power Plant Storm Water Pollution Prevention Plan (June 2000).

Other Wastewater Discharges

16. Wastewater Ponds No. 1, 2, and 3 receive wastes from various sources on an intermittent basis. Air preheater/boiler fireside/stack wash water, chemical cleaning wastewater, boiler lay-up water, and Seawater Evaporator Cleaning Wastewater, all flow into the lined wastewater ponds. The pond water is neutralized and stabilized, the supernate is tested and discharged to the treated wastewater sump. The solids are filtered out in a press and disposed of at an approved offsite disposal area. The filter press filtrate is tested and pumped to the treated wastewater sump before entering flow stream to Discharge Outfall No. 002.

17. The Discharger uses sodium hypochlorite as an alternative to gaseous chlorine for bio-fouling reduction. Calcium hypochlorite may be used as a backup upon the Executive Officer's approval, while the Discharger continues to evaluate other alternatives. The Discharger also periodically discharges dye, such as rhodamine, during testing of its facilities.

18. Monterey Bay Aquarium may use water from the Discharger's cooling water system (Discharge Outfall No. 002) at its Moss Landing Facility as a back-up system. Discharge is to Monterey Bay through the Discharge Outfall No. 002.

19. Domestic waste generated by plant employees is discharged to onsite septic tank and leachfield systems. Domestic waste discharge is regulated by Waste Discharge Requirements Order No. 89-19.

Beneficial Uses

20. The present and potential beneficial uses of Moss Landing Harbor are:
    a. Water contact recreation;
    b. Non-contact water recreation, including aesthetic enjoyment;
    c. Industrial water supply;
    d. Navigation;
    e. Marine habitat;
    f. Shell fish harvesting;
    g. Ocean commercial and sport fishing;
    h. Preservation of rare and endangered species,
    i. Wildlife habitat;
    j. Migration of aquatic organisms; and
    k. Spawning, reproduction and early development of some aquatic organisms.

21. The beneficial uses of Elkhorn Slough are:
    a. Water contact recreation;
    b. Non-contact water recreation;
    c. Warm fresh water habitat;
    d. Cold fresh water habitat;
    e. Migration of aquatic organisms;
    f. Shellfish harvesting;
    g. Spawning, reproduction and/or early development
    h. Preservation of biological habitat of special significance;
    i. Rare, threatened, or endangered species;

j. Wildlife habitat;
k. Marine habitat;
l. Estuarine habitat;
m. Commercial and sport fishing; and,
n. Aquaculture

22. The beneficial uses of Moro Cojo Slough are:
    a. Water contact recreation;
    b. Non-contact water recreation;
    c. Warm fresh water habitat;
    d. Cold fresh water habitat;
    e. Ground water recharge;
    f. Shellfish harvesting;
    g. Spawning, reproduction and/or early development;
    h. Preservation of biological habitat of special significance;
    i. Rare, threatened, or endangered species;
    j. Estuarine habitat;
    k. Commercial and sport fishing;
    l. Wildlife habitat; and
    m. Migration of aquatic organisms

23. The beneficial uses of Monterey Bay are:
    a. Water contact recreation;
    b. Non-contact water recreation, including aesthetic enjoyment;
    c. Industrial water supply;
    d. Navigation;
    e. Marine habitat;
    f. Shellfish harvesting;
    g. Ocean commercial and sport fishing;
    h. Preservation of rare, threatened and endangered species;
    h. Wildlife habitat; and
    i. Spawning, reproduction and early development of some aquatic organisms

24. The shellfish harvesting beneficial use (Findings 20.f., 21.f., 22.f., and 23.f.) exists wherever mussels, clams, or oysters may be harvested for human consumption. To the knowledge of the Board, mussels, clams, and oysters are all present within Moss Landing Harbor, Elkhorn Slough, and Monterey Bay. The State Health Department currently enforces a prohibition on shellfish harvesting in Elkhorn Slough due to excessive bacteria concentrations.

25. At least three species are documented to exist in the area that are listed as "Threatened" or "Endangered" pursuant to the Federal Endangered Species Act. The three species are the California Southern Sea Otter and Brown Pelican, and tidewater gobies (only found in Bennett Slough). Therefore, the present and potential beneficial use designations of the Moss Landing Harbor, Elkhorn Slough, Moro Cojo Slough and Monterey Bay include rare, threatened, and endangered species.

REGIONAL BASIN PLAN

26. The Water Quality Control Plan, Central Coastal Basin (Basin Plan) was adopted by the Board on November 19, 1989 and approved by the State Board on August 16, 1990. The Board approved amendments to the Basin Plan on February 11, 1994 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 specifies numeric and narrative water quality objectives to protect designated and existing beneficial uses.

CALIFORNIA OCEAN PLAN

27. The Water Quality Control Plan, Ocean Waters of California - California Ocean Plan (Ocean Plan) was adopted by the Board in 1972 and amended in 1978, 1983, 1988, 1990 and 1997. The Ocean Plan (1997) contains water quality objectives and other requirements governing discharge to the Pacific Ocean and Monterey Bay.

28. The Ocean Plan is applicable to Discharge Outfall No. 002 to Monterey Bay. A procedure for determining effluent limitations is based on ocean water quality conditions and the minimum initial dilution of the discharge. An initial dilution ratio of 10.8:1 (Seawater: Effluent) is used in calculating effluent limits for Discharge Outfall No. 002 for the current discharge to Discharge Outfall No. 002. The initial dilution ratio for the modernized power plant is 7.4:1 at Discharge Outfall No. 002.

FEDERAL CLEAN WATER ACT

29. Effluent limitations, and toxic and effluent standards, established pursuant to Sections 301, 302, 303(d), 304, 307, and 316 of the Clean Water Act (CWA) and amendments thereto, are applicable to the discharge.

THE CLEAN WATER ENFORCEMENT AND POLLUTION PREVENTION ACT OF 1999

30. 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 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 Board.

ANTI-BACKSLIDING

31. There is no anti-backsliding because the effluent limitations in the permit are not less stringent than the previous permits.

CALIFORNIA THERMAL PLAN

32. 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 contains objectives governing cooling water discharges. The Thermal Plan provides specific numeric and narrative water quality objectives for new discharges of heat. Thermal discharges defined as "existing" discharges are subject only to a general narrative water quality objective. Existing discharges of heat to Coastal Waters (including Monterey Bay) must, "comply with limitations necessary to assure protection of beneficial uses and areas of special biological significance."

THERMAL DISCHARGES

33. Discharge from Units 6 & 7 is an existing discharge within the meaning of the Thermal Plan. The effluent temperature limits in Order No. 95-22 for discharges from Units 6 & 7 are adequate to protect beneficial uses of the receiving waters.

