

Southern California Edison Company

P. O. BOX 351
LOS ANGELES, CALIFORNIA 90053

April 9, 1971



Dr. Peter A. Morris
Division of Reactor Licensing
United States Atomic Energy Commission
Washington, D.C. 20545

Dear Dr. Morris:

Subject: Docket Nos. 50-361 and 50-362
San Onofre Nuclear Generating Station
Units 2 and 3

Reference is made to your letter of January 26, 1971, transmitting comments from the Department of the Interior concerning our environmental report for the San Onofre Nuclear Generating Station, Units 2 and 3.

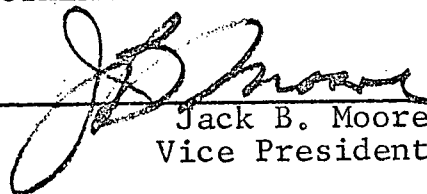
We have reviewed the comments of this agency and are enclosing our responses.

If you have any questions concerning these responses, please let us know.

Very truly yours,


SOUTHERN CALIFORNIA EDISON COMPANY

By


Jack B. Moore
Vice President

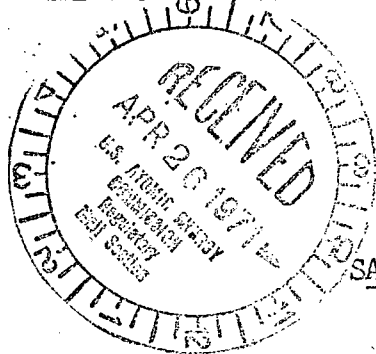
SAN DIEGO GAS & ELECTRIC COMPANY

By


Martin R. Engler, Jr.
Senior Vice President

Enclosures

2009



50-361
50-362

RESPONSE TO COMMENTS ON ENVIRONMENTAL REPORT
SAN ONOFRE NUCLEAR GENERATING STATION UNITS 2 AND 3

COMMENTS BY DEPARTMENT OF INTERIOR

1. Paragraph 3

"....The data provided in the statement is largely physical and stops short of biological interpretation. In some cases there are probably no biological studies to quote--studies are needed. In other cases, the applicant has not taken full advantage of details that were available."

Response: It is true that the details of the biological studies were not included in the environmental report, but the reason is due to the bulk of the studies, not the lack of them. Consultants to the companies have been studying the marine environment offshore of the San Onofre Generating Station for over 7 years. Long lists of the various species observed by diving marine biologists have been presented in a total of 20 quarterly, semi-annual and summary reports. These reports are all on file with the California Regional Water Quality Control Board, San Diego Region, which is the State agency having jurisdiction to control water quality. In addition, copies of the summary reports were submitted to the Director of Regulation of the Atomic Energy Commission on April 16, 1970 for filing in the Public Document Room. No significant detrimental effects on the marine environment have been determined from these monitoring studies.

2. Paragraph 4

"....The applicant suggests there will be no environmental harm by Units 2, 3, 4 and 5 based on pre- and post-operational studies of Unit 1."

Response: Units 4 and 5 were mentioned in the environmental report only to describe the possible ultimate development of the site to meet future system load demands. However, the environmental report describes the probable environmental impact of the construction and operation of Units 2 and 3 only, and in no way implies a prediction of the possible effects of Units 4 and 5.

3. Paragraph 5

"More data should be presented by the applicant to support their contention that Units 2 or 3 will be no more harmful to the environment than Unit 1. Calculations for arriving at this conclusion should be described in detail. While studies at the Unit 1 site by the California Department of Fish and Game showed no significant adverse effects

on the marine environment, they cautioned against any major increase in discharge without additional studies. The applicant should discuss this point and supply adequate evidence where needed."

Response: The companies have supported modeling studies based on Unit 1 operations to predict the thermal sphere of influence from the combined discharges of Units 1, 2 and 3. The results of these studies were summarized in the environmental report. As indicated therein the differential increase in temperature of the condenser cooling water for Units 2 and 3 will be only slightly greater than that for Unit 1. Based upon this design, the modeling studies indicate that the surface temperatures at the Units 2 and 3 outfalls likewise will be only slightly greater than for Unit 1. The net result of adding Units 2 and 3 is to expand only the thermal sphere of influence and not the differential temperature burden. Accordingly, since no significant detrimental biological effects have been observed within the Unit 1 thermal sphere of influence, none are expected to occur within the thermal sphere of influence of Units 1, 2 and 3. This is considered to be a reasonable prediction for an open coastline site which is flushed continuously by tidal currents, such as San Onofre.

In the conclusions of the Department of Fish and Game report, "The Marine Environment in the Vicinity of the San Onofre Nuclear Generating Station," dated February 1970, it is stated that:

"An increase in the amount of water discharged, or in the effluent temperature, could modify this area's ecology. Any such increases should be preceded and accompanied by additional physical and biological studies to document the effects of these changes on the existing biota."

Just such action is currently underway. Expanded physical and biological monitoring programs are now being developed with cognizant State and regional regulatory agencies. It is planned to initiate these programs years in advance of the actual operation of Units 2 and 3 to accurately document background conditions. In this way, if plant operations do have undesirable effects on the marine environment, these effects can be identified and appropriate corrective actions taken.

4. Paragraph 6

"On page VI-4 of the statement, the applicant suggests rather positive plans to add Units 4 and 5 to the San Onofre site by 1980. It is premature to predict the added effects of Units 4 and 5 on the marine environment based upon the observations to this point at Unit 1. Such a suggestion should not be acceptable as a part of this statement on Units 2 and 3. We are concerned that by 1980, the cumulative effect on the marine environment of the five nuclear generating units may be somewhat greater than five times the effect of Unit 1 alone."

Response: Units 4 and 5 were mentioned in the Project Alternatives section of the environmental report to describe the possible future development of the site. The intent of the environmental report is to discuss the impact of only Units 2 and 3 on the environment; no prediction is made as to the added effects of Units 4 and 5. The expanded monitoring program for Units 2 and 3 may, however, aid in the future consideration of Units 4 and 5.

5. Paragraph 7

"The statement does include a discussion of chemical wastes but only in a general way. Since it is anticipated that there will be a high degree of dilution of chemicals by the time they reach the outfall tunnel, the statement assumes that there will be no damage to marine biota. While this may be correct, we believe that it should not be taken for granted. The applicant should elaborate on all operations that result in chemical waste. Details should include expected concentrations and effect on all biota."

