

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
SAN DIEGO REGION

NPDES NO. CA0001228

MONITORING AND REPORTING PROGRAM NO. 88-001  
FOR  
SOUTHERN CALIFORNIA EDISON COMPANY  
SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 1  
SAN DIEGO COUNTY

A. MONITORING PROVISIONS

1. Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge. All samples shall be taken at the monitoring points specified in this Order and, unless otherwise specified, before the effluent joins or is diluted by any other waste stream, body of water, or substance. Monitoring points shall not be changed without notification to and the approval of the Executive Officer.
2. Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated and maintained to ensure that the accuracy of the measurements are consistent with the accepted capability of that type of device. Devices selected shall be capable of measuring flows with a maximum deviation of less than  $\pm 5$  percent from true discharge rates throughout the range of expected discharge volumes. Guidance in selection, installation, calibration and operation of acceptable flow measurement devices can be obtained from the following references:
  - a. "A Guide to Methods and Standards for the Measurement of Water Flow," U.S. Department of Commerce, National Bureau of Standards, NBS Special Publication 421, May 1975, 97 pp. (Available from the U.S. Government Printing Office, Washington, D. C. 20402. Order by SD Catalog No. C13.10:421.)
  - b. "Water Measurement Manual," U.S. Department of Interior, Bureau of Reclamation, Second Edition, Revised Reprint, 1974, 327 pp. (Available from the U.S. Government Printing Office, Washington D. C. 20402. Order by Catalog No. 127,19/2:W29/2, Stock No. S/N 24003-0027.)
  - c. "Flow Measurement in Open Channels and Closed Conduits," U.S. Department of Commerce, National Bureau of Standards, NBS Special Publication 484, October 1977, 982 pp. (Available in paper copy or microfiche from National Technical Information Service (NTIS) Springfield, VA 22151. Order by NTIS No. PB-273-535/5ST.)

- d. "NPDES Compliance Sampling Manual," U.S. Environmental Protection Agency Office of Water Enforcement. Publication MCD-51, 1977, 140 pp. (Available from the General Services Administration (8PFS), Centralized Mailing Lists Services, Building 41, Denver Federal Center, Denver, CO 80225.)
3. Monitoring must be conducted according to United States Environmental Protection Agency test procedures approved under Title 40, Code of Federal Regulations (CFR), Part 136. "Guidelines Establishing Test Procedures for Analysis of Pollutants Under the Clean Water Act" as amended, unless other test procedures have been specified in this Order.
4. All analyses shall be performed in a laboratory certified to perform such analyses by the California Department of Health Services or a laboratory approved by the Executive Officer.
5. Monitoring results must be reported on discharge monitoring report forms approved by the Executive Officer.
6. If the discharger monitors any pollutants more frequently than required by this Order, using test procedures approved under 40 (CFR), Part 136, or as specified in this Order, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the discharger's monitoring report. The increased frequency of monitoring shall also be reported.
7. The discharger shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order. Records shall be maintained for a minimum of five years from the date of the sample, measurement, report, or application. This period may be extended during the course of any unresolved litigation regarding this discharge or when requested by the Regional Board Executive Officer or the United States Environmental Protection Agency.
8. Records of monitoring information shall include:
  - a. The date, exact place, and time of sampling or measurements;
  - b. The individual(s) who performed the sampling or measurements;
  - c. The date(s) analyses were performed;
  - d. The individual(s) who performed the analyses;
  - e. The analytical techniques or method used; and
  - f. The results of such analyses.

9. Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified by the Executive Officer or in this Order.
10. All monitoring instruments and devices used by the discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary to ensure their continued accuracy. All flow measurement devices shall be calibrated at least once per year, or more frequently, to ensure continued accuracy of the devices. Annually, the discharger shall submit to the Executive Officer a written statement signed by a registered professional engineer certifying that all flow measurement devices have been calibrated and will reliably achieve the accuracy required by Monitoring Provision A.2.
11. The discharger shall have, and implement, an acceptable written quality assurance (QA) plan for laboratory analyses. An annual report shall be submitted by January 30 of each year which summarizes the QA activities for the previous year. Duplicate chemical analyses must be conducted on a minimum of ten percent of the samples or at least one sample per month, whichever is greater. A similar frequency shall be maintained for analyzing spiked samples. The discharger should have a success rate equal to or greater than 80 percent.
12. The discharger shall report all instances of noncompliance not reported under Reporting Requirement E.6 of this Order at the time monitoring reports are submitted. The reports shall contain the information listed in Reporting Requirement E.6.
13. The monitoring reports shall be signed by an authorized person as required by Reporting Requirement No. E.12.
14. A composite sample is defined as a combination of at least 8 sample aliquots of at least 100 milliliters, collected at periodic intervals during the operating hours of a facility over a 24-hour period. For volatile pollutants, aliquots must be combined in the laboratory immediately before analysis. The composite must be flow proportional; either the time interval between each aliquot or the volume of each aliquot must be proportional to either the stream flow at the time of sampling or the total stream flow since the collection of the previous aliquot. Aliquots may be collected manually or automatically.
15. A grab sample is an individual sample of at least 100 milliliters collected at a randomly selected time over a period not exceeding 15 minutes.

## B. FISH ENTRAINMENT MONITORING

### 1. Monitoring

During heat treatments and for at least one continuous 24-hour period per week during normal operation, the following shall be obtained:

- (a) Total weight and number of each species of fish removed from the traveling bar racks and screens.
- (b) Standard length and sex of select species in a representative sample<sup>1</sup>/ removed from the traveling bar racks and screens.

### 2. Reporting

- (a) A report containing detailed analyses of the previous year's fish entrainment monitoring data shall be submitted by July 30 of each year.
- (b) The annual report requirement in Section K of this monitoring and reporting program will not apply to Fish Entrainment Monitoring.

## C. COOLING WATER INTAKE MONITORING

Samples of the cooling water intake shall be collected in accordance with the following criteria:

Parameter	Units	Type of <sup>2</sup> / Sample	Minimum Frequency of Analysis
Turbidity	NTU	Grab	Monthly
Temperature	°F	--	Continuous <sup>3</sup> /
pH <sup>4</sup> /	pH Units	Grab	Monthly

## D. COMBINED DISCHARGE<sup>5</sup>/MONITORING PROGRAM

Samples of the combined discharge shall be collected in accordance with the following criteria:

Parameter	Units	Type of Sample <sup>2</sup> /	Minimum Frequency of Analysis
Flow Rate	MGD	--	Continuous
Turbidity	NTU	Grab	Monthly

Parameter	Units	Type of Sample <sup>2</sup> /	Minimum Frequency of Analysis
pH <sup>1</sup> /	pH Units	Grab	Monthly
Temperature <sup>3</sup> /	°F	--	Continuous
Polychlorinated Biphenyls	µg/l lb/day	Grab	Semiannually
Total Residual Chlorine <sup>4</sup> /	µg/l lb/day	Grab	Daily
Free Available Chlorine <sup>5</sup> /	µg/l lb/day	Grab	Daily
Hydrazine <sup>7</sup> /	µg/l lb/day	Grab	Monthly
Toxicity Concentration <sup>8</sup> /	tu	Grab	Semiannually
Arsenic	µg/l lb/day	Grab	Semiannually
Cadmium	µg/l lb/day	Grab	Semiannually
Chromium (Hexavalent) <sup>9</sup> /	µg/l lb/day	Grab	Semiannually
Copper	µg/l lb/day	Grab	Semiannually
Lead	µg/l lb/day	Grab	Semiannually
Mercury	µg/l lb/day	Grab	Semiannually
Nickel	µg/l lb/day	Grab	Semiannually
Silver	µg/l lb/day	Grab	Semiannually
Zinc	µg/l lb/day	Grab	Semiannually
Cyanide	µg/l lb/day	Grab	Semiannually



