UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

JAN 18 1968

Dear Mr. Chairman:

Pursuant to Section 5 of Public Law 89-605 and other authorizations, we are presenting the views of the Department of the Interior in the matter of the application by Consolidated Edison for a construction permit to add Unit No. 3 to the Indian Point nuclear generating station located on the Hudson River in Westchester County, New York, AEC Docket No. 50-286.

We have considered the application in the light of our Memorandum of Understanding of March 20, 1964, our responsibilities for the protection of water quality under the Federal Water Pollution Control Act and Executive Order No. 11288, for the protection of fish and wildlife resources under the Fish and Wildlife Coordination Act, and for the furtherance of the Administration's policy to preserve and to restore the quality of our environment, and the directive of the Congress that the resources of the Hudson should be protected from adverse Federal actions until there has been opportunity for the negotiation of a Hudson River Compact.

Unless certain conditions are met, we are concerned that the project for which the license is sought could impair the value of the waters of the Hudson River. As you know, the State of New York has adopted water quality standards for the Hudson River that have been approved by this Department. In addition, there is a water quality enforcement conference covering this section of the Hudson. We have considered the potential pollution problem in its thermal, radiological, and chemical aspects. Thermal pollution is a matter of particular concern and we will want to continue to work with you and the applicant to assure that adequate cooling measures are installed and effectively operated. We also want to assure that the fishery resources are thoroughly protected by adequate screening facilities.

A detailed discussion of the project application as it relates to our responsibilities, with recommendations, is found in the attached reports. The Department of the Interior would not object to the issuance of the construction permit to Consolidated Edison Company

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provided that the Company be required to comply with the recommendations set forth in the attached reports of the Federal Water Pollution Control Administration and the Fish and Wildlife Service.

Sincerely yours,

David S. Black

Under Secretary of the Interior

Honorable Glenn T. Seaborg
Chairman, United States
Atomic Energy Commission
Washington, D. C. 20545

Enclosures (2)

REPORT OF THE FISH AND WILDLIFE SERVICE ON UNIT NO. 3
OF THE INDIAN POINT NUCLEAR GENERATING STATION, AEC
DOCKET No. 50-286

There are extensive commercial and sport fisheries in the Hudson River. Sport fishing is mainly for striped bass and white perch. The principal commercial fishery is for American shad. During 1964, 181,865 pounds of shad were caught in the Hudson River; approximately 149,000 pounds of this catch were taken south of the Peekskill area. Commercial fishermen also take herring, striped bass, American eel, sturgeon, white perch, tomcod, and American smelt in the river. Although there are no commercial fisheries for shellfish, some oyster setting grounds exist from the New Jersey boundary north for a distance of nine miles.

The applicant indicates that the release of radioactive wastes would not exceed maximum permissible limits prescribed in Title 10, Part 20, of the Code of Federal Regulations. Although these limits refer to maximum levels of radioactivity that can occur in drinking water for man, without resulting in any known harmful effects, operation within these limits may not always guarantee that fish and wildlife will be protected from adverse effects. If concentrations in receiving water were the only consideration, maximum permissible limits would be adequate criteria for determining the safe rate of discharge. However, radioisotopes of many elements are concentrated and stored by organisms that require these elements for their normal metabolic activities. Some organisms concentrate and store radioisotopes of elements not normally required but which are chemically similar to elements essential for metabolism. In both cases, the radionuclides are transferred from one organism to another through various levels of the food chain just as are the nonradioactive elements. These transfers may result in further concentration of radionuclides and wide dispersion from the project area, particularly by migratory fish, mammals, and birds.

In view of the above, even though the post-operational surveys at the Indian Point site indicated that there was no increase in radioactivity levels due to Indian Point Unit No. 1, we believe that pre- and post-operational surveys should be conducted by the applicant to determine any effects of Indian Point Unit No. 3. These surveys should include studies of the effects of radionuclides on selected organisms indigenous to the project area which require these waste elements or similar elements for their metabolic activities.

These surveys should be planned in cooperation with the appropriate Federal and State agencies. If it is determined from pre-operational surveys that the release of radioactive effluents at levels permitted under the Code of Federal Regulations would result in harmful concentrations of radioactivity in fish and wildlife, plans should be made to reduce the discharge of radioactivity to acceptable levels. Post-operational surveys should be conducted to evaluate the predictions

based on the pre-operational surveys and to serve as a basis for reduction of radioactive levels to insure that no unforeseen damage occurs.

