

**BEFORE THE ILLINOIS POLLUTION CONTROL BOARD**

In The Matter of: )  
304.141(c) PETITION FOR ) **AS**  
QUAD CITIES NUCLEAR ) **PCB 3-001**  
GENERATING STATION ) (Alternate Thermal Standard \_\_\_)

**NOTICE OF FILING**

To: Office of the Clerk of the Illinois Pollution Control Board  
James R. Thompson Center  
100 West Randolph Street, Suite 11-500  
Chicago, Illinois 60601

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**SEP 20 2012**

**STATE OF ILLINOIS  
Pollution Control Board**

PLEASE TAKE NOTICE that I have today filed with the Clerk of the Pollution Control Board "Joint Motion for Procedural Order Regarding Conduct of Proceedings to Seek Approval of Alternate Thermal Standards" of Exelon Generation LLC and the Illinois Environmental Protection Agency and "Petition to Approve of Alternate Thermal Standards" of Exelon Generation LLC, copies of which are attached hereto and herewith served upon you.

Dated: September 20, 2012

EXELON GENERATION LLC

By: AC Bill

One of the attorneys for  
Exelon Generation LLC

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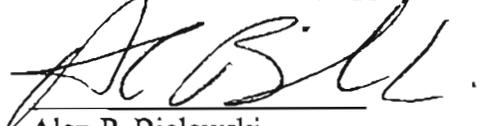
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GENERATING STATION ) (Alternate Thermal Standard \_\_\_)

**APPEARANCE**

I hereby file my appearance in this proceeding, on behalf of Exelon Generation LLC.

  
Alan P. Bielawski

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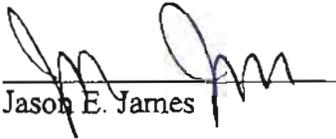
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**APPEARANCE**

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\_\_\_\_\_  
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STATE OF ILLINOIS  
Pollution Control Board

**JOINT MOTION FOR PROCEDURAL ORDER REGARDING CONDUCT OF  
PROCEEDINGS TO SEEK  
APPROVAL OF ALTERNATE THERMAL STANDARDS**

The Illinois Environmental Protection Agency ("Illinois EPA") and Exelon Generation LLC ("Exelon") jointly move the Illinois Pollution Control Board ("Board") for the entry of an Order approving the proposed procedures for determining alternative thermal standards applied to discharges from Exelon's Quad Cities Nuclear Generating Station ("Quad Cities Station" or the "Plant"), as authorized by Section 316(a) of the Clean Water Act and 35 Ill. Adm. Code § 304.141(c). In support, the parties state as follows:

1. Concurrently with this Joint Motion, Exelon is filing a Petition to Approve Alternate Thermal Standards for Quad Cities Station ("Petition"), seeking a determination by the Board, pursuant to the Board's authority under 35 Ill. Adm. Code § 304.141(c), that alternate thermal standards should apply to discharges from the Plant in lieu of generally applicable thermal standards.

2. Section 304.141(c) provides as follows:

The standards of this Chapter shall apply to thermal discharges unless, after public notice and an opportunity for public hearing, in accordance with Section 316 of the CWA and applicable federal regulations, the Administrator and the Board have determined that different standards shall apply to a particular thermal discharge.

Thus, § 304.141(c) empowers the Board to grant relief from generally applicable thermal standards to a discharger, if the discharger demonstrates that it meets the requirements of Section 316 of the Clean Water Act and applicable federal regulations for the issuance of alternate

thermal standards. Section 316(a) of the Clean Water Act provides that a discharger is entitled to alternate thermal standards that the discharger demonstrates will “assure the protection and propagation of a balanced indigenous population of shellfish, fish and wildlife in and on” the waters receiving the discharge. According to USEPA, alternate thermal standards granted under Section 316(a) are tied to the NPDES Permit for the facility, and, therefore, the alternative thermal standards are subject to review and renewal with each NPDES permit renewal.

3. Section 304.141(c) does not specify the procedures that govern the conduct of proceedings before the Board to obtain alternate thermal standards under Section 316(a). Nor are the provisions that govern other Board regulatory relief mechanisms (e.g., variances or adjusted standards) or regulatory proceedings that involve thermal discharges (e.g., heated effluent or artificial cooling lake demonstrations) directly applicable to the proceedings under § 304.141(c) and § 316(a). More specifically, in contrast to relief authorized under § 316(a), the Board’s variance provisions are intended to provide only temporary relief while the applicant implements measures to attain compliance with generally applicable requirements. Likewise, in contrast to USEPA’s interpretation that 316(a) standards require reevaluation with each NPDES permit renewal, the Board’s adjusted standard and heated effluent and artificial cooling lake regulations provide for one-time determinations that are not subject to periodic review.

4. For these reasons, it will be necessary for the Board to identify the procedures that will govern the proceedings before the Board to consider Exelon’s Petition. Exelon and Illinois EPA submit that the Board’s General Rules (35 Ill. Adm. Code Part 101) provide procedural rules that are sufficient and compatible with proceedings under § 304.141(c). Exelon and Illinois EPA request that the Board order that parties to this proceeding be required to comply with the following procedural rules: (1) filing and service of petitions (Part 101 Subpart

C); (2) designation of Illinois EPA as a party in interest (§ 101.404); (3) notice to the public of opportunity for a hearing (§ 101.602); and (4) the conduct of hearings, if hearings are conducted (Subpart F).

WHEREFORE, Illinois EPA and Exelon respectfully request that the Board enter an order specifying that the procedural rules set forth in paragraph 4 above shall be to be utilized for conducting the proceedings before the Board to review and consider Exelon's Petition.

