

## Steven Orth

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**From:** Steven Orth  
**Sent:** Monday, December 08, 2008 1:30 PM  
**To:** [REDACTED]  
**Cc:** Viktoria Mitlyng  
**Subject:** Braidwood Environmental Statement Reports  
**Attachments:** NUREG 1026 (Excerpts).pdf; Braidwood FES (Excerpts) (Jul 1974).pdf

Wanda,

I was pleased to see you and to discuss issues at last week's Braidwood Community Information Night. Based on our discussion, I've located a couple of reports that you referenced -- Braidwood Environmental Statements. Since these reports are somewhat lengthy (over 100 pages each), I've attached excerpts, so that you may determine if they are the ones that you were interested in obtaining. If so, you can contact our Public Document Room at 1-800-397-4209 (WEB address - <http://www.nrc.gov/reading-rm/pdr.html> ) to obtain a full copy of the reports.

I also noticed that the Generic Environmental Impact Statement for License Renewal of Nuclear Plants (NUREG-1437 Vol. 2) is available online at (<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1437/v2/> ). You may also be interested in reviewing this report.

If you should have any questions, please contact me or Viktoria Mitlyng.

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**Final Environmental Statement**  
related to the operation of  
Braidwood Station,  
Units 1 and 2

Docket Nos. STN 50-456 and STN 50-457

Commonwealth Edison Company

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**U.S. Nuclear Regulatory  
Commission**

**Office of Nuclear Reactor Regulation**

June 1984



## ABSTRACT

This Final Environmental Statement contains the second assessment of the environmental impact associated with the operation of Braidwood Station, Units 1 and 2, pursuant to the National Environmental Policy Act of 1969 (NEPA) and Title 10 of the Code of Federal Regulations, Part 51, as amended, of the Nuclear Regulatory Commission regulations. This statement examines the environment, environmental consequences and mitigating actions, and environmental and economic benefits and costs. Land use and terrestrial and aquatic ecological impacts will be small. Operational impacts to historic and archeologic sites will be moderate. The effects of routine operations, energy transmission, and periodic maintenance of rights of way and transmission facilities should not jeopardize any populations of endangered or threatened species. No significant impacts are anticipated from normal operational releases of radioactivity. The risk of radiation exposure associated with accidental release of radioactivity is very low. The net socioeconomic effects of the project will be beneficial. On the basis of the analysis and evaluation set forth in this environmental statement, it is concluded that the action called for under NEPA and 10 CFR 51 is the issuance of operating licenses for Braidwood Station, Units 1 and 2.

## SUMMARY AND CONCLUSIONS

This Final Environmental Statement, operating-license stage (FES-OL), was prepared by the U. S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation (the staff).

- (1) This action is administrative.
- (2) The proposed action is the issuance of an operating license to the Commonwealth Edison Company (CECo) for the startup and operation of Units 1 and 2 of Braidwood Station (Docket Nos. STN 50-456, STN 50-457), located near the Kankakee River in Reed Township, Will County, Illinois, 2.3 km (1.4 mi)\* south of Braidwood and 32 km (20 mi) south-southwest of Joliet, Illinois.

The plant will employ two pressurized water reactors to produce up to 6850 megawatts thermal (Mwt). Two steam turbine-generators will use this heat to provide 2240 MW (net) of electrical power capacity. The maximum design thermal output of the units is 7130 Mwt, with a corresponding maximum calculated electrical output of 2330 MWe. The exhaust steam will be condensed by cooling water circulated from a cooling pond. Makeup and blowdown water (i.e., water to replace that lost by evaporation and water to control the buildup of dissolved solids, respectively) will be taken from, and discharged to, the Kankakee River.