Response: As with all thermal power plants, San Onofre, Units 2 and 3 will use various chemicals for maintenance of plant water quality, corrosion inhibition in certain closed-loop systems, and regeneration of demineralizers. These chemicals may include various acids and bases, phosphates, and other laboratory chemicals. In addition, Units 2 and 3 will use boric acid in the reactor coolant as part of the reactivity control. In the course of normal plant operation, small amounts of these chemicals are collected via the waste handling facilities. These chemicals are treated so that, after dilution with the circulation water, their concentrations are well within those normally associated with seawater. As a result, their presence in the circulating water system is expected to have no effect on the marine environment.

Estimates of the quantities and concentrations of the most significant of these miscellaneous plant wastes are as follows:

- a. Chlorine for slime control - Sufficient sodium hypochlorite will be injected into the circulating water at the condenser inlet until a residual chlorine concentration of 0.50 ppm is detected at the condenser outlet. This will normally require that 2 to 3 ppm sodium hypochlorite be injected at the inlet. The operation will be repeated once every 4 hours for about 15 minutes per condenser. The chlorine, in addition to attacking the slime-forming organisms, also reacts with other constituents of seawater. Therefore, while the outfall circulating water travels 2600 feet to discharge at sea, the residual 0.5 ppm will diminish to essentially zero before the point of discharge.
- b. Steam generator blowdown - Intermittently, condensate from the steam generator blowdown containing up to 30 ppm phosphate will be released to the circulating water

system. During normal plant operation, this blowdown occurs infrequently, only as required to maintain proper steam generator water chemistry. Under abnormal operating conditions with minor condenser tube leakage of seawater into the feedwater system, steam generator blowdown may have to be operated continuously up to flow rates of 150 gpm for each unit. For short periods of time, during plant start-ups, the blowdown rate may reach a maximum of 600 gpm for each unit. In all cases, however, upon dilution with the circulating water flow rate of 840,000 gpm for each unit, the concentration of phosphate in the plant effluent will not be significantly different from that occurring naturally in seawater.

- c. Evaporator brine discharge - It is estimated that the amount of brine returned to the sea from the flash evaporators for both Units 2 and 3 may reach a total of 600 gpm but could be considerably less during normal operation. The salt concentration of the evaporator effluent will be approximately double that of seawater. Upon dilution with the combined circulating water flow of 1,680,000 gpm, this increased salt concentration will be negligible.
- d. Sanitary wastes - Sanitary wastes from plant operating personnel will flow to a septic tank and, after digestion, will be mixed with the cooling water discharge. The total septic tank effluent for Units 2 and 3 is estimated at 2500 gallons per day of water and 270 ppm of solids. These figures are conservatively based upon 50 personnel per 24 hours. This effluent will only be discharged to the outfall when there is circulating water flow; otherwise, it is turned to a leaching bed. The sanitary wastes from the temporary construction work force will be handled by standard portable toilets and will not be discharged to the circulating water system.
- e. Miscellaneous equipment drains, which are not radioactive, are processed to remove oil contaminants and then released to the circulating water. This water may contain small amounts of dirt, traces of oil, and dissolved gases from the air which disqualifies it for return to the steam cycle but which contributes no measurable contaminants to the circulating water. The following quantities are estimated for Units 2 and 3 combined:

1. Continuous normal operation - annual averages

(a) System losses including blowdown	100 gpm
(b) Condenser circulating water pump seals	51 gpm
(c) Condensate pump seals	21 gpm
(d) Heater drain pump seals	21 gpm
(e) Salt water pump seals	21 gpm

2. Intermittent-normal operation

(a) Screen wash pump seals	0.8 gpm
(b) Intake structure sump pump seals	0.8 gpm
(c) Reheater pit sump pump seals	0.8 gpm

3. Start-up and shutdown

(a) Vacuum pump	<u>5.1 gpm</u>
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Miscellaneous Plant Drains - TOTAL 221.5 gpm

The above information was presented to the California Regional Water Quality Control Board, San Diego Region on September 10, 1970 as part of our pending application for a discharge permit to operate the circulating water systems for Units 2 and 3. If any adverse effects on the biota are detected by the marine monitoring program, appropriate changes in the design or operation of the waste disposal systems will be made.

6. Paragraph 8

"California does not yet have water quality standards for ocean discharge. When such standards are established, the applicant may have to consider alternate or supplementary cooling and treatment methods. This possibility should be recognized in the statement.

Response: As indicated on Page V-40 of our environmental report, this matter has been recognized. In addition, subsequent to the issuance of the Department of Interior letter on December 31, 1970, the California State Water Resources Control Board did adopt such water quality standards on January 7, 1971. A copy of these standards entitled "Policy Regarding the Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California" is attached for reference. The companies plan to comply with these standards, and Units 2 and 3 are being designed accordingly.

7. Paragraph 9

"It was stated that as the result of limited land area and fresh water sources, that cooling towers do not seem to be a feasible alternate cooling method. The possible need for alternatives should still be considered and the use of salt water cooling towers for at least partial cooling or the incorporation of powered spray modules should not be ruled out.

Response: The use of evaporative cooling towers at the San Onofre site is not feasible because of the limited confines of our easement with the U. S. Navy Department and the general lack of fresh water supplies for make up to such towers. Even if sufficient space were available, the alternative use of salt water cooling towers to conserve fresh water resources has the serious disadvantages of fogging and drifting large quantities of salt over the adjacent landscape. Estimating even a conservative drift performance for these towers, tons of salt would be emitted each day resulting in serious detrimental effects upon the surrounding vegetation. Use of powered salt water spray modules has similar disadvantages.

These alternatives should not be necessary for Units 2 and 3 as the cooling systems will be designed and operated to comply with the recently adopted California State thermal standards.

8. Paragraph 10

"Radioactive wastes--The statement does discuss radioactive wastes and their disposal, but only in a general way. The applicant should supply more detail including expected quantities and composition of radioactive effluent."

Response: The handling of radioactive wastes is discussed in detail in the Preliminary Safety Analysis Report for San Onofre Units 2 and 3. It was not considered necessary to duplicate this information in the environmental report.