In view of the importance of the sport and commercial fisheries and wildlife resources of the Hudson River, it is imperative that every possible effort be made to protect these valuable resources from radioactive contamination. Therefore, it is recommended that the Consolidated Edison Company be required to:

1. Cooperate with the Secretary of the Interior, the New York Conservation Department, the New York State Department of Health, and other interested State agencies in developing plans for radiological surveys.

2. Conduct or arrange for the conduct of pre-operational radiological surveys of selected organisms indigenous to the area that concentrate and store radioactive isotopes, and of the environment including water and sediment samples. These surveys should be conducted by scientists knowledgeable in the fish and wildlife field.

3. Prepare a report of the pre-operational radiological survey and provide five copies to the Secretary of the Interior for evaluation prior to project operation.

4. Make modifications in project structures and operations to reduce the discharge of radioactive wastes to acceptable levels if it is determined in the pre-operational or the post-operational surveys that the schedule for release of radioactive effluents would result in harmful concentrations of radioactivity in fish and wildlife.

5. Conduct radiological surveys, similar to those specified in recommendation 2 above, analyze the data, and prepare and submit reports every six months during the first year of reactor operation and every six months thereafter or until it has been conclusively demonstrated that no significant adverse conditions exist. Submit five copies of these reports to the Secretary of the Interior for distribution to the appropriate State and Federal agencies for evaluation.

We understand it is the Commission's opinion that its regulatory authority over nuclear power plants involves only those hazards associated with radioactive materials. However, we recommend and urge that before the permit is issued, thermal pollution and any other detrimental effects to fish and wildlife which may result from plant

construction and operation be called to the applicant's attention. We recommend further that the applicant be requested to disucss this matter with appropriate Federal and State conservation officials and to develop measures to minimize hazards.

We are particularly concerned over the possibility of damages to aquatic life from increase water temperatures. Studies of the influence of the heated water on the Hudson River are being conducted with the aid of a model at Alden Laboratories, Worcester Polytechnic Institute, Worcester, Massachusetts. Indications from these studies are that the discharge channel, now being extended downstream a total of 500 feet for plant number 2, will need to be extended an additional 700 feet for plant number 3 in order to assure, for plant efficiency, that water reaching the intake will not exceed ambient water temperatures by more than 2°F. The temperature rise of the cooling water will be 16°F. as it enters the discharge channel from each plant under all stages of development.

Large volumes of heated water discharged into the river could cause profound effects on the aquatic environment. Such discharges may not only be detrimental to fish life directly but may also affect these resources indirectly through changes in the ecological communities, particularly the food organisms on which fish depend. We are also concerned about the discharge of chemical wastes resulting from the control of algae, the reduction of boiler scale and the absorption of copper by the condenser cooling water.

Ecological surveys, to measure biological and ecological changes in the river, should be conducted prior to and following plant operation to measure the effect of plant operation on the biota of the river. These surveys should be planned in cooperation with the appropriate Federal and State agencies. If it is determined from the pre-operational investigations that the heated water or chemical effluent to be discharged into the Hudson River would result in changes in the environment that would be significantly detrimental to fish and wildlife, plans should be made to reduce the temperature of the effluent to acceptable levels. Post-operational surveys should be conducted to evaluate the predictions based on the pre-operational surveys and to insure that no unforeseen damage occurs.

Another potential hazard to fishery resources in the river is the cooling water intake. Unless the intake is adequately screened, fish may be drawn in and destroyed. Suitable fish protective facilities should be installed to prevent significant damage to the fishery resources.

In view of the Administration's policy to maintain, protect, and improve the quality of our environment and most particularly the water and air media, we request that the Commission urge the Consolidated Edison Company to:

1. Cooperate with the Secretary of the Interior, the New York Conservation Department, the New York State Department of Health, and other interested State agencies in developing plans for ecological surveys, initiate these surveys at least two years before reactor operation, and continue them on a regular basis or until it has been conclusively demonstrated that no significant adverse conditions exist.

2. Meet with the above mentioned Federal and State agencies at frequent intervals to discuss new plans and to evaluate results of existing surveys.

3. Construct, operate, and maintain such fish protective facilities over the intake structures as needed to prevent significant damage to fishery resources.

4. Make such modifications in project structures and operation including facilities for cooling discharge waters as may be determined necessary as a result of the pre-operational or post-operational surveys to project the fish and wildlife resources of the area.

REPORT OF THE FEDERAL WATER POLLUTION CONTROL ADMINISTRATION
ON UNIT NO. 3 OF THE INDIAN POINT NUCLEAR GENERATING STATION
AEC DOCKET NO. 50-286

This is in regard to water pollution control problems and programs associated with the proposed enlargement of the Indian Point nuclear thermal-electric generating plant on the Hudson River by addition of Unit No. 3, by Consolidated Edison Company.

