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STATE OF ILLINOIS
Pollution Control Board

ILLINOIS POLLUTION CONTROL BOARD
September 1, 2015

EXELON GENERATION LLC (DRESDEN)
NUCLEAR GENERATION STATION),)
)
Petitioner,)
)
v.)
)
ILLINOIS ENVIRONMENTAL)
PROTECTON AGENCY,)
)
Respondent.)

PCB 15-204
(Thermal Demonstration)



ORIGINAL

HEARING OFFICER ORDER

In an effort to assist the Board in its determination of the above-captioned matter, petitioner is directed to file written responses addressing the twenty-nine questions appearing in the Attachment to this order on or before October 16, 2015.

IT IS SO ORDERED.

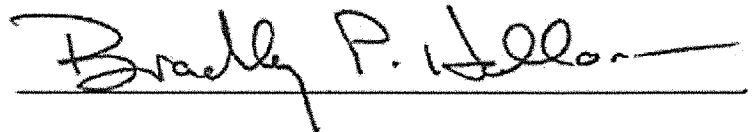
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CERTIFICATE OF SERVICE

It is hereby certified that true copies of the foregoing order were mailed, first class, on September 1, 2015, to each of the persons on the attached service list.

It is hereby certified that a true copy of the foregoing order was hand delivered to the following on September 1, 2015:

John T. Therriault
Illinois Pollution Control Board
James R. Thompson Center
100 W. Randolph St., Ste. 11-500
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A handwritten signature in black ink that reads "Bradley P. Halloran". The signature is written in a cursive style and is positioned above a solid horizontal line.

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Questions for Petitioner

35 Ill. Adm. Code 106.1130(a)(1): Generating capacity

The petition states that Dresden Units 2 and 3 “have a combined maximum generating capacity of 2006 megawatts.” Pet. at 6. Appendix D separately states that the two reactors are “capable of generating 2,006 net megawatts” and have “a combined maximum generating capacity of 1,824 megawatts electric.” Exh. 1, App. D at D-1.

1. Please clarify the values for the generating capacity.

35 Ill. Adm. Code 106.1130(b)(2): Summary information on temperature of discharge to receiving waters in narrative form

Table D-1 presents the frequency distribution of hourly intake (2003-2014) and discharge (1998-2014) temperatures for the period of June 15 through September 30.

2. Please provide “[s]ummary information on temperature of discharge to receiving waters in narrative form” (35 Ill. Adm. Code 106.1130(b)(2)) and difference between intake and discharge temperatures.
3. Please explain the reason for the gap in data noted by EA Engineering, Science, and Technology (EA) from July 2003 to November 2005. Exh. 1, App. D at D-6, Table D-1, Table D-2.

35 Ill. Adm. Code 106.1130(c): A summary of compliance or non-compliance with thermal requirements at the facility in the past five years

Exelon states that Dresden Station has been operating under alternate thermal limits granted by the Board in PCB 79-134. Pet. at 13; *see In the Matter of 410(c) Petition for Dresden Nuclear Generating Station*, PCB 79-134 (July 9, 1981). Exelon states that, “[d]uring the past 5 years, Dresden Station has operated in compliance with the thermal discharge limits in its NPDES [permit], with the exception of 2011 and 2012, when Dresden Station was granted provisional variances that allowed the Plant to exceed its NPDES thermal limits.” Pet. at 11.

4. Please indicate whether Dresden Station received any violation notices related to discharge temperature during the last 5 years.
5. Please provide a copy of the provisional variances cited in the petition (Pet. at 11) and any extensions of those variances.
6. Please indicate whether Exelon was required to perform any studies or provide reports to the Illinois Environmental Protection Agency or Illinois Department of Natural Resources as a condition of receiving the provisional variances. If so, please provide copies for the record.

IEPA states that, “[u]nder the proposed alternative thermal limits, the Dresden Station discharge would only be authorized to exceed 90°F for 259 hours during indirect open cycling.” Rec. at 10. Table D-3 presents the number of hours with discharge temperatures greater than 90°F by month.

7. Please calculate the total number of hours with discharge temperatures greater than 90°F from June 15 to September 30 for each year from 1998-2014.
8. Please calculate the number of hours over the maximum number of hours provided by PCB 79-134 for the same time periods.
9. Of the hours with discharge temperature greater than 90°F in Table D-3, please indicate how many of those hours discharge temperatures were above 93°F by year.
10. Based on Table D-3, the number of hours with discharge temperature greater than 90°F has generally decreased from 1998 to 2014. To what would Exelon attribute that general decrease?

