



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

December 20, 2013

Mr. Michael Gallagher
Vice President, License Renewal Projects
Exelon Generation Company, LLC
200 Exelon Way
Kennett Square, PA 19348


SUBJECT: REQUESTS FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE
BRAIDWOOD NUCLEAR STATIONS LICENSE RENEWAL APPLICATION –
ENVIRONMENTAL AUDIT (TAC NOS. MF1832, MF1833, MF1792, AND
MF1793)

Dear Mr. Gallagher:

By letter, dated May 29, 2013, Exelon Generation Company, LLC (Exelon), submitted an application pursuant to Title 10 of the *Code of Federal Regulation* Part 54 (10 CFR Part 54), to renew the operating licenses for Byron and Braidwood Nuclear Stations, for review by the U.S. Nuclear Regulatory Commission (NRC) staff. The staff is reviewing the information contained in the license renewal application and has identified, in the enclosure, areas where additional information is needed to complete the review.

These requests for additional information were discussed with Ms. Nancy Ranek of your staff and a mutually agreeable date for the response is within 30 days from the date of this letter. If you have any questions, please contact Tam Tran, by telephone at 301-415-3617 or by e-mail at Tam.Tran@nrc.gov.

Sincerely,


for Tam Tran, Environmental Project Manager
Projects Branch 2
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-456 and 50-457

Enclosure:
Requests for Additional Information

cc w/encl: Listserv

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Sincerely,

/RA by David Drucker for/
Tam Tran, Environmental Project Manager
Projects Branch 2
Division of License Renewal
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DISTRIBUTION: See next page

ADAMS Accession Nos.: ML13354B937(LTR)

*concurring via email

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DATE	12/13/13	12/13/13	12/5/13	12/19/13	12/20/13

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Requests for Additional Information (RAI)

The RAIs below are derived from the audit needs list in the audit plan of November 19, 2013 (ADAMS Accession No. ML13270A126).

Historic and Cultural Resources

CR-5: Related to Exelon's environmental review procedures for land-disturbing activities, please provide:

- (a) A description of how inadvertent historical or cultural discoveries on the Braidwood Nuclear Station (Braidwood) site are considered by Exelon staff.
- (b) A list of Exelon's environmental procedures and a short description of their purpose.

CR-6: Related to the cultural resource management plan (Section 4.19 of the Environmental Report (ER)), provide a description of how a proposed activity on the Braidwood site is evaluated for cultural resource impacts by the Chemistry Manager (or designee).

CR-7: Provide a description of Braidwood's transmission line management plan, including: timing of activities; danger tree removal and other clearing; inspections and repair activities conducted by ground vehicles; standard operating procedures or guidelines for the applicant and any contractors; erosion control procedures; technician training programs; and any regulations that restrict maintenance activities (e.g., looking for activities that could affect depth of disturbance, if any disturbance is necessary along the corridor).

CR-8: Provide information on management of the land around less-developed areas of the plant site, especially near known historic and cultural resources or near unsurveyed areas.

CR-13: Does Exelon conduct cultural resource training at Braidwood? If so, provide any documentation of cultural resource training required for staff.

CR-19: Provide the breakdown (in percentages) of land use (i.e., industrial, agricultural, woodland, etc.) for the Braidwood site. Include leased land.

CR-20: Provide information regarding management of the land leased by Exelon associated with the Braidwood site to public or private entities – is Exelon managing this land, or is management left to the lessee with oversight by Exelon?

Socioeconomics

SOC-1: Provide updated permanent workforce data, preferably a residential distribution of permanent workforce by county in table format.

ENCLOSURE

SOC-2: Provide updated property tax information, similar to the data provided in Tables 2.7-2 and 2.7-3 of the ER. Include data for the years 2011 and 2012, if available.

SOC-3: Braidwood's last settlement agreement was signed on March 12, 2008 and covered tax years 2007 through 2011. What is the status of the settlement agreement for current and future years? Has Exelon entered into a new settlement agreement with Will County and other taxing districts to set the equalized assessed value (EAV) of Braidwood for tax years 2012 and beyond? Provide any relevant information.

SOC-4: In accordance with the 2008 settlement agreement, Exelon agreed to make payments in addition to taxes (PIATs) to specific tax recipients. Under the agreement, Exelon made PIAT payments of \$37,711,150 for tax year 2007 (paid in 2008) and \$3,643,566 for tax year 2008 (paid in 2009). Have there, or will there be, additional PIATs in the future? Were PIATs paid in 2010 and 2011 for tax years 2009 and 2010? If so, have there been any changes to the list of recipients or proportion of payments in ER Table 2.7-1? Provide any relevant information.