The Indian Point Plant is located on the east bank of the Hudson River about 24 miles above New York City. It is 22 miles downstream of the emergency New York City, Chelsea Pumping Plant on the Hudson River.

Our comments and recommendations are directed at the thermal, radiological and chemical aspects of water pollution control.

Thermal

We are particularly concerned that the large amount of heat discharged by Unit No. 3, in combination with that from Unit No. 1, already in operation, and Unit No. 2, now nearing completion, will result in serious pollution under certain conditions of a significant reach of the Hudson River Estuary.

For the reasons outlined below, we recommend that the Department enter strong objections to the proposed project unless the following specific provisions are incorporated in the project design:

(1) "The licensee shall so conduct his activities that they do not violate applicable New York State as well as Federal water quality standards, recommendations of any enforcement conference or any Hearing Board approved by the Secretary, or order of any court, all under Section 10 of the Federal Water Pollution Control Act, and other State and Federal water pollution control regulations;" and

(2) "The licensee shall provide a monitoring program acceptable to the State of New York and to the Federal Water Pollution Control Administration so as to assure that all water quality standards are met."

The declared policy of the United States set forth in the Atomic Energy Act is that "the development, use and control of atomic energy shall be directed so as to make the maximum contribution to the general welfare ..." In our judgement a failure to consider the implications of thermal and other pollution at this early stage could add unnecessarily to the cost of application of atomic energy at this site, and would be incompatible with the general welfare objectives of the Atomic Energy Act. We believe that from the standpoint of both the licensee and downstream water users greater economy will be achieved if the licensee is required to comply with Federal and State water pollution control laws as a condition of the AEC Permit to use nuclear fuel.

Executive Order 11288 provides that the Federal Government "should provide leadership in the nationwide effort to improve water quality through prevention, control, and abatement of water pollution from Federal Government activities in the United States." It calls for each agency of the Federal Government to carry out its activities, both internally and externally, in such a way as to contribute to this national effort. On this basis we believe that any permit or license issued by the Federal Government for this project should include provision(s) that the plant meet the applicable water quality standards which have been established in accordance with the Federal Water Pollution Control Act, as amended. Failure to meet these standards could result in Federal enforcement action and possible delays in the full operation of the three units, which would in turn adversely affect the return on the investment in the plant.

Standards for water quality in the Hudson River have been established by the State of New York and were approved by the Secretary of the Interior on August 17, 1967, in accordance with provisions of the Federal Water Pollution Control Act. The standards provide:

"Non-Trout Waters

"1. Mixing Zone - The mixing zone will be separately determined for each discharge so as to minimize detrimental effects. Fish and other aquatic life shall be protected from thermal blocks by providing for a minimum fifty percent stream of estuarine cross-section and/or volumetric passageway, or establishing artificial fishways where considered necessary.

"Generally, the surface water temperature shall not exceed 90°F within the mixing zone. Consideration will be given to effects of each discharge based on hydrodynamics and other factors of receiving waters.

"2. Outside Mixing Zone - Stream temperatures in excess of 86°F will not be permitted after mixing. Further, no permanent change in excess of 5°F will be permitted from naturally occurring background temperatures. In multiple discharge situations, stream capacity to meet such criteria will be apportioned among the discharges.

"3. Outside Mixing Zones: Fresh Surface Water Classes Temperature changes rate shall be limited to 2°F per hour not to exceed 9°F in any 24-hour period, further limited in that for any seven day period the average change will meet the 5°F change of background criteria stated in item 2 above.

"4. Outside Mixing Zone: Tidal Salt Water Classes Discharges shall not raise monthly means of maximum daily temperature more than 4°F from September through May, nor more than 1.5°F during June, July, and August.

"Temperature change shall not be more than 1°F per hour, not to exceed 7°F in any 24-hour period at maximum, except when natural phenomena cause these limits to be exceeded."

Water temperatures have been obtained bi-weekly at the FWPCA water quality surveillance station at Poughkeepsie, New York, about forty miles upstream from the Indian Point Plant. Maximum water temperatures have equalled or exceeded 78°F in most of the years. A maximum temperature of 80.5°F has been reported. The project description provided by the Company indicates a 16°F increase through the condensers of Unit No. 3. For the entire three units an increase of 16.4°F appears possible. Thus, a plant discharge temperature of as high as 96.9°F could occur. This would exceed the 90°F maximum permitted in mixing zones as described in part one of the previously quoted standards.