34. The upgraded facility is a "new discharge" pursuant to the Thermal Plan. The Thermal Plan requires the following for new elevated temperature discharges:

    a. Elevated temperature wastes shall be discharged to the open ocean away from the shoreline to achieve dispersion through the vertical water column.
    b. Elevated temperature wastes shall be discharged a sufficient distance from areas of special biological significance to assure the maintenance of natural temperature in these areas.
    c. The maximum temperature of the thermal waste discharge shall not exceed the natural temperature of the receiving water by more than 20º F.
    d. The discharge of elevated temperature wastes shall not result in increases in the natural water temperature exceeding 4º F at 1) the shoreline, 2) the surface of any ocean substrate, 3) the ocean surface beyond 1,000 feet from the discharge system. The surface temperature limitation shall be maintained at least 50% of the duration of any complete tidal cycle.
    e. Additional limitations shall be imposed when necessary to assure protection of beneficial uses.

35. It is anticipated that the combined discharges of the upgraded plant will meet the 20ºF temperature limitation under most operating conditions. However, the discharge may exceed the 20ºF limitation when only the older Units 6 & 7 are operating or during extended periods of high power generation with all units operating. Effluent Limitations B.7. of this permit delineate the temperature standards for the thermal discharge under conditions where the 20ºF limitation will not be met.

36. The Thermal Plan provides that Regional Boards may grant exceptions to the Specific Water Quality Objectives of the Thermal Plan, in accordance with Clean Water Act section 316(a) (33 U.S.C. section 1326) and applicable federal regulations. Such exceptions are subject to concurrence of the State Water Resource

Control Board. Duke Energy requested the Board to consider and grant a specific exception to the 20º F thermal waste discharge limitation on March 17, 2000.

37. Clean Water Act section 316(a) provides that an exception will be granted if the discharger can demonstrate, to the satisfaction of the Regional Board, that an effluent limitation for heat is more stringent than necessary to assure the protection and propagation of a balanced, indigenous population of shellfish, fish and wildlife in and on the body of water into which the discharge is to be made (hereafter, BIC). If the exception is granted, the Regional Board will adopt an alternative effluent limitation, taking into account the interaction of the heat component of the discharge with other pollutants, that will protect the BIC.

38. On April 28, 2000, Duke Energy submitted a report titled *Evaluation of Proposed Discharge System With Respect to the Thermal Plan – Moss Landing Modernization Project* (hereafter, Thermal Plan-MLPP). The Thermal Plan-MLPP was prepared under the direction of a technical working group that included the Regional Board's independent scientific experts, California Energy Commission, California Coastal Commission, and California Department of Fish and Game staff. The report describes the upgraded facility, estimates future operating parameters, and estimates the dispersion of the thermal plume under future operating conditions. The Thermal Plan-MLPP was used to evaluate Duke Energy's request for an exception to the Thermal Plan's 20º F thermal waste discharge limitation.

39. The receiving water body segment where the BIC must be protected is defined as the area affected by the thermal plume. The thermal discharge occurs at an outfall six hundred feet offshore, within Monterey Bay. There is rapid mixing of the discharge plume with Bay waters resulting in rapid reduction in plume temperature. The thermal plume is dispersed through the vertical water column. The extent of the thermal plume approaching 4°F over ambient temperatures is in an approximate area of a 1000 foot radius around the discharge point within Monterey Bay under worst case conditions (maximum power loading, incoming tide, on-shore winds). However, modeling indicates the thermal plume will not exceed the 4° delta T limit at the shoreline for 50% of the tidal cycle, as required by the Thermal Plan. Duke Energy will determine the actual (rather than modeled) dispersion of the thermal plume under operating conditions per requirements in the Receiving Water Monitoring section of this permit. Heated discharge does not appear to enter Elkhorn Slough (or if it does, it has a minimal effect because of the naturally elevated temperature of the outflow from the Slough to the Bay during normal tidal action). Thus, the heated discharge is within the described area of Monterey Bay that the protection of the BIC was considered.

40. The Thermal Plan-MLPP Report indicates that because of rapid mixing of the thermal plume with the waters of the Bay, the plume's heat quickly dissipates. The discharge is in an area of sandy substrate where degradation of species populations and communities should be minimal. The discharge location minimizes thermal plume contact with sensitive nearshore environments such as rocky intertidal habitat. **Based on** the evaluation of **the thermal plume model and best professional judgement,** there is no **indication of** significant adverse effect on Monterey Bay in the plume area due to the elevated temperature of the discharge.

41. The Board considered the interaction of the discharge thermal component with other pollutants being discharged to the applicable segment of Monterey Bay. There are no thermal point-source pollutant discharges in the segment, except for the MLPP discharge from Outfall No. 002. Effluent limitations for other pollutants in the discharge are set at levels necessary to protect beneficial uses and so other pollutants in the discharge should not interfere with BIC protection.

42. The Board considered the cumulative impact of the discharge thermal component with the impact of entrainment from the MLPP intake facilities. In this case, there is no significant cumulative impact because the thermal plume impacts are limited to the applicable segment of Monterey Bay and the entrainment impacts are

mostly in Moss Landing Harbor and Elkhorn Slough. Additionally, as described below, entrainment impacts will be mitigated.

43. Because the thermal discharge of the modernized power plant will assure protection and propagation of a BIC, an alternative effluent limitation for the thermal discharge from the modernized power plant is approved as specified in Part B: EFFLUENT LIMITATIONS in this Order, below. These alternative effluent limitations are effective upon approval by the State Water Resources Control Board.

ENTRAINMENT

44. Section 316(b) of the Clean Water Act (33 U.S.C. section 1326(b)) requires that the location, design, construction, and capacity of cooling water intake structures reflect Best Technology Available (hereafter BTA) for minimizing adverse environmental impacts.

45. Former owner PG&E submitted a final report in November 1983, and supplemental reports in November 1986 and January 1988, to demonstrate compliance with Clean Water Act Section 316(b). The reports determined that impacts could be minimized through operation and maintenance procedures. Based on these reports the Regional Board determined that the existing intake system operation complied with the BTA requirements of section 316(b). Reported conclusions were re-evaluated as part of the review process for this permit and it was determined that there is no basis for reconsidering the Board's existing determination of compliance regarding the existing intake system operation.

46. By letter dated July 21, 1999, the Board requested that the Discharger conduct certain studies and make submittals to the Board relating to Section 316(b) requirements for the cooling water intake system operation for the two new generating units (Units 1 & 2) modernized project. In response to this request, the Discharger submitted the following documents and studies to the Board: Final Moss Landing Power Plant Modernization Project Cooling Water Intake and Discharge Study Plans dated November 18, 1999; Quarterly Reports Summarizing Entrainment Data beginning August 31, 1999; 316(b) Demonstration Reports for the MLPP including the most recent 316(b) Demonstration Report for the MLPP dated April 28, 2000. The Technical Working Group that was established by the Board to review the design and implementation of the 316(b) studies reviewed each of these reports.

47. The intake structures are located in the Moss Landing Harbor. **Eight fish larval species made up 95** percent of the larvae entrained in twelve months of weekly site surveys. Unidentified larval goby accounted for about 50 percent of the entrained larvae. **Of those eight fish larval species, three (approximately 5 percent) have commercial or recreational value.** Pacific herring and white croaker support human food fisheries and pacific staghorn sculpin support a bait fishery. The direct impacts to sport and commercial fish populations due to entrainment are negligible. However, the cooling water intake does cause a loss of **larval forms of fish organisms** production for entrained slough/harbor species. This loss of production will continue for the life of the power plant. It is impossible to precisely quantify the resulting impact of the losses on the overall slough/harbor ecosystem and the long-term effects on species populations. Thus, mitigation of this impact is based on scientifically supported estimates.

