U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

NUREG-1437, Supplement 38,
Vol. 2

Generic Environmental Impact Statement for License Renewal of Nuclear Plants

Supplement 38

Regarding Indian Point Nuclear Generating Unit Nos. 2 and 3

Final Report Public Comments

Office of Nuclear Reactor Regulation

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Final Report Public Comments

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ABSTRACT

The U.S. Nuclear Regulatory Commission (NRC) considered the environmental impacts of renewing nuclear power plant operating licenses for a 20-year period in NUREG-1437, Volumes 1 and 2, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (hereafter referred to as the GEIS),[1] and codified the results in Title 10, Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," of the *Code of Federal Regulations* (10 CFR Part 51). In the GEIS (and its Addendum 1), the NRC staff identified 92 environmental issues and reached generic conclusions related to environmental impacts for 69 of these issues that apply to all plants or to plants with specific design or site characteristics. Additional plant-specific review is required for the remaining 23 issues. These plant-specific reviews are to be included in a supplement to the GEIS.

This supplemental environmental impact statement (SEIS) has been prepared in response to an application submitted to the NRC by Entergy Nuclear Operations, Inc. (Entergy), Entergy Nuclear Indian Point 2, LLC, and Entergy Nuclear Indian Point 3, LLC (all applicants will be jointly referred to as Entergy) to renew the operating licenses for Indian Point Nuclear Generating Unit Nos. 2 and 3 (IP2 and IP3) for an additional 20 years under 10 CFR Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants." This SEIS includes the NRC staff's analysis which considers and weighs the environmental impacts of the proposed action, the environmental impacts of alternatives to the proposed action, and mitigation measures available for reducing or avoiding adverse impacts. It also includes the NRC staff's recommendation regarding the proposed action.

Regarding the 69 issues for which the GEIS reached generic conclusions, neither Entergy nor the NRC staff has identified information that is both new and significant for any issues that apply to IP2 and/or IP3. In addition, the NRC staff determined that information provided during the scoping process was not new and significant with respect to the conclusions in the GEIS. Therefore, the NRC staff concludes that the impacts of renewing the operating licenses for IP2 and IP3 will not be greater than the impacts identified for these issues in the GEIS. For each of these issues, the NRC staff's conclusion in the GEIS is that the impact is of SMALL[2] significance (except for the collective offsite radiological impacts from the fuel cycle and high-level waste and spent fuel, which were not assigned a single significance level).

Regarding the remaining 23 issues, those that apply to IP2 and IP3 are addressed in this SEIS. The NRC staff determined that several of these issues were not applicable because of the type of facility cooling system or other reasons detailed within this SEIS. For the remaining applicable issues, the NRC staff concludes that the significance of potential environmental impacts related to operating license renewal is SMALL, with three exceptions—entrainment, impingement, and heat shock from the facility's heated discharge. Overall effects from entrainment and impingement are likely to be MODERATE. Impacts from heat shock potentially

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(1) The GEIS was originally issued in 1996. Addendum 1 to the GEIS was issued in 1999. Hereafter, all references to the "GEIS" include the GEIS and its Addendum 1.

(2) Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.

range from SMALL to LARGE depending on the conclusions of thermal studies proposed by the New York State Department of Environmental Conservation (NYSDEC). Based on corrected data received since completing the draft SEIS, NRC staff concludes that impacts to the endangered shortnose sturgeon – which ranged from SMALL to LARGE in the draft SEIS – are likely to be SMALL.

The NRC staff's recommendation is that the Commission determine that the adverse environmental impacts of license renewals for IP2 and IP3 are not so great that preserving the option of license renewal for energy planning decision makers would be unreasonable. This recommendation is based on (1) the analysis and findings in the GEIS, (2) the environmental report and other information submitted by Entergy, (3) consultation with other Federal, State, Tribal, and local agencies, (4) the NRC staff's own independent review, and (5) the NRC staff's consideration of public comments received during the scoping process and in response to the draft SEIS.

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EXECUTIVE SUMMARY

By letter dated April 30, 2007, Entergy Nuclear Operations, Inc. (Entergy) submitted an application to the U.S. Nuclear Regulatory Commission (NRC) to renew the operating licenses for Indian Point Nuclear Generating Unit Nos. 2 and 3 (IP2 and IP3) for an additional 20-year period. If the operating licenses are renewed, State regulatory agencies and Entergy will ultimately decide whether the plant will continue to operate based on factors such as the need for power, issues falling under the purview of the owners, or other matters within the State's jurisdiction, including acceptability of water withdrawal. Two state-level issues (consistency with State water quality standards, and consistency with State coastal zone management plans) need to be resolved. On April 2, 2010, the New York State Department of Environmental Conservation (NYSDEC) issued a Notice of Denial regarding the Clean Water Act Section 401 Water Quality Certification. Entergy has since requested a hearing on the issue, and the matter will be decided through NYSDEC's hearing process. If the operating licenses are not renewed, then IP2 and IP3 must be shut down at or before the expiration date of their current operating licenses which expire September 28, 2013, and December 12, 2015, respectively.

The NRC has implemented Section 102 of the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321), in Title 10, Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," of the *Code of Federal Regulations* (10 CFR Part 51). In 10 CFR 51.20(b)(2), the Commission requires preparation of an environmental impact statement (EIS) or a supplement to an EIS for renewal of a reactor operating license. In addition, 10 CFR 51.95(c) states that the EIS prepared at the operating license renewal stage will be a supplement to NUREG-1437, Volumes 1 and 2, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (hereafter referred to as the GEIS).[1]

Upon acceptance of the IP2 and IP3 application, the NRC began the environmental review process described in 10 CFR Part 51 by publishing a notice of intent to prepare an EIS and conduct scoping. The NRC staff visited the IP2 and IP3 site in September 2007, held two public scoping meetings on September 19, 2007, and conducted two site audits on September 10–14, 2007, and September 24–27, 2007. In the preparation of this supplemental environmental impact statement (SEIS) for IP2 and IP3, the NRC staff reviewed the IP2 and IP3 environmental report (ER) and compared it to the GEIS; consulted with other agencies; conducted an independent review of the issues following the guidance in NUREG-1555, "Standard Review Plans for Environmental Reviews for Nuclear Power Plants, Supplement 1: Operating License Renewal," issued October 1999; and considered the public comments received during the scoping process and in response to the draft SEIS. The public comments received during the scoping process that were considered to be within the scope of the environmental review are contained in the Scoping Summary Report for Indian Point Nuclear Generating Unit Nos. 2 and 3, issued by NRC staff in December 2008. In Appendix A of this SEIS, the NRC staff adopts, by reference, the comments and responses in the Scoping Summary Report and provides information on how to electronically access the scoping summary or view a hard copy.

[1] The GEIS was originally issued in 1996. Addendum 1 to the GEIS was issued in 1999. Hereafter, all references to the "GEIS" include the GEIS and its Addendum 1.

The NRC staff held public meetings in Cortlandt Manor, New York, on February 12, 2009 and described the preliminary results of the NRC environmental review, answered questions, and provided members of the public with information to assist them in formulating comments on the draft SEIS. The NRC staff considered and addressed all of the comments received. These comments are reflected in the SEIS or addressed in Appendix A, Part 2, to this SEIS.

This SEIS includes the NRC staff's analysis that considers and weighs the environmental effects of the proposed action, the environmental impacts of alternatives to the proposed action, and mitigation measures for reducing or avoiding adverse effects. It also includes the NRC staff's recommendation regarding the proposed action.

The Commission has adopted the following statement of purpose and need for license renewal from the GEIS:

> The purpose and need for the proposed action (renewal of an operating license) is to provide an option that allows for power generation capability beyond the term of a current nuclear power plant operating license to meet future system generating needs, as such needs may be determined by State, utility, and, where authorized, Federal (other than NRC) decision makers.

The purpose of the NRC staff's environmental review, as defined in 10 CFR 51.95(c)(4) and the GEIS, is to determine the following:

> …whether or not the adverse environmental impacts of license renewal are so great that preserving the option of license renewal for energy planning decision makers would be unreasonable.

Both the statement of purpose and need and the evaluation criterion implicitly acknowledge that there are factors, in addition to license renewal, that will ultimately determine whether an existing nuclear power plant continues to operate beyond the period of the current operating license (or licenses).

NRC regulations (10 CFR 51.95(c)(2)) contain the following statement regarding the content of SEISs prepared at the license renewal stage:

> The supplemental environmental impact statement for license renewal is not required to include discussion of need for power or the economic costs and economic benefits of the proposed action or of alternatives to the proposed action except insofar as such benefits and costs are either essential for a determination regarding the inclusion of an alternative in the range of alternatives considered or relevant to mitigation. In addition, the supplemental environmental impact statement prepared at the license renewal stage need not discuss other issues not related to the environmental effects of the proposed action and the alternatives, or any aspect of the storage of spent fuel for the facility within the scope of the generic determination in 10 CFR 51.23(a) ["Temporary storage of spent fuel after cessation of reactor operation–generic determination of no significant environmental impact"] and in accordance with 10 CFR 51.23(b).

The GEIS contains the results of a systematic evaluation of the consequences of renewing an operating license and operating a nuclear power plant for an additional 20 years. It evaluates 92 environmental issues using the NRC's three-level standard of significance—SMALL, MODERATE, or LARGE—developed using the Council on Environmental Quality (CEQ)

guidelines.

The following definitions of the three significance levels are set forth in footnotes to Table B-1 of Appendix B, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant," to 10 CFR Part 51, Subpart A, "National Environmental Policy Act—Regulations Implementing Section 102(2)":

> SMALL—Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.
>
> MODERATE—Environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.
>
> LARGE—Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

For 69 of the 92 issues considered in the GEIS, the analysis in the GEIS reached the following conclusions:

(1) The environmental impacts associated with the issue have been determined to apply either to all plants or, for some issues, to plants having a specific type of cooling system or other specified plant or site characteristics.

(2) A single significance level (that is, SMALL, MODERATE, or LARGE) has been assigned to the impacts (except for collective offsite radiological impacts from the fuel cycle and from high-level waste and spent fuel disposal).

(3) Mitigation of adverse impacts associated with the issue has been considered in the analysis, and it has been determined that additional plant-specific mitigation measures are not likely to be sufficiently beneficial to warrant implementation.

These 69 issues were identified in the GEIS as Category 1 issues. In the absence of new and significant information, the staff relied on conclusions in the GEIS for issues designated as Category 1 in Table B-1 of Appendix B to 10 CFR Part 51, Subpart A.

Of the 23 issues that do not meet the criteria set forth above, 21 are classified as Category 2 issues requiring analysis in a plant-specific supplement to the GEIS. The remaining two issues, environmental justice and chronic effects of electromagnetic fields, were not categorized. Environmental justice was not evaluated on a generic basis and must be addressed in a plant-specific supplement to the GEIS. Information on the chronic effects of electromagnetic fields was not conclusive at the time the GEIS was prepared.

This SEIS documents the NRC staff's consideration of all 92 environmental issues identified in the GEIS. The NRC staff considered the environmental impacts associated with alternatives to license renewal and compared the environmental impacts of license renewal and the alternatives. The alternatives to license renewal that were considered include the no-action alternative (not renewing the operating licenses for IP2 and IP3), alternative methods of power generation, and conservation. The NRC staff also considered an alternative that included continued operation of IP2 and IP3 with a closed-cycle cooling system. This alternative is considered for several reasons. First, the New York State Department of Environmental Conservation (NYSDEC) issued a preliminary determination in its 2003 draft and 2004 revised draft State Pollutant Discharge Elimination System (SPDES) permits that closed cycle cooling is the site-specific best technology available (BTA) to reduce impacts on fish and shellfish;

currently the revised draft SPDES permit is the subject of NYSDEC proceedings, and the existing SPDES permit continues in effect at this time. Second, NYSDEC affirmed this view in its April 2, 2010, Notice of Denial of Entergy's Clean Water Act Section 401 Water Quality Certification, indicating that closed cycle cooling would minimize aquatic impacts; that determination is currently subject to further State-level adjudication. Third, NYSDEC has published a draft policy on BTA indicating that "Wet closed-cycle cooling or its equivalent" is the "minimum performance goal for existing industrial facilities that operate a CWIS [cooling water intake system] in connection with a point source thermal discharge." Public comments on that draft policy were submitted through July 9, 2010.

Entergy and the NRC staff have established independent processes for identifying and evaluating the significance of any new information on the environmental impacts of license renewal. Neither Entergy nor the staff has identified information that is both new and significant related to Category 1 issues that would call into question the conclusions in the GEIS. Similarly, neither the scoping process nor the NRC staff has identified any new issue applicable to IP2 and IP3 that has a significant environmental impact. Therefore, the NRC staff relies on the conclusions of the GEIS for all of the Category 1 issues that are applicable to IP2 and IP3.

Entergy's license renewal application presents an analysis of the 21 Category 2 issues that are applicable to IP2 and IP3, plus environmental justice and chronic effects from electromagnetic fields, for a total of 23 issues. The NRC staff has reviewed the Entergy analysis and has conducted an independent assessment of each issue. Six of the Category 2 issues are not applicable because they are related to a type of existing cooling system, water use conflicts, and ground water use not found at IP2 and IP3. Entergy has stated that its evaluation of structures and components, as required by 10 CFR 54.21, "Contents of Application—Technical Information," did not identify any major plant refurbishment activities or modifications as necessary to support the continued operation of IP2 and IP3 for the license renewal period. Entergy did, however, indicate that it plans to replace reactor vessel heads and control rod drive mechanisms at IP2 and IP3. The NRC staff has evaluated the potential impacts of these activities using the framework provided by the GEIS for addressing refurbishment issues.