Respectfully submitted,

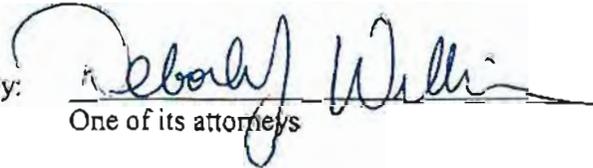
EXELON GENERATION LLC

Dated: September 20, 2012

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One of its attorneys

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THIS FILING SUBMITTED ON RECYCLED PAPER

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SEP 20 2012

In The Matter of: )  
304.141(c) PETITION FOR )  
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GENERATING STATION )

AS 13-001  
PCB STATE OF ILLINOIS  
(Alternate Thermal Standard )  
Pollution Control Board

**PETITION TO APPROVE ALTERNATE THERMAL STANDARDS**

Pursuant to 35 Ill. Adm. Code § 304.141(c), Section 316(a) of the Clean Water Act and the general authority granted the Illinois Pollution Control Board ("Board") by the Illinois Environmental Protection Act to conduct proceedings to implement the Board's rules, Exelon Generation LLC ("Exelon") requests that the Board determine that alternative thermal standards should apply to discharges from Exelon's Quad Cities Nuclear Generating Station ("Quad Cities Station" or the "Plant") in lieu of those imposed by 35 Ill. Adm. Code §§ 302.102(b)(8), 302.211(e) and 303.341. Specifically, Exelon requests that the Board order that the alternate standards requested herein should apply to the thermal discharges from the Quad Cities Station to the Mississippi River.

**I. INTRODUCTION**

**A. Regulatory Basis for Petition**

Section 316(a) of the Clean Water Act grants a discharger of heated effluent the right to obtain specific effluent limits for its discharge that differ from generally applicable limits that would otherwise be imposed. Specifically, Section 316(a) provides:

With respect to any point source otherwise subject to the provisions of Section 301 or Section 306 of the [Clean Water] Act, whenever the owner or operator of any such source, after opportunity for public hearing, can demonstrate to the satisfaction of the Administrator (or, if appropriate, the State) that any effluent limitation proposed for the control of the thermal component of any discharge

from any such source will require effluent limitations more stringent than necessary to assure the protection and propagation of a balanced, indigenous population of shellfish, fish and wildlife in and on the body of water into which the discharge is to be made, the Administrator (or, if appropriate, the State) may impose an effluent limitation under such section on such plant, with respect to the thermal component of such discharge (taking into account the interaction with other pollutants), that will assure the protection and propagation of a balanced indigenous population of shellfish, fish and wildlife in and on that body of water.

In Illinois, Section 316(a) is implemented through 35 Ill. Adm. Code

§ 304.141(c), which authorizes the Board to determine that specific thermal standards should apply to a particular discharger in lieu of those imposed by the Board's generally applicable rules. Specifically, § 304.141(c) provides as follows:

The standards of this Chapter shall apply to thermal discharges unless, after public notice and an opportunity for public hearing, in accordance with Section 316 of the CWA and applicable federal regulations, the Administrator and the Board have determined that different standards shall apply to a particular thermal discharge.

As explained in this Petition, Exelon has prepared a demonstration pursuant to Section 316(a) which shows that certain thermal limits that apply to the Quad Cities Station are more stringent than necessary to assure the protection and propagation of a balanced, indigenous population of shellfish, fish and wildlife ("BIP") in the receiving waters of the Plant's discharge (Pool 14 of the Mississippi River). The demonstration also shows that the alternate thermal limits proposed by Exelon for the Quad Cities Station discharge assure the protection and propagation of the BIP in Pool 14.

This Petition also explains that Exelon has fully considered and planned for impacts to endangered species which possibly could result from the proposed alternate thermal standards. In coordination with the United States Fish and Wildlife Service ("USFWS"), Exelon prepared a Habitat Conservation Plan ("HCP") to address

endangered species concerns. USFWS approved the HCP and issued an Incidental Take Permit to cover possible (though unexpected) impacts to individual animals.

## **B. Applicable Procedural Requirements**

The relief requested in this Petition is sought pursuant to the authority granted to the Board by 35 Ill. Adm. Code § 304.141(c), which authorizes the Board to determine that different thermal standards may apply in lieu of those imposed by the Board's generally applicable standards. Section 304.141(c) requires that such proceedings must (1) be before the Board, (2) include public notice and opportunity for public hearing, (3) provide an opportunity for the applicant to demonstrate entitlement to alternate limits that satisfy the 316(a) substantive standard, and (4) allow for review and approval by the United States Environmental Protection Agency ("USEPA") of alternate 316(a) limits approved by the Board.<sup>1</sup> However, neither § 304.141(c) nor other Board rules specify the procedures for conducting proceedings pursuant to that Section. Nor do the Board's rules governing regulatory relief mechanisms (e.g., variances or adjusted standards) or regulatory proceedings that involve thermal discharges (e.g., heated effluent or artificial cooling lake demonstrations) provide a useful model for conducting proceedings under § 304.141(c) and Section 316(a).<sup>2</sup>

The Illinois Environmental Protection Act, however, provides the Board the authority needed to conduct proceedings under § 304.141(c). Pursuant to 415 ILCS 5/5(d), the Board is authorized to conduct proceedings "as may be provided by [the

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<sup>1</sup> CWA § 316(a) similarly states that such a demonstration should be made "after opportunity for public hearing."

