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NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

COMMENTS ON

THE NRC STAFF'S FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT FOR THE  
LICENSE RENEWAL OF INDIAN POINT UNITS 2 AND 3, BUCHANAN, NEW YORK

submitted to the United States Nuclear Regulatory Commission

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**VIII. CONCLUSION**

The staff of the United States Nuclear Regulatory Commission (NRC) issued a Final Supplemental Environmental Impact Statement (EIS) for the 20-year license renewal of Indian Point Units 2 and 3. The environmental review is required by the National Environmental Policy Act (NEPA). In the Final Supplemental EIS, NRC staff recommended that the NRC should determine that the adverse environmental impacts of continued operation of Indian Point Units 2 and 3 are not significant. Therefore, according to NRC staff, it would be unreasonable to deny the license renewal application for the continued operation for another 20 years. The NRC's review plainly ignores the significant body of environmental studies and work conducted regarding the Hudson River and these facilities, and in doing so, produces conclusions that contradict the record and requires that nothing be done regarding the significant harm that operation of these facilities imposes on the River. As demonstrated below, the NRC staff's recommendation is not based on sound science and does not comport with the requirements of NEPA.

## I. INTRODUCTION

The Hudson River and its estuary are a necessary part of the life cycle of many species that call the River home - they are born in the River, they leave the River, and ultimately return to the River to start the cycle anew. This essential river habitat is also a critical part of the timeless and rhythmic flow of life through the Hudson River Valley, which has existed since time immemorial. This unparalleled natural resource also contributes to the lives and economic vitality of millions of people and many businesses. The Hudson is tidal to the Federal Dam at Troy and is known as "the River that flows both ways." As a natural resource, its biological potential and its ability to be the daily home to many species is under significant stress and impact. Critical consumers of the River's water, and a considerable stressor of life in the Hudson, are Units 2 and 3 of the Indian Point Nuclear Generating Facility at Buchanan, New York. The facility uses a once-through cooling system that removes large volumes of water from the Hudson River, passes it through a steam condenser once, and then discharges the water back to the River at a higher temperature in what is called a "thermal discharge." Consequences abound from Indian Point Units 2 and 3's consumption of 2.5 *billion* gallons of water each day.

The operation of this facility has significant environmental impacts. Large fish are "impinged" on screens at the water intake where they are severely stressed and then suffocated. Smaller fish are "entrained" in the water intake - pulled through the operating plant and killed. There is heightened concern for particular endangered and threatened species. For example, operation of the facility impinges shortnose sturgeon - an endangered species - and impinges and entrains the Atlantic sturgeon - a candidate threatened species. The massive volumes of Hudson River water used daily returns heated water back to the river. The Hudson River would be a far more productive estuarine ecosystem if the heat shock/thermal impacts from Indian Point could be mitigated. As it presently operates, tens of millions of fish are affected, from behavioral and growth impacts to premature death.

Most importantly, federal and state agencies have long recognized that Indian Point Units 2 and 3 need to be operated in a far less environmentally destructive way. In fact, the

NRC reached that conclusion in 1976 – 35 years ago – in its Environmental Impact Statement for the “Selection of the Preferred Closed Cycle Cooling System,” a system that would almost eliminate use of Hudson River water. In 1976, as the United States Environmental Protection Agency (EPA) took an active permitting role under the Clean Water Act for the facility, that agency reached a similar conclusion. In 2003, the New York State Department of Environmental Conservation (NYSDEC) issued a draft Clean Water Act permit requiring closed-cycle cooling or an “equivalent technology.” During these past 35 years, and to this day, the owners and operators of the facility have repeatedly fought these closed-cycle cooling determinations in administrative proceedings.

The state and federal regulatory agencies that also have a role of addressing environmental issues related to the continued operation of Indian Point – NYSDEC and the National Marine Fisheries Service – have again concluded that mitigation of the significant adverse environmental impacts of the operation of Indian Point Units 2 and 3 is available and needs to be implemented at this facility. The NRC staff, however, has created a hollow legal argument concluding that it does not need to follow these agency determinations, and has produced an analysis that contradicts scientific rationale and cannot pass scrutiny. In essence, the NRC staff has abdicated its responsibility to conduct a full NEPA review, and has done so without offering any valid legal rationale.

The State of New York has actively participated in the NEPA process for the license renewals of Indian Point Units 2 and 3. New York’s scoping comments in 2007 and its comments on the Draft Supplemental EIS for Indian Point urged a full and thorough review and analysis of the issues addressed below. *See New York State Executive Agencies and the Department of Law Scoping Comments on the License Renewal of Indian Point Units 2 and 3, Buchanan, New York (Oct. 31, 2007) (ADAMS ML073090588); New York State Supplemental Submission Concerning NEPA Scoping on the License Renewal of Indian Point Units 2 and 3, Buchanan, New York (Nov. 30, 2007) (ADAMS ML073600658); New York State Department of Environmental Conservation Comments on the NRC Staff’s Draft Supplemental Environmental Impact Statement for the License Renewal of Indian Point Units 2 and 3, Buchanan, New York (Mar. 18, 2009) (ADAMS ML090780782); Comments Submitted by the New York State Office of the Attorney General on the Draft Supplemental Environmental Impact Statement Prepared by the Staff of the Nuclear Regulatory Commission for the Renewal of the Operating Licenses for Indian Point Units 2 and 3, Buchanan, New York (Mar. 18, 2009) (ADAMS ML090771328).* The NRC Final Supplemental EIS takes a limited view of the natural resource impacts, particularly the aquatic resources affected by the operation of Units 2 and 3. The NRC bases its conclusions of natural resources impacts on population trends for a limited number of species and only on presumed impacts of the operation of the facilities on the immature of these species. The NYSDEC has repeatedly and consistently criticized the efficacy and adequacy of these methods. Compounding the errors in the analytical methods chosen by NRC staff is that the conclusions are based upon incomplete data – data that do not even include endangered or threatened species.

The NRC’s dubious science in this analysis renders the Final Supplemental EIS conclusions on aquatic impacts unsupportable and thus invalid. Further, the NRC staff and the Commission itself have repeatedly taken the position that other agencies such as the NYSDEC would conduct needed environmental reviews and reach necessary environmental conclusions,

particularly under the federal Clean Water Act. However, even with these agency analyses and conclusions regarding aquatic impacts in the record in the license renewal proceeding, critical comments of the State of New York have never been fully incorporated by the NRC staff. In fact, they have been ignored.

For these reasons, which are discussed more fully below, the Final Supplemental EIS prepared by the NRC staff does not meet the requirements of NEPA regarding consideration of the natural resources of New York, particularly aquatic resources. Not only is the NRC required by law to fully and thoroughly analyze these environmental impacts, it must also conduct the substantive assessment itself. The NRC staff's effort ignores the lengthy 35-year record of decisions on the matter, and its Final Supplemental EIS fails to meet the requirements of NEPA.

In addition to the environmental impacts upon New York's natural resources from the once-through cooling system at Indian Point, the tragic events unfolding at the Fukushima Dai-ichi nuclear power plants in Japan demonstrate that the NRC must also consider the environmental impacts at Indian Point from a seismic event, emergency preparedness and evacuation scenarios, and the loss of cooling water in the spent fuel pools. As demonstrated below, these very real events at Fukushima Dai-ichi require the NRC staff to further supplement the EIS for the 20-year license renewal of Indian Point.