Studies of possible thermal pollution by the plant being carried out by consulting engineers were mentioned by the Company in their Preliminary Safety Analysis Report and noted by company representatives at the meeting with representatives of the Department of the Interior on August 7, 1967. The Company had expected this report to be completed by mid-September and it is understood that it is now being reviewed by their own engineering staff. The opportunity to review these studies is necessary for our appraisal of the facilities to be provided to control thermal effects of the project.

The Hudson River Estuary is at this point subject to tidal action. Under flood tide conditions, which occur twice daily, there is an extended period of slack tide and reversal of flow which would result in the accumulation of a mass of warmed water in the vicinity of the cooling water discharge. Information from other sources indicates that such masses of heated water maintain their identity for a considerable period of time and move with the tides. Information from studies by the Tennessee Valley Authority and others indicates that a considerable period of time may elapse before the temperature of such a mass of water will approach natural levels. Outside the mixing zone the temperature should not exceed 86°F. In our judgement the movement of such masses of warm water by the tides should not be considered a part of the mixing zone.

As a minimum, measures to assure that Federal Water Quality Standards as to temperature are met should include cooling towers or other means of heat dissipation to meet presently anticipated conditions. In addition, provisions should be made so that it will be possible to install additional cooling towers or other measures when this proves to be necessary.

Inclusion of pollution control requirements in the license and their consideration in the early phases of design is considered essential in obtaining appropriate design of the entire boiler-turbine-condenser system. Prevention of pollution of the environment is a necessary and proper cost of power production and failure to incorporate control measures at this early date will result in higher costs because it is generally less efficient to add control measures than to design them into the plant.

Radiological

A separate liquid waste treatment system is provided for each reactor. The collection of wastes and their batch treatment is appropriate, considering the small volumes involved. This proposed waste treatment system, together with proper operation, should provide the decontamination necessary to maintain concentrations of radionuclides in the water environment below currently accepted limits and appears to constitute a substantial effort to reduce radionuclides to the lowest practicable level. We interpret the statement in the report "...experience with the design of similar systems has shown that the expected concentrations in the discharge canal will be less than about 0.02 MPC of 10CFR20 per year of all isotopes" -- to include tritium. If this is not the correct interpretation, we recommend that the analysis requirements be expanded to include tritium.

Information on the environmental monitoring program is quite limited in the Preliminary Safety Analysis Report. The program has been acceptable for use with Unit No. 1. That program provides for monthly sampling of water in the Hudson River Estuary and for less frequent sampling of algae, fish and bottom muds. Because radionuclides can be concentrated and stored by aquatic organisms that require these or similar elements in their normal metabolic activities and then be transferred to other edible life forms or to wildlife, it is important that the marine life being monitored include types that can be expected to accumulate radionuclides. Shellfish should be monitored at seasons of maximum growth. Consideration should be given to scheduling samples in mid February, July, August, September and October so as to have a greater likelihood of detecting increasing radioactivity in the aquatic environment if it occurs.

The permit issued to the Consolidated Edison Company should require the Company to make modifications in operations and/or in project structures to reduce the discharge of radioactive wastes to levels consistent with all uses of the Hudson River if results of the monitoring program indicate that releases are hazardous to human or fish and wildlife populations of the area.

Chemical

Chemicals are generally used for the control of algae and biological fouling organisms in the condensors and cooling towers, for the reduction of scale in boilers, or for the control of corrosion in the condensers. The New York standards provide that "toxic wastes" or "deleterious substances" shall not be discharged "alone or in combination with other substances or wastes in sufficient amounts or at such temperatures as to be injurious to edible fish or shellfish or the culture or propagation thereof, or which in any manner shall adversely affect the flavor, color, odor or sanitary condition thereof..." Free residual chlorine and chromium (tri- or Hexa- valent) should be limited to 0.1 mg/l and 0.05 mg/l, respectively, outside the mixing zone to prevent toxic effects in fish and fish food, and to minimize the possibility of adverse effects on the flavor of shellfish. Means to control concentrations of these chemicals or any others that are used, acceptable to the State of New York and the Federal Water Pollution Control Administration should be included in the design and operational procedure for the entire plant.

The Consolidated Edison Company has indicated its willingness to take reasonable measures to reduce to a minimum the thermal effects of its plants on adjacent waters where those effects would be adverse to good principles of conservation. Considering the complexity of the effects of wastes involved, we feel that license provisions requiring a continuing program of surveillance and appropriate corrective action as soon as surveillance data indicate it to be necessary, are essential to control the effects of pollution on the environment.