SOC-5: Exelon pays annual property taxes to a number of taxing entities within, and including, Will County. The Will County Treasurer collects Braidwood's property tax payment and disperses it to the various taxing entities to partially fund their respective operating budgets. Please provide additional information about tax payments to Will County (after tax triggers and not including PIAT payments) and the portion of the county tax monies allocated to "the forest preserve, township and forest districts, school districts, fire protection districts, park districts, library districts, and the county's cities and villages." Please provide a brief explanation of how these payments are allocated. Please provide a table showing the amount of distribution (or percentage) of the Braidwood property tax payment and each recipient's total revenue (or percent of total revenue). Note, the staff is seeking information to know how dependent some of these recipients may be on the revenue received from the Braidwood property tax payment via Will County.

SOC-6: In addition to property tax payments and PIAT information presented in Section 2.7 of the ER, describe any other major annual support payments, one-time payments, and other forms of non-tax compensation (if any) provided to local organizations, communities, and jurisdictions (e.g., county, municipality, townships, villages, incorporated places, and school districts) by Exelon.

SOC-7: Provide information about any anticipated changes in state and local tax laws, rates, and assessed property value or any other recent or anticipated tax payment adjustments that could result in notable future increases or decreases in property taxes or other payments.

Environmental Justice

EJ-1: Provide summaries of telephone interviews conducted by Exelon regarding local subsistence consumption behavior patterns. These interviews were located in Supplemental Report, Volume II, Table 1, during the environmental audit.

EJ-2: Provide information about current or past wildlife sampling and testing of game animals such as deer, squirrel, turkey, pheasant, duck, fish and other game birds and animals that may have been conducted in the vicinity of Braidwood. Wildlife sampling and testing may have been conducted before, during, and after plant construction and in the early days of plant operation, but was discontinued after determining that tissue samples consistently showed no significant or measurable radiological impact on the environment from plant operations.

Terrestrial Resources

TE-1: Provide the following references:

- (a) (ComEd 1973a) Commonwealth Edison Company. 1973. Braidwood Station Environmental Report - Volume I. July 1973 (Terrestrial Ecology sections only).
- (b) (ComEd 1973b) Commonwealth Edison Company. 1973. Braidwood Station Environmental Report - Volume II. July 1973 (Terrestrial Ecology sections only).
- (c) (ComEd 1985) Commonwealth Edison Company. 1985. Braidwood Station Units 1 and 2, Environmental Report – Operating License Stage. NRC Docket Nos. 50-456 and 457, Amendment 7. June 10, 1985 (Terrestrial Ecology sections only).

TE-3: Provide the following information:

- (a) The May 31, 2013, Wildlife at Work recertification application and enclosed Wildlife Management Plan that was discussed with the NRC staff for review during the site audit in response to TE-3 (Environmental Report, Section 2.4, Page 2 - 30, paragraph 4).
- (b) The October 18, 2013, letter from Margaret O’Gorman, Wildlife Habitat Council, to Brittney O’Conner, Exelon, that was discussed with the NRC staff for review during the site audit in response to TE-3 (Environmental Report, Section 2.4, Page 2 - 30, paragraph 4).
- (c) During the site audit, Exelon staff indicated that Exelon intends to continue to maintain its Wildlife at Work Certification throughout the proposed license renewal term. Please confirm that this statement is true.

Land Use

LU-1: The June 20, 2013, final rule that amended 10 CFR Part 51 revised the scope of the transmission line review for license renewal to be those "transmission lines that connect the nuclear power plant to the substation where electricity is fed into the regional power distribution system and transmission lines that supply power to the nuclear plant from the grid" (see 10 CFR Part 51, Appendix B to Subpart A, Table B-1, Footnote 4). Please provide the following information:

- (a) Identify the name and location of the substation that connects Braidwood to the regional grid.
- (b) Clarify which portions of the transmission lines described in Section 3.1.6 of the ER are in scope for the license renewal review according to the revised definition.
- (c) Confirm that the following statement regarding transmission lines that supply power to Braidwood remains true under the revised transmission line scope (ER Section 3.1.6, Page 3-14, Paragraph 2): "No separate transmission lines exist for the purpose of supplying power to Braidwood from the grid (off-site power)."