## **II. THE NATIONAL ENVIRONMENTAL POLICY ACT IMPOSES A SIGNIFICANT RESPONSIBILITY UPON NRC STAFF IN ITS REVIEW OF LICENSE RENEWAL APPLICATIONS.**

The National Environmental Policy Act imposes a simple, though critically important, obligation on a reviewing agency - that environmental impacts will be fully and thoroughly analyzed in a public process before federal actions are approved. The State of New York has continually argued and demonstrated that the significant environmental impacts of license renewal for Indian Point must be assessed. In the context of the NEPA environmental review process, New York has repeatedly pointed out what was necessary under NEPA's basic requirements, and that these requirements have not been met for the Indian Point review.

The Supreme Court has ruled that NEPA "places upon an agency the obligation to consider every significant aspect of the environmental impact of a proposed action," and "ensures that the agency will inform the public that it has indeed considered environmental concerns in its decisionmaking process." *Baltimore Gas & Elec. Co. v. Natural Res. Def. Counsel, Inc.*, 462 U.S. 87, 97 (1983). NEPA requires that federal agencies take a "hard look" at the environmental impacts of proposed actions, specifically

- (i) the environmental impact of the proposed action,
- (ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,
- (iii) alternatives to the proposed action,

- (iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and
- (v) any irreversible and irretrievable commitments of resources which would be involved if the proposed action should be implemented.

42 U.S.C. § 4332(2)(C). Federal agencies must prepare an Environmental Impact Statement for "all major Federal actions significantly affecting the . . . environment." *Id.* The requirements of NEPA are mandatory and apply to the NRC. *Calvert Cliffs Coordinating Comm., Inc. v. U.S. Atomic Energy Comm'n*, 449 F.2d 1109 (D.C. Cir. 1971). In *Calvert Cliffs*, the court rejected the claim of the NRC's predecessor agency that it would consider environmental impacts of the licensing of a facility only if parties in a proceeding raised those issues. *Id.*, at 1117 (stating that the court believed that "the Commission's crabbed interpretation of NEPA makes a mockery of the Act.") The court thus underscored the obligation that NEPA imposes on federal agencies. In addition, "significant new circumstances or information relevant to the environmental concerns that bear on the proposed action or its impacts" must be reviewed by the agency in a Supplemental EIS. 40 C.F.R. § 1502.9 (c)(1)(ii).

In this license renewal matter, the NEPA review of Indian Point's application involves a number of documents that the NRC generated over the past fifteen years. In May 1996, the NRC produced a Generic Environmental Impact Statement (Generic EIS) for License Renewal of Nuclear Plants. See NUREG-1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (May 1996); see also 61 Fed. Reg. 28,469 (June 5, 1996); 61 Fed. Reg. 66,546 (Dec. 18, 1996). The NRC divided potential environmental issues into Category 1 and Category 2 issues. The so-called Category 1 issues are included in the Generic EIS, which was codified at 10 CFR Part 51. In 1999, the NRC added a table of Category 2 issues. Table B-1, "Summary of Findings on NEPA Issues for License Renewal of Nuclear Power Plants," 10 C.F.R. Part 51, App. B to Subpart A. The NRC deemed these Category 2 issues as warranting site-specific review in a Supplemental Generic EIS for each plant that applies for license renewal. As stated above (p. 4), the State of New York participated in the site-specific NEPA review for the license renewal of Indian Point by submitting written Scoping Comments on October 31, 2007, Supplemental Scoping Comments on November 30, 2007, and two sets of written comments to the Draft Supplemental EIS on March 18, 2009.

As demonstrated below, the State of New York asserts that the Final Supplemental EIS is incomplete, full of factual and legal errors, and arrives at an unsupportable conclusion. Without question, Indian Point produces significant adverse impacts that must be fully analyzed and addressed in the context of the NEPA review for the license renewal application. In several respects, the NRC's Final Supplemental EIS does not address in any meaningful way the impacts that the agency is obligated to review under federal law.

**III. THE ONGOING DISASTER AT THE FUKUSHIMA DAI-ICHI NUCLEAR POWER PLANTS IN JAPAN COMPELS THE NRC TO FURTHER SUPPLEMENT THE EIS FOR INDIAN POINT TO EVALUATE SEISMIC IMPACTS, EMERGENCY PREPAREDNESS AND EVACUATION SCENARIOS, AND LOSS OF COOLING WATER IN THE SPENT FUEL POOLS.**

On March 11, 2011, a catastrophic but not unforeseeable event occurred. On that day, a massive earthquake measuring a magnitude of 9.0 rocked Japan. Buildings, homes, roads, and other infrastructure suffered great damage from the earthquake. Within hours, the world watched in horror as a massive tsunami with a wall of water 30 feet high swept across Japan. The tsunami overcame the Fukushima Dai-ichi nuclear power plants in northeastern Japan, disabling the cooling systems and the back-up systems that are necessary to prevent explosions, fires, emission of radiation to the atmosphere and into the sea, and a meltdown of fuel rods in the core of the nuclear reactor and in the spent fuel pools.

The extent of the damage to the plants from the earthquake itself is unknown at present, and may not be known for quite some time. Aftershocks continued to stress the plants and hampered the plant operator's ongoing measures to cool the fuel rods in the containment structures and in the on-site spent fuel pools. As of the date of this submission to NRC, four of the six plants at Fukushima Dai-ichi are slated to be scrapped; decommissioning will take years, perhaps decades. Plainly, the planning for emergency situations and seismic events at Fukushima Dai-ichi was woefully insufficient, and the plants were not able to withstand this disaster.

A result of the disastrous tragedy in Japan should be that the "lessons learned" from the multiple levels of failure at these nuclear plants be addressed as they correspond to Indian Point's license renewal. The State of New York has consistently argued that these issues need to be addressed in the NEPA review, and now is clearly the time that these issues should be incorporated into that review through an additional plant-specific Supplemental EIS. The world has witnessed significant and new information as the Fukushima Dai-ichi disaster continues to unravel, and this information was not available when the NEPA process for Indian Point commenced. As demonstrated below, the events at Fukushima Dai-ichi that relate to seismic risks, emergency planning and evacuation, and spent fuel pools present "significant new circumstances or information relevant to the environmental concerns that bear on the proposed action or its impacts" at Indian Point and must be reviewed by the NRC in a further Supplemental EIS. 40 C.F.R. § 1502.9 (c)(1)(ii). Certainly, such events have never been considered on the public record for the review of the license renewals for Indian Point Units 2 and 3.

1. *NEPA Requires the NRC to Evaluate the Environmental Impacts Related to Seismic Risk at the Indian Point Nuclear Power Plants.*

While there is no recorded tsunami event in the Hudson River since European settlement, there is risk of an earthquake at or near the site of the Indian Point plants. Recent data from researchers at Columbia University's Lamont-Doherty Earth Observatory demonstrate that "a pattern of subtle but active faults makes the risk of earthquakes to the New York City area substantially greater than formerly believed." *Columbia University Earth Institute*



(2010) *Earthquakes May Endanger New York More Than Thought, Says Study, Indian Point Nuclear Power Plant Seen As Particular Risk* (Press Release)(<http://www.earth.columbia.edu/articles/view/2235>); see also, Sykes, et al., *Observations and Tectonic Setting of Historic and Instrumentally Located Earthquakes in the Greater New York City-Philadelphia Area*, *Bulletin of the Seismological Society of America* 2008 98: 1696-1719. These researchers have also found that a fault runs very near Indian Point – running 25 miles from Stamford, Connecticut, to Peekskill, New York, passing within 1 mile north of the Indian Point plants. Sykes, et al., at 1709-1710. The researchers also caution that New York is prone to shallow earthquakes, which can generate higher ground motion intensities than deep earthquakes. *Id.*, at 1710. This is especially so in areas like those surrounding Indian Point where hard rock is found at or close to the surface. *Id.* Even with this newly available information, the NRC's Final Supplemental EIS does not address seismic hazards, much less the resulting environmental harm that would result if an earthquake did occur.

