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OCT 17 1969

Wisconsin Ecological Society
P. O. Box 514
Green Bay, Wisconsin 54305

Attention: Mr. R. J. Barlament

Gentlemen:

In your letter of September 17, 1969, you requested a copy of a report on "thermal and radioactive discharges into Lake Michigan" which you stated was to be filed by Wisconsin Public Service Corporation about September 13, 1969. We have no knowledge of such a report.

About one year ago we in the Regulatory Staff evaluated the proposed environmental monitoring program in connection with our review for the construction permit issuance of the Kewaunee Nuclear Station. A copy of our letter transmitting the comments of the U. S. Fish and Wildlife Service is enclosed for your information.

In a letter to Wisconsin Public Service Corporation dated August 22, 1969, we requested a summary report on the programs that have been carried out at the Kewaunee site in response to the Fish and Wildlife Service's recommendations. A copy of the utility's response is also enclosed.

Sincerely,

Original Signed by
Peter A. Morris

Peter A. Morris, Director
Division of Reactor Licensing

Enclosures:
1. Ltr fm WPS to PAMorris, dtd 9-26-69
2. Ltr fm PAMorris to WPS, dtd 5-7-68
3. Ltr fm F&W Service to HLPrice, dtd 4-15-68

OFFICE ▶	DRL/RPB-5	DRL/AD:RP	DRL			
SURNAME ▶	DFKnuth/emm x7791	RSBoyd	PAMorris			
DATE ▶	10/16/69	10/17/69	10/17/69			

Form AEC-318 (Rev. 9-53) AECM 0240

U.S. GOVERNMENT PRINTING OFFICE : 1968 O—296-617

WISCONSIN PUBLIC SERVICE CORPORATION

P.O. Box 700, Green Bay, Wisconsin 54305

September 26, 1969

DOCKET NO. 50-305

Mr. Peter A. Morris, Director
Division of Reactor Licensing
U. S. Atomic Energy Commission
Washington, D. C. 20545

Dear Mr. Morris:

This letter is in reference to your letter of August 22, 1969, requesting a summary report on the programs that have been carried out in response to the recommendations by the Fish and Wildlife Service for the Kewaunee Nuclear Power Plant.

In May, 1970, the Kewaunee Plant made a grant to the University of Wisconsin-Milwaukee to conduct studies in Lake Michigan in the immediate vicinity of the plant. Dr. Ralph Grunewald of the university is in charge of this study. As this study is relatively new, no reports have been issued.

The portion of the lake included in Dr. Grunewald's study includes from the lake shore to the water intake, and about 1 mile north to about 2½ miles south of the plant site. The area of his study briefly is as follows:

1. Temperature - Temperature recorders are located about 8 and 16 feet below surface and about 2000 feet from shore to provide background data on site water temperatures. This location is in the area of our water intake; the intake is being installed at the present time.

2. Benthic algae - Plexiglass slides are located at 5 sampling locations to determine the distribution and occurrence of benthic algae.

3. Zooplankton - Floating plankton are being collected at sampling locations. Plankton are also being collected at various depths to provide data on stratified populations and occurrence of zooplankton.

4. Sediment - Shoreline sand and bottom sediment samples are being collected to determine percent size composition.

5. Environmental radioactivity - Measurements of the natural radioactivity are being made on samples of shoreline sand, sediment, algae and plankton samples collected from the area. Samples will be analyzed for both beta and gamma radioactivity.

We have also recently signed a contract with Industrial Bio-Test Laboratories, Inc. of Northbrook, Illinois to perform a monitoring program at the plant site. Included in their contract is sampling of fish, bottom sediment, bottom organisms and slime samples. Samples will be analyzed for both beta and gamma radioactivity.

The Great Lakes Research Division of the University of Michigan is under contract to the six utilities building nuclear plants on Lake Michigan to perform a radiological survey of Lake Michigan. Fifty sampling stations will be sampled three times during the one year contract. One sampling station will be in the vicinity of the Kewaunee Plant. Water sediment and lake biota will be sampled and analyzed. A report will be issued within three months after completion of study.

The plant circulating water system has its inlet located approximately 1700 feet off shore and at a water depth of approximately 15 feet. The top of the inlet cones are located 1 foot above the lake bottom and an air screen will be used as our fish screening device. A shoreline discharge is used for returning water to the lake.

We have expressed our willingness to work with the various state and federal agencies and are conducting our studies as described in line with the recommendations of the Fish and Wildlife Service. We have worked with and assisted Dr. Lea of the Wisconsin State Board of Health and Social Services in their environmental studies being conducted in the area.

A symposium on the environmental studies being done in the Kewaunee-Point Beach area is scheduled for October 10, 1970, at the University of Wisconsin-Milwaukee. The various state and federal agencies have been invited to attend this symposium. The University of Wisconsin-Milwaukee, Wisconsin State Board of Health and Social Services, Point Beach and Kewaunee personnel will participate in this symposium.