A discussion of the radioactive waste handling system is presented in Section 11.1 of the PSAR. Details of the expected quantities and composition of radioactive effluent are presented in Section 1.8-11 of the PSAR in response to specific AEC questions in recent licensing proceedings. The pertinent responses are on pages 1.8-15lca through 1.8-15lcb, and on 1.8-15lcq through 1.8-15lex (Amendment No. 4).

9. Paragraph 11

"Effects on biota--While the applicant supplies an abundance of physical evidence of the thermal effect of Unit 1 on the marine environment, interpretation in terms of the ultimate effect on biota is limited to the general observation, "lush marine life exists in the plant vicinity." The statement lacks the detail necessary to adequately appraise the magnitude and duration of environmental degradation which may occur with the construction and operation of these new facilities. The final draft of the environmental statement should include sufficient detail to judge the ultimate effect of Units 2 and 3. Those details should include the following:

1. The effect of redistribution by wave action of spoil material in the intertidal zone. Reference was made to a study following beach spoil disposal for Unit 1, but no details are supplied.

Response: The details of the beach and bottom profiling studies are summarized in Chapter VI of the May 1969 "Summary Report of San Onofre Oceanographic Surveys - July 1963 to December 1968." This summary report was submitted to the Director of Regulation of the Atomic Energy Commission on April 16, 1970 for filing in the Public Documents Room.

2. The levels of radioactivity which could be expected in the affected marine environment and the methods that would be employed to reduce these radioactivity levels should problems of this nature become evident.

Response: The radiological environmental monitoring program conducted at the San Onofre site since 1965 has shown no significant increase in radioactivity in any marine

organism as a result of Unit 1 operation. This result is not expected to change with operation of Units 2 and 3 since their radwaste system is even more efficient than that for Unit 1. Liquid wastes will normally be processed and held for reuse. In addition, optional capabilities will exist for shipment offsite by an AEC-licensed contractor. Any liquid wastes which are discharged to the environment will be continuously monitored to insure that they are as low as practicable below the AEC regulatory limits specified in 10CFR, Part 20. Capability will be provided for processing all liquid wastes through multiple stages of ion exchange and evaporation in order to reduce radioactivity to minimum levels prior to recycle or release. Should our monitoring program detect significant radiation buildup in any organism, action will be taken to reduce discharges to appropriate levels.

3. The assumed environmental conditions such as wind, tide and air temperature under which predicted thermal effects were described for Unit 1.

Response: The Unit 1 temperature distributions shown in the environmental report are not predictions, but actual measurements taken as part of the Unit 1 monitoring program.

The thermal effects predictions for Units 1, 2 and 3 are for full power operations and represent average conditions that could be expected for an ambient summertime condition. The model assumes a downcoast regional current superimposed on a rotary tidal current. The tidal current pattern assumed was:

- 0.3 knot downcoast current for 4 hours;
- 0.2 knot downcoast current for 2 hours;
- 0.3 knot downcoast current for 4 hours, and a
- 0.2 knot downcoast current for 2 hours.

Three different regional currents were assumed. Zero, 0.1, and 0.2 knot downcoast. A wind speed of 7 knots was assumed for calculating surface cooling.

4. The limits established by all cognizant state regional regulatory agencies should be fully explained since no numerical thermal discharge water quality requirements have been established for California marine waters at this time.

Response: Numerical thermal discharge water quality requirements were established subsequent to the writing of your December 31, 1970 letter. The California State Water Resources Control Board adopted the new "Policy Regarding the Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California" on January 7, 1971. A copy of this policy is attached for your information. The San Onofre Units 2 and 3 facilities will be designed to comply with these requirements.

5. Qualitative and quantitative data for the organisms which may be affected by the proposed units.

Response: Qualitative and quantitative data for marine organisms in the San Onofre area were included in the two summary reports of the San Onofre Oceanographic Monitoring Program previously submitted to the Atomic Energy Commission on April 16, 1970 for filing in the Public Document Room. These two reports summarize and document 6 years of our detailed intertidal and offshore monitoring studies at the San Onofre site. In addition to these two reports, 18 quarterly and semi-annual reports containing the detailed findings of these studies are all on file with the California Regional Water Quality Control Board, San Diego Region, which has regulatory jurisdiction over water quality matters in the San Onofre area.

10. Paragraph 12

"Monitoring programs—The applicant should supply more details of their anticipated monitoring programs. This should include a sampling schedule, the analyses performed, and station locations. We would also like to see a summary of the monitoring results for Unit 1.

Response: Based upon the extensive monitoring experience gained with Unit 1, the companies submitted a proposed comprehensive oceanographic monitoring program for Units 2 and 3 to the California Regional Water Quality Board, San Diego Region on September 10, 1970. The Board is currently reviewing this program with their consultants to assure that all possible environmental effects of the construction and operation of the proposed plants will be adequately monitored.

To date only that portion of the program associated with the sand disposal operation has been adopted by the Board. A copy of this phase of the program is attached for your information. We will forward a copy of the remainder of the program as soon as it is adopted by the Board.

The Unit 1 monitoring results are documented in the two summary reports previously submitted to the Atomic Energy Commission on April 16, 1970 for filing in the Public Document Room.

11. Paragraph 13

"Geologic considerations—The section of the report describing geologic considerations does not present sufficient data for our evaluation of safety aspects of the geology of the site. A review of the stratigraphy and geologic structure of the San Onofre site was made by the Geological Survey during licensing of Unit 1. The Survey is now reviewing the applicant's Safety Analysis Report for Units 2 and 3 with regard to faulting, earthquake effects, and foundation conditions. This review has been delayed pending receipt of additional data from the applicant.

Response: The environmental report for San Onofre Units 2 and 3 was not intended to contain any evaluation of the safety considerations of the site. Matters of safety are covered in definitive detail in the PSAR. Please refer to PSAR sections 2.9 and 2.10 plus Appendices 2A, 2B, and 2C of the PSAR as amended through Amendment 8 for information on the geologic and seismic conditions of the site.

12. Paragraph 14

"In due preparation for unforeseen results that become apparent only after operation begins, the applicant should consider alternative waste control facilities. A discussion of this would be helpful."