Seventeen environmental issues related to operational impacts and postulated accidents during the renewal term are discussed in detail in this SEIS. These include 15 Category 2 issues and 2 uncategorized issues, environmental justice and chronic effects of electromagnetic fields. The NRC staff also discusses in detail the potential impacts related to the 10 Category 2 issues that apply to refurbishment activities. The NRC staff concludes that the potential environmental effects for most of these issues are of SMALL significance in the context of the standards set forth in the GEIS with three exceptions—entrainment, impingement, and heat shock from the facility's heated discharge. The NRC staff jointly assessed the impacts of entrainment and impingement to be MODERATE based on NRC's analysis of representative important species. Impacts from heat shock potentially range from SMALL to LARGE depending on the conclusions of thermal studies proposed by the NYSDEC. Based on corrected data received since completing the draft SEIS, the NRC staff concludes that impacts to the endangered shortnose sturgeon – which ranged from SMALL to LARGE in the draft SEIS – are likely to be SMALL.

The NRC staff also determined that appropriate Federal health agencies have not reached a consensus on the existence of chronic adverse effects from electromagnetic fields. Therefore, no further evaluation of this issue is required.

For severe accident mitigation alternatives (SAMAs), the staff concludes that a reasonable, comprehensive effort was made to identify and evaluate SAMAs. Based on its review of the SAMAs for IP2 and IP3 and the plant improvements already made, the NRC staff concludes that several SAMAs may be cost-beneficial. However, these SAMAs do not relate to adequate management of the effects of aging during the period of extended operation. Therefore, they do not need to be implemented as part of license renewal pursuant to 10 CFR Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants."

Cumulative impacts of past, present, and reasonably foreseeable future actions were considered, regardless of what agency (Federal or non-Federal) or person undertakes such other actions. For purposes of this analysis, the NRC staff determined that the cumulative impacts to terrestrial and aquatic resources in the IP2 and IP3 environs would be LARGE, due primarily to past development and pollution, much of which preceded IP2 and IP3 or occurred as a result of other actions (for example, suburban development and hardening of the Hudson River shoreline).

The NRC staff's analysis indicates that the adverse impacts of potential alternatives will differ from those of the proposed action. Most alternatives result in smaller impacts to aquatic life, while creating greater impacts in other resource areas. Often, the most significant environmental impacts of alternatives result from constructing new facilities or infrastructure.

The recommendation of the NRC staff is that the Commission determine that the adverse environmental impacts of license renewals for IP2 and IP3 are not so great that not preserving the option of license renewal for energy planning decision makers would be unreasonable. This recommendation is based on (1) the analysis and findings in the GEIS, (2) the ER and other information submitted by Entergy, (3) consultation with other Federal, State, Tribal, and local agencies, (4) the staff's own independent review, and (5) the staff's consideration of public comments received during the scoping process and in response to the draft SEIS.

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Abbreviations/Acronyms

°	degree(s)
µm	micron(s)
3D	three dimensional
ACAA	American Coal Ash Association
ac	acre(s)
AC	alternating current
ACC	averted cleanup and decontamination
ADAMS	Agencywide Documents Access and Management System
ADAPT	Atmospheric Data Assimilation and Parameterization Technique
ACEEE	American Council for an Energy Efficient Economy
AEC	Atomic Energy Commission
AFW	auxiliary feed water
AGTC	Algonquin Gas Transmission Company
ALARA	as low as reasonably achievable
ANOVA	analysis of variance
AOC	averted off-site property damage costs
AOE	averted occupational exposure costs
AOSC	averted on-site costs
APE	averted public exposure
ASA	Applied Science Associates
ASME	American Society of Mechanical Engineers
ASMFC	Atlantic States Marine Fisheries Commission
ASSS	alternate safe shutdown system
ATWS	anticipated transient without scram
AUTOSAM	Automated Abundance Sampler
BA	biological assessment
BO	Biological Opinion
Board	Atomic Safety and Licensing Board
Bq/L	becquerel per liter
Bq/kg	becquerel per kilogram
BSS	Beach Seine Survey
BTA	best technology available
BTU	British thermal unit(s)
C	Celsius
CAA	Clean Air Act
CAFTA	computer aided fault-tree analysis code
CAIR	Clean Air Interstate Rule
CAMR	Clean Air Mercury Rule
CCF	common cause failure
CCMP	Comprehensive Conservation and Management Plan
CCW	component cooling water

CCWD	Cortlandt Consolidated Water District
CDF	core damage frequency
CDM	Clean Development Mechanism
CET	Containment Event Tree
CEQ	Council on Environmental Quality
CFR	*Code of Federal Regulations*
cfs	cubic foot (feet) per second
CHGEC	Central Hudson Gas & Electric Corporation
Ci	curie(s)
CI	confidence interval
cm	centimeter(s)
CMP	Coastal Management Plan
CMR	conditional mortality rate
CNP	Cook Nuclear Plant
CO	carbon monoxide
CO_2	carbon dioxide
COE	cost of enhancement
COL	Combined License
Con Edison	Consolidated Edison Company of New York
CORMIX	Cornell University Mixing Zone Model
CPUE	catch-per-unit-effort
CRDM	control rod drive mechanism
CST	condensate storage tank
CV	coefficient of variation
CWA	Clean Water Act
CWIS	Circulating Water Intake System
CZMA	Coastal Zone Management Act
dB(A)	decibel(s)
DBA	Design-basis accident
DC	direct current
DDT	dichloro-diphenyl-trichloroethane
DEIS	Draft Environmental Impact Statement
DF	Decontamination Factor
DNA	deoxyribonucleic acid
DNR	Department of Natural Resources
DO	dissolved oxygen
DOC	dissolved organic carbon
DOE	U.S. Department of Energy
DOS	Department of State
DOT	U.S. Department of Transportation
DPS	Distinct Population Segment
DSEIS	Draft Supplemental Environmental Impact Statement
EA	Environmental Assessment
ECL	Environmental Conservation Law
EDG	emergency diesel generator

EIA	Energy Information Administration
EIS	environmental impact statement
EFH	Essential Fish Habitat
ELF-EMF	extremely low frequency-electromagnetic field
EMR	entrainment mortality rate
Entergy	Entergy Nuclear Operations, Inc.
EOP	emergency operating procedure
EPA	U.S. Environmental Protection Agency
EPRI	Electric Power Research Institute
ER	Environmental Report
ER-M	effects-range-median
ESA	Endangered Species Act
F	Fahrenheit
F&O	Facts and Observations
FAA	Federal Aviation Administration
FDA	Food and Drug Administration
FEIS	Final Environmental Impact Statement
FERC	Federal Energy Regulatory Commission
FES	Final Environmental Statement
FJS	Fall Juvenile Survey
FPC	Federal Power Commission
fps	feet per second
FPS	fire protection system
FR	*Federal Register*
FSAR	Final Safety Analysis Report
FSS	Fall Shoals Survey
ft	foot (feet)
ft^2	square feet
ft^3	cubic feet
FWS	U.S. Fish and Wildlife Service
g	gram(s)
gal	gallon(s)
gC_{eq}/kWh	gram(s) of carbon dioxide equivalents per kilowatt-hour
GEIS	*Generic Environmental Impact Statement for License Renewal of Nuclear Plants, NUREG-1437*
GHG	greenhouse gas
GL	Generic Letter
gpm	gallon(s) per minute
GW	gigawatt
ha	hectare(s)
HAP	hazardous air pollutant
HLW	high-level waste
hr	hour(s)
HRA	Human Reliability Analysis

HRERF	Hudson River Estuary Restoration Fund
HRFI	Hudson River Fisheries Investigation
HRPC	Hudson River Policy Committee
HRSA	Hudson River Settlement Agreement
IAEA	International Atomic Energy Agency
IMR	impingement mortality rate
in.	inch(es)
INEEL	Idaho National Energy and Environmental Laboratory
IP1	Indian Point Nuclear Generating Unit No. 1
IP2	Indian Point Nuclear Generating Unit No. 2
IP3	Indian Point Nuclear Generating Unit No. 3
IPE	individual plant examination
IPEEE	individual plant examination of external events
ISFSI	Independent Fuel Storage Installation
ISLOCA	Interfacing Systems Loss of Coolant Accidents
IWSA	Integrated Waste Services Association
kg	kilogram(s)
km	kilometer(s)
km^2	square kilometer(s)
kV	kilovolt(s)
kWh	kilowatt hour(s)
lb	pound(s)
L	liter(s)
LERF	Large Early Release Frequency
LLMW	low-level mixed waste
LLNL	Lawrence Livermore National Library
LOCA	loss of coolant accident
LODI	Lagrangian Operational Dispersion Integrator
LOE	Line(s) of Evidence
lpm	liters per minute
LRA	license renewal application
LR	linear regression
LRS	Long River Survey
LSE	load serving entities
m	meter(s)
mm	millimeter(s)
m^2	square meter(s)
m^3	cubic meter(s)
m^3/sec	cubic meter(s) per second
MAAP	Modular Accident Analysis Program
MACCS2	MELCOR Accident Consequence Code System 2
MBq	megabecquerel
mg	milligram(s)

mgd	million gallons per day
mg/L	milligram(s) per liter
mGy	milligray
mi	mile(s)
min	minute(s)
MIT	Massachusetts Institute of Technology
mL	milliliter(s)
MLES	Marine Life Exclusion System
MMBtu	million British thermal unit(s)
mps	meter(s) per second
mrad	millirad(s)
mrem	millirem(s)
mRNA	messenger ribonucleic acid
MSE	mean squared error
MSL	mean sea level
MSPI	Mitigating Systems Performance Indicator
mSv	millisievert
MT	metric ton(s)
MTU	metric ton of uranium
MW	megawatt
MWd	megawatt-days
MW(e)	megawatt(s) electric
MW(h)	megawatt hour(s)
MW(t)	megawatt(s) thermal
MWSF	Mixed Waste Storage Facility
NAAQS	National Ambient Air Quality Standards
NARAC	National Atmospheric Release Advisory Center
NAS	National Academy of Sciences
NEA	Nuclear Energy Agency
NEPA	National Environmental Policy Act of 1969, as amended
NESC	National Electric Safety Code
NGO	Nongovernmental Organization
NHPA	National Historic Preservation Act
NIEHS	National Institute of Environmental Health Sciences
NIRS	Nuclear Information and Resource Service
NMFS	National Marine Fisheries Service
NJDEP	New Jersey Department of Environmental Protection
NO_2	nitrogen dioxide
NO_x	nitrogen oxide(s)
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRC	U.S. Nuclear Regulatory Commission
NRHP	National Register of Historic Places
NSSS	nuclear steam supply system
NWJWW	Northern Westchester Joint Water Works
NY/NJ/PHL	New York/New Jersey/Philadelphia

	NYCA	New York Control Area
	NYCDEP	New York City Department of Environmental Protection
	NYCRR	New York Code of Rules and Regulations
	NYISO	New York Independent System Operator
	NYPA	New York Power Authority
	NYPSC	New York Public Service Commission
	NYRI	New York Regional Interconnect, Inc.
	NYSDEC	New York State Department of Environmental Conservation
	NYSDOH	New York State Department of Health
	NYSERDA	New York State Energy Research and Development Authority
	NYSHPO	New York State Historic Preservation Office
	O_3	ozone 8-hour standard
	OCNGS	Oyster Creek Nuclear Generating Station
	ODCM	Offsite Dose Calculation Manual
	OMB	Office of Management and Budget
	OPR	Office of Protected Resources
	PAB	primary auxiliary building
	PAH	polycyclic aromatic hydrocarbon
	PCB	polychlorinated biphenyls
	pCi/L	picoCuries per liter
	pCi/kg	picoCuries per kilogram
	PDS	plant damage state
	PILOT	payment-in-lieu-of-taxes
	PM	particulate matter
	$PM_{2.5}$	particulate matter, 2.5 microns or less in diameter
	PM_{10}	particulate matter, 10 microns or less in diameter
	POC	particulate organic carbon
	PORV	power operated relief valve
	POST	Parliamentary Office of Science and Technology
	ppm	parts per million
	ppt	parts per thousand
	PRA	probabilistic risk assessment
	PSA	probabilistic safety assessment
	PV	photovoltaic
	PWR	pressurized water reactor
	PWW	Poughkeepsie Water Works
	PYSL	post yolk-sac larvae
	REMP	Radiological Environmental Monitoring Program
	R-EMAP	regional environmental monitoring and assessment program
	RAI	request for additional information
	RCP	reactor coolant pump
	RCRA	Resource Conservation and Recovery Act
	RCS	reactor cooling system
	REMP	radiological environmental monitoring program

RHR	residual heat removal
Riverkeeper	Hudson River Fishermen's Association
RIS	Representative Important Species
RKM	river kilometer(s)
RM	river mile(s)
RMP	Risk Management Plan
ROD	Record of Decision
ROI	region of influence
ROW	right-of-way
RPC	long-term replacement power costs
rpm	revolutions per minute
RRW	risk reduction worth
RWST	refueling water storage tank
s	second(s)
SAFSTOR	safe storage condition
SAMA	severe accident mitigation alternative
SAR	Safety Analysis Report
SAV	submerged aquatic vegetation
SBO	station blackout
Scenic Hudson	Scenic Hudson Preservation Conference
SCR	selective catalytic reduction
SECPOP	sector population, land fraction and economic estimation program
SEIS	Supplemental Environmental Impact Statement
SFP	Spent Fuel Pool
SGTR	Steam Generator Tube Ruptures
SI	Safety Injection
SO_2	sulfur dioxide
SO_x	sulfur oxide(s)
SPDES	State Pollutant Discharge Elimination System
SPU	stretch power update
sq mi	square mile(s)
SR	segmented regression
SRP	Standard Review Plan
SRT	Status Review Team
SSBR	spawning stock biomass per-recruit
SSE	safe shutdown earthquake
Sv	person-sievert
SWS	service water system
t	ton(s)
TDEC	Tennessee Department of Environment and Conservation
TI-SGTR	thermally-induced Steam Generator Tube Ruptures
TLD	Thermoluminescent dosimeter
TOC	total organic carbon
TRC	TRC Environmental Corporation

U.S.	United States
U.S.C.	United States Code
USACE	U.S. Army Corps of Engineers
USAEC	U.S. Atomic Energy Commission
USCB	U.S. Census Bureau
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
UWNY	United Water New York
V	volt(s)
VALWNF	value of non-farm wealth
VOC	volatile organic compound
WCDOH	Westchester County Department of Health
WISE	World Information Service on Energy
WJWW	Westchester Joint Water Works
WOE	weight of evidence
WOG	Westinghouse Owner's Group
YSL	yolk-sac larvae
YOY	young of year
yr	year(s)

Appendix A

Comments Received on the Environmental Review

The following pages contain the original comment letters, e-mail messages, and public meeting transcripts pertaining to the IP scoping summary report. Each commented is labeled and identified by a unique comment identification code.