LU-2: Does Exelon intend to perform any construction or land-disturbing activities during the proposed license renewal period that would be unrelated to refurbishment activities?

Aquatic Ecology

AQ-2: Provide the following reference:

HDR Engineering, Inc. (HDR). 2008. Investigations to Determine Presence of State-Listed Species of Fish and Freshwater Mussels in the Kankakee River near the Braidwood Nuclear Station Warm-water Discharge Channel. October 2008.

AQ-3: Provide the following references:

- (a) Exelon's Incidental Take Permit regarding construction of the new discharge structure.
- (b) Exelon Nuclear (Exelon). 2010. Final Report: Unionid Relocation near the Braidwood Nuclear Station Kankakee River Discharge Location. September 2010.

AQ-4: Section 3.1.3 of the ER describes grills, trash rakes, and traveling screens within the lake screen house and the river screen house. Provide the following information:

- (a) Describe the mesh size of traveling screens at the lake screen house.
- (b) Describe the through-screen velocity at the traveling screens at the lake screen house.
- (c) Clarify whether the intake houses include any fish return structures. If fish return structures occur, discuss estimates of survival rates for fish that go through the return structure.
- (d) Describe the cleaning and maintenance procedures at the river screen house and discharge structure, including the frequency of dredging, physical cleaning, and other maintenance procedures.

Provide the following references:

- (e) Exelon Generation (Exelon). 2009. Letter from Exelon Generation (L. Coyle) to U.S. Army Corps of Engineers (K. Bliss) regarding Regional Permit #8 Utility Line Application to Dredge the River Inlet to the Intake Forebay of the Braidwood Generating Station's River Screen House on the Kankakee River. February 3, 2009.
- (f) U.S. Army Corps of Engineers (ACOE). 2009. Letter from U.S. Army Corps of Engineers (K. Wozniak) to Exelon Corporation Braidwood Nuclear Generating System (L. Coyle) regarding authorization to proceed with proposed dredging. June 11, 2009.
- (g) Exelon Generation Procedure CR-BR-120-4130, Braidwood Lake Microbiological Strategic Plan.
- (h) CW-2, Circulating Water Training Figure 39-3, Lake Screen House Sectional (June 13, 2013, Rev. 1).

AQ-6: Exelon has conducted biological monitoring in the Kankakee River for over 20 years. Please provide tables that describe the number of fish caught by species at each monitoring location and by sampling gear for each year that monitoring has occurred. For 2012 monitoring information, provide Tables 3-3 and 3-4 from the HDR Engineering report.

Additionally, provide the following references:

- (a) EA Science and Technology (EA). 1990. Results of entrainment and impingement studies conducted at the Braidwood Nuclear Station and the adjacent Kankakee River.
- (b) EA Science and Technology (EA). 1991. Results of a three month impingement study at the Braidwood Nuclear Station, April through June 1991.
- (c) Larimore RW, Peterson JT. 1989. Kankakee River Fishes of the Braidwood Station Aquatic Monitoring Area, August 1988. Illinois Natural History Survey Aquatic Biology Technical Report. January 1989.
- (d) HDR Engineering, Inc. (HDR). 2013. Braidwood Station Kankakee River Fish Monitoring Program, 2012.

AQ-10: Provide the following references:

- (a) Commonwealth Edison Company. 1973. Braidwood Station Environmental Report - Volume II. Aquatic Ecology Sections. July 1973.
- (b) Larimore, R.W. 1989. Kankakee River Fishes of the Braidwood Station Aquatic Monitoring Area, August 1989. Illinois Natural History Survey Aquatic Biology Technical Report. January 1989.
- (c) EA Engineering, Science, and Technology (EA). 2012. Braidwood Station 2011 Benthos Monitoring and Historical Fish and Benthos Comparisons. July 2012.
- (d) Exelon Nuclear (Exelon). 2009. Standard Operating Procedures for Braidwood Station's Fisheries Monitoring Program in the Kankakee River and Horse Creek. July 2009.
- (e) Exelon Nuclear (Exelon). 2009. Final Report: Characterization of Unionid Communities near the Braidwood Nuclear Station Kankakee River Discharge Location. January 2009.