35 Ill. Adm. Code 106.1130(d): The detailed plan of study submitted to the Agency pursuant to Section 106.1120(a) and the Agency’s written response pursuant to Section 106.1120(f)

11. Please indicate whether United States Environmental Protection Agency Region 5 participated in developing Exelon’s plan of study or commented on the 316(a) demonstration for Dresden Station submitted with the instant petition. If so, please describe and provide copies of USEPA’s response.

35 Ill. Adm. Code 106.1130(e)(3): Summaries of physical, chemical, biological and technical data supporting the demonstration, along with a discussion of the data

One of the conditions on relief granted in PCB 79-134 was that:

Commonwealth Edison shall conduct monitoring studies in conformity with Edison’s two documents submitted to the Agency on May 23, 1980 entitled “Proposed Hydrothermal Study Plan for Summer 1980” and “Proposed 1980 Environmental Program” as modified by Agency suggestions as set forth in its Recommendation submitted on May 26, 1981. In the Matter of 410(c) Petition for Dresden Nuclear Generating Station, PCB 79-134, slip op. at 4 (July 9, 1981) (Condition 2).

12. Please provide results of the monitoring studies required by this condition or explain whether and how the studies were incorporated into the current petition

35 Ill. Adm. Code 106.1130(e)(4): criteria or methodology used to assess whether a balanced indigenous community of shellfish, fish and wildlife will be maintained in the receiving waters and the protection of threatened and endangered species

Exelon's demonstration states that "[f]ederally-protected freshwater mussels are not known to currently exist within the vicinity of the DNS" but refers to the sheepnose, snuffbox, and spectaclecase mussels. Exh. 1, App. A at A-32, App. H at H-2. The U.S. Fish and Wildlife Service identifies the endangered Scaleshell mussel (*Leptodea leptodon*) in Grundy County. The 2014 mussel survey did not encounter this species. Exh. 1, App. H at Figure H-3 (Survey Results).

13. Please address whether any other information indicates that this species is now known to exist within the vicinity of the Dresden Station.

The thermal demonstration states that threatened and endangered fish and mussel species were collected in the vicinity of the Dresden Station: river redhorse, greater redhorse, pallid shiner, western sand darter, banded killifish, purple wartyback, and blank sandshell. Exh. 1, App. A at A-34, App. H at H-4. The Illinois Department of Natural Resources' EcoCAT tool indicated other endangered and threatened species present in the vicinity of the Dresden discharge. Agency Recommendation at 12. Under 17 Ill. Adm. Code 1075.40, activity authorized by a State agency that may affect a listed species or its essential habitat must be evaluated through a consultation with IDNR. IEPA's recommendation states that "IDNR evaluated the submittal and determined that impacts to the protected resources are unlikely. IDNR terminated the consultation on May 5, 2015." Agency Recommendation at 12-13.

14. Please clarify whether the submittal evaluated by IDNR included the Demonstration (Exh. 1) and its appendices, particularly Appendices A and H.

35 Ill. Adm. Code 106.1130(g)(1): alternative effluent limitation

NPDES Permit IL0002224 establishes a temperature parameter and includes Special Conditions 3 and 11 addressing for temperature for 3 outfalls: Outfall 001 (Unit 1 House Service Water to the Illinois River); Outfall 002 (Cooling Pond Blowdown to the Illinois River); and Outfall 004 (Cooling Pond Siphon Discharge to the Kankakee River). Agency Recommendation, Att. 1. Special Condition 3 incorporates the alternative thermal effluent limitation only for "cooling pond blowdown", which is Outfall 002. Special Condition 18 requiring an updated 316(a) demonstration refers to "the thermal discharge from its Dresden Nuclear Power Station" and "the seasonal alternate effluent limitations granted under the original demonstration". Special Condition 18 does not specifically identify that it applies to a particular outfall.

15. Please clarify whether the requested alternative thermal effluent limitation applies only to Outfall 002 Cooling Pond Blowdown.

Exelon explains that, under the relief granted in PCB 79-134, "[c]ompliance with the limits was to be measured at the end of the discharge pipe from the cooling pond to the River, not at the edge of a mixing zone." Pet. at 13. The Board's order in PCB 79-134 states that "[t]he proposed amendment [by Commonwealth Edison to Rule 203(i)(3) and (4), now codified as 35 Ill. Adm. Code 302.211(d) and (e)] does not include a mixing zone. . . ." PCB 79-134, slip. op at 1 (July 9, 1981). Similarly, Exelon's demonstration also states that "[c]ompliance with the ATL

[alternative thermal effluent limit] is measured end of pipe discharge point from DNS to the River.” Exh. 1, App. D at D-5.