MR. ADAMS: Good evening. I'm Kenneth Adams. I'm the president and CEO of the Business Council of New York State, which is the leading statewide business association. We represent more than 3000 private-sector employers, over a million of their employees and about 90 local Chambers of Commerce throughout the state of New York. The largest component of our membership at the Business Council is manufacturing with more than 1100 employers. It's the sector for which the reliability and cost of electric power is a significant concern. We also represent many businesses in the energy field, including Entergy, which has been a Business Council member since 2000. Because the importance of energy issues to our broad membership, we welcome the opportunity to testify in support of the Indian Point Energy Center and the important role the site plays in maintaining the economic health of the whole state of New York.

1-a-EC/SO/SR

The most recent data from the U.S. Energy Information Administration show electric rates in New York of residential and commercial customers at about 64% above the national average. And for industrial customers, many of our Business Council members, something like 47% above the national average. Several years ago, we estimated that this electric energy premium share in New York State costs our economy more than $6 billion a year. Given these price pressures and continuing

1-b-EC/SE

increases in energy consumption and peak demand, there's an obvious need to maintain or add to our existing generating capacity. Energy supply and price remains a key factor for the competitiveness of our state's economy. If we're going to get our economy to turnaround, energy pricing and availability and reliability are just going to be fundamental. One company that is already paying an extraordinary cost for conducting business in New York State is in fact Entergy. We need to remember that Entergy was invited to become the state's business partner in running two of the three nuclear plants the company purchased in New York back in 2000.

At that time, the company's background and expertise was thoroughly scrutinized by the state. After an extensive vetting and licensing process, the company, you can say, won the right to run Indian Point 3 and James A. FitzPatrick nuclear facility in upstate New York. In addition to their initial one billion-dollar investment in buying these plants, Entergy has invested hundreds of millions of dollars to run these assets, making marked improvements in their performance. Entergy's operations also directly benefit the state through a substantial revenue-sharing agreement. They support many other in-state businesses through the goods and services they buy. They pay significant taxes to the local communities and schools, invest millions in emergency planning upgrades, invest millions more

1-b-EC/ SE contd.

into regional non-profit organizations and most importantly, employ thousands in the state at a time when many other companies are making significant cutbacks in their New York State employment. 1-b-EC/SE contd.

In upstate New York where Entergy is a welcome member of the Oswego County community, there is interest in expanding nuclear power there and rightly so. The FitzPatrick plant is just as well run as the one here, just as critical and provides the stabilizing economic force in an area of New York State suffering in this recession. Downstate here in this region, some try to portray Indian Point's potential closure as being somehow far less consequential to the area than a closure in upstate New York. But this assumption is widely incorrect. 1-c-EC/SO

Indian Point provides 2000 Mw of affordable, reliable, green, clean power something to 40% of this region's energy supply during peak times. Overall, nuclear power is essential to the state's energy grid. Last year through the end of October, nuclear plants provided 30.3% of all kilowatt hours of electric power produced in New York. Nearly the same level as natural gas generation, which is about 31.9%. Importantly, in the carbon restricted regulatory environment imposed by the Regional Greenhouse Gas Initiative, these 35 million Mw hours were produced at nuclear facilities without significant greenhouse gas emissions from power generation. Both public and 1-d-AQ/EC

private studies, including extensive analysis done by Westchester County and the federal government, have shown the critical importance of Indian Point, the lack of viable replacement power and the consequences of shutting the facility down. According to the New York Independent System Operator, the closing of Indian Point Energy Center quote would cause an immediate violation of reliability standards close quote. Closing Indian Point would significantly weaken the state's energy grid. Every day the demand grows for affordable, reliable, low- carbon electric power generation, no question. Indian Point meets all three of these needs in the lower Hudson Valley making the plant an invaluable facility in this region. Nuclear power is an environmentally sound and carbon-clean source of power. If Indian Point is not re-licensed, replacement power would have to come from sources already deemed inadequate to replace Indian Point. Furthermore, studies show that replacing Indian Point's power with fossil fuel based plants will likely create a rise in carbon dioxide emissions, a 19% jump in nitrous oxide emissions and an 11% hike in sulfur dioxide emissions. 1-d-AQ/ EC contd.

MR. RAKOVAN: Sir, if you could conclude, please.

MR. ADAMS: For all of these reasons, I'm going to conclude right now.

MR. RAKOVAN: Thank you.

MR. ADAMS: As well as the million dollars in annual economic stimulus Indian Point provides the state, the Business Council of New York State, my organization, strongly supports the re-licensing of the Indian Point Energy Center. Thank you all for being here. Thank you very much for your attention. 1-e-SR

MS. ALLEN: Hi, I'm Judy Allen. I live in Putnam Valley. I do not get any electricity from Indian Point because Putnam County does not. However, I live 14 miles away from the plant. So, I am actually going to address the environmental impact and I would like to see who are the people here from the NRC, so I know who I'm talking to? Okay, thank you very much. The slide that I'm addressing is the Example Common Issue: Radiological Impacts and it says, Preliminary findings: no new and significant information. GEIS conducted impacts are SMALL. So, you're not going to want to know about the Wall Street article in November 21st that says, surprise drop in power worries utilities. You're not going to want to know about cover story in Time of December 31st that says, America's untapped energy resource boosting efficiency. This is not about conservation. This is not about putting on a sweater or turning the lights off. This is just about increased efficiency. 2-a-AL/RI

You're not going to know about, you're not going to want to know about the study on rising child leukemia rates near U.S. nuclear plants because Joe Mangano, I believe is going to be submitting written information about that. So, what I'm going to talk about is the study that faults regulators for relying on reference-man radiation dose standard. A study from the Institute for Energy and Environment Research indicates that U.S. radiation exposure regulations and compliance assessment 2-b-HH/RI

guidelines often underestimate the risk of radiation for women and children because they are based on standards of the reference-man. A hypothetical 20 to 30 year old white male. Could I have a show of hands please, how many people fall into that category of 20 to 30 year old white male. That's one. Anyone else?

Okay, so at least three federal agencies: the Environmental Protection Agency, Nuclear Regulatory Commission and Department of Energy, still use reference-man criteria to guide radiation dose regulations and compliance assessment. A woman is 52% more likely than a man to develop cancer from the same radiation doses according to the study. Children are at greater risk than adults. A female infant has about an 11 times greater chance of eventually developing cancer than a 30-year-old male in the same radiation dose. Pregnant women and the developing fetus are particularly vulnerable, but non-cancer reproductive effects are generally not part of U.S. regulatory framework for radiation production.

Okay, so, the last thing about this in the report recommends that compliance with radiation protection always the estimated by calculating doses for those at greatest risk. It calls for a significant reduction in the maximum allowable dose to the general public from 100 mrem per year to 25 mrem per year. So, I believe that would be considered new information

2-b-HH/RI contd.

and I will hope that the NRC will consider that new information in determining whether Indian Point should be re-licensed and after 20 years. Thank you very much.

2-b-HH/ RI contd.

IPRenewalCEmails ML090440387

From: Judy Allen [judya814@comcast.net]
Sent: Friday, February 13, 2009 9:44 AM
To: IndianPointEIS Resource
Subject: "Reference Man" issue

Hello NRC person -

I live 14 miles from Indian Point in Putnam Valley, NY and though we get no electricity from Indian Point, we are still subjected to the emissions and radioactive releases permitted by the NRC.

Following is the study I presented at yesterday's meeting about Indian Point in Cortlandt. There was only one "Reference Man", the 20-30 year-old white male, in the entire audience yesterday.

Study faults regulators for relying on 'reference man' radiation dose standard

http://www.diagnosticimaging.com/nuclear/article/113619/1364522#
By James Brice

A study from the Institute for Energy and Environment Research indicates that U.S. radiation exposure regulations and compliance assessment guidelines often underestimate the risk of radiation for women and children because they are based on standards of a "reference man," a hypothetical 20- to 30-year-old white male.

At least three federal agencies -- the Environmental Protection Agency, Nuclear Regulatory Commission, and Department of Energy -- still use reference man criteria to guide radiation dose regulations and compliance assessment, according to the IEER.

"The use of the reference man standard is pervasive in U.S. radiation protection regulations and compliance guidelines," said IEER president Arjun Makihjani, Ph.D. the report's author. "This is wrong because it often fails to adequately protect groups other than young adult males."

A woman is 52% more likely than a man to develop cancer from the same radiation doses, according to Makihjani. Children are at greater risk than adults. A female infant has about a seven times greater chance of eventually developing cancer than a 30-year-old male from the same radiation dose.

Pregnant women and the developing fetus are particular vulnerable, but noncancer reproductive effects are generally not part of the U.S. regulatory framework for radiation production, he said.

The institute noted that the House Committee on Oversight and Government Reform queried the EPA in May 2008 about its continued use of the reference man standard. In its response, the EPA admitted that it was still used in some guidelines, despite falling out of favor among regulators.

The report recommends that compliance with radiation protection always be estimated by calculating doses for those at the greatest risk. It calls for a significant reduction in the maximum allowable dose to the general public from 100 mrem per year to 25 mrem per year. It also recommends a revamping of EPA guidance documents to reflect doses received by men and women of all ages.

2-c-HH

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> Other recommendations include tightening radiation protection standards for women who are exposed to radiation in the workplace and publication of an official federal guidance on in utero dose estimation methods.

###

Furthermore, I received the following note from a friend after the meeting. Apparently you are already aware that "Reference Man" is outdated, but have taken no action to change the measurement parameters to include women and children. For an agency whose mission is FIRST to "Protect public health and safety", this is a matter I don't believe you can continue to ignore.

> Arjun Makhijani PhD of IEER has spoken widely on this, as well I have submitted testimony to the NRC in the past. In fact **there is correspondence on record between me, Chairwoman Barrier Cornell and Director Blough of the NRC.** This info is cited in a study put out by IEER.
>
> The NRC is well aware of the faults with "reference man " as a threshold for acceptable limits. It should not come as a surprise to anyone there. It is good to raise the issue again and again, as it cuts to the core of the issue.

Thank you for the opportunity to provide input to your Environmental Review.

Judy Allen
24 Seifert Lane
Putnam Valley, NY 10579
845 528-6643 H
914 382-1193 C

2-c-HH contd.

12/31/08

73 FR 80440

ML090650498

PUBLIC SUBMISSION

As of: February 24, 2009
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Tracking No. 808060e
Comments Due: March 18, 2009
Submission Type: Web

Docket: NRC-2008-0672
Environmental Impact Statement; Availability, etc.: Indian Point Nuclear Generating Unit Nos. 2 and 3, Buchanan, NY; License Renewal and Public Meeting

Comment On: NRC-2008-0672-0001
Indian Point Nuclear Generating Unit Nos. 2 and 3; Notice of Availability of the Draft Supplement 38 to the Generic Environmental Impact Statement for License Renewal of Nuclear Plants and Public Meeting for the License Renewal of Indian Point Nuclear Generating Unit Nos. 2 and 3

Document: NRC-2008-0672-DRAFT-0001
Comment on FR Doc # E8-31161

Submitter Information

Name: american citizen
Address:
na
na, NJ, 00000
Submitter's Representative: american citizen
Organization: american citizens
Government Agency Type: Federal
Government Agency: NRC

General Comment

i do not thelieve the standard of care is careful enough when granting renewal permits. i note that these nuclear plants are allowed to kill fish in the millions. i note this plant was leaking toxics into the area too. i belive this agency is acting as a rubber stamp for the industry instead of truly regulating, kind of like the sec which allowed the wall street master of the universe to get out of control. we need a heavy hand to keep nuclear safe. i dont think that heavy hand has been present by this commission. tighten up and do your job right please.

3-a-AE/LE/LR

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STATE OF NEW YORK
DEPARTMENT OF STATE
ONE COMMERCE PLAZA
99 WASHINGTON AVENUE
ALBANY, NY 12231-0001

DAVID A. PATERSON
GOVERNOR

LORRAINE A. CORTÉS-VÁZQUEZ
SECRETARY OF STATE

March 18, 2009

Chief, Rules Review and Directives Branch
U.S. Nuclear Regulatory Commission
Mail Stop TWB-05-B01
Washington, DC 20555-0001

RE: Comments on the Generic Impact Statement for License Renewal of Nuclear Plants Supplement 38 Regarding Indian Point Generating Unit Nos. 2 and 3

The Department of State (Department), as the agency charged with implementing the State's Coastal Management Program (CMP), appreciates the opportunity to review Supplement 38 to the Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Regarding Indian Point Nuclear Generating Unit Nos. 2 and 3 Draft Report (SEIS).

The Department reviewed the SEIS with the knowledge that the FEIS will comprise a portion of the information needed for our consistency review and Entergy will be required to submit a consistency certification for the proposed license renewal which must address all policies of the State CMP. Given that, we would like to offer the following comments on the SEIS. Many of the comments addressed herein were also raised in the October 31, 2007 Scoping Comments on the License Renewal of Indian Point units 2 and 3, submitted by the New York State Executive Agencies and the Department of Law (2007 Scoping Letter).