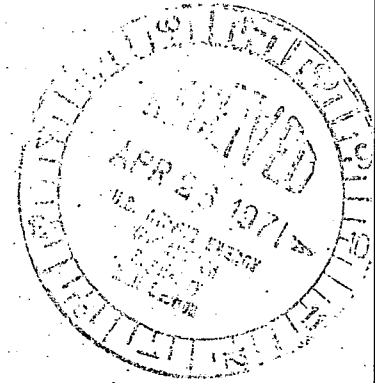
Response: The radioactive waste disposal systems are designed to minimize or preclude discharge to the environment of radioactive liquids, gases, and solids of plant origin. Considerable flexibility is designed into these systems to allow for alternative means of waste handling. Liquid wastes will normally be processed and held for reuse. In addition, optional capabilities will exist for shipment offsite by AEC-licensed contractors, or for discharge to the two circulating water systems. Any discharges to the environment will be continuously monitored to insure that they are well within the AEC regulatory limits specified in 10CFR, Part 20.

Capability will be provided for processing all liquid wastes through multiple stages of ion exchange and evaporation in order to reduce radioactivity to minimum levels prior to recycle or release. Radioactive gaseous wastes will be collected in a waste gas header and compressed into storage tanks for decay and sampling prior to controlled release through absolute filters to the plant vent. The vent is continuously monitored to verify that all releases are well within applicable regulatory limits. Solid radioactive wastes will be packaged in ICC-approved containers and shipped offsite for disposal by AEC-licensed contractors.

Disposal of waste heat is accomplished by the circulation of sea water through the steam condensers and return to the ocean. This is the only practicable alternative available at the San Onofre site. Based upon our experience with the thermal discharge from Unit 1, no significant detrimental environmental effects are expected from this operation. Intensive monitoring programs will be conducted, however, to develop acceptable revised design or operating criteria if adverse effects are judged to be caused by operation of the proposed facilities.

January 7, 1971

State Water Resources Control Board

POLICY REGARDING THE CONTROL OF
TEMPERATURE IN THE
COASTAL AND INTERSTATE WATERS
AND ENCLOSED BAYS AND ESTUARIES
OF CALIFORNIADEFINITION OF TERMS

1. Thermal Waste - Cooling water and industrial process water used for the purpose of transporting waste heat.
2. Elevated Temperature Waste - Liquid, solid, or gaseous material including thermal waste discharged at a temperature higher than the ambient temperature of receiving water. Irrigation return water is not considered elevated temperature waste for the purpose of this policy.
3. Ambient Receiving Water Temperature - The temperature of the receiving water at locations, depths, and times which represent conditions unaffected by any elevated temperature waste discharge.
4. Interstate Waters - All rivers, lakes, artificial impoundments, and other waters that flow across or form a part of the boundary with other states or Mexico.
5. Coastal Waters - Waters of the Pacific Ocean outside of enclosed bays and estuaries which are within the territorial limits of California.

6. Enclosed Bays - Indentations along the coast which enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays will include all bays where the narrowest distance between headlands or outermost harbor works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. This definition includes but is not limited to the following: Humboldt Bay, Bodega Harbor, Tomales Bay, Drakes Estero, San Francisco Bay, Carmel Bay, Morro Bay, Los Angeles Harbor, Upper and Lower Newport Bay, Mission Bay, and San Diego Bay.
7. Estuaries and Coastal Lagoons - Waters at the mouths of streams which serve as mixing zones for fresh and ocean water during a major portion of the year. Mouths of streams which are temporarily separated from the ocean by sandbars shall be considered as estuaries. Estuarine waters will generally be considered to extend from a bay or the open ocean to the upstream limit of tidal action but may be considered to extend seaward if significant mixing of fresh and saltwater occurs in the open coastal waters. This definition includes but is not limited to the following: Smith River, Klamath River, Mad River, Eel River, Noyo River, Russian River, Sacramento River (including Suisun Bay) downstream to Carquinez Bridge, Sacramento-San Joaquin Delta as defined by Section 12220 of the California Water Code.
8. Cold Interstate Waters - Streams and lakes having a range of temperatures generally suitable for trout and salmon including but not limited to the following: Lake Tahoe,

Truckee River, West Fork Carson River, East Fork Carson River, West Walker River and Lake Topaz, East Walker River, Minor California-Nevada waters, Klamath River, Smith River, Goose Lake, and Colorado River from stateline to the Needles-Bullhead City Highway Bridge.

9. Warm Interstate Waters - Interstate streams and lakes having a range of temperatures generally suitable for warm water fishes such as bass and catfish. This definition includes but is not limited to the following: Colorado River from the Needles-Topock Highway Bridge to the northerly international boundary of Mexico, Tijuana River, New River, and Alamo River.

10. Existing Discharge - Any discharge (a) which is presently taking place or (b) for which waste discharge requirements have been established and construction commenced prior to the adoption of this policy. Commencement of construction shall include execution of a contract for on-site construction or for major equipment which is related to the condenser cooling system.

Major thermal discharges under construction which are included within this definition are:

- A. Diablo Canyon Units 1 and 2, Pacific Gas and Electric Company
- B. Ormond Beach Generating Station Unit 1, Southern California Edison Company
- C. Pittsburg No. 7 Generating Plant, Pacific Gas and Electric Company

D. South Bay Generating Plant, San Diego Gas and Electric Company

11. New Discharge - Any discharge which is not presently taking place and for which waste discharge requirements have not been established, and any existing discharge for which a material change is proposed except when the material change is waste from facilities the construction of which commenced, within the meaning of paragraph 10, prior to adoption of this policy.

SPECIFIC WATER QUALITY OBJECTIVES

1. Cold Interstate Waters

- A. Elevated temperature waste discharges into cold interstate waters are prohibited.

2. Warm Interstate Waters

- A. Thermal waste discharges having a maximum temperature greater than 5°F above ambient receiving water temperature are prohibited.
- B. Elevated temperature wastes shall not cause the temperature of warm interstate waters to increase by more than 5°F.
- C. Lost River - Elevated temperature wastes discharged to the Lost River shall not cause the temperature of the receiving water to increase by more than 2°F when the receiving water temperature is less than 62°F, and 0°F when the receiving water temperature exceeds 62°F.

3. Coastal Waters

- A. Existing discharges:

(1) Elevated temperature wastes shall comply with specific temperature limitations and other

restrictions necessary to assure protection of the beneficial uses including areas of special biological significance.

B. New discharges:

- (1) Elevated temperature wastes shall be discharged a sufficient distance from areas of special biological significance to assure the maintenance of ambient temperature in these areas.
- (2) The maximum temperature of thermal waste discharges shall not exceed the ambient temperature of receiving waters by more than 20°F.
- (3) Additional limitations shall be imposed when necessary to assure protection of beneficial uses.

