BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

In The Matter Of:	)	
	)	
SOUTHERN ILLINOIS POWER,	)	
COOPERATIVE,	)	
Petitioner,	)	
v.	)	PCB No. 2014-129
	)	(Thermal Demonstration – Water)
ILLINOIS ENVIRONMENTAL	)	
PROTECTION AGENCY,	)	
Respondent.	)	

NOTICE OF FILING

John Therriault, Assistant Clerk,
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PLEASE TAKE NOTICE that I have today filed with the Office of the Clerk of the Illinois Pollution Control Board an APPEARANCE and RECOMMENDATION OF THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY, copies of which are herewith served upon you.

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

By: Stephanie Flowers

Stephanie Flowers
Assistant Counsel
Division of Legal Counsel

DATED: 6-27-14
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PROTECTION AGENCY,	)	
Respondent.	)	

APPEARANCE

The undersigned hereby enters her appearance as attorney in the above-titled proceeding on behalf of the Illinois Environmental Protection Agency.

By: Stephanie Flowers
Stephanie Flowers
Assistant Counsel

DATED: 6-27-14

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PROTECTION AGENCY,	)	
	)	
Respondent.	)	

RECOMMENDATION OF THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

NOW COMES the Illinois Environmental Protection Agency ("Agency"), by and through one of its attorneys, Stephanie Flowers, and in response to the Petition for Alternate Thermal Effluent Limitations ("Petition") filed with the Illinois Pollution Control Board ("Board") on May 13, 2014 by Southern Illinois Power Cooperative ("SIPC" or "Petitioner"), pursuant to 35 Ill. Adm. Code 106.1100 et seq. ("Part 106, Subpart K"), submits the following recommendation.

INTRODUCTION

On May 13, 2014, SIPC filed the Petition asking the Board to approve alternative thermal effluent limitations for its discharge to the Lake of Egypt from the SIPC Marion Generating Station ("Marion Station"). The current thermal limitations are set forth as Special Condition 4 in the NPDES Permit No. IL 0004316 ("Permit") issued to Marion Station by the Agency on February 1, 2007 and effective from March 1, 2007 to February 29, 2012.

The current thermal limitations set forth in the Permit issued to the Marion Station are imposed by:

A. Subsection 302.211(d) requiring that the maximum temperature rise above natural temperature must not exceed 5 degrees Fahrenheit. [35 Ill. Adm. Code 302.211(d)]; and,

B. Section 302.211(e) requiring that the water temperature at representative locations shall not exceed the maximum limits in the following table during more than one percent of the hours (87.6 excursion hours) in the 12 month period ending with any month (rolling 12-month period) and at no time exceeding the maximum limits by more than 3 degrees Fahrenheit:

Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	
60	60	60	90	90	90	90	90	90	90	90	60	°F

[35 Ill. Adm. Code 302.211(e)].

Section 316(a) of the Federal Clean Water Act, 33 U.S.C. 1326, allows for an owner or operator to demonstrate that the effluent limitations for the facility's heated effluent are more stringent than necessary to "assure the projection 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 Board incorporated this Federal Clean Water Act provision into 35 Ill. Adm. Code 304.141(c) which allows the Board to determine that alternative requirements may apply to thermal discharge. The Petition was filed pursuant to the Board's procedures for requesting alternative thermal relief under Part 106, Subpart K to demonstrate that the effluent limitations for the facility's heated effluent set forth in the Permit are more stringent than necessary and to request alternative thermal requirements.

BACKGROUND

Marion Station is presently regulated with the general use temperature standards found at 35 Illinois Adm. Code 302.211. The facility requests from the Board site-specific thermal effluent standards for their NPDES permit that authorizes discharges into Lake of Egypt. SIPC is requesting seasonal temperature limits for its Marion Station that are necessary to accommodate current operating conditions at the facility, in part due to a boiler replacement in 2003 and a new operating regime which has increased thermal loading to Lake of Egypt. The 316(a) demonstration is based on an assessment of the Lake of Egypt fishery pre and post 2003. Pre-2003 fishery surveys consisted of intensive work conducted by Southern Illinois University Carbondale ("SIUC") from 1997-1999, which included electrofishing, temperature and dissolved oxygen monitoring, ichthyoplankton tows, diet analyses, age, growth and mortality estimates, and tracking movements of largemouth bass and channel catfish with telemetry. Post-2003 surveys consisted of electrofishing surveys conducted by MACTEC in 2005, 2006 and 2010, along with temperature monitoring and temperature modeling and ancillary biological information collected from impingement surveys, seining, and gill netting. The assessment was completed prior to the new Board regulations at 35 Illinois Adm. Code 106.115 (Early Screening) and 35 Ill. Adm. Code 106.1120 (Detailed Plan of Study) and have been deemed met as stated in an April 15, 2014 letter to SIPC from the Agency (see Petitioner's Exhibit E).