4-a- AE/LR

1. The discussion of federal consistency requirements needs to be clarified.

Under The Purpose and Need for the Proposed Action, NRC places the need for a renewed license in the context of other regulatory requirements. Page 1-7, lines 10-15 state: "Once an operating license is renewed, State regulatory agencies and the owners of the plant will ultimately decide whether the plant will continue to operate based on factors such as the need for power or matters within the State's jurisdiction—including

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acceptability of water withdrawal, consistency with State water quality standards, and consistency with State coastal zone management plans—or the purview of the owners, such as whether continued operation makes economic sense."

The above statement needs to be corrected to reflect the following: Pursuant to the federal consistency provisions of the Coastal Zone Management Act (16 USC § 1456), federal license or permit activities that have reasonably foreseeable coastal effects (see NOAA regulations, 15 C.F.R. 930.11(g)) on the environment and coastal uses, must be fully consistent with the enforceable policies of state coastal management programs. An applicant for federal authorization in the coastal area must submit a certification that the proposed activity is consistent with all applicable State coastal policies. The designated state agency, in this case, the Secretary of State, must make a decision either concurring with or objecting to an applicant's consistency certification before NRC reissues an operating permit. The federal consistency provisions preclude federal agencies from authorizing any activity if the Department determines the activity is not consistent with the coastal policies of the State CMP. Therefore, the Nuclear Regulatory Commission (NRC) cannot issue a renewed operating license unless and until the Department concurs with Entergy's consistency certification. This requirement should be made clear to the applicant and to the public.

2. Adverse impacts of the once-through cooling system need to be reduced.

The adverse impacts of the once-through cooling system at Indian Point due to impingement, entrainment, and thermal discharge have adverse effects throughout much of the Hudson River estuary. The Department supports the Department of Environmental Conservation's (DEC) position regarding the need to reduce these adverse impacts. Although the intake and out-take structures at Indian Point are not within a Significant Coastal Fish and Wildlife Habitat (SCFWH), the high levels of impingement and entrainment that take place there affect important aquatic resources of the Hudson River estuary and of the nearby SCFWH's. As stated on page 2-137, line 38 of the SEIS, Indian Point is located adjacent to the Haverstraw Bay SCFWH. The narrative for this habitat states: "Haverstraw Bay is a critical habitat for most estuarine-dependent fisheries originating from the Hudson River. This area contributes directly to the production of in-river and ocean populations of food, game, and forage fish species. Consequently, commercial and recreational fisheries throughout the North Atlantic depend on, or benefit from, these biological inputs from the Hudson River estuary." Therefore, any impacts to these important fisheries species would affect nearby habitats and policy 7 of the State CMP. Such impacts would also affect policies 9 and 10 with respect to fisheries, and policies 21 and 22 as they relate to recreational uses of the River. A renewed license should provide for a means to reduce these impacts using the most current and best available technology.

4-a-LR contd.

3. Impacts on Visual Resources and State Designated Scenic Areas of State Significance (SASS) must be further investigated.

DEC has identified closed-cycle cooling as the best technology available for minimizing adverse impacts to resources of the Hudson River from the cooling water intake. In order for the Department to determine the consistency of this alternative, the closed-cycle

4-b-AL/LR

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option will need to be addressed in much greater detail, including a more detailed analysis of visual impacts of the proposed cooling towers.

As was outlined in the 2007 Scoping Letter, the State CMP provides for protection of unique visual resources in the coastal region through the designation of Scenic Area of Statewide Significance (SASS). Indian Point is outside of, but adjacent to, the southern part of the Hudson Highlands SASS. Given that closed loop cooling has been identified by DEC as the best technology available, the SEIS did not adequately analyze the potential visual impacts of cooling towers in the context of the SASS documentation or within the context of their impact on surrounding communities and the general visual character of the River. This will need to be addressed in the SEIS in order for the Department to assess consistency with the State CMP.

4-b-AL/LR contd.

4. Spent fuel storage, disposal and groundwater contamination must conform to state standards

Because of Indian Point's proximity to the Hudson River, and to the many resources of the State's coastal area, all aspects of Indian Point's operation have the potential to affect coastal uses and resources. The storage and disposal of spent fuel is no exception, especially with federal disposal options recently eliminated, thereby increasing potential for long-term onsite storage at nuclear facilities. The Department requires rigorous data and analysis demonstrating that the cumulative and continued storage and disposal of spent fuels will not adversely impact coastal uses, users, and resources, particularly given recently discovered leaks of radioactive and other toxic material on the Indian Point Property.

4-c-LR/SF

5. Community impacts

The State CMP not only seeks to protect the important environmental resources of the coastal area, but also to preserve and improve the recreational, cultural, and economic factors that combine to create the character and appeal of waterfront communities along the Hudson. Section 2.2 entitled Plant Interaction with the Environment and Section 4.4 entitled Socioeconomic Impacts of Plant Operation during the License Renewal Term provide only a cursory review of the current and potential future impacts of Indian Point on the waterfront communities in the region. Because the SEIS will provide a substantial amount of information upon which the Department will rely when conducting our consistency review, it must address the impacts on riverfront communities and users.

The SEIS should provide detailed analyses supported by data of how the proposed relicensing would impact existing and future coastal land and water uses. This should include analysis of the cumulative changes that have occurred in the region over the life of all existing reactors at the site, whether caused by the existing structures and activities or not, as well as potential future impacts of the proposed relicensing and any associated new construction. These analyses should include public access impacts, use conflicts, and development trends.

4-d-CI/LR/SO

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The Department is aware that the safety plans and measures taken will be addressed in separate documents. However, such plans influence individual perceptions of quality of life. Therefore, NRC's analysis of community impacts should take such safety plans and their potential effects on community resources into consideration.

4-d-CI/LR/SO contd.

In summary, the Department would like to make clear that when the applicant prepares and submits the consistency certification and necessary data and information (of which the SEIS is part) those materials will need to address effects on all applicable coastal policies, not just those issues identified by NRC in this draft of the SEIS.

4-e-LR

Sincerely,

Fred Anders
Chief, Natural Resources Bureau
Office of Coastal, Local Government
and Community Sustainability

Cc: Dara Gray, Entergy

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REV. DR. ANTHONY: Good afternoon, my name is Reverend Dr. Cheryl Anthony and I am the pastor and CEO of Jude International Christian Center. Jude International Christian Center is a multi-faceted inner-city ministry that serves as an intermediary to government agencies, the private sector, churches, mosques, temples and synagogues. I have served as a faith-based liaison and advisor to Presidents Bush and Clinton helping them to implement programs within our local community. I'm here today representing my congregation as well as the African-American clergy and elected officials, the Brooklyn Council of Churches and Woman of Faith advocating change. We are here in support of the Indian Point Energy Center.

Over the past years, we have seen the air quality in Brooklyn get worse and worse as more people move into our neighborhood and fill our streets with cars and diesel trucks that pollute the air that we breathe. In fact, the air-quality throughout New York City is dangerously below federal standards. I support the re-licensing of Indian point because I know that nuclear power is a safe way to reduce greenhouse gas emissions and pollution in our community and keep Brooklyn safe for future generations. The dangers of rising greenhouse gases and pollution are visible even today, particularly in Brooklyn's low income families.

5-a-AQ/SR

Our children, exposed to dangerously poor air quality are developing, and it's been said previously, but I need to reiterate, are developing asthma at a rate that is four times a national average. Many of Brooklyn's families cannot afford to pay for the metal care and medicines that children need, leading to hospitalization and missed school days for low income children. Yet, because of this disease, poor air quality can be prevented through smart policy decisions and a dedication clean air technology. Re-licensing the Indian Point Energy Center is a critical step in improving air quality in our communities and lowering the number of those that suffer from asthma. Religious leaders throughout Brooklyn see Indian Point as a clean, safe and affordable option for New York City's energy supply.

5-b -AQ/SR

By re-licensing Indian Point, New York has the opportunity to invest in a future that reduces greenhouse gases and is safer for our children. Thank you for giving me this opportunity to speak today. I hope that through my testimony and that of other supporters, you will see how keeping Indian Point open is the right move for New York. Thank you.

5-c-AQ/SR

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IPRenewalCEmails ML090790173

From: Herb Argintar [herbpe@optonline.net]
Sent: Tuesday, March 10, 2009 7:00 PM
To: IndianPointEIS Resource
Subject: Indian Point Environmental Impact: Public Submission of Comments to NRC

6-a-EP/OR

After 40 years of too many operating failures in the Plant; and, with the Area Warning Alarm system outside the Plant,

CLOSE INDIAN POINT!

Heed the Precautionary Principle:

The Precautionary Principle says that lack of certainty, given scientific and technological knowledge, shall not prevent effective prudent and proportional actions to prevent hazards.

Herbert Argintar, P.E.

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IPRenewalCEmails ML 090403T3

From: Assemblyman Greg Ball [ball@assembly.state.ny.us]
Sent: Friday, February 27, 2009 4:55 PM
To: Sam Collins
Cc: IndianPointEIS Resource; durso@area-alliance.org; Christopher R. Arnold; Sean T McSherry
Subject: IPEC Renewal Application

February 27, 2009

Mr. Samuel J. Collins
Regional Administrator
U.S. Nuclear Regulatory Commission, Region I
475 Allendale Road
King of Prussia, PA 19406-1415

Dear Mr. Collins:

As a member of the New York State Assembly and a proud resident of the Hudson Valley, I am writing to offer my strong support for Indian Point Energy Center's (IPEC) license renewal application. — 7-a-SE/SL

Many of my constituents – residents and business owners alike – have expressed concerns about the need to address our energy challenges. They recognize the importance of keeping Indian Point online and they believe Entergy is a good corporate citizen, something you would not know from listening to Indian Point's vocal opponents. — 7-a-SE/SL

New York State and our nation as a whole are in the midst of a long-overdue conversation regarding energy independence and environmental sustainability. To achieve both of these important ends, our region must continue to utilize the safe, clean and low-cost baseload power generated by Indian Point. — 7-b-AL

Indian Point is a source for more than 1,000 jobs within the Hudson Valley, and is also responsible for over $700 million in direct economic benefit for our region. Indian Point is a strong friend of organized labor, with hundreds of its employees and scores of outside workers serving as members of numerous labor unions. Working families throughout the Hudson Valley are truly the beneficiaries of Indian Point's sustained operations. — 7-c-SO

The facility's continued operations are also critical to meeting new greenhouse gas emission standards. Indian Point operates virtually emissions-free, which significantly reduce our region's carbon footprint. Closing Indian Point would result in a loss of more than 2,000 megawatts of clean electricity, and would require the construction and operation of up to five fossil fuel-burning plants to replace the power Indian Point generates. This is truly an unacceptable option. — 7-d-AQ/EC/SR

Closing Indian Point at the expense of good-paying jobs, clean air and reliable baseload power defies sensible energy policy. I urge you to support the relicensing of Indian Point. — 7-e-SR

Sincerely yours,

[signature]

Gregory R. Ball
Member, New York State Assembly

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IPRenewalCEmails ML090700180

From: John Durso Jr. [durso@erec-alliance.org]
Sent: Tuesday, March 10, 2009 2:25 PM
To: IndianPointEIS Resource
Subject: FW: Indian Point Letter
Attachments: 20090310125527892.pdf

The following letter is being forwarded on behalf of William Banfield, Senior Council Representative from the Empire State Regional Council of Carpenters.

Thank you.

-----Original Message-----
From: William R. Banfield [mailto:bbanfield@esrcc.org]
Sent: Tuesday, March 10, 2009 2:16 PM
To: John Durso Jr.
Subject: Indian Point Letter

William R. Banfield
Region 2 Senior Council Rep.
Empire State Regional Council of Carpenters 914-592-0100 ext. 101

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EMPIRE STATE REGIONAL COUNCIL OF CARPENTERS

Patrick B. Marin
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14 Saw Mill River Road
Hawthorne, N.Y. 10532
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David Haines
President
181 Industrial Park Road
Horseheads, N.Y. 14845
Tel: (607) 739-1628
Fax: (607) 739-3042

March 9, 2009

Mr. Samuel J. Collins
Regional Administrator
U.S. Nuclear Regulatory Commission, Region 1
475 Allendale Road
King of Prussia, PA 19406-1415

Dear Mr. Collins:

On behalf of the Empire State Regional Council of Carpenters, Region 2 which covers Westchester, Putnam, Rockland, Dutchess, Columbia, Ulster, Sullivan and Orange Counties, I am writing in support of the relicensing application for the Indian Point Energy Center (IPEC). I also urge you to issue an expedited timetable for the final review of Indian Point's application.

These are tough economic times, and working families are particularly feeling the pinch. High costs for home heating oil and natural gas are damaging our economy and hitting the middle class right in their wallets. Our state's energy transmission infrastructure is outdated, and in need of serious repair. The lack of a comprehensive power plant siting law has also has impacted energy investment, and curtailed efforts to grow our energy capacity.

This is why Indian Point is so critical.

The facility produces 2,000 megawatts of affordable, reliable baseload power, and is directly responsible for millions of dollars in direct economic impact for our region. It is responsible for hundreds of well-paid union jobs, and also produces electricity in an emission-free manner. This is good for our air and water -- and lowers the rates of child asthma and other ailments that impact our community.

Indian Point is a good neighbor, with a strong reputation for community support. It provides jobs, low-cost energy and fosters a positive impact on our environment.

For these reasons, I ask you to support the relicensing of Indian Point.