- (3) The information in this environmental statement represents the second assessment of the environmental impact associated with the Braidwood Station pursuant to the Commission's regulations as set forth in Title 10 of the Code of Federal Regulations Part 51 (10 CFR 51), which implements the requirements of the National Environmental Policy Act of 1969 (NEPA). After receiving an application in September 1973 to construct Units 1 and 2 of the Braidwood Station, the staff carried out a review of the environmental impact that would occur during construction and operation. This evaluation was issued in July 1974 as a Final Environmental Statement - construction-permit phase (FES-CP). After this environmental review, a safety review, an evaluation by the Advisory Committee on Reactor Safeguards, and public hearings in Rockford, Illinois, and Bethesda, Maryland, the U.S. Atomic Energy Commission (now U.S. Nuclear Regulatory Commission) issued permit Nos. CPPR-132 and CPPR-133 on December 31, 1975, for construction of Units 1 and 2 of the Braidwood Station. As of June 1, 1984, the construction of Unit 1 was about 73% complete and Unit 2 was about 54% complete. The applicant has applied for a license to operate Units 1

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\*Throughout the text of this document, values are presented in both metric and English units. For the most part, measurements and calculations were originally made in English units and subsequently converted to metric. The number of significant figures given in a metric conversion is not meant to imply greater or lesser accuracy than that implied in the original English value.

and 2 and has submitted, in November 1978, the required safety and environmental reports in support of the application. The applicant estimates fuel-loading dates of August 1985 for Unit 1 and August 1986 for Unit 2.

- (4) The staff has reviewed the activities associated with the proposed operation of the station and the potential impacts, both beneficial and adverse. The staff's conclusions are summarized as follows:
- (a) Alteration of about 1803 ha (4454 acres) of land for the plant has been necessary. This is not a significant detrimental environmental impact (Section 4.2.2).
  - (b) Surface water quality impacts for the Kankakee River caused by the blowdown discharge from the Braidwood cooling pond are predicted to be small based on the staff's assessment of pollutant loading of the cooling pond blowdown to the river and on the small blowdown flow rate compared to the river flow rate (Sections 5.3.2 and 5.5.2).
  - (c) The presence of the plant and plant operations will have a negligible effect on the 100-year flood plain (Section 5.3.3).
  - (d) Periodic operation of the diesel generators (the predominant contributors to air pollutant discharges) and auxiliary boilers should not have a significant impact on air quality (Section 5.4.2).
  - (e) The staff has found no evidence to date indicating that the operation of the Braidwood transmission system will have an adverse effect on the health of humans or that its operation will adversely affect plant or animal life (Section 5.5.1.2).
  - (f) The staff has evaluated the biological conditions anticipated with operation of the pond and concludes that the aquatic resources of the cooling pond will be typical of a generally stressed system characterized by possibly large numbers of a few heat-tolerant species. However, since the state has not identified the pond as a fishery resource and the applicant indicates that it will only be used for cooling purposes (ER-01 Section 5.1), the conditions in the cooling pond are not in conflict with any planned use of the water body (Section 5.5.2.1).
  - (g) Adverse effects on the biota of the cooling pond are not expected at the projected level of residual chlorine discharged to the cooling pond (Section 5.5.2.1).
  - (h) New estimates of blowdown flow rate and temperature increase to the Kankakee River are lower than previously described in the FES-CP. Therefore, effects of the blowdown on river biota are less than previously predicted. Adverse impacts to the allowed mixing zone will be minimal and localized (Section 5.5.2.2).
  - (i) Impacts from entrainment of biota in makeup water drawn from the Kankakee River are expected to be minimal. During extreme low-flow

conditions in the river, the State of Illinois requires that water withdrawal be stopped so that impacts at low flow will be minimized (Section 5.5.2.2).