Instead, the NRC is engaged in slow-paced review of seismic risk through its "Generic Issue" process, which it has undertaken outside of the license renewal process. This generic process is fraught with delay, is vague, and does not account for the ongoing events at Fukushima Dai-ichi. The NRC has informed New York State that it uses the Generic Issue (GI) process for issues that, in its view, "do not need short term review." The NRC began Generic Issue-199 (GI-199) in 2005. In September 2010, the NRC issued a safety/risk assessment entitled *Implications of Updated Probabilistic Seismic Hazard Estimates in Central and Eastern United States on Existing Plants – Safety/Risk Assessment*. The NRC concluded in this GI-199 safety/risk assessment that all Central and Eastern United States nuclear power plants are "safe." The risk increased significantly at Indian Point, but the NRC claims that the increase is not at a level at which it would require immediate action at a nuclear generating facility. The State of New York has asked the NRC to provide further information on the GI-199 assessment.

A number of steps remain before the NRC concludes its GI-199 seismic review. Now that the screening and safety/risk assessment has been completed in GI-199, the next step in the NRC's analysis is to send a generic letter to the 96 Central and Eastern U.S. nuclear power plants, which will pose four questions. This next step has been delayed. The questions have not been finalized, and a set of "consensus hazard curves" will not be issued until 2012. The full analysis and follow up to the September 2010 GI-199 safety/risk assessment will not be complete until the end of 2012, at the earliest. The Indian Point license renewal hearing will likely begin in early 2012. Thus, the two are on separate tracks. While the NRC has committed to make Indian Point its top priority as part of a site-specific review of 27 plants under GI 199, it has also informed New York State that, in its view, the seismic issue at Indian Point "is not urgent" and has rejected the State's request to expedite the site-specific review at Indian Point.

In any event, while the NRC may conveniently exclude from license review an analysis of seismic risks at Indian Point, Congress had a different plan for the NRC when it passed NEPA into federal law. Simply stated, NEPA does not permit the NRC to ignore the environmental impacts from a potential seismic event at Indian Point, nor does it allow the NRC to point instead to a separate and protracted generic issue review process that may extend beyond the license renewal proceeding for a pending application, as is the case for Indian Point. The events at Fukushima Dai-ichi require a different approach here.

2. *NEPA Requires the NRC to Evaluate the Environmental Impacts Related to Emergency Planning and Evacuation of People Should a Disaster Occur at Indian Point.*

The Emergency Planning Zone (EPZ) around the Fukushima Dai-ichi plants is 20 kilometers, or 12.4 miles. As the events related to the earthquake and the tsunami of March 11, 2011, were unfolding, the Japanese government ordered an evacuation of residents within a zone expanded to 19 miles. The United States Embassy in Japan, however, recommended an evacuation zone for United States citizens residing within 50 miles. See *Travel Warning, U.S. Department of State, Bureau of Consular Affairs (Mar. 30, 2011)*. The population difference for 19 and 50 miles around Fukushima Dai-ichi is significant: 139,000 people reside within 19 miles, but 2 million people reside within 50 miles.

The Emergency Planning Zone around Indian Point is 10 miles. With the now existing precedent for a 50-mile evacuation at another plant when an actual nuclear release occurred, the NRC must account for such a possibility at Indian Point. The implications of such a nuclear release are enormous, and the process to analyze and account for such implications is ongoing. Based on 2010 census data, the population difference between 10 and 50 miles around Indian Point is even greater than at Fukushima Dai-ichi: in New York, 233,000 people reside within 10 miles, but 17.2 million people reside within 50 miles. These data do not even account for the people who work within 10 and 50 miles of Indian Point. The millions of people who reside and work within the 50 mile radius of Indian Point represent about 6 percent of the United States population.

Moreover, the events at Fukushima Dai-ichi have been slower moving, which poses fewer challenges for an orderly and effective evacuation than for populations around plants located in a complicated area, such as at Indian Point. Only slow-moving events have been premised for emergency planning and evacuation scenarios at Indian Point. To be sure, slow-moving events present major challenges given the unique features of terrain, roads, and high population near Indian Point. However, the NRC has never analyzed the substantially greater challenges that a fast-breaking scenario at Indian Point would present and whether any evacuation would be feasible under that circumstance, especially if the event is predicated by an earthquake of adequate strength to cause significant damage to Units 2 and 3 at Indian Point.

New York has repeatedly raised issues of concern to the NRC related to emergency planning and evacuation at Indian Point. Specifically, the Indian Point Units 2 and 3 license renewal record includes sworn expert testimony that addresses the following significant issues:

- Roadway constraints (inability of roads to handle large-scale evacuations)
- Increasing population
- Private sector not sufficiently engaged in evacuation planning
- Unique problems with school evacuations (parents would head to schools to pick up their children, ignoring the evacuation plan that would bus children to another locale)
- Lack of annual certifications by Rockland and Westchester Counties since 2003
- Uniqueness of local terrain
- Phenomena and implications of a fast-breaking scenario

- Hard lessons learned from Hurricane Katrina about the behavior of first responders (despite evacuation plans, the actual responders chose to go home to save their own families first)

*See Declaration of Raymond C. Williams (dated Nov. 29, 2007), submitted in support of New York State Notice of Intention to Participate and Petition to Intervene.*

The NRC has not addressed these concerns in its environmental review for the license renewal of Indian Point. NEPA, however, mandates that the NRC consider the environmental impacts related to emergency planning and evacuation, particularly given the new circumstances at the Fukushima Dai-ichi plants in Japan.

3. *NEPA Requires the NRC to Evaluate the Environmental Impacts Related to a Loss of Cooling Water in the Spent Fuel Pools at the Indian Point Nuclear Power Plants.*

The events at Fukushima Dai-ichi demonstrate the significant dangers posed by storing spent nuclear fuel in pools outside of the radiation containment structures for the nuclear generating facility. Although the NRC has not considered the environmental impacts that are presented by a loss of coolant from the spent fuel pools at Indian Point in the license renewal of Indian Point, NEPA requires that the environmental impacts of such a risk be evaluated.

At Indian Point, every two years, one-third to one-half of the fuel in the core is off-loaded and replaced with new nuclear fuel rods. These actions are part of the normal and routine operation of the plant. The spent fuel (high-level radioactive waste) is stored on-site at the nuclear power plant after it is used by the facility and no longer viable for energy production. The spent fuel is transferred (under cover of water) through a channel to the spent fuel pool, where it is stored underwater in specially designed racks for a specified time period. The water provides physical cooling and radiation shielding. At Indian Point, the spent fuel pools are located inside buildings adjacent to the reactors. Unlike the reactors, however, the spent fuel pools are not located within the containment structures of the facility.