Parameter	Units	Type of Sample <sup>1</sup> /	Minimum Frequency of Analysis
Ammonia (expressed as Nitrogen)	µg/l lb/day	Grab	Semiannually
Phenolic Compounds	µg/l lb/day	Grab	Semiannually
Chlorinated Phenolics	µg/l lb/day	Grab	Semiannually
Aldrin & Dieldrin	µg/l lb/day	Grab	Semiannually
Chlordane <sup>10</sup> / Related Compounds	µg/l lb/day	Grab	Semiannually
DDT <sup>11</sup> / & Derivative	µg/l lb/day	Grab	Semiannually
Endrin	µg/l lb/day	Grab	Semiannually
HCH <sup>12</sup> /	µg/l lb/day	Grab	Semiannually
Toxaphene	µg/l lb/day	Grab	Semiannually

#### E. IN-PLANT WASTE STREAMS<sup>13</sup>/MONITORING PROGRAM

The following shall constitute the in-plant waste streams monitoring program for the purpose of monitoring discharge compliance with discharge specification B.15.

Note: NTU = Nephelometric Turbidity Units  
 °F = degrees Fahrenheit  
 MGD = million gallons per day  
 tu = toxicity units  
 µg/l = micrograms per liter

Parameter	Units	Type of Sample <sup>2/13/</sup>	Minimum Frequency of Analysis
Toxicity	tu	Grab	Semiannually
Arsenic	lbs/day	Grab	Semiannually
Cadmium	lbs/day	Grab	Semiannually
Chromium (Hexavalent) <sup>9/</sup>	lbs/day	Grab	Semiannually
Copper	lbs/day	Grab	Semiannually
Lead	lbs/day	Grab	Semiannually
Mercury	lbs/day	Grab	Semiannually
Nickel	lbs/day	Grab	Semiannually
Silver	lbs/day	Grab	Semiannually
Zinc	lbs/day	Grab	Semiannually
Cyanide	lbs/day	Grab	Semiannually
Ammonia (Expressed as Nitrogen)	lb/day	Grab	Semiannually
Phenolic Compounds	lb/day	Grab	Semiannually
Chlorinated Phenolics	lb/day	Grab	Semiannually
Aldrin & Dieldrin	lb/day	Grab	Semiannually
Phenolic Compounds (Nonchlorinated)	lb/day	Grab	Semiannually
Chlordane and Compounds <sup>10/</sup>	lb/day	Grab	Semiannually
DDT <sup>11/</sup> & Derivative	lb/day	Grab	Semiannually

Parameter	Units	Type of Sample <sup>2/13/</sup>	Minimum Frequency of Analysis
Endrin	lb/day	Grab	Semiannually
HCH <sup>12/</sup>	lb/day	Grab	Semiannually
Toxaphene	lb/day	Grab	Semiannually

F. LOW VOLUME WASTES MONITORING

The following shall constitute the low volume wastes monitoring program for each low volume waste stream.

Parameter	Units	Type of Sample <sup>14/</sup>	Minimum Frequency of Analysis
Flow Rate	MGD	--	Monthly
Total Suspended Solids	mg/l lb/day	14/	Monthly
Grease & Oil	mg/l lbs/day	14	Monthly

G. SEWAGE TREATMENT PLANT INFLUENT MONITORING

The following shall constitute the influent monitoring program for both sewage treatment plants.

Determination	Units	Type of Sample <sup>15/</sup>	Minimum Frequency of Analysis
Total Suspended Solids	mg/l	Grab	Monthly



H. SEWAGE TREATMENT PLANT EFFLUENT MONITORING

The following shall constitute the effluent monitoring program for both sewage treatment plants.