Very truly yours,

E. W. James, Vice President
Power Generation & Engineering

EWJ:RWL:sna

3088

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

Docket No. 50-305

MAY 7 1968

Wisconsin Public Service Corporation
P. O. Box 700
Green Bay, Wisconsin 54305

Attention: Mr. G. F. Hrubesky
Vice President

Gentlemen:

This refers to your application for a construction permit and facility license which would authorize the construction and operation of a nuclear power reactor at the corporation's site located in the Town of Carlton, Kewaunee County, Wisconsin.

We are transmitting for your information a copy of the United States Fish and Wildlife Service Report containing comments and recommendations on both radiological and non-radiological effects on the proposed facility. Copies of this report are also being sent to appropriate state and local officials. The radiological safety aspects of this report will be considered in the analysis of the safety of the project by the regulatory staff and by the Advisory Committee on Reactor Safeguards. Our conclusions will be included in the safety evaluation we will prepare for the public hearing which will be held to consider the issuance of the construction permit.

We call your attention to the recommendations made by the Fish and Wildlife Service. We note that your application (at Section 2.1; 8/18/67) reflects your general plans for conducting pre-operational radiological surveys. The reports which you will submit on the results of the pre-operational surveys will be evaluated by the Commission and transmitted to the Fish and Wildlife Service at the time we consider your application for provisional operating licenses in this proceeding. The reports of surveys made after operations have begun will similarly be reviewed.

The substantive regulatory jurisdiction of the AEC under present law is limited essentially, however, to matters of radiological health and safety and the common defense and security, and we now lack authority to impose restrictions regarding the thermal effects of discharges from licensed

nuclear facilities. However, we wish to call these matters to your attention in order that you may have the benefit of the Service's recommendations concerning potential non-radiological effects upon the environments.

Sincerely yours,

Peter A. Morris, Director
Division of Reactor Licensing

Enclosure:
U. S. Fish and Wildlife Report
dated 4/15/68

cc: Mr. William M. White, Chief
Division of River Basin Studies
Bureau of Sport Fisheries and Wildlife
U. S. Department of the Interior

Mr. Arthur L. Padrutt
Chairman of the Public Service Commission
of Wisconsin
State Capitol
Madison, Wisconsin 53701

Mr. Donald L. Quistorff, Chairman
Kewaunee County Board
Kewaunee, Wisconsin 54216

Mr. Arden Koehler, Chairman
Town of Carlton
Kewaunee County
Kewaunee, Wisconsin 54216

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IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
WASHINGTON, D. C. 20240

OCT 15 1968

Mr. Harold Price
Director of Regulations
U. S. Atomic Energy Commission
Washington, D. C. 20545

Dear Mr. Price:

This is in response to your letter of August 31, 1967, requesting our comments on the application of the Wisconsin Public Service Corporation for a construction permit and operating license for the proposed Kewaunee Nuclear Power Plant, Lake Michigan, Kewaunee County, Wisconsin, Docket No. 50-305.

The plant would be located on the west shore of Lake Michigan about 30 miles east-southeast of Green Bay and about 90 miles north-northeast of Milwaukee, Wisconsin. It would be 4½ miles north of the Point Beach Nuclear Plant now under construction. A pressurized water reactor, designed for an initial output of 1650 megawatts and a net electrical output of 559 megawatts, would be used as a power source. A radioactive waste disposal system and other facilities required for a complete and operable nuclear power plant would be provided. Condenser cooling water would be pumped from Lake Michigan at a rate of approximately 450,000 gpm (1,000 c.f.s.) and returned to the lake through a discharge canal or conduit, after absorption of radioactive wastes and heat wastes from the plant.

It is stated in the application that an environmental radiological program would be started one year prior to plant operation. The pre-operational program would include samples of air, water, and milk. Evaluations of fish and other plant or animal life on or in Lake Michigan are not planned at this time. The nature and extent of the post-operational environmental survey were not given in the report but presumably would be determined on the results and data accumulated from the pre-operational study.

Lake Michigan supports a commercial fishery shared by the States of Michigan, Wisconsin, Illinois, and Indiana. The lake annually yields several million pounds of fish to the consumer's market. The more important fish species are chubs, alewives, yellow perch, carp, smelt, suckers, whitefish, walleye, catfishes, lake herring, pickerel, lake trout, burbot, sculpin, sturgeon, bowfin, rock bass, sauger, freshwater drum, white bass, and the recently introduced coho salmon. Sport fishing is a prime tourist attraction all along the Wisconsin shoreline of the lake.

The Michigan Department of Conservation initiated a coho salmon introduction program in the spring of 1966 when it planted 658,800 smolts in Platte River and Bear Creek, tributaries to Lake Michigan; and 192,400 smolts in Big Huron River, tributary to Lake Superior. This resulted in a return of 10,000 jacks, cohos averaging 3 pounds each, in the fall of 1966; and a return of about 265,000 adults in 1967. The 1967 run provided a sport fish catch of 33,500 in Lake Michigan and 20,000 in Lake Superior; a commercial catch of 21,000; and about 190,000 escaped the fisheries and were taken at weirs in the streams. The bulk of the cohos taken in 1967 were in the 12 to 17 pound size group. The 1967 coho fishing provided anglers with 157,000 man days of sport fishing in Lake Michigan and tributaries. This program was continued in the spring of 1967 when 1,780,000 coho and 800,000 chinook salmon smolts were stocked in Lake Michigan tributaries and in 1968 it is planned to stock 1,050,000 coho smolts in the tributaries of the lake.