The NPDES Permit IL0002224 Special Condition 3 states that “[f]or outfalls 001 and 002) [t]his facility meets the criteria for establishment of a formal mixing zone for thermal discharges pursuant to 35 IAC 302.102. Water quality standards for temperature listed in the table below must be met at every point outside of the mixing zone from the dates October 1 through June 14.” Agency Recommendation, Att. 1. The permit does not specifically state that a mixing zone applies from June 15 through September 30.

However, from June 15 through September 30, IEPA’s recommendation refers to a mixing zone in the context of the proposed alternative thermal effluent limits and the Hydrothermal Analysis (Exh. 1, App. D). IEPA states that “[w]hen the [Dresden] facility is operated in the indirect open cycle mode, the facility cannot always meet the water quality standards at the edge of the mixing zone and therefore requests alternative thermal limitations.” Rec. at 2-3. Referring to the Biothermal Assessment – Predictive Demonstration (Exh. 1, App. B), IEPA’s Recommendation refers to temperatures at the edge of the mixing zone. Rec. at 6, 7, 9. For the “Extreme High Temperature Scenario”, the recommendation states that “the maximum temperature modeled at the end of the mixing zone was 93.2°F. . . . Of the 12 RIS analyzed under the Extreme High Temperature Scenario, modeling suggests that bluegill, freshwater drum, black crappie, golden redhorse, and white sucker would temporarily be exposed to temperatures outside the mixing zone that exceed the upper zero growth and/or avoidance temperatures for these species.” Rec. at 9.

16. Please explain the relevance of a mixing zone to the 316(a) demonstration for compliance with an effluent limit which is to be determined at the Dresden Station discharge point.
17. Please clarify whether, from June 15 to September 30, compliance with the alternative thermal effluent limits would be measured at the Dresden Station’s discharge point into the Illinois River instead of being measured the edge of a mixing zone.
18. Please clarify whether “[r]eceiving water temperatures outside any (State established) mixing zone will not be in excess of the upper temperature limits for survival, growth, and reproduction, as applicable, of any RIS occurring in the receiving water.” Draft 316(a) Technical Guidance Manual (1977) at 71.

USEPA “Interagency 316(a) Technical Guidance Manual and Guide for Thermal Effects Sections of Nuclear Facilities Environmental Impact Statements (DRAFT)”, May 1, 1977 (316(a) Manual)

Section 3.3.1: Phytoplankton

For phytoplankton, Section 3.3.1.3 of the 316(a) Manual states that,

[a]t a minimum, the data collected should include:

1. The standing crops of organisms per volume of water;
2. Identification of numerically dominant taxa (*i.e.*, 5% or more by number) and nuisance organisms; and
3. Delineation of the euphotic zone, preferably with a submersible photometer. 316(a) Manual at 20.

Exhibit 1 cites to phytoplankton studies, surveys, and observations made during fish and benthic monitoring. Pet. Exh. 1 at 19-20; App. A at A-26; App. C at C-5 - C-6; App. E at E-4 - E-5. Exhibit 1 states that EA found that the data address the criteria for phytoplankton under Section 3.3.1.1 in the 316(a) Manual in order for a demonstration to be judged successful. Exh. 1. at 19-20.

19. Please clarify whether the data collected included the Section 3.3.1.3 items and whether such data was used to arrive at the conclusions EA made regarding the Section 3.3.1.1 criteria on page 20 of Exhibit 1.

Section 3.3.2: Zooplankton and Meroplankton

Section 3.3.2.1 includes three decision criteria for zooplankton and meroplankton. The third criterion states that, “[t]he thermal plume does not constitute a lethal barrier to the free movement (drift) of zooplankton and meroplankton.” 316(a) Manual at 20. Exhibit 1 addresses the first two criteria under Section 3.3.2.1. Exh. 1. at 23.

20. Please address the third criterion or point to the section(s) of the petition in which it is already addressed.

Section 3.3.4: Shellfish/Macroinvertebrates

Exhibit 1 states that, “[o]f the transects located immediately downstream of the discharge along the left descending bank, the transect located within the warmest portion of the plume contained the greatest number of mussels.” Exh. 1 at 26. The 2014 mussel survey states that “[t]he largest concentration and highest densities of mussels occurred along the right descending bank opposite and downstream of the DNS discharge, near the typical path of the DNS thermal plume.” Exh. 1, App. H at H-8.

21. Please clarify whether the transects along the descending bank referred to above are denoted as Group C or F in Figure H-4 of App. H.

22. Please clarify whether the transect with the largest concentration and highest densities of mussels occurred in the warmest part of the plume.