<sup>2</sup> For example, the rules governing variances require hearings and a showing that the petitioner is taking steps to come into compliance with the requirement from which the variance is sought. Adjusted standards require showings regarding a number of factors (such as cost considerations) that are not relevant to obtaining 316(a) relief. Similarly, heated effluent and artificial cooling lake demonstrations require

Environmental Protection] Act or any other statute or rule.” The Board’s General Rules (35 Ill. Adm. Code Part 101) provide procedural rules that cover all necessary aspects of proceedings under § 304.141(c), including rules governing: (1) filing and service of petitions (Subpart C); (2) designating the Illinois Environmental Protection Agency (“Illinois EPA”) as a party in interest (§ 101.404); (3) notice to the public of opportunity for a hearing (§ 101.602), and the conduct of hearings (Subpart F). Accordingly, Exelon requests that proceedings on this Petition be conducted pursuant to the applicable provisions of the Board’s General Rules.

### **C. Quad Cities Station Generally Applicable Thermal Limits**

The Quad Cities Station is a two unit nuclear electric generating facility located at river mile 506.5 on the east bank of the Mississippi River, approximately four miles north of Cordova, Illinois. Since 1984, the Plant has operated in an open cycle, once through cooling mode, drawing water from the Mississippi River, heating the water as it passes through the Plant’s steam condensers, and discharging the heated water, via a diffuser piping system, directly back into the Mississippi River.

The discharge of heated water from the Station to the Mississippi River is subject to the limits and restrictions imposed by the Board’s regulations. Specifically, 35 Ill. Adm. Code § 303.331 sets forth the maximum monthly temperature standards for the reach of the Mississippi River into which the Station discharges.<sup>3</sup> Section 303.331 provides that the monthly temperature standards may be exceeded by up to 3° F (1.7° C),

hearings and provide for of a one-time showing, that is not subject to be review in connection with NPDES permit renewals.

<sup>3</sup> The monthly limits are: January -- 45° F; February -- 45° F; March -- 57° F; April -- 68° F; May -- 78° F; June -- 85° F; July -- 86° F; August -- 86° F; September -- 85° F; October -- 75° F; November -- 65° F; and December -- 52° F.

for 1% of the hours in any 12 month period.<sup>4</sup> In addition, 35 Ill. Adm. Code § 302.211(d) imposes a separate limit, requiring that a discharger not cause temperatures in the receiving stream to increase by more than 5° F above natural temperatures.

The Plant is authorized to discharge effluent to the Mississippi River pursuant to NPDES Permit IL0005037 (the "Permit"), issued by the Illinois EPA. The Permit provides that the Plant must comply with the applicable limitations of Sections 303.331 and 302.21, measured at the edge of a mixing zone. 35 Ill. Adm. Code § 302.102 sets forth the requirements applicable to mixing zones in Illinois, including the requirement for maintaining a zone of passage within the receiving waters. The portions of cross-sectional area or volume of flow of the receiving stream not included in a mixing zone is termed the zone of passage (ZOP). Pursuant to the 35 Ill. Adm. Code § 302.102(b)(8) the ZOP must contain at least 75% of the cross-sectional area or volume of flow of the receiving stream.

As discussed in the following section, under certain ambient temperature and river flow conditions, the above-referenced standards present operational challenges for Quad Cities Station. These challenges prompted the studies and demonstration to support the alternate standards requested herein.

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<sup>4</sup> One percent of the hours in a year equates to 87.6 hours. When temperatures in the River are within the 3°F above the monthly limit zone (referred to as the "excursion zone"), the Station tracks the number of hours its operations contribute to temperatures being in the excursion zone (referred to as "excursion hours") and is required to reduce or cease operations to assure that the number of excursion hours remain within the 1% per 12 month permit limit.

## **D. Generally Applicable Requirements -- Compliance Concerns**

### **1. Excursion Hours and Rolling 12-Month Tracking**

During summer months, as ambient river temperatures rise, river flow rates decrease, and the demand for electricity peaks, the Quad Cities Station typically needs to consume excursion hours to satisfy the energy needs of its customers. The warmer or drier the summer, the more it is likely that excursion hours will need to be consumed, and the more likely it is that the entire 1% allotment of excursion hours will be consumed before the end of the summer. To complicate matters, if a significant number of excursion hours were consumed during the late summer months (August and September) of the prior year, the Station will not regain those hours until the corresponding months of the current year, due to the rolling 12 month method that the regulations require for tracking excursion hours. Thus, in some years, the Plant will not have even the full 1% allotment of excursion hours available to cover a given summer.

### **2. Zone of Passage**

Modeling studies conducted by Exelon's consultants show that when Mississippi River flows fall below 16,400 cubic feet per second ("cfs"), and the Quad Cities Station is operating at full capacity, the thermal mixing zone may occupy more than 25% of the River flow. As a result, under such flow conditions, there is less than 75% of the River flow available for a Zone of Passage, as required by 35 Ill. Adm. Code § 302.102(b)(8).

### **3. Compliance Options**

The only operational option for maintaining compliance with these requirements is to reduce the thermal discharge by reducing electrical generation output. Reducing power often may not be a practical or desirable option, because the time of year

excursion hours typically are consumed is the same time that the demands for power and electrical grid stability concerns require that the Plant operate at or near maximum capacity. Moreover, during periods that the ambient (i.e., upstream) temperature of the River exceeds the monthly maximum, the only option available is to shut the Plant down entirely when available excursion hours are depleted.