48. The Discharger must use BTA to minimize adverse environmental impacts caused by the cooling water intake system. If the cost of implementing any alternative for achieving BTA is wholly disproportionate to the environmental benefits to be achieved, the Board may consider alternative methods to mitigate these adverse environmental impacts. In this case the costs of alternatives to minimize entrainment impacts are wholly disproportionate to the environmental benefits. However, Duke Energy will upgrade the existing intake structure for the new units to minimize the impacts due to impingement of larger fish on the traveling screens, and will fund a mitigation package to directly enhance and protect habitat resources in the Elkhorn

Slough watershed as explained below.

49. Minimization of adverse impacts of the intake system to Elkhorn Slough watershed can be accomplished in two ways: 1) modification of the existing intake system to reduce entrainment and impingement; and 2) environmental enhancement projects that result in permanent preservation or direct enhancement of Elkhorn Slough watershed resources. With respect to intake structure modifications, Duke Energy will upgrade the intake system for the new units. New angled traveling screen technology using finer mesh will be installed to reduce approach velocities and better maintain the intake free of debris that might otherwise entangle fish and shellfish. The new intake screens will operate with a continuous slow rotation. The new combined-cycle project will eliminate having a 350-foot tunnel in front of the intake screens and **will greatly reduce** entrapment of organisms. Each of these factors will directly reduce impingement effects. Additionally, the facility's new power generation technology enables a 34 percent reduction in that intake's permitted intake flow (depending on power demand) compared to the old retired units, a direct reduction in potential entrainment effects of the same percentage. Duke Energy will minimize the volume of cooling water used by shutting down circulation pumps whenever possible during low power demand. However, these modifications alone are not sufficient to minimize adverse environmental effects of the intake system and to achieve compliance with the BTA requirements of section 316(b) because the modifications do not address entrainment impacts.

50. **Environmental Enhancement Program**

In addition to the intake modifications mentioned above, the Board, California Energy Commission, and Duke Energy have developed an acquisition and aquatic habitat enhancement program called the Elkhorn Slough Enhancement Program. The enhancement program, in addition to the modifications to the intake system described above, will minimize adverse environmental effects of the intake system on the Elkhorn Slough watershed resources so that Duke Energy can comply with Clean Water Act section 316(b). Adverse environmental effects will be minimized by increasing health and biological productivity of aquatic habitat in the Elkhorn Slough watershed. Duke Energy will deposit a total of $7,000,000 (seven million dollars), into a dedicated account as specified by the Executive Officer and California Energy Commission. The $7,000,000 will be paid in full within 120 days after the start of construction for the new power generation units (anticipated at the end of December 2000). The dedicated account will be invested in a manner approved by the Executive Officer.

The funds will be used as follows:

a. The dedicated fund will be used by Elkhorn Slough Foundation to only fund projects "for permanent preservation and enhancement" of habitat within the Elkhorn Slough watershed so that health and biological productivity of aquatic habitat will be increased.

b. The goal of the Elkhorn Slough Enhancement Project is to mitigate significant effects of larvae entrainment by the cooling water intake system by using the most direct means to increase the biological health and productivity of the Elkhorn Slough watershed aquatic habitat through acquisition, permanent preservation, and restoration of habitat including wetland and upland areas in the Elkhorn Slough watershed and can include other improvements and enhancements to increase the health and productivity of the slough's aquatic habitat. For habitat acquired, protected, or restored, measures will be identified to monitor the

long-term maintenance of such habitat.

The Elkhorn Slough Enhancement Project will be implemented by the Elkhorn Slough Foundation subject to oversight by the Regional Board and Energy Commission. The Elkhorn Slough Foundation will implement the project in accordance with the plan and Memorandum of Agreement, described below.

c. The objectives to achieve the project goal are:

- Implement an aggressive conservation acquisition program for the Elkhorn Slough that includes acquiring fee interests, conservation easements or management agreements on lands that either directly impinge on the slough or that contribute damaging inputs to the slough. Damaging inputs can refer to debris or sediment coming from eroding uplands in the slough, nutrients or chemicals running off into the slough or other components that tend to degrade the productivity, species diversity or the long-term health of the slough ecosystem.

  - The priority for transactions is to:

    - Purchase fee interest or easements on wetland areas that are in need of restoration or enhancement.

    - Restore degraded wetlands and former wetlands that have been diked or impacted by other uses.

    - Purchase fee interest or easements on lands immediately adjoining the slough that are currently impacting aquatic resources in negative ways to reduce or eliminate the damaging practices.

    - Develop vegetated buffers between waterways and upland areas that are contributing runoff to the slough.
    - Purchase fee interest or easements on the best remaining wetlands that are currently unprotected or in jeopardy.

  - Priority for lands with damaging impacts to slough will be based on analyses by the NRCS and other local partners. Those lands that contribute the greatest negative input: sediment, chemicals, nutrients, debris, will be targeted first.

- **As previously described,** restore wetlands in the slough. The priority for this objective is to restore those areas, particularly degraded wetlands, that will contribute to the improvement of water quality entering the system by trapping sediments, filtering and transforming nutrients, and increasing wetland habitats for aquatic species.

- Establish from a portion of the $7 million (approximately $2 million) a fund to be invested to provide a permanent endowment to accomplish short-term and long-term stewardship (management and maintenance) of the selected mitigation projects in perpetuity.

- The Elkhorn Slough Foundation may implement these projects in cooperation and coordination with other conservation organizations and agencies and may use funds in the dedicated account to secure matching grants for the benefit of the Elkhorn Slough watershed. This objective is included to clarify that leveraging of the dedicated account is permitted to obtain additional benefits for the Elkhorn Slough watershed without additional expenditures from the dedicated account.

- The location of the Enhancement Project will be in the Elkhorn Slough watershed. Those lands that directly impinge on the health and productivity of the slough aquatic habitat and/or that have strategic importance for restoring and managing the slough's aquatic habitat over the long-run will be targeted.

  (It is generally not advisable to identify specific parcels of property for acquisition before contact has been made with landowners. The acquisition process is

contingent on willing sellers or landowners willing to grant or sell easements on their property. Therefore, the general criteria for acquisition are outlined. It would be premature and counterproductive to identify specific parcels, but all acquisitions would meet the goals outlined here and the due diligence standards for conservation real estate transactions.)

d. The Plan will be implemented through the following procedures:

- The Regional Board and Energy Commission (permitting agencies) will prescribe final project requirements to assure funds are spent appropriately. As a part of this process a series of *Advisory Team* meetings will be held to obtain advice from representatives of the California Coastal Commission, California Department of Fish and Game, Monterey Bay National Marine Sanctuary, Elkhorn Slough National Estuarine Research Reserve, Monterey County, Elkhorn Slough Foundation, and Environmental organizations designated by the Regional Board and Energy Commission (the *Advisory Team*). Within 60 days of Project certification by the Energy Commission, one or more *Advisory Team* meetings will be held to identify categories of projects that could be funded with Elkhorn Slough Enhancement Project funds, and for each category of project, identify specific goals, objectives, performance standards, fund management protocols, and stewardship activities that may be needed to maintain goals and objectives over time. The Regional Board and Energy Commission will produce and circulate a written Elkhorn Slough Enhancement Project plan for review and comment by the *Advisory Team* and other interested stakeholders. The Regional Board and Energy Commission shall hold meeting(s) and complete the written plan in a timely manner to ensure prompt mitigation efforts. The Regional Board will approve or disapprove the plan at a public meeting after public comment. It is expected that the first *Advisory Team* meeting will be in November.