Both Exelon and IEPA note factors mitigating effects of exposure to thermal discharges: fluctuation from day to night in discharge temperature, short-term nature of exposure, capability of organisms to avoid stressful temperatures, and availability of thermal refuge. Exh. 1, App. B at B-26 - B-35; Agency Recommendation at 7, 9.

23. Please identify and discuss mitigating factors applicable to mussels that are not able to seek thermal refuge.

Section 3.5.2: Development of Representative Important Species Rationale

Under the development of a Representative Important Species (RIS) rationale, the 316(a) Manual states that, “[o]fficially listed ‘threatened or endangered species’ are automatically ‘important.’” 316(a) Manual at 36. Threatened and endangered fish and mussel species were collected in the vicinity of the Dresden Station: river redhorse, greater redhorse, pallid shiner, western sand darter, banded killifish, purple wartyback, and blank sandshell. IDNR’s EcoCAT tool indicated other endangered and threatened species present in the vicinity of Dresden Station. Exh. 1, App. A at A-34, App. H at H-4, Agency Recommendation at 12.

The RIS did not include threatened or endangered species. For the threatened river redhorse and endangered greater redhorse, Exelon’s demonstration states that “[g]olden redhorse (*Moxostoma erythrurum*) was selected as a surrogate RIS because the incidental occurrence of both the state-listed redhorse species precluded evaluation of thermal effects on these species.” Exh. 1, App. A at A-34.

The Predictive Demonstration states that lower trophic levels including benthic macroinvertebrates “were not selected as RIS because of a general lack of thermal endpoint data and historical § 316(a) studies have shown only localized thermal effects on lower trophic levels that have not resulted in adverse harm.” Exh. 1, App. B at B-7, citing Duke/Fluor Daniel, North Oak Creek Power Plant 316(a) Demonstration (1992). The Predictive Demonstration further states that “[o]nly fish species were selected as RIS for the DNS thermal evaluation . . . because their overall wellbeing shows that the lower trophic levels are supporting the trophic levels occupied by the RIS.” Exh. 1, App. B at B-7.

24. Please clarify whether the RIS selected are representative of all the listed threatened and endangered species known to be present in the vicinity of the DNS discharge.

25. For these threatened and endangered species, please address any adverse effects that may result from the requested alternative thermal effluent limitation and clarify how the thermal demonstration shows that the alternative limitation will assure protection and propagation of a balanced, indigenous population.

Section 3.5.3: Engineering and Hydrological Data for Type II Demonstration

The petition states that, during indirect open cycle mode from June 15 to September 30, “flow regulating gates divert all cooling water from the cold canal to the Illinois River via the discharge canal.” Pet. at 9-10. A previous variance describes a “diffuser pipe” and a “slot-jet discharge structure.” See Commonwealth Edison Company v. Environmental Protection Agency, PCB 73-359, slip op. at 4 (Jan. 17, 1974).

26. Please specifically describe the current outfall configuration where the discharge canal meets the Illinois River.

Exelon's demonstration states that "DO concentrations in the discharge canal and thermally-influenced locations in the Dresden Pool averaged 0.5 to 1.4 ppm lower than outside that influence of the discharge. . . . DNS [Dresden Nuclear Station] operations have not been shown to impact dissolved oxygen levels in the upper Illinois River Basin." Exh. 1, App. A at A-10. Referring to the Dresden Station discharge location, IEPA's Recommendation states that "[t]he Illinois River, Waterbody Segment, D-10, is listed on the draft 2014 Illinois Integrated Water Quality Report and Section 303(d) List. . . . Aquatic life . . . uses are fully supported. This segment of the Illinois River is subject to enhanced dissolved oxygen standards." Rec. at 2. Stream segments for enhanced dissolved oxygen protection are listed at 35 Ill. Adm. Code 302.Appendix D, and the only segment identified in the Illinois River is Segment 236.

27. For Illinois River Segment 236, please elaborate on EA's conclusion that "DNS operations have not been shown to impact dissolved oxygen levels in the upper Illinois River Basin."

28. Please also address the impact of the proposed alternative thermal effluent limitation in Segment 236 under the enhanced dissolved oxygen standards.

For the current alternative thermal effluent limitation, testimony stated that "[i]ndirect open cycle operation benefits water quality in the Illinois River by . . . adding dissolved oxygen. . . ." In the Matter of 410(c) Petition for Dresden Nuclear Generating Station, PCB 79-134, slip op. at 3 (July 9, 1981).

29. Please comment on the applicability of this earlier testimony regarding dissolved oxygen to the pending petition.