In past years, Exelon has sought emergency Provisional Variances from Illinois EPA as a compliance measure to address the need to continue Plant operations during periods of elevated ambient temperatures and low River flows. During related discussions with Illinois EPA, the Agency informed Exelon that Quad Cities Station should investigate the existence of permanent solutions that, if implemented, would limit the need for invoking the provisional variance process to address thermal compliance issues that arise during summer months. In response, Exelon initiated the underlying studies to support the 316(a) Demonstration for Quad Cities Station<sup>5</sup> that provides the basis for alternate thermal standards for the Plant set forth below.

#### **E. Proposed Alternate Thermal Standards and Related Relief**

Exelon seeks an order from the Board approving alternate thermal standards applicable to discharges from the Quad Cities Station and stating the following:

1. The monthly temperature standards set forth in § 303.331 shall apply to discharges from the Quad Cities Nuclear Station, provided that Quad Cities Nuclear Station may exceed such standards by 3° F for no more than 219 hours (2.5%) per calendar year, except that during July, August and September the temperature standards may be exceeded by up to 5° F for no more than 131.4 hours of the 219 hour annual allotment.
2. The mixing zone for the Quad Cities Nuclear Station must not contain more than 34% of the cross-sectional area or volume of flow of the Mississippi River.

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<sup>5</sup> Attached as Exhibit I is Exelon's Quad Cities Nuclear Station 316(a) Demonstration (hereinafter "316(a) Demonstration").

3. The NPDES permit for the Quad Cities Nuclear Station shall be modified to incorporate the standards in 1 and 2 above.
4. With each NPDES permit renewal application the Quad Cities Nuclear Station shall be required to provide Illinois EPA, as requested by Illinois EPA, information sufficient to assess whether the standards in 1 and 2 above remain in the renewed permit.
5. During each NPDES permit renewal application proceeding for the Quad Cities Nuclear Station, Illinois EPA shall determine whether the standards in 1 and 2 above are still justified.

## II. LEGAL STANDARDS APPLICABLE TO 316(a) RELIEF

### A. Federal

Congress determined that discharges of heat should be treated differently than discharges of other pollutants. Therefore, with respect to thermal discharges, Section 316(a) of the Clean Water Act establishes a flexible, case-by-case alternative to the uniform application of standards based on either a prescribed technology or water quality criteria.<sup>6</sup> During the 39 years since its enactment, USEPA has consistently interpreted Section 316(a) to mean that a discharger will be granted relief from otherwise applicable federal or state limits on its thermal discharge if the discharger provides “reasonable assurance” that would satisfy a “reasonable person” that a proposed alternative thermal limit will be consistent with the protection and propagation of a balanced indigenous community (“BIC”)<sup>7</sup> of biota in or on the receiving waterbody.

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<sup>6</sup> See A Legislative History of the Water Pollution Control Act Amendments of 1972, *reprinted by* Congressional Research Service (“Legislative History”) at 263 (1973) (Statement of Rep. Clausen); *id.* at p. 227 (Statement of Rep. Harsha) (Section 316 is “[i]ntended to provide modifications of effluent limitations or standards of performance under these other Sections [301, 302 and 306] because heat should be treated in a different manner than other pollutants”).

<sup>7</sup> The statute uses the term “population”; the EPA regulations use the term “community.” See 40 C.F.R. § 125.71. Recognizing that the biological term “community” consists of populations, EPA uses the terms “population” and “community” interchangeably.

## 1. Petitioner's Burden of Persuasion

To obtain relief under Section 316(a), Exelon ultimately must demonstrate that Quad Cities Station's operation under Exelon's proposed alternate standards will be protective of the BIC. Numerous USEPA documents make clear that the standard does not require proof to a mathematical certainty that the BIC will be protected.<sup>8</sup> Instead, the standard is one of "reasonable assurance" of a "reasonable person" based on the best information "reasonably obtainable." The mere fact that there may be unanswered questions in the scientific record does not mean the discharger's demonstration is unsuccessful.<sup>9</sup>

Exelon's burden is to provide "enough specificity" regarding the likely effects of its proposed thermal discharge "to permit qualified experts to draw conclusions upon which regulatory judgment may appropriately be based." Seabrook II.<sup>10</sup> Where a discharger "has presented all relevant and reasonably obtainable data, accounted for any significant deficiencies, utilized available prospective methodologies effectively, and

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<sup>8</sup> EPA, Draft 316(a) Technical Guidance, September 30, 1974 ("1974 Draft 316(a) Technical Guidance"), at 8 ("Mathematical certainty regarding a dynamic biological situation is not obtainable."); EPA, Draft Advanced NPDES Permit Writer's Course, #1, Power Plant Permitting, Instructor Manual ("1995 Permit Writer's Instruction Manual"), at IV-5 ("EPA recognizes some speculation may be necessary due to the uncertainties in the field of predictive aquatic biology."); Information Document on Section 316 of the Clean Water Act, October 26, 1999 ("Region 1 Draft Guidance").

<sup>9</sup> 1974 Draft 316(a) Technical Guidance at 8. *In the Matter of Public Service Co. of New Hampshire, Seabrook Station ("Seabrook I")* (NPDES Permit No. 0020338), 1 E.A.D. 332, 346-47 (June 10, 1977) (lack of information about the thermal tolerance of certain life stages of RIS not determinative); *Pilgrim (Boston Edison), EPA Region I* (Determination re: Issuance of Proposed NPDES Permit No. MA025135) ("*Pilgrim*"), at p. 15 (March 11, 1977) (inability to define with precision the size and distribution of affected populations does not preclude issuance of variance).

<sup>10</sup> *In the Matter of Public Service Co. of New Hampshire, Seabrook Station Units 1 and 2 ("Seabrook II")* (NPDES Permit No. NH0020338) (Decision of Administrator on Remand), 1 E.A.D. 455, 485-86 (Aug. 4, 1978).

provided a reasonable basis for evaluating biological impacts,” that burden is satisfied.