- The Elkhorn Slough Foundation will apply all due diligence, as outlined in the Land Trust Alliance Standards and Practices, to the evaluation, negotiation and purchase of fee or easement interests in targeted properties. All transactions are predicated on the following:

- Transaction meet all due diligence standards:

  Clear title;
  Phase I environmental review;
  Phase II environmental review if necessary; and
  Fair market-appraisals

- Fee Acquisition of appropriate properties – for those lands and waters that can be protected only by permanent ownership, we propose to acquire fee interest. Some of these lands may be annexed to the Elkhorn Slough National Estuarine Research Reserve, some to The Nature Conservancy Preserve, and some permanently managed by the Elkhorn Slough Foundation.

- Purchase of Conservation Easements – easements can protect the fundamental natural resources of many of the areas of concern. Where possible, easements are the preferred tool, as they tend to reduce long-term management costs for the conserving entity.

- Restoration activities will follow existing plans: The Moro Cojo Slough Wetlands Management and Enhancement Plan, the Elkhorn Slough Wetland Plan, and the Elkhorn Slough National Estuarine Research Reserve Vegetation Management Plan provide guidance for restoration activities in the slough that will improve water quality.

- Elkhorn Slough Foundation and the permitting agencies will enter into a Memorandum of Agreement (MOA) governing the process for the Foundation to submit specific project proposals to the

permitting agencies for approval. The MOA will require the permitting agency staff to review the proposed project for conformity to the Elkhorn Slough Enhancement Project plan and to approve the project as consistent with the plan and approve the level of funding for the project. Before such approvals the permitting agencies will consult with the *Advisory Team*.

The MOA will also provide for project monitoring and invoice approval by the permitting agencies. The MOA will require The Foundation to provide progress and final reports for specific projects. If the Enhancement Program fund is in the custody of the Elkhorn Slough Foundation, the MOA shall provide that no funds may be released without written approval of the Regional Board and the Energy Commission and shall provide for fiscal reports and auditing.

- Elkhorn Slough Foundation, will provide an annual report including description of projects implemented, a schedule and description of future projects, and if the Foundation has custody of the Enhancement Program fund, a summary of financial account activity.

- To maximize the benefits of the environmental enhancement program, the Regional Board and Energy Commission will approve projects for funding and implementation as soon as possible after funds are deposited in the dedicated account and the Elkhorn Slough Enhancement Plan is approved by the Regional Board and the Energy Commission.

- Over the course of approximately five years, the projects funded by the mitigation money are expected to be complete except for any necessary stewardship activities.

e. The following guidance will be followed for monitoring mitigation by the Elkhorn Slough Enhancement Program :

- Performance standards

  Measures that gauge progress toward the goals of the plan will include:

  Numbers of acres acquired and protected;
  Numbers of acres restored;
  Numbers of acres of vegetated buffers created; and
  Estimated quantities of Sediment prevented from entering the system due to acquisition and restoration of targeted lands.

  Reduction of chemical and nutrient inputs to slough based on calculations provided by NRCS and partner agencies.

- Integrating monitoring with CEC compliance program

  The Elkhorn Slough National Estuarine Research Reserve, Elkhorn Slough Foundation, National Oceanic and Atmospheric Administration, Department of Fish and Game, and the Monterey County Water Resources Agency cooperatively monitor 24 stations throughout the Elkhorn Slough and lower Salinas River system. This program, established in 1988, monitors nitrate, phosphate, ammonia, temperature, salinity, turbidity, pH, dissolved oxygen, and conductivity on a monthly basis. It is the longest running surface water quality monitoring program in the central Monterey Bay area. This data collection program will run in parallel with the acquisition and restoration associated with the mitigation and may provide a measure of nutrient reduction associated with implementation of the plan.

  The Reserve and Foundation fly regular series of aerial surveys collecting photographs for tracking land use changes and vegetative cover in the slough watershed. This will continue through the period of acquisition and restoration and be used, in combination with GIS to provide another measure of performance.

  To maximize the benefits of the

environmental enhancement program, projects will be approved for funding as soon as possible and will be implemented as soon as possible after funds are deposited in the dedicated account. This provision is included because the program emphasizes land acquisition. Demand for coastal land and prices for that land are constantly increasing. Delay may result in lost opportunity to acquire a certain parcel or an increased price for that parcel. Additionally, every year a source of erosion or toxic run-off to the slough continues to discharge the more difficult ecosystem enhancement will be. Time has a direct connection to environmental benefit.

51. Based upon the above findings, implementation of the above described intake modifications, and complete funding of the environmental enhancement program, as described in the above finding, constitutes compliance with Clean Water Act section 316(b) by implementing BTA that minimizes adverse environmental effects on the environment due to operation of the modernized MLPP cooling water intake system.

California Environmental Quality Act

52. Waste discharge requirements for this discharge are exempt from the provisions of the California Environmental Quality Act (Public Resources Code, Section 21100, et seq.) in accordance with section 13389 of the California Water Code.

Discharging is a Privilege

53. A permit and the privilege to discharge waste into waters of the State is conditional upon the discharge complying with provisions of Division 7 of the California Water Code and of the Clean Water Act (as amended or as supplemented by implementing guidelines and regulations) and with any more stringent effluent limitations necessary to implement water quality control plans, to protect beneficial uses, and to prevent nuisance. This Order shall serve as a National Pollutant Discharge Elimination System Permit pursuant to Section 402 of the Clean Water Act. Compliance with this Order should assure conditions are met and mitigate any potential changes in water quality due to the project.

Changes to the Order

54. Order No. 00-041 includes findings for both the existing power plant and the proposed Units 1 & 2. The Order includes revised effluent limitations in accordance with the Thermal Plan and a variance under limited conditions from one of the Thermal Plan objectives according to Clean Water Act section 316(a). Order No. 00-041 includes provisions for cooling water intake system compliance with Clean Water Act section 316(b) based upon some improvements to the system and implementation of an environmental enhancement program.

Changes to the Monitoring and Reporting Program

55. The Discharger has indicated a willingness to participate in development of a regional monitoring program in the Monterey Bay National Marine Sanctuary. The receiving water monitoring may be revised based on program development. Duke Energy will conduct a comprehensive evaluation of the three dimensional thermal plume dispersion areas under actual operating conditions when the new power generation units come on-line. A thermal plume evaluation plan must be submitted to the Board for review six months prior to full commercial operation of the new power generation units. The Board's independent consultants will review the evaluation plan.