The spent fuel pools at Indian Point Units 2 and 3 are currently at or near storage capacity for the facility. To address this situation, Entergy has constructed a large concrete dry cask storage area on the Unit 2 side of the site. Following the spent fuel pool storage period, the nuclear waste is deemed appropriate for dry cask storage. The storage area is sized to hold 78 casks, and each cask holds up to 32 fuel assemblies. Unit 1, shut down since 1974, still had 160 fuel assemblies in the spent fuel pool. This spent fuel pool was also leaking radionuclides into groundwater. The assemblies have since been placed into 5 casks and moved to the dry cask storage area. The pool has also been drained, and further leakage has been stopped. The Unit 2 spent fuel pool had a capacity of 1,374 fuel assemblies and was near capacity after the 2006 refueling outage (Unit 2 reactor core has 195 fuel assemblies). Entergy began moving fuel assemblies from the Unit 2 spent fuel pool to dry cask storage in 2008. To date, Entergy has moved 8 casks, each with 32 fuel assemblies, from Unit 2 to the dry cask storage area.

The Unit 3 spent fuel pool is at full capacity and must move the spent fuel out before the next refueling outage which is scheduled for the spring of 2013. The unit recently underwent a

refueling outage and had to forego the normal practice of a full-core off-load because there was not enough room in the spent fuel pool to off-load the current core load of 193 assemblies. Despite the need to act before the 2013 refuel outage, the configuration and crane capacity at the Unit 3 spent fuel pool building is not sufficient to handle the massive weight (more than 180 tons) for a full cask loaded with 32 fuel assemblies. To accomplish the move, Entergy has proposed moving fuel in smaller loads of up to 12 fuel assemblies from Unit 3 to the Unit 2 spent fuel pool, where they will be unloaded and placed into the Unit 2 spent fuel pool. When enough assemblies are moved to the Unit 2 spent fuel pool, they will be loaded into a storage cask and moved to the dry cask storage area. The NRC has not yet approved this process of moving fuel from Unit 3 to Unit 2.

The situation at Indian Point demonstrates that a great deal of spent fuel is located inside the spent fuel pools at these facilities, which are outside of the nuclear radiation containment structures. The volume of nuclear fuel outside the containment structures far exceeds the volume inside. The events at Fukushima Dai-ichi demonstrate the dangers of the loss of cooling water in these spent fuel pools. Whether that loss would be due to an earthquake, a loss of power with back-up systems failing, a terrorist attack, or some other occurrence possible at Indian Point, the NRC's NEPA review for Indian Point Units 2 and 3 needs to address the environmental impacts that would surely result.

The challenges posed by the Fukushima Dai-ichi situation present concrete and real evidence, and are beyond the probabilistic risk analysis approach undertaken by NRC for these types of issues. In sum, the events at Fukushima Dai-ichi that relate to seismic risks, emergency planning and evacuation, and spent fuel pools demonstrate the reality of these significant issues and present evidence into the record of Indian Point Units 2 and 3 of "significant new circumstances or information relevant to the environmental concerns that bear on the proposed action or its impacts" and must be reviewed by the NRC in a further Supplemental EIS. 40 C.F.R. § 1502.9 (c)(1)(ii).

**IV. IN THE FINAL SUPPLEMENTAL EIS, THE NRC STAFF FAILED TO ADDRESS AND ANALYZE THE FINDINGS OF STATE AND FEDERAL AGENCIES THAT ACTIVELY REVIEWED ENVIRONMENTAL ISSUES DURING THE NEPA REVIEW.**

The NRC staff stated that its conclusion that the continued operation of Indian Point Units 2 and 3 is acceptable is based in part on staff's "consultation with other Federal, State, Tribal, and local agencies." The facts belie this conclusion. Both the NYSDEC and the National Marine Fisheries Service provided information to NRC staff that would lead to a vastly different conclusion.

1. *The NRC Staff Failed to Acknowledge the Direct Impact of New York State's Denial of a Clean Water Act Section 401 Water Quality Certificate for the License Renewal of Indian Point.*

The NRC staff's Final Supplemental EIS for the license renewal of Indian Point does not discuss the significance of the recent New York State Department of Environmental Conservation (DEC) denial of a Clean Water Act Section 401 water quality certificate. DEC

specifically determined that "the facilities, whether operated as they have for the last 35 years (as proposed in the original Joint Application) or operated with the addition of a cylindrical wedge-wire screen system (as proposed in Entergy's February 12, 2010, submission to DEC) do not and will not comply with existing New York Water Quality Standards." *NYSDEC Notice of Denial of Section 401 Water Quality Certification (April 2, 2010)*, at 1-2. The State of New York is clearly empowered and capable of reaching these natural resources conclusions. N.Y.S. Constitution Article XIV, section 4. The Commissioner of Environmental Conservation is also designated the trustee for New York State's natural resources. See *CERCLA Subpart G of the National Contingency Plan*, 40 CFR Section 300.605; Section 107(f)(2) of the *Comprehensive Environmental Response, Compensation and Liability Act*, 42 U.S.C. Section 9607(f)(2); 33 U.S.C. Section 2706 (b)(3); the *Clean Water Act* Section 311(f)(5), 33 U.S.C. Section 1321(f)(5); see also *New York Environmental Conservation Law*, sections 1-0101 and 3-0301(1)(b). This significant State authority, however, does not supplant the NRC's obligations under NEPA to conduct its own analysis.

NRC staff has argued that critical environmental analysis and decision-making are solely within the jurisdiction of the State. See, e.g., *Transcript of Oral Argument before the Atomic Safety and Licensing Board Panel on the Petitions to Intervene in the License Renewal Proceeding of Indian Point (March 11, 2007)*, at 467-469. The Atomic Safety and Licensing Board adopted the NRC staff's position in its ruling on New York State's contentions in the Indian Point license renewal proceeding. See *Memorandum and Order (Ruling on Petitions to Intervene and Requests for Hearing) (July 31, 2007)*, at 139. Despite the NRC staff's position, the Commission cannot ignore the substance or legal consequences of New York's Clean Water Act Section 401 denial and go forward with a license renewal proceeding for Units 2 and 3 for an additional 20 years as though New York has not acted. For the NRC to issue the license renewal, New York's decision must be reversed, or Entergy's proposal reconceived. Even in light of the clear legal consequences of New York's April 2, 2010, decision, the repercussions of this denial are not discussed anywhere in the NRC staff's Final Supplemental EIS, even though they contradict and render legally meaningless the NRC staff's conclusions.

Despite the NRC's repeated claim of the primacy of New York's natural resources determinations, the NRC staff ignores the substantive environmental implications regarding New York's conclusions on aquatic impacts to the Hudson River. The significance of the DEC Section 401 water quality certification denial needed to be fully addressed in the Final Supplemental EIS. The NRC should therefore make it clear that without resolution of the issues raised in the DEC's April 2, 2010, Section 401 water quality certification denial, Units 2 and 3 cannot be allowed to operate past the current license term. New York's denial of the Section 401 water quality certification cannot be side-stepped by the NRC as though such facts are not relevant. The NRC staff repeatedly asserts that federal Clean Water Act issues are beyond its legal obligation, instead, pointing to New York State's role on these environmental issues. However, the denial of a Section 401 water quality certificate has a direct impact on the NRC's final decision on whether the Indian Point Units 2 and 3 licenses will be renewed.