- (j) Some fish may be impinged at the makeup water intake screens. Based on experience gained during filling of the cooling pond, impingement losses should have minimal effects on the fish fauna of the Kankakee River (Section 5.5.2.2).
- (k) Operation of the Braidwood Station will not impact any terrestrial or aquatic species identified as threatened or endangered on the Federal or state lists. The pallid shiner, Notropis amnis, which has been proposed for the state's list of threatened species, has been collected downstream of the blowdown discharge location on the Kankakee River. Impacts to the pallid shiner from the blowdown discharge should be minimal (Section 5.6).
- (l) The operation and maintenance of the Braidwood Station will have no significant impact on the archeological resources or historic sites with one provision. The NRC is in the process of having a determination of eligibility completed for archeological site 11Ka179 for possible inclusion in the National Register of Historic Places. The NRC will take the action required on this outstanding item dependent on the finding of the Keeper of the Register (Section 5.7).
- (m) The staff concludes that the primary socioeconomic impacts of plant operation are tax benefits and employment. Other socioeconomic impacts are expected to be small (Section 5.8).
- (n) The risk to public health and safety from exposure to radioactive effluents and the transportation of fuel and wastes from normal operations will be very small (Section 5.9.3).
- (o) Activities off site that might adversely affect safe operation of the plant (nearby industrial, military, and transportation facilities that might create explosive, missile, toxic gas, or similar hazards) have been evaluated. The risk to Braidwood Station from such hazards is negligibly small (Section 5.9.4.4(2)).
- (p) There are no special or unique circumstances about the Braidwood site and environs that would warrant consideration of alternatives for accident mitigation purposes (Section 5.9.4.6).
- (q) The environmental impact of the Braidwood Station as a result of the uranium fuel cycle is very small when compared with the impact of natural background radiation (Section 5.10).
- (r) Noise levels off site during station and river pumphouse operation are predicted by the staff to be somewhat above ambient levels. Examination of the predicted broadband noise and the potential for

annoyance and activity interference as a result of audibility of tones indicates that adverse community reaction would not be expected from the noise of operation of the station (Section 5.12).

- (s) The Braidwood Station will provide approximately 11 billion kWh of electrical energy annually (assuming that both units will operate at an annual average capacity factor of 55%). The addition of the station will add 2240 MW of operating capacity to the Commonwealth Edison Company system, resulting in increased system and regional reliability (Section 6).
- (5) This statement assesses various impacts associated with the operation of the facility in terms of annual impacts and balances these impacts against the anticipated annual energy production benefits. Thus, the overall assessment and conclusion would not be dependent on specific operating life. Where appropriate, however, a specific operating life of 40 years was assumed.
- (6) The Draft Environmental Statement was made available for comment to the public, to the Environmental Protection Agency, and to other agencies, as specified in Section 8. Comments received are addressed in Section 9 and the comment letters are reprinted in Appendix A.
- (7) The personnel who participated in the preparation of this statement and their areas of responsibility are identified in Section 7.
- (8) On the basis of the analyses and evaluations set forth in this statement, after weighing the environmental, economic, technical, and other benefits against environmental and economic costs at the operating-license stage, the staff concludes that the action called for under NEPA and 10 CFR 51 is the issuance of operating licenses for Braidwood Units 1 and 2, subject to the following conditions for the protection of the environment (Section 6.1):
  - (a) Before engaging in additional construction or operational activities that may result in a significant adverse impact that was not evaluated or that is significantly greater than that evaluated in this statement, the applicant will provide written notification of such activities to the Director of the Office of Nuclear Reactor Regulation and will receive written approval from that office before proceeding with such activities.
  - (b) The applicant will carry out the environmental monitoring programs outlined in Section 5 of this statement, as modified and approved by the staff, and implemented in the Environmental Protection Plan and Technical Specifications that will be incorporated in the operating licenses for Braidwood Units 1 and 2. Monitoring of the aquatic environment shall be as specified in the National Pollutant Discharge Elimination System (NPDES) permit.
  - (c) If an adverse environmental effect or evidence of irreversible environmental damage is detected during the operating life of the plant, the applicant will provide the staff with an analysis of the problem and a proposed course of action to alleviate it.

*Final*

# **environmental statement**

**related to the proposed**

## **BRAIDWOOD STATION**

**COMMONWEALTH EDISON COMPANY**

DOCKET NOS: STN 50-456 and STN 50-457



U.S. Nuclear Regulatory Commission  
Office of Inspection & Enforcement  
Region III-Library  
799 Roosevelt Road  
Glen Ellyn, Illinois 60137

**JULY 1974**

**UNITED STATES ATOMIC ENERGY COMMISSION  
DIRECTORATE OF LICENSING**

## SUMMARY AND CONCLUSIONS

This Environmental Statement was prepared by the U. S. Atomic Energy Commission, Directorate of Licensing.