Permit Application

56. The Discharger submitted an application for authorization to continue to discharge wastes under the NPDES on January 28, 2000. The Board last issued Permit No. CA0006254 on February 10, 1995 (Order No. 95-22).

57. The permit was automatically administratively

extended on January 28, 2000. This extension is effective until a new permit is issued or the Board terminates the existing permit. Regional Board staff notified the Discharger and interested persons of its intent to reissue waste discharge requirements for the discharge on October 27, 2000, provided them with an opportunity to submit their written views and recommendations, and scheduled a public hearing.

58. In public hearings on September 15, 2000 and October 27, 2000, the Board heard and considered all evidence, comments and other matters in the Regional Board record pertaining to the discharge and found this Order consistent with the above findings.

IT IS HEREBY ORDERED, pursuant to authority in Section 13377 of the California Water Code, that Duke Energy North America (Discharger), its agents, successors, and assigns, may discharge waste from its Moss Landing Power Plant providing they comply with the following:

(General permit conditions, definitions and the method of determining compliance are contained in the attached "Standard Provisions and Reporting Requirements for National Pollutant Discharge Elimination System Permits," dated January 1985. Applicable paragraphs are referenced in paragraph D.3. of this Order.)

Requirements specified in this Order are based on staff's professional judgement and the following documents:

A = Basin Plan
B = Ocean Plan
C = Thermal Plan
D = Standard Provisions & Reporting Requirements
E = 40CFR 423.12

Throughout the Order and Monitoring and Reporting Program, subscripts are included to indicate the source of specified requirements. Requirements not referenced are based on professional judgement or are carried over from the previous Order.

A. DISCHARGE PROHIBITIONS

1. Discharge at any location other than that described in the Permit application, Finding No. 13 or shown on Figures 1 & 2, is prohibited.

2. Discharge of polychlorinated biphenyl compounds is prohibited.[E.]

3. Discharge of domestic wastewater or solid waste to surface waters is prohibited.

4. Discharges of pollutants which are not otherwise authorized by this NPDES permit, to a storm drain system or waters of the state are prohibited.

5. Storm water discharges shall not cause pollution, contamination, or nuisance.

6. Adverse affects of the discharge to beneficial uses of water or threatened or endangered species are prohibited.

B. EFFLUENT LIMITATIONS

Effluent Limitations for Discharge Outfall No. 002 for the Existing Power Plant

1. Discharge shall not exceed 890 MGD.

2. During heat treatment to remove mussels and other biofouling organisms from cooling water system conduits, the maximum temperature of the discharge shall not exceed the natural temperature of the intake water by more than 40 degrees F (22.2 degrees C).[C]

3. Except during periods of heat treatment, the daily temperature of the discharge shall not exceed the natural daily average temperature of the intake water by more than 28 degrees F (15.6 degrees C).[C]

4. Discharge Outfall No. 002 shall not contain constituents in excess of the following limits:[B]

A. EFFLUENT LIMITATIONS

Constituent	Units	Monthly (30-day average)	Weekly (7-day average)	Maximum At anytime
Grease & Oil	mg/l	25	40	75
Suspended Solids	mg/l		60	
Settleable Solids	ml/l	1.0	1.5	3.0
Turbidity	NTU	75	100	225
PH	Units		6.0 – 9.0 at all times	

B. PROTECTION OF MARINE AQUATIC LIFE*

Constituents	Units	6-Month Median	Daily Maximum	Instantaneous Maximum
Arsenic	ug/1	62	345.2	911.6
Cadmium	ug/1	11.8	47.2	118
Chromium (Hex)**	ug/1	23.6	94.4	236
Copper	ug/1	13.8	120	332.4
Lead	ug/1	23.6	94.4	236
Mercury	ug/1	0.4666	1.8826	4.7146
Nickel	ug/1	59	236	590
Selenium	ug/1	177	708	1770
Silver	ug/1	6.53	31.31	80.87
Zinc	ug/1	149.6	857.6	2273.6
Cyanide	ug/1	11.8	47.2	118
Total Chlorine Residual***	ug/1	--	--	708
Ammonia (expressed as nitrogen)	ug/1	7080	28320	70800
Chronic Toxicity	TUc	--	12.0	--
Phenolic Compounds (nonchlorinated)	ug/1	354	1416	3540
Chlorinated Phenolics	ug/1	11.8	47.2	118
Endosulfan	ng/1	106.2	212.4	318.6
Endrin	ng/1	23.6	47.2	70.8
HCH	ng/l	47.2	94.4	141.6
Radioactivity	Not to exceed limits specified in Title 17, Division 1, Chapter 5, Subchapter 4, Group 3, Article 3, Section 30269 of the California Code of Regulations.			

C. PROTECTION OF HUMAN HEALTH - NONCARCINOGENS*

Constituent	Units	30-DayAverage
Acrolein	ug/1	2596
Antimony	mg/1	141.6
Bis(2-chloroethoxy) methane	ug/1	51.9
Bis(2-chloroisopropyl) ether	mg/1	141.6

Chlorobenzene	ug/1	6726
Chromium (III)	mg/1	2242
di-n-butyl phthalate	mg/1	413
Dichlorobenzenes	mg/1	601.8
1,1-dichloroethylene	mg/1	837.8
Diethyl phthalate	mg/1	389.4
Dimethyl phthalate	mg/1	9676
4,6-dinitro-2-methylphenol	ug/l	2596
2,4-dinitrophenol	ug/1	47.2
Ethylbenzene	mg/1	48.4
Fluoranthene	ug/1	177
Hexachlorocyclopentadiene	ug/1	684.4
Isophorone	mg/1	1770
Nitrobenzene	ug/1	57.8
Thallium	ug/1	165.2
Toluene	mg/1	1003
1,1,2,2-tetrachloroethane	mg/1	14.2
Tributyltin	ng/1	16.5
1,1,1-trichloroethane	mg/1	6372
1,1,2-trichloroethane	mg/1	507.4

D. PROTECTION OF HUMAN HEALTH - CARCINOGENS*

Constituent	**Units**	**30-DayAverage**
Acrylonitrile	µg/l	1.2
Aldrin	ng/l	0.26
Benzene	µg/l	69.6
Benzidine	µg/l	0.814
Beryllium	ng/1	389.4
bis(2-chloroethyl) ether	µg/l	0.531
Bis(2-ethylhexyl) phthalate	µg/l	41.3
Carbon tetrachloride	µg/l	10.6
Chlordane	ng/1	0.271
Chloroform	mg/1	1.53
DDT	ng/1	2.01
1,4-dichlorobenzene	µg/l	212.4
3,3'-dichlorobenzidine	ng/1	95.6
1,2-dichloroethane	mg/1	1.53
Dichloromethane	mg/1	5.31
1,3-dichloropropene	µg/l	105
Dieldrin	ng/1	0.47
2,4-dinitrotoluene	µg/l	30.7
1,2-diphenylhydrazine	µg/l	1.89
Halomethanes	mg/1	1.53
Heptachlor	ng/1	8.5
Hexachlorobenzene	ng/1	2.48
Hexachlorobutadiene	µg/l	165.2
Hexachloroethane	µg/l	29.5
N-nitrosodimethylamine	µg/l	86.1

N-nitrosodiphenylamine	µg/l	29.5
PAHs	ng/1	103.8
PCBs****	ng/l	0.224
TCDD equivalents	pa/1	0.046
Tetrachloroethylene	µg/l	1168.2
Toxaphene	ng/1	2.48
Trichlorocthylene	ug/1	318.6
2,4,6-trichlorophenol	ug/1	3.42
Vinyl chloride	ug/1	424.8

* Based on California Ocean Plan criteria using a minimum initial dilution ratio of 10.8:1 (Seawater:effluent). If the actual dilution is found to be less than this value, it will be recalculated and the Order revised.