2. *The NRC Staff Failed to Adequately Respond to the National Marine Fisheries Service's Extensive Conservation Recommendations for the Essential Fish Habitat of the Hudson River.*

The Magnuson-Stevens Fishery Conservation and Management Act requires federal agencies to consult with the Secretary of Interior, through the National Marine Fisheries Service, on any action the federal agency authorizes, funds, or undertakes that may adversely affect Essential Fish Habitat. See *Magnuson-Stevens Act*, Section 305(b)(2); 16 U.S.C. § 1855(b)(2). Eight species in the Hudson River Estuary have received Essential Fish Habitat designations: Atlantic sea herring, bluefish, Atlantic butterfish, red hake, black sea bass, summer flounder, winter flounder, and windowpane flounder. See <http://www.nero.noaa.gov/hcd/ny3.html>. As a part of the consultation process, the federal agency is required to prepare an Essential Fish Habitat assessment. See 50 C.F.R. 600.920(e). If the National Marine Fisheries Service determines that the federal agency action will adversely affect any Essential Fish Habitat, then it will recommend measures that can be taken to conserve the habitat. See *Magnuson-Stevens Act* § 305 (b)(4)(A); 16 U.S.C. § 1855(b)(4)(A). The federal agency is then required to provide a detailed response to the National Marine Fisheries Service, which includes a "description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on such habitat." See *Magnuson-Stevens Act* § 305 (b)(4)(B); 16 U.S.C. § 1855(b)(4)(B).

The National Marine Fisheries Service responded to the NRC's Essential Fish Habitat assessment in a detailed ten-page letter dated October 12, 2010. The National Marine Fisheries Service concluded that the license renewal of Indian Point Units 2 and 3 would result in a significant impact to the Essential Fish Habitat of the Hudson River estuary. The National Marine Fisheries Service recommended that this potential impact be mitigated by replacing the once-through cooling water system with a closed-cycle cooling system. The NRC staff responded to the National Marine Fisheries Service's conclusion and recommendation in a letter dated December 3, 2010. In that letter, the NRC staff concluded that it would not consider closed-cycle cooling as an alternative, claiming that NYSDEC and not the NRC has the authority to require closed-cycle cooling to mitigate the Essential Fish Habitat impacts.

The NRC staff's response does not follow the requirements established under section 305(b)(4)(B) of the Magnuson-Stevens Act. To meet its obligation under the Magnuson-Stevens Act, the NRC staff's response to the National Marine Fisheries Service's October 12, 2010, letter "must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH." See *Magnuson-Stevens Act* § 305 (b)(4)(B); 16 U.S.C. § 1855(b)(4)(B); see also 50 CFR 600.920(k). Simply placing the responsibility for its action on New York State does *not* fulfill this requirement. Furthermore, when a response from a federal agency (here, the NRC) is inconsistent with conservation recommendations from the National Marine Fisheries Service, "the Federal agency must explain its reasons for not following the recommendations, including the scientific justification for any disagreements with the National Marine Fisheries Service over the anticipated effects of the action and the measures needed to avoid, minimize, mitigate, or offset such effects." See 50 CFR 600.920 (k). The NRC did not provide the scientific justification for its failure to follow the National Marine Fisheries Service, as it is required to do by the Magnuson-Stevens Act. For the NRC staff to simply state that the NRC has no authority to require the recommended mitigation (e.g., closed-cycle cooling) does

not fulfill the NRC's obligation to minimize Essential Fish Habitat impacts. Nor does it fulfill the NRC's obligation under NEPA.

**V. THE NRC STAFF'S ANALYSIS OF AQUATIC IMPACTS IN THE FINAL SUPPLEMENTAL EIS IS WOEFULLY INADEQUATE AND FAILS TO MEET THE LEGAL REQUIREMENTS UNDER NEPA.**

The NRC staff has failed to meet its obligations under NEPA because its analysis of aquatic impacts in the Final Supplemental EIS is woefully inadequate. As demonstrated below, the Final Supplemental EIS used an improperly narrow definition of "aquatic resource impact," drew conclusions from faulty and missing data, changed significantly from the Draft Supplemental EIS with no chance for the public to comment, failed to assess impacts to endangered and candidate threatened species, and failed to assess thermal impacts.

*1. The NRC Staff's Definition of "Aquatic Resource Impact" Is Too Narrow Because It Ignores Other Known Environmental Impacts on the Hudson River Estuary.*

The NRC staff narrowly defined the impacts to aquatic resources in the Hudson River estuary. The NRC staff's narrow definition is the direct impact that the impingement and entrainment of 17 types of fish and 1 type of crustacean would have on the populations of these 18 Representative Important Species. The NRC staff's impact conclusion was based on two lines of evidence:

- (1) evident river population trends for each of the 18 species; and
- (2) whether a density change in the young of the year of each species was potentially connected with operation of the cooling water systems of Indian Point Units 2 and 3.

The NRC staff reasoned that to declare the existence of such an impact,

- (1) the population must have declined; and
- (2) a connection can be made between the decline and the number of young of the year fish impinged or entrained.

The NRC implicitly assumes that somehow these lines of evidence would be able to predict the likely impact (small, moderate, or large) that the operation of Indian Point Units 2 and 3 would have on the aquatic resources of the Hudson River estuary. Through this narrow definition, the NRC staff ignored other known impacts to the aquatic resources. Thus, the NRC staff has failed to fully assess the environmental impacts from the operation of Indian Point on the Hudson River estuary.

The NRC staff concluded that overall there would be a "moderate" impact – a noticeable impact, but not one that would lead to the destabilization of one or more important attributes of the resource. The NRC staff, however, analyzed only one attribute of the resource – the population of 18 aquatic organisms. What the NRC staff is therefore concluding is that the continued operation of Indian Point Units 2 and 3 will likely cause a noticeable population change to some of these 18 aquatic species, but that this change, taken in isolation of all other stressors on fish populations, would not cause the fish population to crash.

This Final Supplemental EIS's conclusion is hollow because it fails to consider other cumulative impacts. The NRC staff ignored or only briefly considered other potential impacts that the operation of Indian Point Units 2 and 3 would have on aquatic resources including the following:

- (1) long-term thermal impacts;
- (2) cumulative impacts caused by other industrial facilities withdrawing Hudson River water and/or discharging thermal pollution;
- (3) thermal impacts in relation to predicted climate change over the 20-year license renewal period;
- (4) cumulative impacts caused by commercial and recreational fishing pressure; and
- (5) the ecological importance of the impinged and entrained organisms in supporting the estuarine food web.

In fact, the only "cumulative impact" that the NRC staff analyzed was the impact that the zebra mussel invasion may have had on the 18 Representative Important Species. As discussed below, the NRC staff's analyses and conclusions on that issue were not supported by the data.

2. *The NRC Staff's Elaborate Weight of Evidence Analysis – from Which It Drew Its Conclusion of "Small" Impact for a Number of Representative Important Species – Was Fraught with Errors and Could Not Even Be Applied to Five Species, Including an Endangered Species and a Candidate Threatened Species.*

The NRC staff developed an elaborate "weight of evidence" method to quantitatively determine the likelihood that the license renewal of Indian Point Units 2 and 3 would impact 18 Representative Important Species found in the Hudson River. The NRC staff incorporated fisheries data that had been collected by the utility companies as part of the Hudson River Monitoring Program. The NRC staff developed a numerical scale (from one to four) to be used to make a quantitative assessment of several lines of evidence used in making the Final Supplemental EIS determinations. The NRC staff defended the method as being an "independent, strong, and scientifically rigorous and defensible analysis." The NRC staff proceeded upon the following operating assumption: "[a]ssignment of an NRC level of impact (small, moderate, or large) requires information on both a measurable response in the RIS (Representative Important Species) population and clear evidence that the RIS is influenced by the operation of the IP2 and IP3 cooling systems." See *Final Supplemental EIS at H-48*. This means that for the NRC staff to make a final aquatic impact decision on any of the 18 Representative Important Species, both lines of evidence (e.g., population trend and strength of connection) used in the impact analysis must be evaluated. However, as demonstrated below, this was not done. The NRC staff did not have information about 5 Representative Important Species and thus could not have rendered any aquatic impact decision on them.