Determination	Units	Type of <sup>1</sup> / <sub>15</sub> / Sample	Minimum Frequency of Analysis
Flow Rate	MGD	-	Daily
Grease & Oil	mg/l	Grab	Monthly
Total Suspended Solids	mg/l	Grab	Monthly
Settleable Solids	ml/l	Grab	Monthly
Turbidity	NTU	Grab	Monthly
pH	pH Units	Grab	Monthly

Note: ml/l = milliliters per liter

I. RECEIVING WATER MONITORING

1. Station Locations

<u>Station</u>	<u>Description</u>
XO	Discharge structure
C1N	1,000 ft upcoast of the Unit 1 Outfall between the 25 and 30 ft depth contours.
C2N	2,000 ft upcoast of the Unit 1 Outfall between the 25 and 30 ft depth contours.
C1S	1,000 ft downcoast of the Unit 1 Outfall between the 25 and 30 ft depth contours.
C2S	2,000 ft downcoast of the Unit 1 Outfall between the 25 and 30 ft depth contours.
C22S (reference)	22,000 ft downcoast of the Unit 1 Outfall between the 25 and 30 ft depth contours.
SMK	San Mateo Kelp Bed
SOK	San Onofre Kelp Bed
BK	Barn Kelp
TSO2	Otter trawl station starting at approximately 2,000 ft downcoast of the Unit 1 Outfall at the 20 ft depth contour.
TSO4	Otter trawl station starting at approximately 1,200 ft directly offshore of the Unit 1 discharge point at the 40 ft depth contour.

<u>Station</u>	<u>Description</u>
TS06	Otter trawl station starting at approximately 1,000 ft downcoast of the Unit 1 Outfall at the 60 ft depth contour.
TR2 (reference)	Otter trawl station starting at approximately 22,000 ft downcoast of the Unit 1 Outfall at the 20 ft depth contour.
TR4 (references)	Otter trawl station starting at approximately 22,000 ft downcoast of the Unit 1 Outfall at the 40 ft depth contour.
TR6 (reference)	Otter trawl station starting at approximately 22,000 ft downcoast of the Unit 1 Outfall at the 60 ft depth contour.

2. Receiving water monitoring shall be conducted as follows:

a. Continuous Temperature Monitoring

Continuously recording thermographs shall be deployed at stations C2S and C22F. Measurements shall be obtained from the surface, 5 meter, 10 meter, and near bottom depths. Measurements shall be reported as hourly data.

b. Turbidity

Quarterly aerial photographic surveys shall be conducted in the vicinity of the Unit 1 discharge.

c. Fish Populations

Bimonthly trawling surveys shall be conducted at stations TS02, TS04, TS06, TR2, TR4, and TR6. Each trawl shall be of ten minute duration at a uniform speed of between 2.0 and 2.5 knots. Collected fishes shall be identified to species and enumerated. Standard length and weight of all fishes shall be determined. Any external anomalies observed shall be reported.

d. Kelp Mapping

Acoustic data for kelp, depth, and bottom composition shall be acquired by side-scanning and down-looking sonar at San Mateo Kelp, San Onofre Kelp and Barn Kelp semiannually. Ground truth data shall also be taken. Sonar data shall be analyzed to provide bottom composition and kelp density information.

e. Kelp Densities

Individual giant kelp plants and the number of associated stipes greater than 2 m shall be counted three times a per year at six fixed sampling sites located in the San Onofre kelp bed (SOK) as identified in Chapter 4 of the 1986 SONGS "Marine Environmental Analysis and Interpretation Report". The composition of the substrate shall be qualitatively described. Additional substrate and percent cover information shall be collected.

In addition to the above information, SCE shall sample a randomly selected 100 m<sup>2</sup> site in the SOK semiannually to enumerate giant kelp, and to qualitatively estimate percent sand, cobble and boulders in the sampling site area.

f. Kelp Bed Monitoring

Kelp bed monitoring is conducted to assess the extent to which the discharge of wastes may affect the areal extent and health of coastal kelp beds.

The discharger shall participate with other ocean dischargers in the San Diego Region in an annual regional kelp bed photographic survey.