Sincerely yours,

William R. Banfield
Region 2 Senior Council Representative
Empire State Regional Council of Carpenters

8-a-SR

8-b-SO

8-c-AQ/HH/SO

8-d-SE/SR

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The Graduate Class of 2010
Bard Center for Environmental Policy
PO Box 5000
30 Campus Road
Annandale-on-Hudson, NY 12504

March 18, 2009

Chief, Rules, Directives and Editing Branch
Divisions of Administrative Services
Mailstop T-6D59
U.S. NRC
Washington, DC 20555

Dear Nuclear Regulatory Commission staff:

Subject: Re-licensing Indian Point Nuclear Power Plant, Comments on Draft EIS

This letter contains comments and concerns that we, the graduate students attending Bard Center for Environmental Policy, have with the draft Environmental Impact Statement (EIS) submitted on December 22, 2008 for the license renewal of Indian Point nuclear power plant. We compose of a group of individuals from local, regional and international communities with a vested interest in improving this draft EIS. On February 12, 2009 we attended the public license renewal meeting held in Cortlandt, New York . Afterwards, we had a class assignment to evaluate and discuss section 8 of the draft EIS on alternatives to Nuclear Energy. From this evaluation and following class discussion we generated the following comments for the NRC to consider.

Nuclear power is a valuable resource for the United States, providing over 20% of the total electric energy consumption. Nuclear power has many environmental, economic, and social benefits; these benefits include an elimination of air pollution, tax revenues for the local communities, and the creation of jobs. These benefits were clearly extolled at the public meeting held in Cortlandt New York on February 12, 2009 and should not be discounted. However, there are many impacts of nuclear power that have been overlooked in the submitted draft EIS. We contend that the negative consequences of the nuclear power generated at Indian Point are not inevitable or unavoidable and through a more comprehensive Environmental Impact Statement can be mitigated.

9-a-GI

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We feel that Indian Point nuclear power plant should not be granted a renewed license until these discrepancies are properly addressed in the draft EIS and remediated. Chief among our concerns is the disposal and storage of nuclear waste produced at Indian Point. Secondly we submit that the safety procedures and systems installed to protect surrounding citizens are inadequate and must be revised.

9-b-OR/SA

Over 15,000 tons of on site nuclear waste are stored in pools and dry casks at the Indian Point facility, and we maintain this posses a much greater threat to human health than the submitted draft EIS suggests. As this facility has had previous incidents of radioactive leakage, we submit that a further and much more detailed inspection of the effects and sources of nuclear waste leakage on current and future human health, the effects to the ecology and the effects on water use and quality must be done. In addition, the threat of earthquakes has become apparent as Columbia University's Lamont-Doherty Earth Observatory has recently identified a seismic zone extending from Stamford, Connecticut, to Peekskill. We propose that this poses a much greater threat than realized in the draft EIS and must be further examined and mitigated for.

9-c-LE/PA/RW

Emergency sirens are intended to warn citizens within a 10 mile radius in the case of a plant related emergency, and a back-up power system is essential for this operation if Indian Point were to lose power. We know from the draft EIS and from our independent research that Indian Point has been fined for not developing an emergency siren plan and for failing to ensure that public warning systems have back-up power. Both of these measures are vital to protecting the health and safety of the community around Indian Point in the event of an emergency. We submit that this must be more adequately addressed in this draft EIS.

9-d-EP

Furthermore, we contend that this draft EIS has not adequately addressed the ecological impacts of the existent once through cooling system. We call for a more serious environmental review of the effects of the current system. With this in mind, we feel that the EIS does not sufficiently address all possible alternatives. An additional alternative should include the re-licensing, conditioned upon Entergy installing a closed-cooling system at Indian Point nuclear power plant. While this would require a large financial input from Entergy, it would greatly decrease the plants impact on the aquatic environment of the Hudson River. Closed-system cooling is a mature and feasible technology. Requiring this investment by Entergy would enable the public at large to benefit from Nuclear generation while mitigating negative side-effects and protecting the popular sport fishing industry of the Hudson River.

9-e-AE/AL

8.2 Comments on No-Action Alternative

In its consideration of the impacts of the No Action Alternative, the EIS document fails to address the fact that 'no-action', has implicit effects. The selection of this alternative does

9-f-AL

not occur in a vacuum; it has substantive repercussions. For one, it means that there will be less electricity supply on the grid. This shortfall may have environmental and economic impacts beyond those that are discussed in this section. Any alternative that is brought on-line in order to replace Indian Point will be a direct result of the closure and should be considered an impact of 'no action'. For instance, building a new coal plant in a pre-existing non-attainment area would definitely be considered an adverse environmental impact. And should no replacement of Indian Point be installed, then the higher energy costs of energy for residents of New York that may arise as a result, are a socio-economic impact. Any alternative that is brought on-line in order to replace Indian Point will be a direct result of the closure and should be considered an impact of 'no action'. Even if it is redundant to repeat information contained in other sections that deal with alternatives, it is worth mentioning that 'no action' does not preclude other actions, in fact, it invites a response. This means adjudications of the impacts of 'no action' would depend on the cascade of events that follow the selection of that alternative. Even though there is no knowing what the future might bring, it seems misleading to suggest that no action has no impacts beyond those currently indicated.

9-f-AL contd.

The socioeconomic effects described under the "no action alternative," section 8.2, do not accurately address the negative impacts the denial of the relicensing request would have on local communities. In fact, the NRC labels the socioeconomic impacts as "small to moderate." We believe this is a misrepresentation. The impacts of the loss of 1255 full-time jobs and $21.2 million in tax payments to the towns of Cortlandt and Buchanan (8-29) are not small, and surely should not be labeled as moderate either, as these towns would be depressed by such economic losses. This point is demonstrated in numerous examples of similar Northeast communities that have become impoverished after a local factory or plant closes. Additionally, the increase in taxes households would be required to pay as a result of the shutdown of IP2 and IP3 are only addressed as having a "noticeable effect on some homeowners and business, (8-30)." This point should be clarified and it should be noted that the financial security of many households would be further harmed from their potential loss of employment from the shutdown of these plants. The income and employment losses to the towns, businesses, and individual households are far-reaching. Higher taxes would hurt local business and depress household expenditures, which would indirectly effect the business sector. Furthermore, this effect could be disastrous as businesses fold, thus again increasing taxes. None of these possibilities are addressed in the socioeconomic section, but we think they are critical in fully assessing the situation of a no action alternative.

9-g-AL/SO

8.3.1 Comments on Coal-Fired Generation

Under the Air Quality section of 8.3.1 Supercritical Coal-Fired Generation, it is mentioned that an alternative site would most be built in an ozone non-attainment area. The effects of NOx are taken into account, but in the entire section of air quality there is no mention of the other ozone precursor, VOCs. Despite the probable small percentage of total emissions, the role of VOCs in ozone formation is problematic and should be considered in the option of a coal-fired power plant.

Recent research indicates that of the two ozone precursors, VOCs are the more reactive

9-h-AE/AL/AQ

precursor, so even with low levels of VOC emissions, ozone formation could be multiplied to levels beyond original thought (Guariston et. al 2004; Webster et al 2007; Keller et al 2008). Placing a coal-fired power plant in an already non-attainment area will not improve the air quality situation, despite the carbon offsets mentioned in the Indian Point draft.

The NRC concluded that the impact to aquatic ecology would be SMALL from Supercritical Coal-Fired Generation power alternative. However, the NRC did not take into consideration the effects coal mining would have on aquatic ecology. Discharge volume, pH, total acidity, and concentration of dissolved metals all effect aquatic ecology. When pH falls below the tolerance range, respiratory or osmoregulatory failure occurs in fish and macroinvertebrate species. Low pH can also affect fish growth and reproduction. Zinc, cadmium, and copper are toxic at extremely low levels. Precipitated iron andaluminum hydroxide decrease oxygen availability and the precipitate coats gills and body surfaces, smother eggs, and covers the stream bottom.

It is crucially important to consider the health impact of operating coal-fired power plant if we want to employ it as an alternative to nuclear power plant. First, coal-fired power plant requires coal from coal mining, which has a severe health impact on coal miners. Coal dust from mining creates hazardous health problems to coal miners. For instance, black lung disease, heart disease and respiratory diseases. The intensity can vary from minor to chronic; in extreme case, it can lead to fatal disease.

Second, dust released from coal mining can harm the health condition of the nearby communities. By inhaling the dust, people, especially children, can suffer from either acute or chronic diseases, such as kidney disease, chronic lung disease and high blood pressure.

Third, once coal is transported to the power plant from the mine, burning coal creates several health problems to the communities, which live near the power plant, by impairing the air quality. The impact can vary depending on the location that the power plant is built. For instance, the closer the power plant is built to the communities, the larger the health impact can be. People can suffer from asthma attacks, respiratory disease, heart attacks and premature death.

9-h-AE/AL/AQ contd.

8.3.2 Comments on Natural Gas Fired Combined-Cycle Generation

We felt that the natural gas section was comprehensive and well composed. On the whole the document was very informative, with most areas adequately addressed. However, we would like to comment on several points that we feel, if addressed, will enhance the argument for natural gas as an option to replace nuclear power.

1. Enhancement of the introduction section
We feel that the introduction could be a little more informative by providing information about gas supplies in the United States and in particular New York State and the viability of adding a natural gas plant into the network grid. Additionally, it is ambiguous whether

9-i-AL/ED

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or not a closed-cycle cooling system will be used. In one sentence it says it is assumed that it would be used and in the very next sentence it is stated that it is likely a closed-cycle cooling system will be used. As we see it, a natural gas plant as an option would only be environmentally viable if a closed cycle cooling system was ensured. This needs to be clarified in the document.

2. Ambiguous language

We have concerns about the conditional language used in the NGCC section as this creates a sense of ambiguity. Due to this, the NRC creates implicit assumptions that are not fully clear. For example, in many places you use the conditional terms "likely or unlikely." Where this conditional language is used we would like them to be adjusted to indicate more certainty (i.e. would or would not). Or make the assumption clear to the reader by beginning with a conditional word, such as "if." For example, you say on page 8-46 line 6; "This replacement natural gas-fired plant would likely use combined-cycle technology." We think it should read either as "If the replacement natural gas-fired plant would use combined-cycle…," or "The natural gas-fired plant would use combined-cycle…" Your statement makes it unclear whether an NGCC plant would actually be the alternative natural gas facility. In addition, even though the section title refers to an NGCC plant, the use of "gas-fired alternative" would make it unclear if the NRC is actually referring to a NGCC plant or not. If it is possible that an NGCC type plant will not be the "gas-fired alternative" then an additional section assessing the impacts of a single-fire natural gas plant is needed. Otherwise, please use the acronym "NGCC" when referring to a "gas-fired alternative." In another example of conditional language, under the NGCC ecological section beginning on page 8-48 line 25 you use conditional language (unlikely) to describe the impacts of construction. We would prefer it if this section was addressed separately from overall aquatic ecology assessment by using more direct language to describe the environmental impacts of construction that are consistent with the draft EIS's terminology of small, moderate, large. There is another example on page 8-51 line 30 with the use of "expected" when referring to health impacts. Either health impacts "will be controlled" or they "will not be controlled." We understand the use of conditional language at time is appropriate, since the NRC does not have control over Entergy or its hired contractors. Nevertheless, the use of conditional language exhibits a lack of coordination between Entergy and the NRC causes the NRC to seem presumptuous; and opens loopholes that Entergy could exploit.

3. Clarity on plant location

The draft states that the NRC staff finds it possible that a gas-fired alternative could be constructed and operated on the IP2 and IP3 site, but they need a more convincing term (as opposed to possible). How likely is it that the natural gas plant could be constructed on-site? If it is feasible to have the location on-site, what would the land impacts be? Would the environmental impacts be double what they are now? Can the NGCC plant be constructed while IP2 and IP3 are continually operating? If not, where will the energy supply come from while it takes three years to get the NGCC plant up and running? How feasible is that?

4. Land use

9-i-AL/ED contd.

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The draft mentions the pipeline upgrades needed for a combined-cycle alternative. What are the land and other impacts of this upgrade? What are the land impacts, specifically for the proposed mechanical-draft cooling tower?

9-i-AL/ED contd.

8.3.4 Comments on Efficiency and Renewable Energy Sources

While we understand that the NRC is necessarily limited in the number of combinations of efficiency and renewable energy sources that it may assess, we feel that the two such combinations presented in section 8.3.5 are overly limited in scope and may be strengthened via the explicit incorporation of more local renewable options. For example, we feel that the renewable energy capacity in New York State at this time is not adequate to compensate for the loss of capacity that would result from shutting down both Indian Point plants. This conclusion is supported by the fact that "combination alternative 2," presented in section 8.3.5, includes the construction of massive transmission lines to bring power from upstate New York and Canada. The EIS fails to specify the source of this additional energy, which limits the ability of NRC to accurately assess the impact of the proposed combination. We propose that the EIS specifically state that this energy would come from offshore wind farms, as this would strengthen the renewable energy alternative and allow for more specific assessments of the impacts of combination alternative 2.

In addition, we feel that the emphasis on biomass, in particular wood waste, in the two combinations is somewhat counterproductive to the goal of promoting clean renewable energies. While New York is admittedly rich in wood resources, according to the EIS the burning of wood creates pollution similar to that of a coal-fired power plant. This pollution would have an unacceptable adverse effect on populations around the proposed plant, and we feel that such pollution would not be an improvement over the current nuclear energy plant at Indian Point.

Finally, the issue of location of proposed facilities is integral to production of an accurate assessment of the environmental impact of the proposed alternative combinations. While it is true that innumerable variables affect the ultimate decision of where to site a natural gas plant, wind farm, or other energy-generating facility, the draft EIS makes the misleading assertion that it is currently impossible to predict where such a facility would be sited in New York. We contend that it should be possible for the NRC to include an assessment of the environmental impact of proposed energy generation projects, many of which are already permitted but have not been constructed due to difficulties accessing credit and/or the recent downturn in demand for renewable energy. In addition, the capacity to generate energy in New York from renewable sources has increased in the three months since the publication of the draft EIS; for example, the New York Independent Systems Operator (ISO) reported in February that the state now produces over 1,000 MW of energy from wind alone, more than double the capacity at the beginning of 2008. Assessment of the land use impacts of these sites (both newly built and potential) would be significantly more helpful than the vague assertions of SMALL TO LARGE effects found in the draft EIS.