The NRC staff lacked the necessary data to apply the Weight of Evidence analysis for 5 (30 percent) of the 18 Representative Important Species, including the endangered shortnose



sturgeon and the candidate species Atlantic sturgeon. For these 5 species – Atlantic menhaden, Atlantic sturgeon, gizzard shad, shortnose sturgeon, and blue crab – the NRC staff could not assess a measurable response in the population nor determine if these five species were influenced by the operation of Indian Point Units 2 and 3's once-through cooling systems. Though this clearly violated the NRC staff's operating assumption stated above, and though the NRC staff had no data to support the conclusion, NRC staff arbitrarily assigned a "small" impact assessment to these 5 species.

The NRC staff's conclusion for these 5 species is not at all supported by the 2,000 plus pages that comprise the Final Supplemental EIS. The NRC lacked data for these 5 species when it issued the Draft Supplemental EIS and concluded that the likely impacts to these 5 species were "unknown." New York State criticized this lack of data and the NRC's march to draw a conclusion when it did not have complete data. *See NYSDEC Comments on the NRC Staff's Draft Supplemental EIS for the License Renewal of Indian Point Units 2 and 3 (March 18, 2009), at 12-13.* To change the impact assessment from "unknown" to "small" without any data to support such a change is arbitrary and capricious, and is neither scientifically rigorous nor defensible. It appears that the NRC staff simply did this to respond to the criticism that without being able to assess the impact to 30 percent of the Representative Important Species, including federally listed endangered species, no final assessment on impact could be made. *Id.* Instead of acknowledging that it did not have the necessary data to determine the impact, the NRC staff simply moved the target.

The impact of this arbitrary scientific conclusion by the NRC staff can be seen clearly in the overall aquatic resource impact assessment for Indian Point as "moderate." These 5 species represent 45 percent of the Representative Important Species assigned a "small" impact level. If the NRC assigned the "unknown" level of impact required by the Weight of Evidence approach, of the remaining 13 Representative Important Species, more than 50 percent resulted in a moderate to large impact assessment, and 30 percent would result in a large impact. By not including these 5 species in the overall aquatic impact assessment, the final aquatic resource impact conclusion made by the NRC could very well be greater than moderate.

In the Final Supplemental EIS, the NRC staff concludes that the population trend was "unresolved" for these 5 Representative Important Species. *See Final Supplemental EIS at Tables 4-4 and H-14.* This term, though defined in a footnote, is misleading. In truth, these 5 species were not present in the data sets the NRC analyzed so, therefore, the NRC lacked the necessary data to make this assessment. "Unresolved" would indicate that the data were inconclusive, but the fact is the NRC had *no data* to evaluate the population trends of these 5 species. A more appropriate denotation would be "no data available" or "did not determine" – but not "unresolved."

3. *The NRC Staff Significantly Modified the Weight of Evidence Evaluation without Offering the Public an Opportunity to Comment.*

The NRC staff significantly modified the Weight of Evidence evaluation form that it used to write the Draft Supplemental EIS. These changes include the following:

- The NRC staff used an alternative approach that uses impingement and entrainment data to provide ancillary (*versus* direct) information concerning the strength of connection between population changes and the operation of Indian Point Units 2 and 3. *See Final Supplemental EIS Comment Response, at A-72, line 23.* In the original analysis, the NRC staff determined the strength of connection line of evidence to the number of Representative Important Species impinged and entrained. The NRC staff also considered the potential ecological impacts caused by the impingement and entrainment of prey species. In the Final Supplemental EIS, the NRC staff only used the impingement and entrainment of young of the year Representative Important Species fish in an additional Monte Carlo analysis that had not been used in the Draft Supplemental EIS.
- The NRC staff no longer considered coastal population trends in determining the population line of evidence. *See Final Supplemental EIS, Comment Response, at A-72, line 31.* For several of the Representative Important Species, such as American shad, alewife, blue back herring, and Atlantic sturgeon, coastal population crashes have lead to closures of recreational and commercial fisheries on the Hudson River, clearly indicating the importance of these trends in assessing overall potential impacts. Since the NRC staff did conclude that the populations of some of the 18 Representative Important Species will likely be changed by the continued operation of Indian Point Units 2 and 3, coastal population trends should have been evaluated as an important cumulative effect.
- The NRC staff also stated that it considered the *Barnthouse et al.* 2008 and 2009 reports to improve the Weight of Evidence approach. *See Final Supplemental EIS, Comment Response, at A-74, line 1.* Though the NRC staff claims to have used these reports, the NRC staff does not explain nor indicate where in the Weight of Evidence methods the substance of these reports could be included.

These changes from the Draft Supplemental EIS to the Final Supplemental EIS are not minor tweaks based on public comments but represent significant changes to how the final impact assessment was made. The public has had no opportunity to review and comment on the new methods employed – prior to the issuance of the Final Supplemental EIS.

4. *The NRC Staff Failed to Assess the Impacts to Endangered Species Contrary to the Requirements of the Endangered Species Act.*

The operation of the once-through cooling water intake system of Indian Point Units 2 and 3 causes the impingement of both shortnose sturgeon, a federally listed endangered species, and Atlantic sturgeon, a candidate threatened species. Thus, the NRC is required to provide the necessary data and information that the U.S. National Marine Fisheries Service requested to initiate a Biological Opinion for both of these species. *See National Marine Fisheries Service letter, dated March 19, 2007 (ADAMS ML071060289.)* On December 10, 2010, the NRC provided to the National Marine Fisheries Service a “Revised Biological Assessment” (ADAMS ML102990043).

This assessment only provided information and a conclusion on the impact to the shortnose sturgeon, but failed to provide an assessment of the potential impacts to the Atlantic sturgeon. In addition, the NRC staff concludes in the Final Supplemental EIS for Indian Point that impacts caused by impingement and entrainment would be "small," but thermal impacts could be the wide-ranging "small to large" because the NRC staff did not conduct an analysis of the potential impacts.

How the NRC staff reached these conclusions is not clear given that they are based on a lack of data and analysis. In the Final Supplemental EIS, the NRC staff lacked the data necessary to complete the Weight of Evidence analysis for either sturgeon species, but arbitrarily concluded that the overall impact would be "small" simply based on an observation that the percent of the total impingement and entrainment attributed to sturgeon species is small. The National Marine Fisheries Service requested the NRC to provide updated information on impingement, entrainment, and potential thermal impacts. The NRC provided none of this information but proceeded to undertake the assessment.