- (f) Exelon Nuclear (Exelon). 2009. Application for an Incidental Take Permit for Threatened or Endangered Species and Conservation Plan. May 11, 2009.
- (g) Exelon Nuclear (Exelon). 2011. Braidwood Station Kankakee River Fish Monitoring Program, 2010.
- (h) (Exelon Nuclear 2011b) Exelon Nuclear. 2011. Braidwood Station Kankakee River Fish Monitoring Program, 2010.
- (i) Illinois Department of Natural Resources (IDNR). 2008. Status of Fish Communities and Sport Fishery in the Kankakee River and Tributary Streams: 2005 Basin Survey. Fisheries Region II, Streams Program. April 2008.
- (j) Illinois Department of Natural Resources (IDNR). 2000. Permit No NE2000125 – proposed operation and maintenance of the Braidwood Nuclear Station cooling pond dam, Will County. Office of Water Resources. December 20, 2000.

Groundwater

GW-4: Discuss what impact on groundwater flow, either recharge to or discharge from the cooling pond has on aquifers around the sides of the pond.

GW-7: Provide the following references:

- (a) (Exelon Generation 2011) Exelon Generation Company, LLC. 2011. Hydrogeologic Investigation Report - Fleetwide Assessment - Braidwood Generating Station, Braceville, IL, Revision 1. Braceville, IL. December 2011.
- (b) (IEPA 2013a) Illinois Environmental Protection Agency. 2013. Re: Exelon Braidwood Station NPDES Permit Number IL0048321 VB 1 Completion Report. Letter to J. B. Fewell, and M. E. Kanavos. March 28, 2013.
- (c) (IEPA 2013b) Illinois Environmental Protection Agency. 2013. Re: Exelon Braidwood Station NPDES Permit Number IL0048321 VB 2/3 and Pond Area Completion Report. Letter to J. B. Fewell, and M. E. Kanavos. March 28, 2013.
- (d) (IEPA 2013c) Illinois Environmental Protection Agency. 2013. Re: Exelon Braidwood Station NPDES Permit Number IL0048321 VB 4 Completion Report. Letter to J. B. Fewell, and M. E. Kanavos. March 28, 2013.
- (e) Letter to IEPA, "Final Plan Completion Report for the VB-1, VB-2/3, and Pond, and VB-4 Areas", dated January 16, 2013.
- (f) Plan Completion Report for the VB-1 Area, Braidwood Generation Station, Braceville, Illinois, October 2012.
- (g) Plan Completion Report for the VB-2/3 and Pond Area, Braidwood Generation Station, Braceville, Illinois, December 2012.
- (h) Plan Completion Report for the VB-4 Area, Braidwood Generation Station, Braceville, Illinois, October 2011.
- (i) Plan Completion Report for the VB-6 Area, Braidwood Generation Station, Braceville, Illinois, August 2009.
- (j) Plan Completion Report for the VB-7 Area, Braidwood Generation Station, Braceville, Illinois, February 2010.

Surface Water

SW-1: Provide the agreement with the Illinois Environmental Protection Agency (IEPA) limiting Braidwood's consumptive use of surface water.

SW-2: Provide the reference, "Braidwood Storm Water Pollution Prevention Plan."

SW-3: Provide a status summary of issuance of Braidwood's National Pollutant Discharge Elimination System (NPDES) permit that expired September 1, 2000.

SW-4: Provide a large-scale map or maps depicting NPDES outfall locations.

SW-5: As discussed with applicant's staff during the site audit, provide a summary of available historical and current water quality data for the cooling pond (including temperature), include average ambient values and maximum observed values and date of occurrence, if available. Provide a data set that covers the last 10 years.

SW-6: Provide all non-radiological monitoring reports from the last 5 years, including NPDES Discharge Monitoring Reports and surface water withdrawal records/reports.

SW-7: Provide copies of any Notices of Violation (NOVs), nonconformance notifications, or related infractions received from regulatory agencies associated with NPDES permitted discharges, sanitary sewage systems, groundwater or soil contamination, including spills, leaks, and other inadvertent releases of fuel solvents, chemicals, or radionuclides (covering the past 5 years). Include correspondence of self-reported violations to responsible agencies.

SW-8: In light of excessive cooling pond temperatures experienced during July 2012, provide a discussion and any relevant information as to whether a warming trend has been observed in the cooling pond during the period of plant operations. Provide any study(s) or data that support the conclusions reached (e.g., mean annual, seasonal, and/or monthly water temperature trend for the period of record). Also, describe any measures that Exelon has taken or plans to take to mitigate the impact of high cooling pond temperatures on plant operations.