** Discharger may at their option meet this objective as a total chromium objective.

*** Water quality objective for total chlorine residual applying to intermittent discharges not exceeding two hours, shall be determined through the use of the following equation:
log Y = -0.43 (log x) + 1.8
Where: y = the water quality objective (in µg/l) to apply when chlorine is being discharged;
x = the duration of uninterrupted chlorine discharge in minutes.

**** PCBs (polychlorinated biphenyles) shall means the sum of chlorinated biphenyls whose analytical characteristics resemble those of Aroclor-1016, Acrlor-1221, Arclor-1232, arclor-1242, Arclor-1248, Arclor-1254, and Arclor-1260.

Effluent Limitations for Discharge Outfall No. 002 for the Modernized Power Plant

5. Discharge shall not exceed 1,226 MGD.

6. During heat treatment to remove mussels and other biofouling organisms from cooling water system conduits, the maximum temperature of the discharge[1] shall not exceed the natural temperature of the receiving water[2] by more than 40°F (22.2° C).

7. Except during periods of heat treatment, the daily average temperature of the discharge[3] shall not exceed the daily average natural temperature of the receiving water[4] by more than:

   a. 28°F (15.6°C) during the days in which either one or both Units 6 & 7 are operating, but neither Units 1 nor 2 is operating;
   b. 26°F (14.4°C) during the days in which either one or both Units 1 or 2 are operating and, one or both Units 6 & 7 are operating;
   c. 20°F (11.1°C) during the days in which either one or both Units 1 & 2 are operating, but neither Unit 6 nor Unit 7 is operating.

8. The instantaneous maximum temperature of the discharge[5] shall not exceed the natural temperature of the receiving water[6] by more than:

   a. 34°F (18.9°C) during the days in which either one or both Units 6 & 7 are operating but neither Units 1 or 2 is operating;

   b. 32°F (17.8°C) during the days in which either one or both Units 1 & 2 are operating and, either one or both Units 6 & 7 are operating;

   c. 26°F (14.4°C) during the days in which either one or both of Units 1 & 2 are operating, but neither Units 6 nor 7 is operating.

[1]During heat treatments, the temperature of the discharge is defined as any single hourly average temperature of the discharge as measured in the surge chamber(s) of the discharge conduit(s).

[2]During heat treatments, the natural temperature of the receiving water is defined as any single hourly average of temperature measurements recorded at the power plant cooling water system intake with *1.9* °F (*1.06*°C) subtracted from it.

[3]Daily average temperature of the discharge is defined as the average of temperature measurements taken over 24 hours in a calendar day as measured in the surge chamber(s) of the discharge conduit(s) in operation during that day.

[4]Daily average natural temperature of the receiving water is defined as the average of temperature measurements recorded over 24 hours in a calendar day at the power plant cooling water system intake with *1.9*°F (1.06°C) subtracted from it.

[5]Instantaneous maximum temperature of the discharge is defined as any single hourly average temperature of the discharge as measured in the surge chamber(s) of the two discharge conduits.

[6]Natural temperature of the receiving water is defined as any single hourly average of temperature measurements recorded at the power plant cooling water system intake with 1.9°F (1.06°C) subtracted from it.

9. Discharge Outfall No. 002 shall not contain constituents in excess of the following limits*:[B]

A. EFFLUENT LIMITATIONS

Constituent	**Units**	Monthly (30-day average)	Weekly (7-day average)	Maximum At anytime
Grease & Oil	mg/l	25	40	75
Suspended Solids	mg/l		60	
Settleable Solids	ml/l	1.0	1.5	3.0
Turbidity	NTU	75	100	225
PH	Units		6.0 – 9.0 at all times	

B. PROTECTION OF MARINE AQUATIC LIFE

Constituent	**Units**	**6-Month Median**	**Daily Maximum**	**Instantaneous Maximum**
Arsenic	µg/l	45	246.6	649.8
Cadmium	µg/l	8.4	33.6	84
Chromium(Hex)**	µg/l	16.8	67.2	168
Copper	µg/l	10.4	86	237.2
Lead	µg/l	16.8	67.2	168
Mercury	µg/l	0.3323	1.3403	3.3563
Nickel	µg/l	42	168	420
Selenium	µg/l	126	504	1260
Silver	µg/l	4.7	22.34	57.62
Zinc	µg/l	108.8	612.8	1620.8
Cyanide	µg/l	8.4	33.6	84
Total Chlorine Residual***	µg/l	--	--	504
Ammonia (as N)	µg/l	5040	20160	50400
Chronic Toxicity	TUc	--	8.4	--
Phenolic Compounds (non-chlorinated)	µg/l	252	1008	2520
Chlorinated Phenolics	µg/l	8.4	33.6	84

Constituent	Units	6-Month Median	Daily Maximum	Instantaneous Maximum
Endosulfan	ng/l	75.6	151.2	226.8
Endrin	ng/l	16.8	33.6	50.4
HCH	ng/l	33.6	67.2	100.8
Radioactivity	Not to exceed limits specified in Title 17, Division 1, Chapter 5, Subchapter 4, Group 3, Article 3, Section 30269 of the California Code of Regulations.			

C. PROTECTION OF HUMAN HEALTH - NONCARCINOGENS

Constituent	Units	30-DayAverage
acrolein	ug/1	1848
antimony	mg/1	100.8
bis(2-chloroethoxy) methane	ug/1	37
bis(2-chloroisopropyl) ether	mg/1	100.8
chlorobenzene	ug/1	4788
chromium (III)	mg/1	1596
di-n-butyl phthalate	mg/1	294
dichlorobenzenes	mg/1	428.4
1,1-dichloroethylene	mg/1	596.4
diethyl phthalate	mg/1	277.2
Dimethyl phthalate	mg/1	6888
4,6-dinitro-2-methylphenol	ug/l	1848
2,4-dinitrophenol	ug/1	33.6
ethylbenzene	mg/1	34.4
fluoranthene	ug/1	126
Hexachlorocyclopentadiene	ug/1	487.2
Isophorone	mg/1	1260
Nitrobenzene	ug/1	41.2
Thallium	ug/1	117.6
Toluene	mg/1	714
1,1,2,2-tetrachloroethane	mg/1	10.1
Tributyltin	ng/1	11.8
1,1,1-trichloroethane	mg/1	4536
1,1,2-trichloroethane	mg/1	361.2