The NRC staff has also improperly blamed the NYSDEC for the lack of recent data. In its response to comments, the NRC staff confuses its responsibility to determine the impacts of its proposed action with unrelated regulatory authority held by New York State. Regarding the lack of recent impingement and entrainment data, the NRC states that New York State, and not the NRC, is responsible for requiring impingement and entrainment data collection, as if New York acquiring such data could usurp the NRC's responsibility under NEPA to conduct a thorough environmental impact determination. *See Final Supplemental EIS, at A-62.* The NRC staff chose to use old impingement and entrainment data to fulfill the NEPA requirement and defended its Weight of Evidence method to determine the impacts to the aquatic resources. The NRC's efforts on this point are disingenuous and indefensible - the NRC staff knew that the data are not current or relevant when it was presented with the newer correct data. The NRC staff also stated that New York State, and not the NRC, is responsible for ensuring that the thermal discharges meet water quality criteria. *See Final Supplemental EIS, at A-63.*

The NRC staff has determined that the impingement of a federally listed endangered species, the shortnose sturgeon, will result in a "small" impact and that the *potential* to remove Indiana bat roosting habitat (also a listed endangered species) by constructing cooling towers, would be "small to moderate." *See Final Supplemental EIS, at Table 8-1.* Since neither of these conclusions is based on data, both are scientifically unsupportable and arbitrary opinions of the NRC staff. In addition, the final decision as to whether these activities would have an impact on listed endangered species lies with the federal agencies responsible for their protection and not the NRC, and any such analysis must include the information and methods that relevant and responsible federal agencies are requiring. Therefore, the NRC's *opinion* that the impacts to endangered species as a result of re-licensing Indian Point Units 2 and 3 may be "small to moderate" for Indiana bats and "small" for shortnose sturgeon is neither relevant nor a final conclusion.

New York's authority to regulate thermal discharges to New York waters does not negate the NRC's responsibility to obtain the thermal data and other information that the National Marine Fisheries Service requested it obtain to determine impacts to a federally listed

endangered species. Moreover, the NRC staff has an independent responsibility under NEPA to require the collection of current impingement, entrainment, and thermal data and information. The NRC staff fell short of its responsibility to obtain the best information necessary to accurately determine the aquatic impacts – from thermal discharges, impingement, and entrainment, including the impact on federally listed endangered species – that will result from the license renewal for Indian Point Units 2 and 3 for 20 additional years.

5. *The NRC Staff Failed to Assess Thermal Impacts of the Continued Operation of the Once-Through Cooling System at Indian Point Units 2 and 3.*

The NRC staff makes no final assessment on the potential environmental impacts caused by the thermal discharge into the Hudson River as a result of the once-through cooling system at Indian Point. The NRC staff lacked data to make such a necessary determination, but “concluded” that the impacts would range from “small to large,” and then stated that it has no legal authority to address this impact anyway. The NRC, it appears, wishes to defer to New York State on this point. Whatever New York’s legal responsibility may be regarding this issue under State law, Congress imposed an independent obligation upon the NRC – and all federal agencies – to assess the environmental impacts of their actions under NEPA. An agency cannot choose to ignore and not analyze an issue. The NRC has failed to meet its responsibility under NEPA to accurately assess a significant adverse environmental impact from the thermal discharges to the Hudson River.

**VI. THE NRC STAFF’S AQUATIC RESOURCE IMPACTS ANALYSIS IS WITHOUT SUPPORT IN THE RECORD, IS NOT BASED ON SOUND SCIENCE, AND THUS IS ARBITRARY AND CAPRICIOUS.**

A review of the Final Supplemental EIS for the license renewal of Indian Point Units 2 and 3 leads to a troubling conclusion: the NRC staff has made numerous assumptions in its impact analysis that are not supported by sound science. This further undermines the credibility of the NRC NEPA efforts, and calls into question the NRC staff’s ability to analyze issues and produce a viable Final Supplemental EIS.

1. *The NRC Staff Did Not Employ a Holistic Ecologically Relevant Analysis of Potential Impacts.*

The NRC staff states that the Weight of Evidence approach it used was done to satisfy NEPA, which it states “requires an ecologically relevant analysis of potential impacts that is more holistic than a *general fisheries biology approach*.” However, the NRC staff did not employ a holistic ecologically relevant analysis of potential impacts. Rather, the NRC staff narrowly defined the aquatic resource and relied heavily on fisheries biology data collected under the Hudson River Monitoring Program. Elsewhere in the Final Supplemental EIS, the NRC staff states that the data collected under the Hudson River Monitoring Program (Falls Shoals, Long River, and Beach Seine Surveys) were designed to *evaluate the population abundance of selected species* and “were not designed to evaluate competing and confounding factors affecting population abundance.” *See Final Supplemental EIS, at H-53.* Both lines of evidence in the Weight of Evidence approach relied on Hudson River Monitoring Program data to lead the

NRC staff to the final conclusion that the 20-year license renewal of Indian Point Units 2 and 3 would only result in a "moderate" impact to the aquatic resources of the Hudson River estuary.

The data that the NRC staff relied on, however, were not suited to the purpose of evaluating impacts pursuant to NEPA. The NRC staff relied on data collected under monitoring programs that were designed to address trends in fish abundance to determine the impact of competing and confounding factors, namely the continued operation of Indian Point Units 2 and 3 for 20 years.

2. *The NRC Staff Incorrectly Assumed that Species Spawn Well Outside the Vicinity of Indian Point.*

The NRC staff analysis states that many of the Representative Important Species reproduce 100 river miles upriver, and the eggs and larvae of some species float downstream where some are entrained. *See Final Supplemental EIS, at H-38.* This again calls into question the experience that NRC staff has in Hudson River fisheries ecology. The majority of the organisms entrained represent species that spawn well within the vicinity of the Indian Point Units 2 and 3 cooling water system (e.g., bay anchovy, Atlantic tomcod, white perch, and striped bass). The NRC staff's statement also indicates that the NRC staff does not consider that it takes weeks for water to travel 100 miles along the estuary due to the influence of tidal action.

3. *The NRC Staff's Characterization of the Indian Point Nuclear Generating Facility as a "Hybrid Predator," Which Places Indian Point in a "Unique Position" in the Hudson River Estuary, Is Bizarre.*

The NRC staff makes some bizarre analogies about the ecological role that Indian Point Units 2 and 3's cooling water intake structures play in the Hudson River estuary. The NRC staff states that "[w]ithin th[e] food web concept, the IP2 and IP3 cooling systems can be viewed as hybrid predators." *See Final Supplemental EIS, at H-28.* This statement is very troubling and further indicates how unfamiliar the NRC staff is with basic ecological principles. No predator on earth consumes the range of species, life stages, and numbers of organisms that Indian Point Units 2 and 3 impinge and entrain each year.

The NRC staff further states that "the fixed position of [IP2 and IP3] in the environment, their relatively continuous operation, and their lack of sensitivity to traditional environmental stressors that affect predators place them in a unique position in the estuarine system." *See Final Supplemental EIS, at H-29.* New York State wants to make it perfectly clear to the NRC that Indian Point Units 2 and 3 are *not* part of the Hudson River estuarine system and are *not* "hybrid predators." In fact, the only unique ability that the cooling water intake structures of Indian Point Units 2 and 3 have is to indiscriminately kill billions of fish annually.