SW-9: Provide the application for Clean Water Act Section 401 Certification referenced in Exelon's letter to the IEPA dated May 18, 2012.

SW-13: As observed and discussed with Exelon staff during the site audit, provide a brief description of the plant water treatment upgrades being implemented at the lake screen house and how they relate to Braidwood's Lake Chemistry Strategic Plan. Specifically, address whether and how the quality of water in the cooling pond would be modified as a result of the upgrades. Identify the approximate start date(s) of the construction and when the project(s) is scheduled for completion and commissioning to support plant operations.

Meteorology, Air Quality, and Noise

MET-1: Provide the copy of the Braidwood Station Units 1 and 2 (Braidwood) Federally Enforceable State Operating Permit for stationary emission sources provided at the site audit. Indicate whether correspondence more recent than October 29, 2007, is available regarding the status of this permit, and include as applicable.

MET-2: Provide copies of Braidwood's annual emission reports for the most recent 5 years.

MET-3: Identify combustion sources of hazardous air pollutants (HAPs) at Braidwood and amount released for the most recent 5 years.

MET-4: Provide details of Braidwood's stationary emission sources including, as applicable, operating hours per year (last 5 years), fuel consumption and rate, horsepower ratings, and capacity.

MET-6: Are there expected upgrade/replacement activities for equipment/operation that could increase or decrease air emissions over the license renewal period (period of extended operation)?

MET-7: Provide the information provided at the site audit addressing site-wide emission inventory data (annual) for greenhouse gases (GHG) for the most recent 5 years. Also, include available information on emissions from mobile sources (commuters, visitors, delivery vehicles, etc.)

MET-8: Provide a description of the primary meteorological tower. Also, describe the backup meteorological tower if one is present. Include a description of instrumentation installed and height of installation for each instrument. Describe any changes in land use around the tower sites that have occurred since installation that may affect any meteorological sensor performance.

MET-9: Provide the following meteorological information from the data recorded at Braidwood's meteorological facility. The meteorological data should include the most recent 5 years for which the data are available:

- (a) mean monthly and annual temperatures
- (b) mean monthly precipitation and annual precipitation
- (c) Provide seasonal and annual summary wind statistics in the form of wind direction and speed frequency distribution tables and wind roses. Discuss predominant wind direction and speed by season and annual average, local terrain features affecting wind direction and speed, and provide a value for annual average wind speed.
- (d) Provide seasonal stability class statistics determined from the Braidwood meteorological tower in tabular form for the last 5 years.

MET-10: Provide the information provided at the site audit addressing:

- (a) Has an atmospheric warming trend been observed in the vicinity of Braidwood during the period of plant operations? Provide data to support the conclusions reached (e.g., mean daily maximum annual temperatures, mean daily minimum

annual temperatures, or mean annual temperature for the available period of record from Braidwood's meteorological station).

- (b) Has a river warming trend been observed in the Kankakee River during the period of plant operations? Provide any study(s) or data that support the conclusions reached (e.g., mean annual, seasonal, and/or monthly water temperature trend for the period of record).

MET-12: Provide information about any noise complaints for the most recent 5 years resulting from plant operation.

MET-15: Identify nearby noise-sensitive receptors (e.g., residences, school, nursing home, childcare facility) and distance to those receptors.

Alternatives

ALT-1: Provide a copy of the calculation packages referenced in Section 7 of the ER as Tetra Tech 2012d, Air Emissions and Solid Waste from Coal- and Gas-Fired Alternatives for Braidwood Units 1 and 3; Chapter 7 Energy Alternatives Calculation Package, September 19, 2012; and Tetra Tech 2012e, Employment and Land Requirements for Alternatives to Byron Units 1 and 2 and Braidwood Units 1 and 2, LR Chapter 7 Energy Alternatives Calculation Package, September 18, 2012.

Refurbishment

R-1: Clarify the factors influencing whether Unit 2 steam generator replacement would occur and whether this hypothetical activity should be considered refurbishment. Also briefly describe contributing factors discussed during the audit (i.e., water chemistry program and improved design features of Unit 2 steam generator).

R-2: In support of NRC's analysis of the impacts of Unit 2 steam generator replacement, clarify:

- (a) How many temporary or permanent buildings will be constructed to support steam generator replacement activities?
- (b) What is the estimated footprint (ft²) of new buildings to be constructed? What is the estimated depth of excavation?