D. PROTECTION OF HUMAN HEALTH - CARCINOGENS

Constituent	Units	30-DayAverage
Acrylonitrile	ug/1	0.8
Aldrin	ng/l	0.185
Benzene	ug/1	49.6
Benzidine	ng/1	0.58
Beryllium	ng/1	277.2
bis(2-chloroethyl) ether	ug/1	0.378
bis(2-ethylhexyl) phthalate	ug/1	29.4

Carbon tetrachloride	ug/1	7.6
Chlordane	ng/1	0.193
Chloroform	mg/1	1.09
DDT	ng/1	1.43
1,4-dichlorobenzene	ug/1	151.2
3,3'-dichlorobenzidine	ng/1	68
1,2-dichloroethane	mg/1	1.09
Dichloromethane	mg/1	3.78
1,3-dichloropropene	ug/1	74.8
Dieldrin	ng/1	0.34
2,4-dinitrotoluene	ug/1	21.8
1,2-diphenylhydrazine	ug/1	1.34
Halomethanes	mg/1	1.09
Heptachlor	ng/1	6.05
Hexachlorobenzene	ng/1	1.76
Hexachlorobutadiene	ug/1	117.6
Hexachloroethane	ug/1	21
N-nitrosodimethylamine	ug/1	61.3
N-nitrosodiphenylamine	ug/1	21
PAHs	ng/1	73.9
PCBs****	ng/1	0.16
TCDD equivalents	pa/1	0.0328
Tetrachloroethylene	ug/1	831.6
Toxaphene	ng/1	1.76
Trichlorocthylene	ug/1	226.8
2,4,6-trichlorophenol	ug/1	2.44
Vinyl chloride	ug/1	302.4

* Based on California Ocean Plan criteria using a minimum initial dilution ratio of 7.4:1 (Seawater:effluent). If the actual dilution is found to be different from this value, it will be recalculated and the Order revised.

** Discharger may at their option meet this objective as a total chromium objective.

*** Water quality objective for total chlorine residual applying to intermittent discharges not exceeding two hours, shall be determined through the use of the following equation:
log Y = -0.43 (log x) + 1.8
Where: y = the water quality objective (in µg/l) to apply when chlorine is being discharged;
x = the duration of uninterrupted chlorine discharge in minutes.

**** PCBs (polychlorinated biphenyles) shall means the sum of chlorinated biphenyls whose analytical characteristics resemble those of Aroclor-1016, Acrlor-1221, Arclor-1232, arclor-1242, Arclor-1248, Arclor-1254, and Arclor-1260.

10. The following effluent limitations, B.11, B.12, B.13 and B.14 apply to Discharge Outfall No. 002 from both the **Existing Power Plant** and the **Modernized Power Plant**.

11. Discharge shall be essentially free of materials and substances that:[B]

    a. float or become floatable upon discharge.

    b. may form sediments which degrade benthic etc.

    c. accumulate to toxic levels in marine waters, sediments or biota.

    d. significantly decrease the natural light to benthic communities and other marine life.

    e. result in aesthetically undesirable discoloration of the ocean surface.

12. Foam and scum shall be controlled to the extent necessary to preclude nuisance and adverse effects on beneficial uses.

13. Discharges No. 002B, D, and E(1-12) shall not contain constituents in excess of the following limits:[E]

Constituent	30-Day Average	Maximum at any time
Total Suspended Solids	30.0 mg/l	100.0 mg/l
Oil and Grease	15.0 mg/l	20.0 mg/l

14. Discharges No. 002E3, if from chemical metal cleaning, and 002E6 shall not contain constituents in excess of the following:[E]

Constituent	30-Day Average	Daily Average
Copper	1.0 mg/l	1.0 mg/l
Iron	1.0 mg/l	1.0 mg/l

C. RECEIVING WATER LIMITATIONS

(Receiving water quality is a result of many factors, some unrelated to the discharge. This permit considers these factors and is designed to minimize the influence of the discharge to the receiving water.)

Discharges 001, 002, 003, and 004 shall not cause:

1. Floating particulates and grease and oil to be visible on the ocean surface.[B]

2. Aesthetically undesirable discoloration of the ocean surface. [B]

3. Significant reduction of transmittance of natural light in ocean waters outside the "zone of initial dilution. [B]

4. Change in the rate of deposition of inert solids and the characteristics of inert solids in ocean sediments such that benthic communities are degraded.[B]

5. The dissolved oxygen concentration outside the “zone of initial dilution" to fall below 5.0 mg/l or to be depressed more than 10 percent from that which occurs naturally. [AB]

6. The pH outside the "zone of initial dilution" to be depressed below 7.0, raised above 8.5 in the ocean, or changed more than 0.2 units from that which occurs naturally.[AB]

7. Dissolved sulfide concentrations of waters in and near sediments to significantly increase above that present under natural conditions.[B]

8. Concentrations of the same substances listed in Effluent Limitation Nos. B.4 and B.9 to increase in marine sediments to levels which would degrade indigenous biota.[B]

9. Objectionable aquatic growth or degradation of indigenous biota.[B]

10. Concentrations of organic materials in marine sediments to increase to a level which would degrade marine life.[B]

11. Degradation of marine communities, including vertebrate, invertebrate, and plant species.[B]

12. Alteration in natural taste, odor, and color of fish, shellfish, or other marine resources used for human consumption.[B B]

13. Concentrations of organic materials in fish, shellfish or other marine resources used for human consumption to bioaccumulate to levels that are harmful to human health.[B]

14. Degradation of marine life due to radioactive waste.[B]

15. Temperature of the receiving water to adversely affect beneficial uses.[AC]

16. This discharge shall not cause a violation of any applicable water quality standard for receiving waters adopted by the Board or the

State Water Resources Board as required by the Clean Water Act and regulations adopted thereunder.

17. Storm water discharges shall not adversely impact human health or the environment.

18. Storm water discharges shall not cause or contribute to a violation of any applicable water quality objective for receiving waters contained in the Basin Plan.

D. PROVISIONS

1. The requirements prescribed by Order No. 00-041 supersede the requirements prescribed by Order No. 95-22, adopted by the Board on February 10, 1995. Order No. 95-22 is hereby rescinded.

2. Discharger shall comply with "Monitoring and Reporting Program No. 00-041," as ordered by the Executive Officer.

3. Discharger shall comply with items of the attached "Standard Provisions and Reporting Requirements for National Pollutant Discharge Elimination System Permits," dated January 1985 (also referred to as "Standard Provisions"), except Item No. A.1., 6., 7., 13., 24.; C.9., 17.; D.1. and E.2. Paragraph (a) of Item E.1. shall apply only if the bypass is for essential maintenance to assure efficient operation. Bypasses authorized under paragraph (a) of Item E.1. are not subject to paragraphs (b) and (c) of Item E.1.

4. Discharge of any wastes not described in the permit, or of a character different than described in the permit application shall be reported to the Executive Officer within five (5) days.