*Pilgrim.*<sup>11</sup>

## **2. Prospective and retrospective aspects of the 316(a) Demonstration.**

In addition to showing that proposed alternate standards are protective of the BIC, the regulations implementing Section 316(a) allow an existing discharger to support alternate thermal standards based on the absence of prior appreciable harm related to historical thermal discharges. Specifically, such a demonstration must show:

- (i) That no appreciable harm has resulted from the ... discharge (taking into account the interaction of such thermal component with other pollutants) ... to the [BIC]; or
- (ii) That despite the occurrence of such previous harm, the desired alternative effluent limitations (or appropriate modifications therefore) will nevertheless assure the protection and propagation of a [BIC]....

40 C.F.R. § 125.73(c)(1).

Because Exelon’s proposed alternate standards are only incrementally different from the standards that have applied to the Quad Cities Station since December 23, 1983, and because past thermal discharges from the Plant (authorized pursuant to grants of temporary emergency relief) have, at times, been similar to those that would be allowed under the proposed alternate standards, the 316(a) Demonstration conducted for Quad Cities Station examined whether historical operations have caused any appreciable harm to the BIC, in addition to conducting a prospective analysis of the future effects of the Quad Cities Station’s thermal discharge under the proposed alternate thermal standards.

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<sup>11</sup> (*Boston Edison*), *EPA Region I* (Determination re: Issuance of Proposed NPDES Permit No. MA025135) (“*Pilgrim*”) at 16 (March 11, 1977).

### 3. Nature of 316(a) Relief

If the discharger meets its burden under Section 316(a), the discharger is entitled to effluent limits for its thermal discharges that are consistent with the 316(a) standard of protecting the BIC. Long-standing USEPA precedent holds that relief under Section 316(a) must be granted if the requisite showing has been made. This interpretation was first adopted in 1973, shortly after Section 316(a) was enacted, in an opinion of USEPA's General Counsel, Robert Zener.<sup>12</sup> The Zener Memo recognized that Congress enacted Section 316(a) precisely to ensure that thermal discharges would not be subject to effluent limitations more stringent than necessary to protect the relevant aquatic populations:

There is nothing in the legislative history of section 316(a) to indicate that, once an applicant has made a demonstration sufficiently convincing to satisfy a reasonable person that a proposed thermal effluent limitation is inordinately stringent to assure the protection of the relevant aquatic population, the Administrator or the State may nevertheless insist on that level of control. For example, Rep. Wright stated during the House debates on the Conference Committee Report: 'Section 316(a) modifies the requirements of both sections 301 and 306 as they pertain to the thermal components of discharges from point sources, and authorizes the imposition of less stringent effluent limitations than would otherwise be imposed. Those limitations will apply whenever the owner or operator can satisfy the appropriate certifying or permitting agency that they will assure the protection and propagation of a balanced indigenous population.' Zener Memo, at p. 3 (emphasis in original). In order to give effect to Congress' intent, it is necessarily the case that, "if the applicant [has] presented substantial evidence that the [otherwise applicable] limitations are excessively stringent and this evidence has not been rebutted" the grant of a variance becomes a "mandatory duty."

Zener Memo at pp. 2-3.

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<sup>12</sup> See Memorandum from Deputy General Counsel Robert V. Zener to the Deputy Assistant Administrator for Water Planning and Standards ("Zener Memo"), EPA, Dec. 28, 1973.

The interpretation adopted in the Zener Memo has been reaffirmed by USEPA as recently as 1995,<sup>13</sup> and consistently applied in practice. For example, USEPA's Technical Guidance Manual<sup>14</sup> states that if the applicant's rationale is convincing, and not "convincingly negated by outside evidence, the applicant's 316(a) demonstration is successful."

By its express terms, Section 316(a) establishes that a successful applicant is entitled to relief from "any effluent limitation" that is more stringent than necessary. The statute makes no distinction between technology- or water quality-based limitations. Nor does the statute distinguish between limitations proposed by USEPA or a state. (Zener Memo at p. 2.) The superseding effect of relief provided by Section 316(a) is also dictated by Section 303(g) of the Clean Water Act, which specifically requires that "[w]ater quality standards relating to heat shall be consistent with the requirements of Section 316." (Emphasis supplied.) As recently as 1997, USEPA confirmed that "316(a) applies to both technology-based thermal effluent limitations and to water quality-based effluent limitations under § 303."<sup>15</sup>

As shown in the 316(a) Demonstration for the Quad Cities Station, Illinois' generally applicable standards are more stringent than necessary to protect the BIC and should be superseded by Exelon's proposed alternate thermal standards for the Station.

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<sup>13</sup> See, NPDES Permit Writer's Instruction Manual at p. IV-3-5 (1995); EPA, Review of Water Quality Standards, Permit Limitations and Variances for Thermal Discharges at Power Plants ("1992 Thermal Permitting Review"), p. 14 (October 1992).

<sup>14</sup> EPA Interagency 316(a) Technical Guidance Manual and Guide for Thermal Effects Sections of Nuclear Facilities Environmental Impact Statements 17 (1977).

<sup>15</sup> May 20, 1997 Letter of Chief of EPA Surface Water Permits and Facilities Branch Douglas F. Mundrick to James Coles, Alabama Department of Environmental Management ("Mundrick Letter"); see also Zener Memo at pp. 7-8.

## **B. Illinois**

In Illinois, Section 316(a) is implemented through 35 Ill. Adm. Code § 304.141(c), which authorizes the Board to determine that specific thermal standards should apply to a particular discharger in lieu of those imposed by the Board's generally applicable rules.