4. Enclosed Bays

A. Existing discharges:

- (1) Elevated temperature waste discharges shall comply with specific temperature limitations and other restrictions necessary to assure protection of beneficial uses.

B. New discharges:

- (1) Elevated temperature waste discharges shall comply with specific temperature limitations and other restrictions necessary to assure protection of beneficial uses. The maximum temperature of waste discharges shall not exceed the ambient temperature of the receiving waters by more than 20°F.

- (2) Thermal waste discharges having a maximum temperature greater than 4°F above the ambient temperature of the receiving water are prohibited.

5. Estuaries

A. Existing discharges:

- (1) Elevated temperature waste discharges shall comply with the following:

- a. The maximum temperature shall not exceed the ambient receiving water temperature by more than 20°F.
- b. Elevated temperature waste discharges either individually or combined with other discharges shall not create a zone, defined by water temperatures of more than 1°F above ambient receiving water temperature, which exceeds 25 percent of the cross-sectional area of a main river channel at any point.
- c. No discharge shall cause a surface water temperature rise greater than 4°F above the ambient temperature of the receiving waters at any time.
- d. Additional limitations shall be imposed when necessary to assure protection of beneficial uses.

- (2) Thermal waste discharges shall comply with the provisions of 5A(1) above and, in addition, the

maximum temperature of thermal waste discharges shall not exceed 86°F.

B. New discharges:

- (1) Elevated temperature waste discharges shall comply with item 5A(1) above.
- (2) Thermal waste discharges having a maximum temperature greater than 4°F above the ambient temperature of the receiving water are prohibited.
- (3) Additional limitations shall be imposed when necessary to assure protection of beneficial uses.

GENERAL WATER QUALITY PROVISIONS

1. Additional limitations, including discharge prohibitions, shall be imposed if necessary for the protection of specific beneficial uses including areas of special biological significance.
2. The cumulative effects of elevated temperature waste discharges shall not cause temperatures to be increased except as provided in specific water quality objectives contained herein.
3. The reclamation of waste heat energy from cooling water shall be encouraged.
4. Exceptions to the provisions of this policy may be included in waste discharge requirements to allow the use of heat on an intermittent basis to control fouling organisms if it has been determined that other alternative methods will result in a greater potential for deleterious effects upon beneficial uses.

5. A conditional modification of the objectives of the policy may be authorized upon a finding that an elevated temperature waste discharge operating in compliance with modified objectives will result in the enhancement of beneficial uses.
6. Ambient water temperature will be compared with waste discharge temperature by near-simultaneous measurements accurate to within 1°F. In lieu of near-simultaneous measurements, measurements may be made under calculated conditions of constant waste discharge and receiving water characteristics.
7. Areas of special biological significance shall be designated by the State Board after review of regional board recommendations and public hearing.

IMPLEMENTATION

1. The State Water Resources Control Board and the California Regional Water Quality Control Boards will administer this policy by establishing waste discharge requirements for discharges of elevated temperature wastes.
2. This policy is effective as of the date of adoption by the State Water Resources Control Board and the sections pertaining to temperature control in each of the 32 policies for the individual interstate and coastal waters shall be void and superseded by all applicable provisions of this policy.
3. Existing discharges:
 - A. All dischargers of thermal waste shall be required to conduct a study to define the effect of the discharge on beneficial uses and submit the results thereof to the appropriate regional board prior to January 1973.

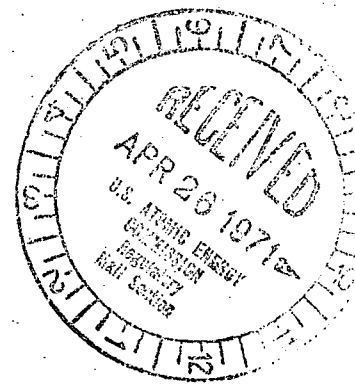
- B. Waste discharge requirements for elevated temperature wastes shall be reviewed to determine the need for studies on the effect of the discharge on beneficial uses, changes in monitoring programs and revision of waste discharge requirements.
- C. The scope of any necessary studies shall be as outlined by the regional board or State Board for each discharge.
- D. The regional board shall review all studies and shall make necessary revisions to waste discharge requirements prior to July 1973 to assure compliance with all applicable provisions of this policy.
- E. Revised waste discharge requirements shall include a time schedule which assures compliance at the earliest possible date but not later than January 1976.

4. New discharges:

- A. Every discharger of thermal waste shall submit a pre-discharge study to the appropriate regional board defining the effect of the discharge on beneficial uses prior to the establishment of waste discharge requirements.

Dischargers of elevated temperature wastes may be required by the regional board to submit such studies prior to the establishment of waste discharge requirements. The regional board shall include in its requirements appropriate postdischarge studies by the discharger.

50-361
50-362



CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

ORDER NO. 71 - 6

MONITORING AND REPORTING PROGRAM
TO ACCOMPANY RESOLUTION 70-R42,
"A RESOLUTION PRESCRIBING REQUIREMENTS FOR THE
DISPOSAL OF SPOIL INTO THE PACIFIC OCEAN
IN THE VICINITY OF SAN ONOFRE NUCLEAR GENERATING STATION
BY THE SOUTHERN CALIFORNIA EDISON COMPANY AND THE
SAN DIEGO GAS & ELECTRIC COMPANY"

GENERAL PROVISIONS FOR SAMPLING AND ANALYSIS

THIS MONITORING PROGRAM IS ESTABLISHED TO PROVIDE INFORMATION ON THE EFFECTS OF THE SPOIL DISPOSAL OPERATION AND TO PROVIDE SOME BASIC BACKGROUND INFORMATION TO ENABLE DIFFERENTIATION BETWEEN THE EFFECTS WHICH MIGHT BE CAUSED BY THIS DISPOSAL OPERATION AND THOSE WHICH MIGHT BE CAUSED BY THE PROPOSED DISPOSAL OF INCREASED VOLUMES OF COOLING WATER FROM UNITS 2 AND 3.