1. This action is administrative.

2. The proposed action is the issuance of construction permits to the Commonwealth Edison Company for the construction of the Braidwood Station, Units 1 and 2 (Docket Nos. STN 50-456 and STN 50-457), located near the Kankakee River in Will County, Illinois, and scheduled for commercial service in early 1980 and late 1981.

Braidwood Station will employ two pressurized water reactors to produce up to 6850 megawatts thermal (Mwt). Two steam-turbine generators will use this heat to provide 2240 MW (net) of electrical power capacity. The exhaust steam will be cooled by a once-through flow of water obtained from an artificial cooling lake. Makeup (93 cfs, avg.) will be drawn from the Kankakee River and blowdown (47 cfs, avt.) will be discharged to it.

3. Summary of environmental impact and adverse effects:

(a) Approximately 734 acres of agricultural land, 848 acres of woods and fallow field, and 2838 acres of strip-mine spoil will be required for the station and the cooling lake.

(b) Eleven farm residences will be displaced. Farming on part of the site will be suspended.

(c) Traffic on local roads will increase due to construction and commuting activities.

(d) Approximately 2376 acres of transmission line right-of-way will be on land used primarily for agriculture, with some woodland of which approximately ten acres will be used for tower bases. The remainder of the farmlands can remain in use.

(e) Minor and temporary impacts to the biota of the station area river bank will result from construction activities.

(f) The proposed station will withdraw up to 93 cfs of water from the Kankakee River and discharge about 46 cfs. The average net consumptive loss due to evaporation from the lake is estimated to be about 47 cfs.

(g) During the 7-day 10-year low flow periods of the Kankakee River, approximately 20% of the river flow and its entrained small biota will be diverted to the cooling lake. The staff expects that a large fraction of the organisms entrained in this fraction of river water would be lost due to thermal and mechanical shock. Losses of this magnitude might stress the river downstream of the station but the river ecosystem is expected to recover when normal flows return.

(h) An excessive growth of algae in the cooling lake might impose an adverse impact upon the Kankakee River below the discharge. Should this occur, the staff believes that by proper choice and use of control measures the algae growth could be controlled so as not to result in a significant disturbance of the river ecosystem.

(i) The risk associated with accidental radiation exposure is very low.

(j) No significant environmental impacts are anticipated from normal operational releases of radioactive materials within 50 miles. The estimated dose to the offsite population within 50 miles from operation of the station is less than the normal fluctuations (5%) in the 610,000 man-rems/year background dose this population would receive.

4. Principal alternatives considered:

Purchase of power from outside sources.

Alternative energy sources.

Alternative sites.

Alternative methods of heat dissipation.

5. The following Federal, State, and local agencies were asked to comment on the Draft Environmental Statement:

Advisory Council on Historic Preservation  
Department of Agriculture  
Department of the Army, Corps of Engineers  
Department of Commerce  
Department of Health, Education and Welfare  
Department of Housing and Urban Development  
Department of the Interior  
Department of Transportation  
Environmental Protection Agency  
Federal Power Commission  
Illinois Institute for Environmental Quality  
Illinois Department of Public Health  
Chairman, Will County Board of Supervisors

6. This Final Environmental Statement was made available to the public, to the Council on Environmental Quality, and to other specified agencies in July 1974.

7. On the basis of the analysis and evaluation set forth in this statement, after weighing the environmental, economic, technical, and other benefits of the Braidwood Station, Units 1 and 2, against environmental and other costs, and considering available alternatives, it is concluded that the action called for under the National Environmental Policy Act of 1969 (NEPA) and Appendix D to 10 CFR Part 50 is the issuance of construction permits for the facility subject to the following limitations for the protection of the environment:

(a) The applicant shall take the necessary mitigating actions, including those summarized in Sec. 4.5 of this Environmental Statement, during construction of the station and associated transmission lines to avoid unnecessary adverse environmental impacts from construction activities.