Specifically, § 304.141(c) provides:

The standards of this Chapter shall apply to thermal discharges unless, after public notice and an opportunity for public hearing, in accordance with Section 316 of the CWA and applicable federal regulations, the Administrator and the Board have determined that different standards shall apply to a particular thermal discharge.

Section 304.141 also provides that the USEPA determine, along with the Board, that alternate thermal standards under § 316(a) are warranted. The determination required by USEPA under § 304.141(c) occurs in connection with review of NPDES permits issued by Illinois EPA that incorporate alternate 316(a) standards ordered by the Board.

### **III. 316(a) DEMONSTRATION**

Exelon's 316(a) Demonstration includes: (1) a detailed description of the characteristics of the receiving waters for Quad Cities Station's thermal discharge – Pool 14 of the Mississippi River – including hydrology, geology, water quality, biology and anthropogenic influences (316(a) Demonstration, Appendix A); (2) a prospective (predictive) analysis of the effects on the BIC of thermal discharges from the plant under the alternate standards proposed by Exelon (316(a) Demonstration, Appendix B); (3) a retrospective evaluation on the BIC of historical thermal discharges from the Quad Cities Station (316(a) Demonstration, Appendix C); (4) a detailed description of Quad Cities

Station and its operations (316(a) Demonstration, Appendix D); and (5) Quad Cities Station's Data Collection Programs (316(a) Demonstration, Appendix E).

As summarized below, and as set forth in greater detail in the studies and supporting materials presented in the 316(a) Demonstration, Quad Cities Station's historical operations have not resulted in appreciable harm to the BIC of Pool 14, and operations under the alternate thermal standards proposed by Exelon in this Petition will assure the protection and propagation of the BIC, going forward.

**A. Prospective Analysis (316(a) Demonstration, Appendix B)**

A prospective assessment of potential effects on the fish community of Pool 14 resulting from the Quad Cities Station discharges under an alternate thermal standard that would allow 262.8 excursion hours (3%) of which 1.5% (131.4) of those hours may be at temperatures between 89° F and 91° F was conducted for Exelon by HDR.<sup>16</sup> As explained in Appendix B of the 316(a) Demonstration, HDR's prospective analysis is based on its evaluation of thermal conditions that will result from Quad Cities Station's operations under Exelon's proposed alternate standards on a set of Representative Important Species ("RIS") of fish that are part of the indigenous community of fish present in Pool 14. (316(a) Demonstration, Appendix B, Sec. 1.3.) Based on a detailed biothermal assessment of the selected RIS, HDR is able to reach conclusions regarding the anticipated effects on the BIC of fish in Pool 14 resulting from Exelon's proposed alternate thermal standards for the Quad Cities Station.

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<sup>16</sup> Exelon originally contemplated a request for an alternate thermal standard that would allow 262.8 excursion hours (3%) and HDR performed the prospective analyses on that basis. Exelon has now reduced the proposed number of excursion hours to 219 (2.5%). The modeling analysis, data interpretation and conclusions presented here and in the 316(a) Demonstration for the 3% case provide a very conservative measure of the effects of the proposed 2.5% standard.

The RIS of fish selected for the prospective assessment were largemouth bass, channel catfish, spotfin shiner, and walleye. (316(a) Demonstration, Appendix B, Sec. 1.3.1.) River and plant operating conditions evaluated by HDR were selected to provide a conservative assessment of potential plant-related effects on fish growth, avoidance behavior and mortality. (316(a) Demonstration, Appendix B, Sec. 1.3.2.)

The results of the assessment indicate that Exelon's proposed alternate thermal standards will have a negligible impact on largemouth bass, channel catfish, and spotfin shiner. (316(a) Demonstration, Appendix B, Sec. 4.) The assessment indicates that chronic mortality for walleye could be increased by as much 8.5% immediately downstream of the mixing zone, even if one assumes (unrealistically) no avoidance behavior by the fish. Of course, HDR recognizes that it is a "very rare" event for fish not to avoid elevated temperatures by leaving the area at issue. However, even assuming the worst case (i.e. no avoidance behavior), this 8.5% impact translates to less than 1% of the overall walleye population in Pool 14.<sup>17</sup> On the basis of this assessment, HDR concluded that Station operations under Exelon's proposed alternative thermal standards will not impair the successful completion of life cycles of indigenous species of fish in Pool 14, thus assuring the protection and propagation of a balanced, indigenous community of fish.

#### **B. Retrospective Analysis (316(a) Demonstration, Appendix C)**

Quad Cities Station became operational in 1973 and has been operating in its present mode since 1984. As detailed in Appendix A and Appendix E to the 316(a)

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<sup>17</sup> As indicated above, these results were obtained when 262.8 excursion hours were assumed in the prospective analysis. The effects would be even less under the 219 excursion hours now requested by Exelon.

Demonstration, biological life in the Quad Cities Station receiving waters have been the subject of extensive and continuing sampling, monitoring and analysis during much of the plant's operating life. As a result there is a vast amount of data and information available from which to assess the impacts of Quad Cities Station's operations on the BIC of Pool 14 of the Mississippi River, and to determine whether the Plant's operations have caused any appreciable harm to the BIC.