BIOLOGICAL MONITORING IN THIS ORDER WILL BE REVISED AND INCLUDED IN A MUCH MORE COMPREHENSIVE MONITORING PROGRAM WHICH WILL BE DEVELOPED FOR THE THERMAL DISCHARGE. REVISIONS IN THIS MONITORING PROGRAM MAY BE MADE BY THE EXECUTIVE OFFICER OF THE REGIONAL BOARD.

ALL WORK SHALL BE PERFORMED BY OR UNDER THE DIRECT SUPERVISION OF A QUALIFIED MARINE BIOLOGIST-OCEANOGRAPHER. THE NAMES AND PROFESSIONAL RESUMES OF ALL PERSONS ASSOCIATED WITH THE WORK SHALL BE SUBMITTED FOR APPROVAL BY THE EXECUTIVE OFFICER PRIOR TO THE WORK BEING PERFORMED. ANALYSES SHALL BE IN ACCORDANCE WITH THE PROCEDURES OF THE AMERICAN SOCIETY FOR TESTING MATERIALS, MODIFIED FOR THE MARINE ENVIRONMENT, OR WITH THE APPROVAL OF THE EXECUTIVE OFFICER.

SUFFICIENT STANDBY EQUIPMENT SHALL BE AVAILABLE WHENEVER PRACTICAL TO PRECLUDE THE POSSIBILITY OF NOT BEING ABLE TO COLLECT THE REQUIRED DATA BECAUSE OF EQUIPMENT BREAKDOWN OR MALFUNCTION.

GENERAL PROVISIONS FOR REPORTING

REPORTS SHALL BE SUBMITTED TO THE EXECUTIVE OFFICER AT THE FREQUENCIES INDICATED IN EACH SECTION OF THE PROGRAM. IN ADDITION, THE CERTIFICATION REPORT CALLED FOR BY REQUIREMENT 4(B) ON PAGE 4 OF RESOLUTION 70-R42 SHALL BE SUBMITTED WITHIN 30 DAYS OF COMPLETION OF THE TERRACE DEPOSITS AND SAND DISPOSAL OPERATIONS.

2009

A. TERRACE DEPOSITS

1. COLOR PHOTOGRAPHS SHOWING THE SITES USED FOR DISPOSAL OF TERRACE DEPOSITS, BOTH PRIOR TO AND AFTER THE SITES BEING USED, SHALL BE SUBMITTED WITHIN 30 DAYS OF COMPLETION OF THE OPERATION.
2. A DETAILED DESCRIPTION OF ALL MEASURES TAKEN TO PREVENT EROSION OF TERRACE DEPOSITS IN EACH FILL SITE SHALL BE SUBMITTED WITHIN 30 DAYS OF COMPLETION OF THE OPERATION.
3. A DAILY LOG OF THE DISPOSAL OPERATION SHOWING THE AMOUNTS OF TERRACE DEPOSITS PLACED IN EACH SITE SHALL BE SUBMITTED WITHIN 30 DAYS OF COMPLETION OF THE PROJECT.

B. SAN MATEO SAND AND CONDUIT CONSTRUCTION SPOIL

1. LOG OF SAND PLACEMENT

A DAILY LOG SHALL BE KEPT OF THE AMOUNT OF SAND PLACED ON THE BEACH AND THE LOCATION AT WHICH THE SAND WAS PLACED WITH RESPECT THE MEAN LOWER LOW WATER LEVEL. SAID LOG SHALL BE AVAILABLE FOR INSPECTION AT ALL TIMES AND SHALL BE SUBMITTED WITHIN 30 DAYS OF COMPLETION OF THE SAND PLACEMENT OPERATION. A DAILY LOG SHALL ALSO BE KEPT ESTIMATING THE AMOUNT OF CONDUIT CONSTRUCTION SPOIL DISPOSAL AND THE LOCATION OF DISPOSAL REFERENCED TO THE UNIT 1 OUTFALL AND MLLW. SAID LOG SHALL BE SUBMITTED QUARTERLY.

2. TURBIDITY DETERMINATIONS

DURING THE FIRST WEEK IMMEDIATELY PRIOR TO SAND PLACEMENT BETWEEN MEAN HIGHER HIGH WATER (MHHW) AND MEAN LOWER LOW WATER (MLLW) DAILY AERIAL PHOTOGRAPHS SHALL BE TAKEN TO RECORD AREAL EXTENT OF VISUAL TURBIDITY PRESENT IN THE OCEAN BEFORE SAND DISPOSAL. TO THE EXTENT PRACTICAL, THIS OPERATION SHALL NOT TAKE PLACE DURING OR WITHIN ONE WEEK FOLLOWING RAINFALL AND RUNOFF PERIODS.

DURING THE FIRST TWO WEEKS OF SAND PLACEMENT BETWEEN MHHW AND MLLW DAILY AERIAL PHOTOGRAPHS SHALL BE TAKEN TO RECORD PLACEMENT OF THE SAND AND THE AREAL EXTENT OF THE VISUAL TURBIDITY CAUSED BY DISPOSED SAND. THEREAFTER, WEEKLY FLIGHTS SHALL BE MADE TO PHOTOGRAPHICALLY RECORD THE EXTENT OF VISUAL TURBIDITY. THE AERIAL PHOTOGRAPHY PROGRAM SHALL CONTINUE UNTIL MHHW AND/OR MLLW LINES RETURN TO EQUILIBRIUM OR UNTIL, IN THE JUDGMENT OF THE EXECUTIVE OFFICER OF THE REGIONAL BOARD, THE PROGRAM CAN BE TERMINATED.

THE AERIAL PHOTOGRAPH COVERAGE SHALL EXTEND TO THE LIMITS OF THE VISIBLE PLUME OF TURBID WATER EMANATING FROM THE SPOIL DISPOSAL REGION AND SHALL EXTEND AT LEAST 3000 FEET OFFSHORE AND TWO MILES UP- AND DOWNCOAST OF THE LIMITS OF THE DISPOSAL REGION. THE KELP BEDS OFF SAN MATEO POINT AND LAS PULGAS CANYON AND ANY NEWLY DEVELOPING KELP BEDS WITHIN THE INFLUENCE OF THE GENERATED TURBIDITY SHALL BE PHOTOGRAPHED EACH SURVEY.

THE EXTENT OF THE VISUAL TURBIDITY AS DETERMINED FROM THE PHOTOGRAPHS AND VISUAL AERIAL OBSERVATIONS SHALL BE PLOTTED ON APPROPRIATE SCALE MAPS ON WHICH THE LOCATION OF ALL KELP BED AREAS ARE SHOWN.