Kelp beds shall be monitored annually by means of vertical aerial infrared photography to determine the maximum areal extent of the region's coastal kelp beds within the calendar year. Surveys shall be conducted as close as possible to the time when kelp bed canopies cover the greatest area, which ordinarily occurs in August or September in the San Diego Region. The entire San Diego Region coastline, from the International Boundary to the San Diego/Santa Ana Region boundary, shall be photographed on the same day. The date of each annual survey shall be approved by Regional Board staff. (Verbal approval will be sufficient, so that the survey will not be delayed while written approval is prepared and distributed.)

The images produced by the surveys shall be presented in the form of a 1:24,000 scale photo-mosaic of the entire San Diego Region coastline. Onshore reference points, locations of all ocean outfalls and diffusers, and the 30-foot (MLLW) and 60-foot (MLLW) depth contours shall be shown.

The areal extent of the various kelp beds photographed in each survey shall be compared to that noted in surveys of previous years. Any significant losses which persist for more than one year shall be investigated by divers to determine the probable reason for the loss.

g. Transmissometer Profiles

Surface to bottom profiles of light transmittance shall be conducted quarterly from stations XO, C1N, C2N, C1S, C2S, and C22S using a standardized transmissometer.

h. Water Quality Measurements

Dissolved oxygen, hydrogen ion concentration and temperature, shall be measured quarterly, at the surface, mid-depth and bottom at stations XO, C1N, C2N, C1S, C2S and C22S.

i. Bioaccumulation Monitoring

Bagged mussels shall be deployed at stations XO, C1N, C2N, C1S, C2S and C22S to evaluate the bioaccumulation of toxic pollutants in the vicinity of the SONGS Unit 1 discharge. The mussels shall be deployed, collected and analyzed semiannually as described in Appendix A of the "California State Mussel Watch Marine Water Quality Monitoring Program 1985-86" (Water Quality Monitoring Report No. 87-2WQ).

J. REPORTING

1. A report containing detailed analyses of the previous year's receiving water monitoring data shall be submitted by July 30 of each year.
2. The annual report requirement in Section K of this Monitoring and Reporting Program will not apply to Receiving Water Monitoring.

K. ANNUAL SUMMARY OF MONITORING DATA

By January 30 of each year, the discharger shall submit an annual report to the Executive Officer. The report shall contain both tabular and graphical summaries of the monitoring data obtained during the previous year. In addition, the discharger shall discuss the compliance record and the corrective actions taken or planned which may be needed to bring the discharge into full compliance with Order No. 88-001.

L. MONITORING REPORT SCHEDULE

Monitoring reports shall be submitted to the Executive Officer in accordance with the following schedule:

Reporting Frequency	Report Period	Report Due
Continuous, Daily, Weekly, Monthly	January, February March, April, May, June, July, August, September, October, November, December	By the 30th of the following month
Quarterly	October - December January - March April - June July - September	January 30 April 30 July 30 October 30
Semiannually	July - December January - June	January 30 July 30
Annually	January - December	January 30 (Effluent) July 30 (Receiving Water)



CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
SAN DIEGO REGION

Footnote references for Monitoring and Reporting Program No. 88-001 (NTDES NO. CA0101228), SOUTHERN CALIFORNIA EDISON COMPANY, SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 1, SAN DIEGO COUNTY.

1. A representative sample for determination of fish length for species removed from SONGS Unit 1 intake structure bar racks and screens shall consist of all individual of a species removed, or not less than 125 individuals when more than 125 individuals are removed. A representative sample for determination of fish sex for species removed from SONGS Unit 1 intake structure bar racks and screens shall consist of all individuals of a species removed, or not less than 50 individuals when more than 50 individuals are removed.
2. A grab sample is defined as an individual sample of at least 100 milliliters collected over a period not exceeding 15 minutes. Grab samples shall be collected at times when wastewater flows and characteristics are most demanding on the treatment facilities.
3. Temperature shall be recorded at a minimum frequency of once every two hours. The average and maximum temperature for each 24-hour period shall be reported.
4. Samples shall be collected and analyzed for pH during chlorination.
5. Combined discharge monitoring shall be conducted at a point in the circulating water system downstream of the condenser, downstream of the point(s) at which the component cooling and turbine plant cooling water streams reenter the circulating water stream, and downstream of the point(s) at which all in-plant waste streams enter the circulating water stream. Combined discharge samples shall be collected immediately following collection of cooling water intake samples.
6. Samples shall be collected and analyzed for total residual chlorine and free available chlorine at times when the concentration of total residual chlorine and free available chlorine in the combined discharge is greatest. The times of uninterrupted chlorine discharges on the days the samples are collected and the times at which samples are collected shall be reported.