### **1. Phytoplankton and Zooplankton**

In Appendix C to the 316(a) Demonstration, HDR explains that although it evaluated the lower trophic level communities of Pool 14 (phytoplankton and zooplankton), its investigation of these communities did not require the extent of sampling data that HDR reviewed in connection with its investigation of higher trophic level communities (freshwater mussels and fish), principally because the detailed assessment of the mussel and fish communities would reveal whether the lower trophic level communities (which serve as a source of food for the fish populations) were suffering adverse effects as a result of Quad Cities Station's operations. As discussed below, both the mussel and fish communities are healthy and balanced indigenous communities, which demonstrates that an adequate food supply (of plankton) has been available. Accordingly, HDR concludes that operation of the Station has not caused appreciable harm to the lower trophic level communities in Pool 14. (316(a) Demonstration, Appendix C, Sec. 2.4.3.)

## 2. Freshwater Mussels

In 2007, Heidi Dunn, a preeminent freshwater unionid mussel expert, conducted a study designed to define the balanced indigenous unionid mussel community in Pool 14. As part of the study, extensive sampling was conducted to identify unionid beds upstream and downstream of the Quad Cities Station thermal diffuser. In all, 15 beds were sampled, with a particular focus on the downstream bed most proximate to the Quad Cities Station diffuser (the Steamboat Slough Bed), an upstream bed generally representative of mussel beds in Pool 14, and the Cordova Bed, which is located about a mile downstream of the diffuser and which is listed as an Essential Habitat Area for the federally endangered *Lampsilis higginsii* by the US Fish and Wildlife Service (“USFWS”). (316(a) Demonstration, Appendix C, Sec. 2.6.2.)

As described in Appendix C (Sec. 2.6.2) and Appendix E (Sec. 6.1) of the 316(a) Demonstration, unionid beds were found throughout the study area in a variety of habitats, both upstream and downstream of the Station diffuser. The study found that mussel density in the Steamboat Slough Bed is similar to beds both upstream and further downstream of the diffuser which have similar habitat characteristics and that unionid and fish communities in the Steamboat Slough Bed reflect their habitat conditions, as similar communities were found in similar habitats both upstream and downstream of the diffuser.

Based on the study, Ms. Dunn and HDR conclude that if the Quad Cities Station had not operated, the unionid community in the Steamboat Slough Bed likely would be similar to the community that presently exists in the Bed. Likewise, the community characteristics of the other unionid beds located downstream of the plant are very similar

to those observed in upstream beds that have comparable habitats. For these reasons, HDR and Ms. Dunn conclude Quad Cities Station's past operations have not harmed the unionid community in Pool 14.

In addition, HDR and Ms. Dunn conclude that the unionid community in the area of the Station's discharge, and in Pool 14 generally, is healthy, balanced, and composed of the indigenous species of unionids one would expect to find at this location.

### **3. Fish**

As previously mentioned, there is an extensive database of fish in Pool 14, as a result of fish sampling and monitoring conducted over the past four decades. HDR's analysis of that database shows the following trends in Pool 14: (1) increases in numbers of freshwater drum, channel catfish, largemouth bass, and bluegill; (2) decreases in the numbers of white crappie, black crappie, and sauger; and (3) flathead catfish abundance has been relatively stable<sup>18</sup>. (316(a) Demonstration, Appendix C, Sec 2.7.3.) These long-term abundance trends are apparent at locations both upstream and downstream of the diffuser pipes, indicating they are not related to Quad Cities Station operations. In addition, HDR found that neither nuisance nor heat tolerant species are dominant in Pool 14. On the basis of these findings, HDR concludes that the Station's operations have not caused appreciable harm to the fish community in Pool 14. (316(a) Demonstration, Appendix C, Sec. 3.)

\* \* \* \* \*

Importantly, the conclusion that past operations have not caused appreciable harm to the BIC of Pool 14 relates not only to historical operations under the Board's generally

applicable regulations, but also to operations similar to those that would be authorized by Exelon's proposed standards. As previously mentioned, at various times since the plant began operating, and particularly in recent years, in response to periods of elevated (weather-related) ambient River temperatures and low River flow conditions, Quad Cities Station has operated in a manner that has caused the Station to exceed the 87.6 hours/year excursion hour limit and the 3° F excursion zone temperature cap set by the Board's generally applicable regulations. For example, during the Summer 2006, the Station used about 223 excursion hours and exceeded the monthly maximum temperature standard by up to 5° F during a portion of the excursion hour period. In addition, on occasion the Mississippi River flow has been less than 16,400 cfs, when the plant was operating at or near full capacity, which, according to modeling studies would have caused the Zone of Passage related to the Quad Cities mixing zone to be less than 75% of the Mississippi River flow.

Thus, the biological communities in the receiving waters for the Station's discharges have been exposed to thermal conditions very similar to conditions that would result from the alternate standards proposed by Exelon in this Petition.<sup>19</sup> HDR (and other experts with whom HDR consulted) were able to review *actual* sampling data obtained during these periods and following these periods of increased excursion hour events, elevated temperatures above the 3° F cap, and decreased zone of passage conditions and have assessed effects on the biological communities resulting from these thermal conditions. The fact that HDR's retrospective assessment concludes that the abundance

<sup>18</sup> Trends in walleye are not monitored in this program because this species is stocked annually in Pool 14.

<sup>19</sup> In fact, as explained in the 316(a) Demonstration Report, Exelon limited its request for increased excursion hours to reflect the Station's past operating history.

trends of indigenous species at sampling station within Pool 14 provide no evidence of an effect of the thermal discharge over the life of the Station's operations shows not only that past operations have not caused appreciable harm, but also that the standards proposed in this Petition will not be a threat to the BIC of Pool 14 in the future.