Marion Station discharges to an artificial cooling lake that was constructed by damming up South Fork of the Saline River to form Lake of Egypt. Lake of Egypt is not listed as a biologically significant stream in the 2008 Illinois Department of Natural Resources Publication *Integrating Multiple Taxa in a Biological Stream Rating System*, nor is it given an integrity rating in that document. Lake of Egypt, Waterbody Segment, RAL, is listed on the draft 2014

Illinois Integrated Water Quality Report and Section 303(d) List as impaired for fish consumption use with potential causes given as mercury and polychlorinated biphenyls. Aquatic life, public and food processing water supply, and aesthetic quality uses are fully supported. Lake of Egypt is not subject to enhanced dissolved oxygen standards.

PETITIONER'S REQUESTED RELIEF

As understood by the Agency, the Petition requests the Board allow the water temperature at the edge of the facility's 26 acre mixing zone in Lake of Egypt to exceed the maximum limits of the table at 35 Ill. Adm. Code 302.211(e) and require that the water temperature not exceed the maximum limits in the alternative table below during more than one percent of the hours (87.6 excursion hours) in a 12 month period and at no time exceed these maximum limits by more than 3 degrees Fahrenheit:

Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	
72	72	72	90	90	101	101	101	101	91	91	72	°F

AGENCY'S RECOMMENDATION

The Agency, pursuant to Section 106.1145 of Part 106, Subpart K, recommends the Board grant the relief requested by the Petitioner but with the following conditions to be met over the next five years:

1. The Agency recommends that the Board require Petitioner study the other biotic categories of phytoplankton, zooplankton and meroplankton, habitat formers,

shellfish/macroinvertebrates or provide additional justification for why these categories are considered low impact. The USEPA 316(a) Technical Guidance Manual lists six biotic categories that should be initially considered in a 316(a) demonstration study: phytoplankton, zooplankton and meroplankton, habitat formers, shellfish/macroinvertebrates, fish, and other vertebrate wildlife. Of these six biotic categories, Petitioner considered all but fish as being of low potential impact, yet provided inadequate justification for this determination. No site-specific data was provided for these other biotic categories as Petitioner only referenced studies from other Illinois reservoirs to support their justification. Although Lake of Egypt is primarily recognized as a valuable resource for sport fishing, organisms from these other biotic categories may be important in sustaining the fishery and should not be assumed to be of low impact in regards to thermal loadings.

2. The Agency recommends the Board require Petitioner to study two additional Representative Important Species ("RIS") categories that the USEPA 316(a) Technical Guidance Manual lists should be considered for a demonstration: (1) thermally sensitive species and (2) species potentially capable of becoming a localized nuisance. Petitioner studied only two of the RIS categories listed: recreationally important species (largemouth bass, channel catfish, bluegill, white crappie, and black crappie) and species necessary in the food chain (threadfin shad and gizzard shad).

Thermally sensitive species: White crappie and black crappie may be considered "thermally sensitive" and the continued study of these species by Petitioner would

fulfill this RIS category, but the nature of study should also focus on the thermal sensitivity of these species rather than simply their presence in the lake as sportfish. (Further comments regarding these species, their sensitivity to thermal loadings at Lake of Egypt, and a suggested study plan for future 316(a) demonstrations are provided below in Item 3).

Species potentially capable of becoming a localized nuisance: Petitioner has not attempted to assess nuisance species within Lake of Egypt and provides no assurance that increased thermal loadings will not lead to an increase in nuisance species. The Agency believes that the common carp would be a suitable nuisance species to be included as a RIS at Lake of Egypt. Common carp have been collected at Lake of Egypt pre and post 2003 and would be a suitable RIS to fulfill the nuisance species category. Common carp are considered a nuisance species given that they are non-native to Illinois and are benthic feeders that may uproot aquatic vegetation and lead to increased turbidity of lakes. Although data on common carp is included in the report, there is no discussion regarding the population of common carp and whether thermal loadings may lead to this species becoming a localized nuisance. Table 3-4 of Exhibit B includes catch per unit effort ("CPUE") data on common carp. Since this table shows that post-2003 CPUE results are twice as high as pre-2003 results, additional research regarding the perceived increase in common carp is needed.

The Agency believes Petitioner should analyze the impact of the increased thermal loadings on the common carp, or other nuisance fish species. At a minimum, requiring electrofishing to assess CPUE and length-frequency distribution of this species is suggested, similar to the methods previously performed by SIUC at

Lake of Egypt (See Exhibit B – Appendix C, Chapter 13). Given that five of the RIS are recreationally important species and there is an over-representation of this category, the Agency believes that one of these species could be removed from further studies and replaced with common carp. The channel catfish is the most thermally tolerant RIS presently studied by Petitioner and therefore the Agency believes this species is a suitable candidate for replacement. Replacement of this species with the common carp, or any other nuisance fish species that could potentially thrive in thermally enhanced water, would lead to a more thorough assessment of whether thermal loadings are compromising a balanced, indigenous biotic community in Lake of Egypt.