9-j-AL/ED

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Yours Sincerely,

Aurapriya A. Reddy

Emily B. Fischer

Katherine C. Galbraith

Kristine E. Pierce

Shaylah C. Reagan

Michel N. Wahome

Matthew A. Guenther

Kaleena S. Miller

Taryn L. Morris

Joshua Z. Jacobson

Jaclyn Harrison

Lindsay Chapman

Anne E. Kline

Than H. Phoo

Daniel Smith

MS. BARTHELME: Hi, I'm Margaret Barthelme. I am the last student from Ramapo College's Environmental Assessment class. I just want to go over three points in regard to the DSEIS. I believe that certain things are lacking from it. I believe that the spent nuclear storage is not adequately examined, specifically in a site-specific examination of the imminent danger of the proximity of the Ramapo faults. Including the unmentioned use of the resources of Unit 1, which never had an impact statement. 10-a-PA

Secondly, to be in compliance, Indian Point must install a cooling tower. This is an unlikely future action and the impacts of the impending tower need to be addressed in a more in-depth analysis including visual impacts and others, instead of just a cursory evaluation. So these are two issues I believe are not addressed in the DSEIS. Without them, it's not an accurate environmental assessment. 10-b-AL

A third side note, we've been talking a lot of the greenhouse gas emissions. But they're based on a 19-year-old study by Mortimer who found savings in greenhouse gas emissions, but it was based on a more pure ore. So, if we could have an updated look at that we might have a more accurate point of the amount of greenhouse gases we're having. So, to be short, thank you for your time. Thank you to the NRC for allowing me to speak. 10-c-GL

ML090720061

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IPRenewalCEmails

From: mbarthel@ramapo.edu
Sent: Wednesday, March 11, 2009 8:13 PM
To: IndianPointEIS Resource; Michael R Boelstein
Subject: Comment Letter

TO:
Mr. Andrew Stuyvenberg
Project Manager
U.S. Regulatory Commission

FROM:
Margaret Barthelme
Student
Ramapo College

RE:
Comments on Indian Point DSEIS

Dear Andrew Stuyvenberg,

Following please find comments in addition to those I spoke of at the DSEIS Public Comment Hearing. They are additional points that I feel have not been fully addressed in the DSEIS prepared by the NRC.

I had spoken of the proximity of the Ramapo Fault of not having been adequately addressed in the DSEIS. An article in the New York Times on August 31, 2008, Neroulias stated:
The plant may be more vulnerable to earthquakes than experts previously thought, because it sits less than a mile south of a newly identified seismic zone running from Stamford, Conn., to Peekskill, according to a study by Columbia University's Lamont-Doherty Earth Observatory. The study compiled information about 383 earthquakes within a 15,000-square-mile area around New York City since 1677 and analyzed 34 years of new data on tremors recorded by modern technology. Based on this research, scientists say magnitude-5 earthquakes -- strong enough to cause damage -- should be expected in the region about every 100 years. The most recent one occurred in 1884. "The last one just knocked over a few chimneys, but now, with our population density, we'd see some buildings falling, people getting killed," said John Armbruster, one of the study's authors, adding that a major tremor could damage aging bridges and Indian Point's nuclear reactors."
This is not adequately addressed in the DSEIS and studies need to be done by a third party as to the seismic durability of all facilities (especially the underground piping) at Indian Point.
Historically, in an article by Marsh, Gates stated, "I found a lot of faults, splays that offshoot from the Ramapo that go 5 to 10 miles away from the fault. I have looked at the Ramapo Fault in other places too. I have seen splays 5 to 10 miles up into the Hudson Highlands. And you can see them right along the roadsides on 287. There's been a lot of damage to those rocks, and obviously it was produced by fault activities. All of these faults have earthquake potential." Page et al. states that "Since 1962 the Lamont seismograph network in southeastern New York and northern New Jersey has recorded four small earthquakes with epicenters along the Ramapo fault near the New York-New Jersey border". In addition, Aggarwal states, "Seismic activity in the greater New York City area is concentrated along several northeast-trending faults of which the Ramapo fault appears to be the most active. Three nuclear power plants at Indian Point, New York, are situated close to the Ramapo fault. For a reactor site in use for 40 years, the probability that the site will experience an intensity equal to or in excess of the design (safe shutdown) earthquake is estimated to be about 5 to 11 percent."
These citations show that there has been an obvious scientifically observed issue with the fault and 40 years later it is still not adequately addressed.

10-d-PA

Thank you for your time and consideration, Margaret Barthelme

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WORKS CITED:

Seismicity in the vicinity of the Ramapo fault, New Jersey-New York PAGE et al. BULLETIN OF THE SEISMOLOGICAL SOCIETY OF AMERICA.1968; 58: 681-687

Earthquakes, Faults, and Nuclear Power Plants in Southern New York and North... AGGARWAL and SYKES. Science 28 April 1978: 425-429 DOI: 10.1126/science.200.4340.425 NASH, M. (2001, March 25). ON THE MAP; Exploring the Fault Where the Next Big One May Be Waiting. New York Times, Retrieved March 5, 2009, from Academic Search Premier database.

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NRCREP Resource

From: Alice Bartholomew [aw777@yahoo.com]
Sent: Thursday, February 26, 2009 10:32 PM
To: NRCREP Resource
Subject: Response from "Comment on NRC Documents"

Below is the result of your feedback form. It was submitted by

Alice Bartholomew (aw777@yahoo.com) on Thursday, February 26, 2009 at 22:31:58

Document_Title: NUREG-1437, Supplement 38

Comments: I am writing to opposes the license renewal of Indian Point because of the following environmental impacts:

•The slaughter of billions of fish, eggs and larvae every year that results from Indian Point's outdated cooling water intake system, which uses billions of gallons of Hudson River water every day to keep the plant operating.

•The killing of shortnose and Atlantic sturgeon when they are trapped against the cooling water intake screens. Shortnose sturgeon are listed as an endangered species under the federal Endangered Species Act.

•The continuing leak of radioactive water from the Indian Point 2 spent fuel pool into the groundwater and Hudson River, and the residual contamination caused by the plumes of contaminated groundwater that slowly leach toxic strontium-90 and cesium-137 into the Hudson River.

•The long term storage of thousands of tons of highly toxic nuclear waste on the banks of the Hudson River, currently housed in poorly maintained spent fuel pools and "dry casks" that are vulnerable to terrorist attack.

We absolutely need to cease this unnecessary toxic and costly means of producing energy for the sake of ourselves and our grandchildren's grandchildren. The hidden cost of toxic waste causes exorbitant expense not made public. There does exist other clean means of producing energy: solar, anaerobic digestion, geothermal power, wind power, small-scale hydropower, solar energy, biomass power, tidal power, and wave power.

organization:

address1: 415 Wall St

address2:

city: Elmira

state: NY

zip: 14905

country: US

phone: 607-734-6097

11-a-OR

11-b-AE

11-c-AE

11-d-LE

11-e-RW/ST

11-f-AL/OR

ML 090700181

IPRenewalCEmails

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From: notfadeaway@earthlink.net
Sent: Tuesday, March 10, 2009 10:02 AM
To: IndianPointEIS Resource
Subject: Indian Point

To whom it may concern:
It is amazing to me that Indian Point Power Plant is operating and that regular citizens have to fight against it. It seems like something out of a conspiracy theory movie or science fiction book.
It is unimaginable that this plant is allowed to operate in today's highly regulated world - in our country where people are jailed for illegal dumping of non-toxic construction debris or illegal use of waterways by recreational boaters- these micromanaged acts are the norm , yet a huge , leaking nuclear plant with pages and pages of serious violations continues to operate right outside of New York City? I don't understand.

12-a-OR

I oppose the license renewal of Indian Point, and am particularly concerned about the following environmental impacts:

•The slaughter of billions of fish, eggs and larvae every year that results from Indian Point's outdated cooling water intake system, which uses billions of gallons of Hudson River water every day to keep the plant operating.

12-b-AE

•The killing of shortnose and Atlantic sturgeon when they are trapped against the cooling water intake screens. Shortnose sturgeon are listed as an endangered species under the federal Endangered Species Act.

12-c-AE

•The continuing leak of radioactive water from the Indian Point 2 spent fuel pool into the groundwater and Hudson River, and the residual contamination caused by the plumes of contaminated groundwater that slowly leach toxic strontium-90 and cesium-137 into the Hudson River.

12-d-LE

•The long term storage of thousands of tons of highly toxic nuclear waste on the banks of the Hudson River, currently housed in poorly maintained spent fuel pools and "dry casks" that are vulnerable to terrorist attack.

12-e-RW/ST

Please consider how much the people in the communities in the New York metro area oppose this power plant. The grassroots organizations which have been spawned in an attempt to close Indian Point will certainly be happy to put their energy toward supporting alternative energy sources.

12-f-AL

Sincerely,

Laura Bassi, Ph. D.
9 Hawk St.
Chestnut Ridge NY 10977

IPRenewalCEmails ML090720680 1

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From: Pete Berasi [berasi@frontiernet.net]
Sent: Wednesday, March 11, 2009 1:58 PM
To: IndianPointEIS Resource
Subject: Opposition to Relicensing of Indian Point

Chief, Rulemaking, Directives and Editing Branch
Division of Administrative Services
Office of Administration, Mailstop T-6D59
U. S. Nuclear Regulatory Commission, Washington, DC 20555-0001

Dear Sir:

This e-mail is provided with the intention of voicing my opposition to the relicensing of the Indian Point Nuclear Power plants for an additional period of twenty years beyond its original licensing period of forty years. This opposition is based in many specific concerns, which are detailed below

1. Direct environmental impacts upon the region surrounding the Indian Point facility.
a. Unreliability of the existing toxic waste pools results in ongoing leakage of radioactive water into groundwater and the Hudson River. Plumes of toxic Strontium 90 and Cesium 137 have long term impact upon the ecology of the Hudson River and surrounding areas.
b. Intake of vast volumes of water from the Hudson River to feed the facility cooling water system impacts the viability of aquatic life in the area, including fish, eggs, and larvae.
c. Return of spent water to the Hudson River alters the ecology of the local environment due to thermal gradients and the presence of effluents from the facility's process.
d. Killing of endangered species such as Shortnose Sturgeon as they are trapped against cooling water intake screens.
e. Long term storage of vast quantities of highly toxic nuclear waste stored adjacent to the Hudson River in poorly maintained spent fuel pools and casks which are subject to failure over time. The spent fuel facility is also a target of terrorist attack based upon its proximity to the New York City metropolitan area.
f. The Indian Point facility is sited on top of a geological fault. As the system ages, will critical components be able to survive an earthquake along the fault?

2. Indirect environmental impacts upon the general environment and ecology.
a. Long term storage of toxic nuclear waste is questionable from a nuclear industry viewpoint. The creation of a national repository at Yucca Mountain in Utah appears to no longer be viable. There appears to be no other potential site available anywhere within the foreseeable future to support such a need. As toxic waste storage continues to build at Indian Point, there is doubt the material would ever be removed for transfer to another repository. Relicensing will only allow this problem to build to untenable levels with no opportunity for relief. It is inevitable, that under these circumstances, the toxic waste pools and/or casks will eventually suffer a major catastrophe.
b. Nuclear power is not inherently a clean or green process. The mining of uranium is an energy intensive process which emits carbon dioxide and other effluents that tax the environment. This is a hidden environmental impact of nuclear power generation and not one which should be ignored.
c. There are sporadic and intermittent discharges of radioactive effluents into both the atmosphere and groundwater from nuclear power facilities. Although infrequent, the emitting species are extremely toxic and the epidemiological impact is difficult to monitor and categorize for identification of the actual damaged parties subjected to this impact.

3. Additional Factors challenging the advisability of relicensing.
a. The relicensing of Indian Point is being pursued primarily under the auspices of a General Environmental Impact Statement (GEIS). A matter of this import should focus much more carefully upon the specifics of the Indian Point Nuclear Power facilities themselves. The plant will have operated for a period of forty years under its original license. When it is relicensed for a period of an additional twenty years, what assurance will there be that all critical system components for the reactor, the cooling systems, the toxic waste storage, and the various control systems are reliable and serviceable as they were forty years ago? What assurance will there be that no critical component will fail endangering the cooling systems and control systems during the period of additional operation? Will it even be possible to gain access to all components to verify reliability and replace individual components if needed?
b. The region in the 50 mile radius of Indian Point is one of the highest density population centers in the nation. It is the home of millions of inhabitants and the financial and economic center of the United States. This facility presents excessive risk to the local population and the nation as a whole to permit relicensing.

13-a-OR

13-b-AE

13-c-AE

13-d-PA/RW/ST

13-e-PA/SF

13-f-AM/GE/OM

13-g-DE/EP

c. In the event of a crisis at the Indian Point facility there is no possibility of performing a timely and effective evacuation of the resident population.

As a local resident residing well within the 50 mile radius of the Indian Point facility, I oppose the relicensing of Indian Point for the reasons stated above. It is my position that it would be a more reasonable position to purchase power from generating sources that are safer, less hazardous and more environmentally sound than extending the operation of the Indian Point facility or an additional period of twenty years.

13-g-DE/EP contd.

13-h-OR

Sincerely,
Peter H. Berasi
e-mail: berasi@frontiernet.net
9 Alpine Drive
Hopewell Junction, NY 12533

African American Environmentalist Association

Written Statement of

Derry Bigby
Vice President
African American Environmentalist Association

For the

Nuclear Regulatory Commission Meeting To Discuss The Draft Supplemental Environmental Impact Statement

For

License Renewal

For the

Indian Point Nuclear Power Plant

Presented to the

U.S. Nuclear Regulatory Commission

Office of Nuclear Reactor Regulation

February 12, 2009

9903 Caltor Lane, Ft. Washington, MD 20744
(301) 265-8185 www.aaenvironment.com

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AAEA Statement on Indian Point License Renewal Application

Introduction

My name is Derry Bigby and I am the Vice President of the African American Environmentalist Association (AAEA). AAEA, founded in 1985, is an organization dedicated to protecting the environment, enhancing human, animal and plant ecologies and promoting the efficient use of natural resources. AAEA includes an African American point of view in environmental policy decision-making and resolves environmental racism and injustice issues through the application of practical environmental solutions. The New York Office was established in 2003.