### **C. Protection of Threatened and Endangered Species**

In addition to demonstrating that historical operations have not harmed the BIC and that the proposed alternate standards will protect the BIC, the 316(a) Demonstration addresses whether operations under the alternate standards could affect endangered species. There is one federally endangered species of mussel, the Higgins' Eye pearly mussel, in Pool 14. The Higgins' Eye mussel is found in several beds in Pool 14, including, the Cordova Bed, which is located about 1 mile downstream of the Station. As previously mentioned, the Cordova Bed has been designated an Essential Habitat for the Higgins' Eye mussel.

In response to concerns regarding possible impacts to the Cordova Bed as a result of Station operations under Exelon's proposed alternate standards, Exelon consulted with USFWS, beginning in 2008. With USFWS's guidance, the Exelon prepared a Habitat Conservation Plan ("HCP"). The HCP was approved by USFWS and the Incidental Take Permit covering possible impacts associated with the alternate standards was issued by USFWS in August 2010<sup>20</sup>. The Incidental Take Permit authorizes possible impacts to individual mussels that might occur as a result of Exelon's proposed alternate thermal standards (the nature of which, is not expected to be acute, but rather, at most, would be

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<sup>20</sup> The Habitat Conservation Plan and the Incidental Take Permit are attached as Exhibit 2 and Exhibit 3, respectively.

non-lethal, temporary stress), provided the Station complies with and implements the HCP. In addition to requiring implementation of a thorough and comprehensive mussel sampling and monitoring program, the HCP provides for innovative measures designed to propagate the endangered mussels. Thus, through the HCP/Incidental Take Permit process, the Station has satisfied the requirements of the Endangered Species Act.

#### **D. Calendar Year Tracking**

In addition to requesting alternate standards that would increase the number of available excursion hours and the maximum temperature cap during excursion hour events and decrease the Zone of Passage for the Plant's mixing zone, Exelon is also seeking to modify the method by which excursion hours will be tracked. 35 Ill. Adm. Code § 303.331 limits the number of excursion hours to "1% of the hours in the twelve month period ending with any month." The rolling 12-month method is intended to protect against the possibility (inherent in the calendar year method) that periods during which relaxed limits are allowed will occur back-to-back during the months of December and the ensuing January. The concern underlying the calendar year method is that using a calendar year to track excursion hours, in effect, could double the length of time biota would be exposed to excursion hour temperatures if substantial periods of excursion hour operations were conducted in late December and then again in early January.

As explained in the 316 (a) Demonstration, the theoretical concern with tracking excursion hours by calendar year does not apply in the case of Quad Cities Station's operations. (316(a) Demonstration, Summary, Sec.1.2.3.) Excursion hours have been used by the Station only in the March-September timeframe. It is unlikely that

circumstances will arise that would require that the Station use *any* excursion hours in December or January, and it is almost certain that there will not be any extended periods of excursion hour operations during these months. Thus, there is no potential that the harm that the rolling 12-month method is intended to protect against will occur as a result of the Station's operations.

The requirement that excursion hours be tracked using the rolling 12-month method unnecessarily limits the Station's ability to operate, with no corresponding environmental benefits. As mentioned above in Section I. D., if any excursion hours are used during the summer months of one year, the rolling 12-month method precludes the Station from having the full allotment of excursion hours available during the subsequent summer season. Thus, for example, if in September of 2011, the Station had used the entire 12 month allotment of excursion hours, the Station would not have had any excursion hours available to deal with low flow or high ambient temperature circumstances in June, July or August of 2012. In this example, there would be no biological reason to prevent excursion hours from being used during the summer months before September 2012. Nevertheless, in order to comply with § 303.331, the Station potentially would have been required to significantly curtail operations.<sup>21</sup>

Using the 316(a) criteria, to the extent § 303.331 restricts the Station from having a full 12 month allotment of excursion hours available for each summer, the restriction is more stringent than necessary to assure the protection of a balanced, indigenous population of shellfish, fish and wildlife. Exelon's proposed alternative calendar year method of tracking excursion hours is sufficient to provide such assurances.

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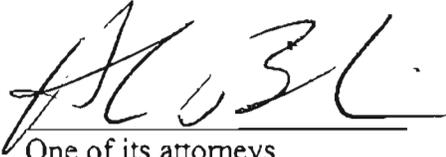
<sup>21</sup> Alternatively, the Plant would have needed to initiate the provisional variance process.

WHEREFORE, for all the foregoing reasons Exelon respectfully requests that its Petition to Approve Alternate Thermal Standards be granted and that the Board provide Exelon the relief requested herein.

Respectfully submitted,

EXELON GENERATION LLC

By:

  
One of its attorneys

Dated: September 20, 2012

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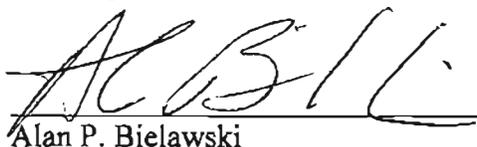
**CERTIFICATE OF SERVICE**

Copies of the foregoing JOINT MOTION FOR PROCEDURAL ORDER REGARDING CONDUCT OF PROCEEDINGS TO SEEK APPROVAL OF ALTERNATE THERMAL STANDARDS and the foregoing PETITION TO APPROVE OF ALTERNATE THERMAL STANDARDS were hereby served upon the following by hand delivery:

Office of the Clerk of the Illinois Pollution Control Board  
James R. Thompson Center  
100 West Randolph Street, Suite 11-500  
Chicago, Illinois 60601

Copies of these filings were also sent to the following by U.S. Mail:

Division Chief of Environmental Enforcement  
Office of the Attorney General  
100 West Randolph Street, Suite 1200  
Chicago, Illinois 60601



Alan P. Bielawski

Dated: September 20, 2012