7. Samples shall be collected and analyzed for hydrazine on the day(s) of the month when the hydrazine concentration is the greatest, but no less frequently than once each month.
8. Samples shall be collected and analyzed for toxicity concentrations no less frequently than once each week if, at any time, the toxicity concentration exceeds 0.55 tu. Collection and analysis of samples for toxicity concentration on a weekly basis shall continue until measured toxicity concentration is less than 0.55 tu. In addition, the toxicity concentration shall be determined when the hydrazine concentration is anticipated to be at a maximum. Toxicity concentration shall be measured in the following manner:

- (a) Toxicity Concentration (Tc)  
Expressed in Toxicity Units (tu)

$$Tc (tu) = \frac{100}{96\text{-hr. TLM\%}}$$

- (b) Median Tolerance Limit (TLM%)

TLM (percent waste giving 50 percent survival of test organisms) shall be determined by static or continuous flow bioassay techniques using standard test species. If specific identifiable substances in wastewater can be demonstrated by the discharger as being rapidly rendered harmless upon discharge to the marine environment, but not as a result of dilution, the TLM may be determined after the test samples are adjusted to remove the influence of those substances.

When it is not possible to measure the 96-hour TLM due to greater than 50 percent survival of the test species in 100 percent waste, the toxicity concentration shall be calculated by the expression:

$$Tc (tu) = \frac{\log (100-S)}{1.7}$$

S = percentage survival in 100 percent waste.  
If S > 99, Tc shall be reported as zero.

If the calculated value for toxicity concentration in the combined discharge falls below the limit of detection of the test method specified in the code of federal regulations 40 CFR, Part 136, "Guidelines Establishing Test Procedures for Analysis of Pollutants," or by a more sensitive method specified by the State Water Resources Control Board or the Regional Board, the limit of detection shall serve as the limiting effluent concentration. The limit of detection of acute toxicity in standard test methods is less than, or equal to, 0.59 tu.

9. The discharger may at their option meet this limitation as a total chromium limitation.
10. Chlordane and related compounds shall mean the sum of chlordane (cis+trans), trans-nonachlor, oxychlordane, heptachlor and hexachlor epoxide.
11. DDT and derivatives shall mean the sum of the P, P' and O, P' isomers of DDT, DDD (TDE) and DDE.
12. HCH shall mean the sum of the alpha, beta, gamma (lindane) and delta isomers of hexachlorocyclohexane.
13. Grab samples of individual in-plant waste streams as identified in Finding No. 7 of this Order shall be collected and composited on a flow-weighted basis for analysis. Measurements or estimates of flows of individual in-plant waste streams used as a basis for compositing shall be reported.
14. During a single 24-hour period, each low volume waste stream shall be individually sampled in the following manner:  
  
At maximum flow and concentration, three grab samples shall be taken of each low volume waste stream. Each sample shall be separated from the last by at least ten minutes. These three grab samples shall then be combined to form a flow weighted composite sample which shall then be analyzed for total suspended solids and oil and grease. Concentration limits, as shown in Discharge Specifications Nos. B. 11 thru 15, shall apply to these individual low volume waste streams.
15. Samples shall be collected during the day shift, Monday through Friday, except on holidays.

Ordered by

*Ladin H. Delaney*

LADIN H. DELANEY  
Executive Officer  
February 8, 1988