4. *The Indian Point Nuclear Generating Facility Is Not an "Environmental Sampling Device" to Provide Data to Identify Trends in Fish Populations.*

The NRC staff describes Indian Point Units 2 and 3 as "environmental sampling device(s)," and that their data can be used to identify trends in populations. *See Final*

*Supplemental EIS, at H-29.* The NRC staff's approach - that entrainment and impingement are effective methods to sample the estuarine fish community - suggests that these destructive killing activities of the operation of Indian Point Units 2 and 3 cooling water systems are somehow positive benefits. Comparative studies recently conducted in the United Kingdom clearly demonstrate that the killing of fish by intake structures have little utility to fisheries scientists and resource managers in assessing fish population and community trends. By making this statement of fact, the NRC staff is once again attempting to provide an environmental benefit of this indiscriminant and unnecessary mortality of fish. This position misrepresents the scientific literature. See Greenwood, M.F.D. "Trawls and cooling-water intakes as estuarine fish sampling tools: Comparisons of catch composition, trends in relative abundance, and length selectivity," *Estuarine, Coastal and Shelf Science* 76 (2008): 121-130. Operation of a power plant is hardly a substitute for a carefully planned fisheries management sampling program and could never meet the rigorous quality control requirements of standard environmental sampling procedures.

5. *The NRC Does Not Clearly Explain the Entrainment Data for Morone spp.*

The NRC staff claims to have combined the estimated number of *Morone spp.* entrained due to difficulty in distinguishing the species at the larval stages. However, the data reported in Table H-7 include the number of *Morone spp.* entrained, as well as white perch (*Morone americana*). See *Final Supplemental EIS, at H-24.* Since only two *Morone spp.* are found in the Hudson River estuary (striped bass and white perch), it is not clear what species, besides striped bass, fall within the *Morone spp.* category. If *Morone spp.* includes striped bass AND white perch, the number of white perch entrained is represented twice in Table H-7.

6. *The NRC Staff's Analysis of Impacts Caused by the Invasion of Zebra Mussels Is Not Supported by the Data.*

The NRC staff applied its Weight of Evidence method to evaluate the impact that the zebra mussel invasion may have had on the 18 Representative Important Species. See *Final Supplemental EIS, at H-53 to H-56.* Of all the potential cumulative impacts that the NRC staff could have evaluated, it is far from clear why it attempted to determine the effect of an extremely complicated ecosystem-wide impact. In addition, while the NRC staff cautioned against the use of the Hudson River Monitoring Program data for identifying "competing and confounding factors affecting population abundance," it nonetheless used these data to assess the potential impacts caused by the zebra mussel invasion. See *Final Supplemental EIS, at H-53.*

The NRC staff's findings are presented in a puzzling manner - the impacts are hypothesized to be "small" for 7 of the 18 Representative Important Species tested - and yet the NRC concludes that it disagrees with Strayer *et al.* (2004), which reported that some fish populations had declined as a result of the zebra mussel invasion. The NRC staff's finding that the zebra mussel invasion had no impact on a subset of the Representative Important Species fish population is not supported by the data. Furthermore, the NRC staff's conclusion that the invasion of the zebra mussel is not a potential cause of the American shad decline grossly misrepresents the results of its analysis.

The NRC staff does not discuss *why* it believes Strayer *et al.* (2004) was wrong. The correct interpretation of the NRC staff's analysis would be that the NRC staff *did not detect* a population decline caused by zebra mussels using the Weight of Evidence method. This is not surprising given the difficulty the NRC staff had in determining the impacts that the extended operation of Indian Point Units 2 and 3 may cause for several of the Representative Important Species chosen. In addition, the results of the NRC staff's analysis do not support the NRC staff's conclusion - failure to *detect* an effect does not mean that an effect does not exist.

**VII. THE NRC STAFF FAILED TO INCLUDE AND ADEQUATELY ANALYZE MITIGATION ALTERNATIVES TO THE LICENSE RENEWAL OF INDIAN POINT.**

The NRC staff has all but removed from the Final Supplemental EIS any discussion of mitigation alternatives to reduce the "moderate" impacts of Indian Point's operation to the aquatic resources of the Hudson River. In its comments on the Draft Supplemental EIS, New York State noted that most of the mitigation alternatives that the NRC staff identified, including fish stocking and wetland restoration to offset the impingement and entrainment of fish, violated the federal Clean Water Act. The only mitigation alternative that the NRC staff discussed at any length in the Final Supplemental EIS is the replacement of the once-through cooling water system with a closed-cycle system. However, the NRC staff concludes that New York State, and not the NRC has the authority to require Entergy to install a closed-cycle cooling system. Thus, the NRC staff does not make that recommendation to the Commission. The NRC staff's position ignores its obligation under NEPA to analyze impacts and mitigation measures.

The NRC staff claims that it considered the comments and requirements of State and Federal Agencies in developing the Final Supplemental EIS. Two federal agencies - National Oceanographic and Atmospheric Administration/National Marine Fisheries Service and the Department of the Interior/Fish and Wildlife Service - and the New York State agency of record - NYSDEC - each concluded that the aquatic impacts are sufficiently high enough to warrant the NRC to require closed-cycle cooling. The views on the need for closed-cycle cooling to mitigate the impacts of ongoing Indian Point operation are uniform and consistent among these varying federal and state agencies. The NRC staff's response to all three of these governmental agencies has been that it has no authority to require closed-cycle cooling and that this authority rests entirely with New York State and the United States Environmental Protection Agency. This response goes against the NRC's clear obligation under NEPA to fully review and assess environmental impacts. Further, the NRC staff's failure to fully analyze the aquatic impacts of Indian Point Units 2 and 3 necessarily means that it also failed to address its responsibilities under the Endangered Species Act and the Magnuson-Stevens Fishery Conservation and Management Act.

## VIII. CONCLUSION

The operation of Indian Point Units 2 and 3 has a significant environmental impact on the Hudson River. The impacts of this facility are well known. For over 35 years, federal government decisions – of both NRC and EPA – have concluded that these significant impacts need to end and that elimination of the once-through cooling water systems that use Hudson River water to cool down the nuclear generating facility is the way to do it. In the last several years, during the NEPA Supplemental EIS review for the license renewal of Indian Point, the New York State DEC and the National Marine Fisheries Services have reaffirmed these multi-decade-old federal agency determinations. There is clear unanimity in the record by federal and state regulatory agencies on the aquatic impacts of Indian Point. Despite the clarity of the overall record, and without credible and adequate scientific rationale or support, NRC staff concludes that license renewal for another 20 years should be granted. Further, the NRC's Final Supplemental EIS concludes that there is no need to change the destructive way that the nuclear generating facility consumes the Hudson River.

The scientific conclusions of the NRC staff are not supportable. Indeed, some of the NRC staff's propositions offered in support of its conclusions are not even credible. Moreover, the NRC staff continually refuses to acknowledge and consider the opinions and determinations of other regulatory agencies regarding the need to mitigate the environmental impacts of Indian Point. Under NEPA, the NRC has a clear legal obligation to fully assess and analyze all of the information in the record regarding the license renewal of Indian Point. The NRC has chosen not to analyze the lengthy record in a comprehensive way, but instead has selectively chosen what to consider despite NEPA's clear requirements.

For these reasons, the NRC staff has produced a Final Supplemental EIS that not only fails to meet its legal requirements, but fails the State of New York and its natural resources affected by its decision – the Hudson River – and the directly impacted people of the State of New York.

Finally, apart from these noted deficiencies in the NRC staff's NEPA review, the recent disaster at the Fukushima Dai-ichi plants in Japan should compel the NRC staff to further supplement the site-specific EIS for Indian Point because it constitutes "significant new circumstances or information relevant to the environmental concerns that bear on the proposed action or its impacts." 40 C.F.R. § 1502.9 (c)(1)(ii).