5. Heat treatments will be conducted approximately once every one to four months in each conduit of the power generating units. The heat treatment procedures are used to ensure effective biofouling control within the intake conduits. Continued diver inspections are not necessary, however, diver inspections may be conducted in conjunction with other scheduled intake maintenance work.

6. Studies may be performed by the Discharger to evaluate alternatives to sodium hypochlorite for biofouling provided that a study plan is submitted to and approved by the Executive Officer prior to commencing the study. The study plan shall include all constituents that may be discharged.

7. Plant operations shall at all times include the recommendations and procedures of the Best Management Practices Plan, dated August 30, 1985, revised April 30, 1999, or as amended and approved by the Executive Officer.

8. Rerouting of in-plant waste streams identified in Figure 3 & 4 may be made with the concurrence of the Executive Officer.

9. The Discharger has indicated a willingness to participate in the development of a regional monitoring program in the Monterey Bay and reconsideration of receiving water monitoring. By way of this provision, the Executive Officer approves suspension of the existing Ocean Receiving Water Monitoring Program until the implementation of the regional monitoring program. The receiving water monitoring program may be revised based on program development.

10. This Order expires October 27, 2005, and the Discharger must file a Report of Waste Discharge in accordance with Title 23, Division 3, Chapter 9, of the California Code of Regulations, not later than April 27, 2005, if it wishes to continue to discharge. The Report of Waste Discharge shall include an analysis of any new entrainment and impingement technologies or cooling water system changes to further reduce the biological impacts from the power plant's cooling water intake systems.

E. STANDARD STORM WATER PROVISIONS

1. The Discharger revised the Storm Water Pollution Prevention Plan (SWPP Plan) in April 1999. The Discharger shall implement the SWPP Plan in accordance with the attached

"Standard Storm Water Provisions". The SWPP Plan shall be reviewed and updated as appropriate by October 1, every year, beginning in 2000. Full compliance with the "Standard Storm Water Provisions" shall be an enforceable requirement of this permit.

2. The SWPP Plan shall be designed in accordance with good engineering practices and shall address the following objectives:

   a. to identify pollutant sources that may affect the quality of storm water discharges; and

   b. to identify, assign, and implement control measures and management practices to reduce pollutants in storm water discharges.

3. The SWPP Plan shall be retained onsite and made available upon request of a representative of the Board.

4. The SWPP Plan shall provide a description of potential sources which may be expected to add significant quantities of pollutants to storm water discharges, or which may result in non-storm water discharges from the facility. The SWPP Plan shall include, at a minimum, the following items:

   a. A topographic map (or other acceptable map if a topographic map is unavailable), extending one-quarter mile beyond the property boundaries of the facility, showing: the plant operations areas, surface water bodies (including springs and wells), and the discharge point(s) where the facility's storm water discharges to a municipal storm drain system or other water body. The requirements of this paragraph may be included in the site map required under the following paragraph if appropriate.

   b. A site map showing:

      i. Storm water conveyance, drainage, and discharge structures;

      ii. An outline of the storm water drainage areas for each storm water discharge point;

      iii. Paved areas and buildings;

      iv. Areas of pollutant contact with storm water or release to storm water, actual or potential, including but not limited to outdoor storage, and process areas, material loading, unloading, and access areas, and waste treatment, storage, and disposal areas;

      v. Location of existing storm water structural control measures (i.e., berms, coverings, etc.);

      vi. Surface water locations, including springs and wetlands;

      vii. Vehicle service areas;

   c. A narrative description of the following:

      i. Plant operations/activity areas.

      ii. Materials, equipment, and vehicle management practices employed to minimize contact of significant materials with storm water discharge;

      iii. Material storage, loading, unloading, and access areas;

      iv. Existing structural and non-structural control measures (if any) to reduce pollutants in storm water discharge;

      v. Methods of onsite storage and disposal of significant materials;

   d. A list of pollutants that have a reasonable potential to be present in storm water discharge in significant quantities.

5. The SWPP Plan shall describe the storm water management controls appropriate for the facility and a time schedule for fully implementing such controls. The appropriateness and priorities of controls in the

SWPP Plan shall reflect identified potential sources of pollutants. The description of storm water management controls shall include, as appropriate:

a. Storm Water Pollution Prevention Personnel. Identify specific individuals (and job titles) who are responsible for developing, implementing, and revising the SWPP Plan.

b. Good Housekeeping. Good housekeeping requires the maintenance of clean, orderly facility areas that discharge storm water. Material handling areas shall be inspected and cleaned to reduce the potential for pollutants to enter the storm water conveyance system.

c. Spill Prevention and Response. Identification of areas where significant materials can spill into or otherwise enter the storm water conveyance systems and their accompanying drainage points. Specific material handling procedures, storage requirements, clean up equipment and procedures should be identified, as appropriate. The necessary equipment to implement a clean-up shall be available and personnel trained in proper response, containment and cleanup of spills. Internal reporting procedures for spills of significant materials shall be established.

d. Source Control. Source controls, such as elimination or reduction of the use of toxic pollutants, covering of pollutant areas, sweeping of paved areas, containment of potential pollutants, labeling all storm drain inlets with "No Dumping" signs, isolation/separation of industrial from non-industrial pollutant sources so that runoff from these areas does not mix, etc.;

e. Storm Water Management Practices. Storm water management practices are practices other than those that control the source of pollutants. They include treatment and conveyance structures such as drop inlets, channels, retention and detention basins, treatment vaults, infiltration galleries, filters, oil/water separators etc. Based on assessment of the potential of various sources to contribute pollutants to storm water discharges in significant quantities, additional storm water management practices to remove pollutants from storm water discharge shall be implemented and design criteria shall be described.

f. Sediment and Erosion Prevention. Measures to limit erosion around the storm water drainage and discharge points such as riprap, revegetation, slope stabilization, etc. shall be described and implemented;

g. Employee Training. Employee training programs shall inform all personnel responsible for implementing the SWPP Plan. Training should address spill response, good housekeeping and material management practices. Periodic dates for training shall be identified.

h. Inspections. All inspections shall be done by trained personnel. Material handling areas shall be inspected for evidence of, or the potential for, pollutants entering storm water discharges. A tracking or follow-up procedure shall be used to ensure appropriate response has been taken in response to an inspection. Inspections and maintenance activities shall be documented and recorded. Inspection records shall be retained for five years.

i. Records. A tracking and follow up procedure shall be described to ensure that adequate response and corrective actions have been taken in response to inspections. Records of inspections shall be maintained. Establishment of internal record keeping and internal reporting procedures of inspections and spill incidents.

6. An annual facility inspection shall be conducted to verify that all elements of the SWPP Plan (i.e., site map, potential pollutant sources, structural and non-structural controls to reduce pollutants in industrial storm water discharge, etc.) are accurate. A report of the annual inspection and observations that require

a response (and the appropriate response to the observation) shall be retained as part of the SWPP Plan.

I, Roger W. Briggs, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Coast Region, on October 27, 2000.

Roger W. Briggs, Executive Officer

File: Central Watershed/NPDES Permits/Duke Energy Moss Landing Plant/Order No.00-041/Order No. 00-041 WDR