(b) In addition to the pre-operational monitoring programs described in Sec. 6.1 of the Environmental Report, with amendments, the staff recommendations included in Sec. 6.1 of this document shall be followed.

(c) A control program shall be established by the applicant to provide for a periodic review of all construction activities to assure that those activities conform to the environmental conditions set forth therein.

(d) Before engaging in a construction activity that may result in a significant adverse environmental impact that was not evaluated, or that is significantly greater than that evaluated in this Environmental Statement, the applicant shall provide written notification to the Director of Licensing.

(e) If unexpected harmful effects or evidence of irreversible damage are detected during facility construction, the applicant shall provide to the staff an acceptable analysis of the problem and a plan of action to eliminate or significantly reduce the harmful effects or damage.

## FOREWORD

This environmental statement was prepared by the U. S. Atomic Energy Commission, Directorate of Licensing (staff) in accordance with the Commission's regulation, 10 CFR Part 50, Appendix D, which implements the requirements of the National Environmental Policy Act of 1969 (NEPA)

The NEPA states, among other things, that it is the continuing responsibility of the Federal Government to use all practicable means, consistent with other essential considerations of national policy, to improve and coordinate Federal plans, functions, programs, and resources to the end that the Nation may:

- Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.
- Assure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings.
- Attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences.
- Preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity and variety of individual choice.
- Achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities.
- Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

Further, with respect to major Federal actions significantly affecting the quality of the human environment, Section 102 (2)(C) of the NEPA calls for preparation of a detailed statement on:

- (i) the environmental impact of the proposed action,
- (ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,
- (iii) alternatives to the proposed action,
- (iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and
- (v) any irreversible and ir retrievable commitments of resources which would be involved in the proposed action should it be implemented.

An environmental report accompanies each application for a construction permit or a full-power operating license. A public announcement of the availability of the report is made. Any comments by interested persons on the report are considered by the staff. In conducting the required NEPA review, the staff meets with the applicant to discuss items of information in the environmental report, to seek new information from the applicant that might be needed for an adequate assessment, and generally to ensure that the staff has a thorough understanding of the proposed project. In addition, the staff seeks information from other sources that will assist in the evaluation, and visits and inspects the project site and surrounding vicinity. Members of the staff may meet with State and local officials who are charged with protecting State and local interests. On the basis of all the foregoing and other such activities or inquiries as are deemed useful and appropriate, the staff makes an independent assessment of the considerations specified in Section 102(2)(C) of the NEPA and Appendix D of 10 CFR 50.

This evaluation leads to the publication of a draft environmental statement, prepared by the Directorate of Licensing, which is then circulated to Federal, State, and local governmental agencies for comment. A summary notice is published in the Federal Register of the availability

of the applicant's environmental report and the draft environmental statement. Interested persons are requested to comment on the proposed action and the draft statement.

After receipt and consideration of comments on the draft statement, the staff prepares a final environmental statement, which includes a discussion of questions and objections raised by the comments and the disposition thereof; a final benefit-cost analysis, which considers and balances the environmental effects of the facility and the alternatives available for reducing or avoiding adverse environmental effects with the environmental, economic, technical, and other benefits of the facility; and a conclusion as to whether--after the environmental, economic, technical, and other benefits are weighed against environmental costs and after available alternatives have been considered, the action called for, with respect to environmental issues, is the issuance or denial of the proposed permit or license, or its appropriate conditioning to protect environmental values. This final environmental statement and the safety evaluation report prepared by the staff are submitted to the Atomic Safety and Licensing Board for its consideration in reaching a decision on the application.

Single copies of this statement may be obtained by writing the Deputy Director for Reactor Projects, Directorate of Licensing, U. S. Atomic Energy Commission, Washington, D. C. 20545. Dr. S. Stanley Kirsliis is the AEC Environmental Project Manager for this statement. (301-443-6980).