AAEA supports the 20-year License Renewal for the Indian Point nuclear power plant located in Buchanan, New York. AAEA expressed public support for nuclear power for the first time in 2001 after a two-year internal process of studying and debating the issue. AAEA was the first environmental organization in the United States to support nuclear power. My comments today address the Generic Environmental Impact Statement for the License Renewal of Nuclear Plants, Supplement 38, Regarding Indian Point Nuclear Generating Unit Nos. 2 and 3.

AAEA has members worldwide. New York members of AAEA live and work – and breathe the air in a Clean Air Act Nonattainment Area. Of particular import to AAEA is the promotion of clean air in African American communities. Because nuclear power is emission-free and has a demonstrated safety record, whereas fossil-fuel power contributes to numerous health issues, AAEA seeks to promote the safe use of nuclear power. AAEA specifically supports the Indian Point 2 and 3 nuclear power facilities because these facilities provide significant electrical capacity to the State of New York with minimal human, animal, air, water, and land impacts. My comments will address specific environmental justice, air pollution, and global warming issues.

14-a-AQ/EJ/SR

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AAEA agrees with the preliminary recommendation of the NRC staff:

> "...that the Commission determine that the adverse environmental impacts of license renewals for IP2 and IP3 are not so great that not preserving the option of license renewals for energy planning decision makers would be unreasonable. This recommendation is based on (1) the analysis and findings in the GEIS, (2) the ER submitted by Entergy, (3) consultation with other Federal, State, and local agencies, (4) the staff's own independent review, and (5) the staff's consideration of public comments received during the scoping process."[1]

14-a-AQ/EJ/SR contd.

Environmental Justice

Environmental justice is defined by AAEA as the fair treatment of all people regardless of race or income with respect to environmental issues. AAEA is deeply concerned with any policy or measure that impacts the air quality of the communities where it is based, or that affects the health of its members. Although AAEA is concerned about air quality in all areas, we are particularly concerned with promoting clean air in African American communities because, in many instances, those communities suffer a disproportionate amount of total pollution.

We agree with the NRC conclusion in the GEIS on the environmental justice impacts if IP 2 and IP 3 are relicensed for another twenty years, which states:

> "Based on the analysis on environmental health and safety impacts presented in this draft SEIS for other resource areas (contained in Chapters 2 and 4 of this SEIS), there would be no disproportionately high and adverse impacts to minority and low income populations form continued operation of IP2 and IP3 during the license renewal period."[2]

We totally disagree with the environmental justice conclusion that, "the overall environmental justice impacts of constructing and operating a closed-

14-b-AQ/EJ/SR

[1] U.S. NRC GEIS for License Renewal of Nuclear Plants, Supplement 38, Regarding IP2 & 3, Draft Report For Comment, Main Report, Executive Summary, p. xvii.
[2] GEIS, 4.4.6 Environmental Justice, p 4/45-4-46.

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cycle cooling system at the IP2 and IP3 site are likely to be SMALL."[3] The impacts would be devastating because we believe Entergy would shut the facility down before building cooling towers and that would lead to significantly more air pollution in minority communities that are already inundated with a disproportionate amount of pollution sites. We support the alternative proposal that would combine the existing once-through cooling system with modified intake retrofits that would be equivalent to a new closed-cycle cooling system. Requiring a closed-cycle cooling system is essentially the No-Action Alternative (shut down).

14-b- AQ/EJ/SR contd.

Supercritical Coal-Fired Generation

The GEIS concludes that even a more efficient supercritical four-unit coal-fired power plant could cause LARGE impacts depending on the site location.[4] Although we approve of supercritical boilers, they cannot replace the emission free nature of IP2 and IP3. Emissions from these plants would still have large negatives impacts on already impacted communities in environmental justice areas.

14-c-AL/AQ

Fossil-Fuel Power Causes Serious Adverse Health Effects

In 1999, coal-fired power plants in the United States emitted into the environment 11.3 million tons of sulfur dioxide ("SO_2"), a criteria air pollutant that is correlated to asthma and impaired lung functions, 6.5 million tons of nitrogen oxides ("NO_x") which, when combined with other pollutants and sunlight, forms ozone, another lung irritant linked to asthma, and 1.9 billion tons of carbon dioxide ("CO_2"), yet another contributor to increased ozone levels and global

14-d-AL/EJ/GL

[3] GEIS, Section 8.1.1.2 Environmental Impacts of the Closed-Cycle Cooling Alternative, Environmental Justice, p. 8-16.
[4] GEIS, 8.3.1 Supercritical Coal-Fired Generation, Environmental Justice, p 4-44.

climate change.[5] This equates to approximately 60% of all SO_2 emissions, 25% of all NO_x emissions, and 32% of all CO_2 emissions nationwide.[6]

These and other airborne pollutants emitted by fossil-fuel power stations may have a direct and significant effect on human health. In a study by Abt Associates, one of the largest for-profit government and business research consulting firms in the world, it was found that over 30,000 deaths each year are attributable to air pollution from U.S. power plants.[7] Another study found that air pollution from power plants was a contributing factor to higher infant mortality rates and higher incidences of Sudden Infant Death Syndrome ("SIDS").[8] Research has further shown that pollutants from fossil-fuel power plants form tiny particles (called fine particulate matter) that are linked to diseases of both the respiratory and cardiovascular systems.[9]

Not surprisingly, air pollution has been characterized as one of the largest threats to public health.[10]

14-d-AL/EJ/GL contd.

Negative Health Effects of Fossil-Fuel Power Borne Disproportionately by Blacks

[5] Rachel H. Cease, ADVERSE HEALTH IMPACTS OF GRANDFATHERED POWER PLANTS AND THE CLEAN AIR ACT: TIME TO TEACH OLD POWER PLANTS NEW TECHNOLOGY, 17 J. Nat. Resources & Envtl. L. 157, 158 (2002-2003); Martha H. Keating, AIR INJUSTICE, at 4 (October 2002) (attached hereto as Exhibit B).
[6] Nat. Resources & Envtl. L. at 158.
[7] Nat Resources & Envtl at 159.
[8] Martha H. Keating, AIR INJUSTICE, (October 2002).
[9] Air Quality in Queens County: Opportunities for Cleaning Up the Air in Queens County and Neighboring Regions, at S-6, Synapse Energy Economics, Inc. (May 2003) ("Air Quality in Queens County") ("Epidemiological studies tell us that on days when air pollution levels are high, more people get sick or die.") (available at http://www.synapse-energy.com/Downloads/Synapse-Report-queens-air-quality-exec-summary-05-20-2003.pdf); Children at Risk: How Pollution from Power Plants Threatens the Health of America's Children, at 2, Clean Air Task Force (May 2002) ("Power plant emissions and their byproducts form particulate matter, ozone smog and air toxics. These pollutants are associated with respiratory hospitalizations, lost school days due to asthma attacks, low birth weight, stunted lung growth and tragically, even infant death.") (available at http://cta.policy.net/proactive/).
[10] Allison L. Russell, URBAN POLLUTANTS: A REVIEW AND ANNOTATED BIBLIOGRAPHY, New York City Environmental Justice Alliance 2000 (http://www.nyceja.org/pdf/Urban.pdf).

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Sadly, these serious health effects disproportionately fall on the shoulders of low-income and minority communities, including African American communities. For instance, the percentage of African Americans and Hispanics living in areas that do not meet national standards for air quality is considerably higher than that of whites.[11] Correspondingly, respiratory ailments affect African Americans at rates significantly higher than whites. Asthma attacks, for example, send African Americans to the emergency room at three times the rate of whites (174.3 visits per 10,000 people for African Americans versus 59.4 visits per 10,000 people for whites), and African Americans are hospitalized for asthma at more than three times the rate of whites (35.6 admissions per 10,000 people for African Americans versus 10.6 admissions for every 10,000 people for whites).[12] Similarly, the death rate from asthma for African Americans is almost three times that of whites (38.7 deaths per million versus 14.2 deaths per million).[13]

14-d-AL/EJ/GL contd.

Conclusion

AAEA supports the 20-year License Renewal (ESP) for the Indian Point nuclear power plant located in Buchanan, New York. We support this renewal because the facility is a positive structure for mitigating ground level air pollution, global warming and environmental injustice.

14-e-SR

[11] Urban Pollutants.
[12] Urban Pollutants.
[13] Urban Pollutants.

ML090860061

St. Patrick Villa
2 Duryea Lane
Nanuet, NY 10954

Chief Administrator
Office of Administration Mailstop T6D59
U.S. Nuclear Regulatory Commission
Washington, DC 20565-0001

Dear Sir,

I wholeheartedly support Riverkeeper's environmental concerns and oppose renewal of license for operating Indian Point. 15-a-OR

Sincerely,
Sr. Rosemarie Bittermann
March 14, 2009

ML090720679 1
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IPRenewalCEmails

From: ablades@ramapo.edu
Sent: Wednesday, March 11, 2009 6:36 PM
To: Andrew Stuyvenberg
Subject: Comments on DSEIS

Andrew Stuyvenberg, 3/11/09
Project Manager
U.S. NRC

I am currently enrolled as a student at Ramapo College, and taking part in the "Environmental Assessment" course with Professor Edelstein. As a class we were given the task of examining the renewal of Indian Points license to operate and its Environmental Impact Statement. Since we began examining the draft environmental impact statement, it became more and more clear to myself over time, that the impact statement was created with the purpose of ensuring that Indian Point Nuclear Power Plant remain open. Focusing on my main indicator, Psychological – Social factors, has given myself an interesting point of view on which to evaluate the documents from. My understanding of Psychological – Social factors, is that it can be interpreted through psychological indicators experienced in commonly in social groups such as trust and stress.

Plant workers and engineers, employees of Entergy and the Nuclear Regulatory Commission, and Buchanan, NY locals who depend on the plant for the local economy show a widespread acceptance for the renewal of Indian Point's operating license. Their adopted viewpoints show trust in the use of nuclear power and regard it as not only safe, but as the most practical way of producing "clean" energy. This was displayed as many of them voiced their opinions at the public hearing we attended on February 12th. It is my belief that I would have had a much harder time understanding the Psychological – Social factor as an indicator, if I did not attend the hearing. It also revealed to me a possible approach to studying psychological – social factors, as they may be hard to discern before a draft environmental impact statement is produced. Furthermore, information revealed in the impact statement may have an effect on psychological – social factors, or even create new psychological – social patterns.

A distrust in how nuclear power is produced in our country would be considered as producing stress in a psychological – social environment. The stress results from people's fears that nuclear power not only offers small dangers like minimal exposure to radioisotopes over a long period of time, but could also create a feeling of impending doom with those who believe strongly that a critically enormous mishap is quite possible due to the "human factor". Resulting from this would be a catastrophic disaster that would have severs long term affects on not only local residents, but our nation as a whole. The "Human Factor" is considered as the element of possible human error in the operation of nuclear power plants. Nuclear power plants such as Indian Point are safe insofar as the engineers and technicians who run the plant do so flawlessly while keeping in line with the highest of safety procedures. Understanding of the human factor adds an interesting element to psychological – social factors.

Usually an accident at one nuclear power plant would produce uniform psychological – social patterns nationwide due to the widespread use of nuclear power. Most susceptible to these stress patterns are people living within a certain vicinity of Indian Point nuclear power plant, who feel a problem at the plant would directly affect them.

In the new millennium, possibilities of Indian Point becoming a large terrorist target have been introduced into psychological – social framework in the wake of the attacks on September 11th 2001. By looking through studies and conducting personal interviews, the results have shown that most people believe that Indian Point is safe from this threat. Documents supporting this claim have been posted on our collaborative sustainability website, but my expert opinion is that Indian Point's security from this threat is still questionable. Contradicting evidence performed in multiple studies has provided mostly inconclusive results on the true nature of how secure Indian Point Nuclear Power Plant really is. The issue of total security at Indian Point and the psychological – social environment it creates is not addressed in the Draft Environmental Impact Statement.

The issue of Indian Point's evacuation procedure and its psychological – social effects is also something that has been neglected in being addressed in the impact statement. In the event that something along the lines of an absolute disaster would occur at Indian Point, current procedure calls for prompt and orderly

16-a-DE/PA

16-b-PS/ST

16-c-EP/PA/PS

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evacuation. From studying the geography of the area around Indian Point and safety measures taken to counteract a meltdown or substantial release of radioactive materials, it is my belief that severe problems would be experienced in a massive wide scale evacuation. This is something that needs to be addressed fully before Indian Point's license to operate is renewed. The most feared enemy is one that cannot be seen, and an accidental dangerous release of radioactive particles even on a small scale would create such mass panic that it could harm the condition of how we view Nuclear Power in our country forever.

16-c-EP/PA/PS contd.

Throughout the impact statement we see how the United States Nuclear Regulatory Commission views the environmental impact of renewing Indian Point's license to operate. Although they do not directly operate the plant themselves, jobs at the Nuclear Regulatory Commission do depend on the continuing operation of not just Indian Point, but all current nuclear power plants in our country. It brings in to question who should really be responsible for drafting an environmental impact statement for a nuclear power plant. The Nuclear Regulatory Commission does utilize many outside sources for scientific research and intelligence on Indian Point, but what the impact statement claims in the end is entirely up to the discretion of the NRC. In a perfect world, a third party that utilizes the best scientific research and information available would actually be responsible for drafting an environmental impact statement. Not to discredit any of the experts at NRC, but an outside group without any political ties or private interests would most likely create a more fair and balanced environmental impact statement.