Additionally, impingement studies by Petitioner have identified the rusty crayfish, an invasive species, as being present in Lake of Egypt, although no information is provided about the abundance of this organism within the lake and its potential harm to the ecosystem. This could be possible alternative nuisance species to be studied, but at the least the Agency believes Petitioner should address the potential for this species to become a localized nuisance due to increased thermal loadings.

3. The Agency recommends that the Board require Petitioner to further study the impact of thermal loadings on white and black crappies within Lake of Egypt. Given the potential for lake-wide summer temperatures to exceed Maximum Weekly Average Temperatures (MWAT) for both species, the Agency recommends that age and growth studies be conducted on both species, similar to the age and growth

studies previously performed by SIUC on Lake of Egypt crappie populations in 1977 and 1988 (see Exhibit B – Appendices D-E).

Petitioner maintains that fish populations are unharmed by the thermal loadings post-2003, but Exhibit B does not adequately justify this in regards to crappie populations. Table 6-2 of Exhibit B provides tolerance levels for the selected RIS in regards to MWAT for growth and Upper Incipient Lethal Temperatures (UILT). When comparing the MWAT levels for white and black crappie to the water temperatures observed by MACTEC in Lake of Egypt at depths of two and eight feet in July and August, 2010, and the modeled water temperatures at the same depths provided in Table 5-7, it is apparent that thermal loadings would adversely affect black and white crappie growth. Exhibit B states that although the measured and modeled temperatures exceed the tolerance levels for both crappie species, these organisms can take refuge in deeper, cooler water and are therefore not impacted by thermal loadings. However, upon review of SIUC studies from 1997-1999 that studied temperature and dissolved oxygen profiles at 0.5 m intervals from the surface to the benthos near the heated discharge and within the main body of the lake, it is apparent that during summer months the only refuge from adverse water temperatures is beneath the thermocline, and dissolved oxygen concentrations beneath the thermocline are at concentrations that are too low to be inhabitable (See Figure 15A.180 of Appendix C in Exhibit B). Thus, during summer months there is a high likelihood that crappie are unable to take refuge from excessive water temperatures and may therefore be adversely affected. This is supported by crappie CPUE data collected pre and post-2003, which has found white crappie to be absent

from electrofishing surveys since 1997, and has found black crappie results to be half of that found in pre-2003 surveys, despite the stocking that has been conducted in 2008, 2009, and 2010.

The Agency recommends the Board require Petitioner to study whether crappie populations have adequate habitat to escape elevated temperatures given that the studies show the primary refuge from excessive water temperatures may exist at oxygen-deficient depths found below the thermocline. Petitioner could perform semi-weekly or weekly temperature and dissolved oxygen monitoring during summer months at the two locations previously used in the SIUC study (See Figure 15.3 of Appendix C in Exhibit B), as well at an additional location in the upper end of the lake. Petitioner could also begin a telemetry study to track seasonal movements of crappie populations, with emphasis placed on summer movement and summer habitat use. Temperature-sensitive sonic transmitters could be utilized similar to previous SIUC research on movement of channel catfish and largemouth bass in Lake of Egypt (see Exhibit B – Appendix C, Chapter 14). A study on both species is preferred, but the Agency acknowledges that study organisms are limited to those that meet the minimum size requirement dependent on the selected transmitter size.

Other than recommending further study on the issues noted above, the Agency agrees the Petitioner demonstrated that the current effluent limitations are more stringent than necessary and that the requested alternative thermal requirements can assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on the Lake of Egypt

into which the heated effluent is discharged from the Marion Station.

The Agency agrees that the Petitioner has met the requirements for requesting alternative thermal relief under Part 106, Subpart K. As noted in Petitioner Exhibit E, Sections 106.1115 and 106.1120 for early screening and a detailed plan of study were satisfied prior to the adoption of Part 106, Subpart K.

The Agency is not aware of the interest or involvement of USEPA or US Fish and Wildlife Service in Lake of Egypt and has not received comments. The Agency has spoken with Illinois Department of Natural Resources about possible future involvement with Lake of Egypt but has not received comments at this time.

Respectfully submitted,

ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY

By: Stephanie Flowers

Stephanie Flowers
Assistant Counsel
Division of Legal Counsel

Dated: 6-27-14

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CERTIFICATE OF SERVICE

I, STEPHANIE FLOWERS, an attorney, do certify that I filed electronically with the Office of the Clerk of the Illinois Pollution Control Board the attached APPEARANCE and RECOMMENDATION OF THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY and will cause the same to be served upon the following persons, by placing a true and correct copy in an envelope addressed to:

John Therriault, Assistant Clerk,
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and mailing it by First Class Mail from Springfield, Illinois on June 27, 2014 with sufficient postage affixed.

Stephanie Flowers
STEPHANIE FLOWERS

DATED: 6-27-14

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