The application indicates that releases 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 the concentration in the 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 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 non-radioactive elements. These transfers may result in further concentration of radionuclides and a wide dispersion from the project area particularly by migratory fish, mammals, and birds.

In view of the above, we believe that the surveys planned by the applicant should include pre- and post-operational radiological monitoring of selected organisms which require the waste elements or similar elements for their metabolic activities. These surveys should be planned in cooperation with the appropriate Federal and State agencies.

In view of the extensive sport and commercial fisheries in Lake Michigan, it is imperative that every possible effort is to be made to protect these valuable resources from radioactive contamination. Therefore, it is recommended that the Wisconsin Public Service Corporation be required to:

1. Cooperate with the Fish and Wildlife Service, the Federal Water Pollution Control Administration, the Wisconsin Conservation Department, the Wisconsin Department of Resource Development, and other interested State agencies in developing plans for radiological surveys.

2. Conduct or arrange for the conduct of pre-operational radiological surveys of the aquatic environment including monitoring of water and sediment samples and organisms indigenous to the project area that concentrate and store radioactive isotopes. Water and sediment should be collected within 500 feet of the reactor effluent outfall and need be measured only for gamma radioactivity. Aquatic plants, mollusks, and crustaceans should be collected near as possible to the reactor effluent outfall and be analyzed for both beta and gamma radioactivity.

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. Conduct radiological surveys, similar to those specified in recommendation 2 above, analyze the data, prepare and submit reports every six months during reactor operation or until it is 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.

5. Make modifications in project structures and operations to reduce the discharge of radioactive wastes to acceptable levels if it is determined in the pre- or post-operational surveys that the release of radioactive effluent permitted under the Code of Federal Regulations would result in harmful concentrations of radioactivity in fish and wildlife.

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 other detrimental effects to fish and wildlife which may result from plant construction and operation be called to the attention of the applicant. We recommend further that the applicant be requested to discuss this matter with appropriate State conservation officials and the Fish and Wildlife Service and to develop measures to minimize these hazards.

One problem we foresee is the possible effects of increased water temperature on aquatic organisms in this general area of Lake Michigan resulting from the combined discharge of two nuclear plants within a distance of five miles. Although large volumes of heated water discharged into the lake may not be sufficient to cause mortality among the organisms present, changes could occur causing adverse effects on the environment. To measure biological changes in aquatic organisms and long term changes in the environment, ecological surveys should be carried out prior to and following plant operation so that comparative data will be available for analysis. These surveys should be planned in cooperation with the appropriate Federal and State agencies. If it is determined from the pre-operational surveys that the heated water to be discharged into Lake Michigan would result in changes in the environment of the lake that are 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 ensure that no unforeseen damage occurs.

Water quality standards for interstate waters, including Lake Michigan, have been developed by the Wisconsin Department of Resource Development and have been approved by the Secretary of the Interior. The applicant should be apprised that the discharge of cooling water must be in compliance with these water quality standards. The protection of fish and wildlife, and associated food sources, was a primary consideration in the establishment of the Wisconsin Standards. Provision of effective measures for control of quality to protect fish and aquatic life uses in Lake Michigan should be a primary consideration in the design of the plant. Our appraisal of the proposed facilities is that they may not provide the necessary control. The Fish and Wildlife Service, and we are sure the Federal Water Pollution Control Administration, will be happy to work with the applicant to develop measures to assure compliance with the standards and protect fish and wildlife resources in the area.

It is likely that fish and wildlife, especially alewives and waterfowl, will be attracted to the warmer waters of the coolant discharge. This may provide benefits in the form of harvesting efficiency while at the same time exposing these resources to prolonged exposure to low level radioactive contamination. Also, there may be problems in screening out the fish in the intake canal. Industries in Chicago Harbor have been plagued by failure of intake screens because of alewife concentrations. In order to prevent undesirable accumulations of fish in the intake canal, the company should install adequate fish screening facilities. The Fish and Wildlife Service is willing to assist the applicant in designing such facilities for this project.

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 Wisconsin Public Service Corporation and affiliated companies to:

1. Cooperate with the Fish and Wildlife Service, the Federal Water Pollution Control Administration, the Wisconsin Conservation Department, the Wisconsin Department of Resource Development, 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 during operation or until it has been conclusively demonstrated that no significant adverse conditions exist.

2. Meet with the Fish and Wildlife Service and State of Wisconsin agencies at frequent intervals to discuss new plans and to evaluate results of existing surveys.

3. Install suitable fish screening facilities at the intakes and outfalls of the cooling water system to prevent significant damage to fishery resources.

4. Make such modifications in project structures and operations as may be determined necessary as a result of the surveys.

The opportunity for presenting our views on this project is appreciated.

Sincerely yours,

Commissioner