BOTH PHOTOGRAPHS AND MAPS SHALL BE SUBMITTED IN WEEKLY SETS OF DATA WITHIN TEN WORKING DAYS OF DATA COLLECTION. FACTORS SUCH AS METEOROLOGICAL, SEA-STATE, AND SWELL CONDITIONS SHALL BE NOTED AND REPORTED ALSO. NATURALLY OCCURRING SOURCES OF TURBIDITY SUCH AS RAINFALL RUNOFF AND COASTAL RIP CURRENTS WILL BE IDENTIFIED.

3. INTERTIDAL REEF MAPPING

PRIOR TO INITIATION OF SAND PLACEMENT ON THE BEACH, ALL EXPOSED ROCKY SUBSTRATE IN THE AREA EXTENDING UP-CAST AND DOWN-CAST 1000 FEET BEYOND THE LIMITS OF THE SAND DISPOSAL AREA, AND THE COBBLE AREA LOCATED APPROXIMATELY 5500 FEET SOUTH OF THE UNIT 1 OUTFALL AXIS, SHALL BE MAPPED TO AN ELEVATION OF -3 FEET BELOW MLLW IN ORDER TO DETERMINE THE AMOUNT OF INUNDATION AND SUBSEQUENT RE-EXPOSURE OF THE COBBLE REEF BY SAND SPOIL. SUBSEQUENT INSPECTION AND MAPPING OF EACH AREA SHALL BE MADE ON A QUARTERLY BASIS. REDUCTION IN AREA OF SUCH BEDS SHALL BE ACCOMPANIED BY DETERMINATION OF THE AMOUNT AND TYPE OF COVER INVOLVED. REEF MAPPING WILL CONTINUE UNTIL THE TERMINATION OF THE "BEACH AND BOTTOM PROFILES".

4. BEACH AND BOTTOM PROFILES

BEACH AND BOTTOM PROFILES EXTENDING FROM ELEVATIONS +10 TO ELEVATION -4 SHALL BE PLOTTED AT LEAST ONCE MONTHLY. THE APPROXIMATE LOCATION OF THE PROFILES SHALL BE 1000 FEET NORTH, 1000 FEET SOUTH, 3000 FEET SOUTH, 9000 FEET SOUTH, AND SIX MILES SOUTH OF THE OUTFALL FOR UNIT 1. SAID PROFILES ARE TO BE DETERMINED USING STANDARD SURVEYING TECHNIQUES AND ARE TO BE DETERMINED AT LEAST ONCE PRIOR TO INITIATION OF THE SAND DISPOSAL OPERATION ON THE BEACH. SURVEYING SHALL BE REFERENCED TO THAT PERFORMED FOR UNIT 1 SO THAT PROFILE DATA CAN BE DIRECTLY COMPARED. AT EACH PROFILE LOCATION, SAMPLES OF THE BEACH SEDIMENT SHALL BE TAKEN AT MHHW, MSL AND MLLW FOR ANALYSIS AND COMPARISON WITH THE MATERIAL BEING PLACED ON THE BEACH FOR DISPOSAL.

REFERENCE STAKES SHALL BE PERMANENTLY EMBEDDED IN THE BOTTOM AT EXISTING BUOY LOCATIONS (UNIT 1 SAMPLING STATIONS B2S, B4S, C4N, C2N, C2S, C4S, C8S, D4N, D2N, E0, E2S, AND F0). BIMONTHLY MEASUREMENTS SHALL BE MADE FOR DETERMINATION OF BOTTOM ELEVATIONS AT THE BUOYS WITH AT LEAST ONE MEASUREMENT BEING MADE PRIOR TO THE BEGINNING OF SAND DISPOSAL.

5. KELP OBSERVATIONS

PRIOR TO INITIATION OF THE SAND PLACEMENT ON THE BEACH, ALL EXISTING KELP BEDS SHALL BE MAPPED FROM SAN MATEO POINT TO THE MOUTH OF THE SANTA MARGARITA RIVER. DIVING INSPECTIONS SHALL ALSO BE MADE TO DETERMINE THE AREAL EXTENT OF THE ROCKY SUBSTRATE AT EACH BED LOCATION. QUARTERLY INSPECTIONS SHALL BE MADE OF EACH KELP BED AREA FOR OBSERVATIONS OF KELP AREA AND CONDITION AS WELL AS CHANGES IN AREAL EXTENT OF ROCKY SUBSTRATE. REPORTS SHALL BE SUBMITTED AT QUARTERLY INTERVALS.

6. BIOLOGICAL MONITORING

(A) INTERTIDAL SAND HABITAT

TRANSECTS FOR THE INTERTIDAL SAND SAMPLING SHALL BE SET UP ON THE PROFILE LINES 1000 FEET SOUTH AND SIX MILES SOUTH OF THE UNIT 1 OUTFALL, AND AS NEAR THE 3000 FOOT SOUTH LINE AS CAN BE DONE WHILE STILL REMAINING NORTH OF THE NORTHERNMOST BOUNDARY OF THE PROPOSED STATE PARK. ON THESE TRANSECTS A GRIDWORK OF CORES 42.5 cm^2 IN AREA AND 20 CM DEEP SHALL BE TAKEN QUARTERLY DURING A DAYLIGHT RISING TIDE ACROSS THE WATER LINE. THE GRID WILL CONSIST OF 25 CORES ON FIVE LINES PARALLEL TO THE TRANSECT (ONE ON THE TRANSECT, TWO NORTH AND TWO SOUTH AT 5 M INTERVALS) WITH FIVE CORES ON EACH LINE AT 2 M INTERVALS, ONE AT THE WATER LINE, THREE BELOW, AND ONE ABOVE. THIS SAMPLING PROCEDURE SHALL BE REPEATED ON THREE SUCCESSIVE DAYS AT THE SAME POINT IN THE TIDAL CYCLE. INITIAL AND SUBSEQUENT SAMPLING RUNS SHALL BE MADE AS CLOSE TO THE SAME TIDAL STAGE AS PRACTICAL, AND COMPLETE TIDAL INFORMATION SHALL BE SUBMITTED FOR EACH RUN.

ALL SAMPLES SHALL BE EXAMINED SEPARATELY AND ALL SPECIMENS RETAINED ON A 1 MM MESH SHALL BE IDENTIFIED TO AS LOW A TAXON AS POSSIBLE, ENUMERATED, MEASURED, AND THEIR REPRODUCTIVE CONDITION ASSESSED WHERE FEASIBLE. SIZE FREQUENCY DISTRIBUTION SHALL BE SHOWN FOR LARGE POPULATIONS, AND APPROPRIATE GRAPHS SHOWING THE RELATIONSHIP BETWEEN SPECIES FREQUENCY AND POPULATION SHALL BE PLOTTED FOR ALL SAMPLES. REPORTS ARE TO BE SUBMITTED WITHIN 45 DAYS OF SAMPLE COLLECTION. SAMPLES SHALL BE COLLECTED AT LEAST ONCE PRIOR TO INITIATION OF THE SAND DISPOSAL OPERATION. ALL SAMPLES SHALL BE STORED FOR FUTURE REFERENCE.

(B) INTERTIDAL ROCKY HABITAT

QUARTERLY SAMPLES SHALL BE TAKEN IN THE COBBLE BEDS LOCATED APPROXIMATELY 1500 FEET NORTH OF THE UNIT 1 OUTFALL AND IN A SUITABLE CONTROL AREA TO THE SOUTH OF THE SOUTHERN BOUNDARY OF THE PROPOSED STATE PARK. AT EACH LOCATION, SAMPLING POINTS SHALL BE LOCATED AT MHHW, MSL, AND MLLW.

MACROBIOTA SHALL BE COUNTED AND IDENTIFIED TO AS LOW A TAXON AS POSSIBLE, ENUMERATED, MEASURED, AND REPRODUCTIVE CONDITION ASSESSED WHERE FEASIBLE IN EACH OF TWO ONE METER SQUARE ($1m^2$) QUADRATS RANDOMLY LOCATED AROUND EACH SAMPLING POINT. WITHIN EACH OF THE QUADRATS, A HAPHAZARDLY LOCATED 0.1 METER SQUARE ($0.1m^2$) DIG SHALL BE MADE TO A DEPTH OF 20 CM BELOW THE SURFACE OF THE SAND. ALL SPECIMENS RETAINED ON A 1 MM MESH FROM EACH DIG SHALL BE IDENTIFIED TO AS LOW A TAXON AS POSSIBLE, ENUMERATED, MEASURED, AND REPRODUCTIVE CONDITION ASSESSED WHERE FEASIBLE.

FOR BOTH EPIFAUNA AND INFAUNA, SIZE FREQUENCY DISTRIBUTION SHALL BE SHOWN FOR LARGE POPULATIONS AND APPROPRIATE GRAPHS SHOWING THE RELATIONSHIP BETWEEN SPECIES FREQUENCY AND POPULATION SHALL BE PLOTTED FOR EACH SAMPLE. REPORTS ARE TO BE SUBMITTED WITHIN 45 DAYS OF SAMPLE COLLECTION. SAMPLES SHALL BE COLLECTED AT LEAST ONCE PRIOR TO INITIATION OF THE SAND DISPOSAL OPERATION. TO THE EXTENT PRACTICAL, SAMPLES SHALL BE STORED FOR FUTURE REFERENCE.

(c) SUBTIDAL SAND AND ROCKY HABITAT

SUBTIDAL SAND STATIONS SHALL BE LOCATED NEAR THE 10 METER DEPTH CONTOUR OFFSHORE OF THE INTERTIDAL SAND HABITAT LOCATIONS. SUBTIDAL ROCK STATIONS SHALL BE LOCATED IN THE COBBLE BED NORTH OF THE UNIT 1 OUTFALL AND IN THE REEF NEAR THE SIX MILE SOUTH TRANSECT AS NEAR THE 10 METER DEPTH AS POSSIBLE. ADEQUATE MEASURES SHALL BE TAKEN TO ASSURE REOCCUPATION OF THE SAME STATIONS FOR INITIAL AND SUBSEQUENT SAMPLINGS. QUARTERLY, AT EACH STATION FOUR $1m^2$ QUADRATS SHALL BE SELECTED WITHIN A 10 METER RADIUS OF THE STATION, TWO RANDOM FOR EACH RUN AND TWO FIXED FOR ALL RUNS. ALL MACROSCOPIC SURFACE BIOTA WITHIN EACH QUADRAT SHALL BE IDENTIFIED TO AS LOW A TAXON AS POSSIBLE, ENUMERATED, MEASURED, AND REPRODUCTIVE CONDITION ASSESSED WHERE FEASIBLE. WITHIN EACH QUADRAT, FOUR CORES OF 42.5 cm^2 CROSS SECTION AND 20 CM IN DEPTH SHALL BE TAKEN HAPHAZARDLY, AND WITHIN EACH QUADRAT FOR THE ROCKY STATIONS, A $0.1m^2$ DIG TO A DEPTH OF 20 CM SHALL BE HAPHAZARDLY TAKEN. ALL CORE AND DIG SPECIMENS RETAINED ON A 1 MM MESH SHALL BE IDENTIFIED TO AS LOW A TAXON AS POSSIBLE, ENUMERATED, MEASURED, AND REPRODUCTIVE CONDITION ASSESSED WHERE FEASIBLE.

ORDER No. 71-6

FOR BOTH EPIFAUNA AND INFAUNA, SIZE FREQUENCY DISTRIBUTION SHALL BE SHOWN FOR LARGE POPULATIONS AND APPROPRIATE GRAPHS SHOWING THE RELATIONSHIP BETWEEN SPECIES FREQUENCY AND POPULATION SHALL BE PLOTTED FOR EACH SAMPLE. REPORTS ARE TO BE SUBMITTED WITHIN 45 DAYS OF SAMPLE COLLECTION. SAMPLES ARE TO BE COLLECTED AT LEAST ONCE PRIOR TO INITIATION OF THE SAND DISPOSAL OPERATION. TO THE EXTENT PRACTICAL, ALL SAMPLES SHALL BE SAVED FOR FUTURE REFERENCE.

THE MONITORING AND REPORTING PROGRAM CONTAINED HEREIN SHALL BE IN EFFECT WITH THE ADOPTION OF ORDER No. 71-6.

ORDERED BY

/SIGNED/

EXECUTIVE OFFICER
JANUARY 21, 1971

File Cy.

Regulatory