16-d-LR

Thank You
Adam Blades

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IPRenewalCEmails ML090720677

From: Snook, Robert O. [Robert.Snook@po.state.ct.us]
Sent: Friday, March 13, 2009 10:02 AM
To: IndianPointEIS Resource
Cc: John Sipos; mannajo@clearwater.org; jdp3@westchestergov.com; jmatthe@gw.dec.state.ny.us; jjparker@gw.dec.state.ny.us; Janice.Dean@oag.state.ny.us; dcurran@harmoncurran.com; William Dennis; sfiller@nylawline.com; mdelaney@nyceda.com; O'Neill, Martin; Paul M. Bessette; Kathryn M. Sutton; Richard Wardwell; Zachary Kahn; Kaye Lathrop; Elise Zoli; Sherwin Turk; Beth Mizuno; David Roth(OGC); Jessica Bielecki; Marcia Simon; Mylan.Denerstein@oag.state.ny.us; Daniel O'Neill; driesel@sprlaw.com; Lawrence McDade; dbrancato@riverkeeper.org; philip@riverkeeper.org
Subject: Comments of the Attorney General on Draft Supplement 38, NUREG-1437
Attachments: indian pt impact statement for license renewals.pdf

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Chief, Rules and Directives Branch
Division of Administrative Service
Mail Stop TWB-05-B01
United States Nuclear Regulatory Commission
Washington, D.C. 20555-0001
Via email to IndianPoint EIS@nrc.gov

GENERIC ENVIRONMENTAL IMPACT STATEMENT FOR LICENSE RENEWALS SUPPLEMENT 38 INDIAN POINT NUCLEAR POWER STATION

COMMENTS OF RICHARD BLUMENTHAL, ATTORNEY GENERAL OF CONNECTICUT

SUMMARY

The proposed 20-year license extension for the Indian Point Nuclear Power Station threatens significant adverse consequences to human health and safety and the environment. The Nuclear Regulatory Commission ("NRC") has not taken the "hard look" required by the National Environmental Policy Act ("NEPA") in the draft supplemental environmental impact statement for the Indian Point Nuclear Power Station released December, 2008. NRC must thoroughly and accurately reevaluate the impacts resulting from a fire, accident or attack on the facility and especially on the stored spent nuclear fuel ("SNF") at the site, as those risks will be profoundly increased by the continued operation of the facility over an additional twenty years. In addition, since Indian Point was originally licensed, there has been a major increase in population in the potential emergency evacuation zone. As a result, the NRC must reanalyze the impact of an accident or attack in the context of a realistic evacuation plan covering areas of both Connecticut and New York. Finally, the draft supplemental impact statement itself clearly acknowledges that important data on potential impacts to natural resources is

17-a-NE/SF

17-b-EP/LI/ST

missing. Until all relevant data is made available and thoroughly reevaluated, NRC will not have met the terms of NEPA.

17-b-EP/LI/ST contd.

NEPA

The National Environmental Policy Act, 42 U.S.C § 4321, *et seq.* ("NEPA"), mandates that federal agencies involved in activities that may have a significant impact on the environment must complete a detailed statement of the environmental impacts and project alternatives. NEPA provides, in pertinent part, as follows:

> The Congress authorizes and directs that, to the fullest extent possible . . .
>
> (2) all agencies of the Federal Government shall -- . . .
>
> (C) include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on --
>
> (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 in the proposed action should it be implemented.

42 U.S.C. § 4332.

17-c-NE

NEPA directs that federal agencies, such as the NRC, must study certain issues and that the reviewing agency must take a "hard look" at these issues, but does not direct what result an agency must reach. Federal appellate courts have been very clear that NEPA is an important federal law and compliance is mandatory. "NEPA was

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created to ensure that agencies will base decisions on detailed information regarding significant environmental impacts and that information will be available to a wide variety of concerned public and private actors. *Morongo Band of Mission Indians v. Federal Aviation Administration*, 161 F.3d 569, 575 (9th Cir. 1998)" (quoted in *Mississippi River Basin Alliance v. Westphal*, 230 F.3d 170, 175 (5th Cir. 2000)).

Thus, the fundamental goal of an evaluation under NEPA is to require responsible government agencies involved with a given project to undertake a careful and thorough analysis of the need for that project and its impacts before committing to proceed with the project. As the Tenth Circuit has held:

> The purpose of NEPA is to require agencies to consider environmentally significant aspects of a proposed action, and, in so doing, let the public know that the agency's decisionmaking process includes environmental concerns. *Baltimore Gas & Elec. Co. v. Natural Resources Defense Council*, 462 U.S. 87, 97, 76 L. Ed. 2d 437, 103 S. Ct. 2246 (1983); *Sierra Club v. United States Dep't of Energy*, 287 F.3d 1256, 1262 (10th Cir. 2002).

Utahns For Better Transportation v. United States Dept. of Transp., 305 F.3d 1152, 1162 (10th Cir. 2002).

As the District of Columbia Circuit has held:

> "NEPA was intended to ensure that decisions about federal actions would be made only after responsible decision-makers had fully adverted to the environmental consequences of the actions, and had decided that the public benefits flowing from the actions outweighed their environmental costs." *Jones v. District of Columbia Redevelopment Land Agency*, 162 U.S. App. D.C. 366, 499 F.2d 502, 512 (D.C. Cir. 1974). . . .

Illinois Commerce Com. v. Interstate Commerce Com., 848 F.2d 1246, 1259 (D.C. Cir. 1988).

17-c-NE contd.

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It is not only the government decision-makers who are to be served by an EIS, but the citizens of this nation as well. As one court noted: "The purpose of an EIS is to 'compel the decision-maker to give serious weight to environmental factors' in making choices, *and to enable the public to* 'understand and consider meaningfully the factors involved.' *County of Suffolk [v. Secretary of Interior]*, 562 F.2d at 1375 (*citing Sierra Club v. Morton*, 510 F.2d 813, 819 (5th Cir. 1975))." *Town of Huntington v. Marsh*, 859 F.2d 1134, 1141 (2d Cir. 1988)(emphasis added.)

17-c-NE contd.

Indian Point

The Indian Point Energy Center ("Indian Point") is located in the Town of Buchanan, New York. The Indian Point facility currently is owned by Entergy Nuclear Northeast, a licensee of the NRC.

The Indian Point nuclear compound contains three reactors: Indian Point Unit 1 ("IP1"), completed in 1962, but retired in 1974 after spending over half the time out of service for repairs; Indian Point Unit 2 ("IP2"), which received an operating license in 1973; and Indian Point Unit 3 ("IP3"), licensed in 1975. The Indian Point Unit 2 and Unit 3 reactors remain in operation today, as do the two separate spent fuel pools for Unit 2 and Unit 3. Indian Point is located in one of the most densely populated regions of the United States. On any given day, approximately, 20 million Americans live, work, or travel within 50 miles of the Indian Point facility.

17-d-DE

Draft Supplement 38 Generic Environmental Impact Statement

The NRC released a draft of Supplement 38 to the Generic Environmental Impact Statement for License Renewals for Nuclear Plants regarding Indian Point Nuclear Power Station ("Draft Supplement") in December, 2008. The Draft Supplement purports to

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evaluate the site specific environmental impacts associated with the proposed 20-year license extension sought by Entergy Nuclear Operations, Inc. ("Entergy") for its facility.

The Connecticut Attorney General offers the following comments on the Draft Supplement that reflect primarily potential impacts to the State of Connecticut from relicensing.

Failure to Evaluate Severe Accidents

Section 5.1.2 of the Draft Supplement acknowledges that "[s]evere nuclear accidents . . . such as . . . floods, earthquakes, fires, and sabotage, traditionally have not been discussed in quantitative terms in [past environmental documents] and were not specifically considered for IP2 and IP3 in the GEIS." This section continues, however, to note that NRC did evaluate impact assessments at 44 *other* nuclear plants and concluded that the risk from these types of events at those plants is small. *Id.*

This approach is not consistent with NEPA. The purpose of an environmental review is, as described above, to allow decision makers to know and understand the full range of potential impacts to public health and safety and the environment from a proposed action. Ignoring major impacts simply because there is a tradition of doing so is a flat violation of federal law. Evaluating a potential impact at one facility and then extrapolating that impact to another without detailed consideration of the differences between the facilities is also manifestly insufficient under NEPA.

Further, Indian Point is unique in many ways. The population density around Indian Point is much higher than that around any other nuclear power station in the country. An accident or attack at Indian Point would have a potentially much greater impact on human health and safety than a similar event at a nuclear power station in a

17-e-NE/PA

17-f- PA

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less urbanized part of the country. Until a site-specific analysis of all reasonably foreseeable threats is made, the Draft Supplement will not meet the requirements of NEPA.

17-f- PA contd.

In this regard, it is important to recognize that the threat of attack or sabotage to Indian Point is ongoing. It remains clear that terrorists are still attempting to create a "dirty bomb" or otherwise cause a deliberate release of radioactive material. On October 23, 2008, Dr. Mohamed ElBaradei, Director General of the International Atomic Energy Agency (IAEA), addressed the United Nations General Assembly and warned the world about nuclear terror: "The possibility of terrorists obtaining nuclear or other radioactive material remains a grave threat."[1] In December 2008, the Commission on the Prevention of WMD Proliferation and Terrorism (the "WMD Commission") reported: "Terrorist organizations are intent on acquiring nuclear weapons or . . . material, . . ."[2] On September 10, 2008, New York City Police Commissioner Raymond Kelly testified to the WMD Commission that:

> Everything we know about al Qaeda tells us that they will try to hit us again, possibly the next time with a weapon of mass destruction. We must do everything in our power to stop them before it's too late.[3]

It is clear that the threat of terrorism is very real and, particularly for a facility as vulnerable as Indian Point, the possibility of an attack or sabotage needs to be considered in any NEPA analysis.

17-g-ST

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[1] World At Risk – The Report of the Commission on the Prevention of WMD Proliferation and Terrorism, Graham & Talent (December 2008), http://www.preventwmd.gov, at 43.
[2] Id. at 43-44.
[3] Id. at 112.

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Spent Nuclear Fuel

Section 6.0 of the Draft Supplement purports to consider the environmental impacts of stored nuclear fuel at Indian Point. At present, the two operating nuclear power reactors at Indian Point store decades of accumulated spent fuel in water-filled storage pools located on-site. This situation is a result of the continuing failure of the Department of Energy (DOE) and NRC to license and build a national permanent repository for spent fuel at Yucca Mountain, Nevada. Further, even if it is ever built, Yucca Mountain is designed to contain only 77,000 metric tons of spent fuel. At current estimates, that amount will have been generated by 2010 and, if re-licensed, Indian Point will continue to produce spent fuel many more years after that. 17-h-SF

Over the years, in order to store more fuel rods, Entergy and its predecessors have placed them in an extremely dense configuration within the spent fuel pools. As a consequence, the majority of the radioactive material at Indian Point is not located within the containment structures protecting the operating reactors, but within the poorly protected spent fuel pools. The danger created by these high-density storage pools in the event of an accident or terrorist attack is obvious. Indian Point is located in one of the most densely populated areas of the country, an area which includes not only New York City and much of southern New York and northern New Jersey, but also much of the State of Connecticut, within its potential exposure zone. 17-i-SF/ ST

In recent years, many experts have recommended moving spent fuel that has cooled for at least five years from fuel storage pools into dry cask storage. Such storage is viewed as safer and more protective than the highly vulnerable fuel pools. While Entergy has proposed a dry cask plan for Indian Point, the plan would not move all of the 17-j-SF

older fuel into dry cask storage, but only enough to make room for additional spent rods created by continuing reactor operation. Thus, the plan will not result in any decrease in the density of the spent fuel rods stored in the pools, nor otherwise reduce the unacceptable risks of the existing spent fuel pool. The plan will merely allow Entergy to *increase* the total available fuel storage capacity at Indian Point while keeping the fuel pools full. The plan has significant economic benefits for Entergy, but significant safety disadvantages, because the amount of fuel in relatively unprotected pool storage will not be reduced. In fact, the problem will be gravely exacerbated by 20 years' additional accumulation of highly radioactive fuel rods.

17-j-SF contd.

Furthermore, NRC has not properly evaluated the consequences of terrorist attack on the spent fuel storage area and it must do so now. In an October, 2000, study, the NRC admitted that:

> "the risk analysis in this study did not evaluate the potential consequences of a sabotage event that could directly cause off-site fission product dispersion, for example, a vehicle bomb driven into or otherwise significantly damaging the SFP [Spent Fuel Pool]. . . ."[4]

An accident or attack damaging a spent fuel pool could release deadly amounts of radiological material and toxic fumes. The NRC October 2000 report stated:

> This reaction of zirconium and air, or zirconium and steam is exothermic (i.e., produces heat). The energy released from the reaction, combined with the fuel's decay energy, can cause the reaction to become self-sustaining and ignite the zirconium. The increase in heat from the oxidation reaction can also raise the temperature in adjacent fuel assemblies and propagate the oxidation reaction. The zirconium fire would result in a significant release of the spent fuel fission products which would be dispersed from the reactor site in the thermal plume from the zirconium fire. Consequence assessments have shown that a

17-k-SF/ST

[4] NRC Report February, 2001, NUREG -1738, at 4-15. This report is respectfully incorporated by reference.

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zirconium fire could have significant latent health effects and resulted (sic) in numbers of early fatalities.[5]

A Department of Energy report indicates that such a fire would release considerable amounts of cesium-137, an isotope that accounted for most of the offsite radiation exposure from the 1986 Chernobyl accident.[6] Another report, authored by NRC, concludes that, in the event of a pool fire, approximately 100 percent of the pool's inventory of cesium would be released to the atmosphere.[7]

The emission of radioactive particles from a spent fuel pool accident would lead to horrific consequences. The NRC study stated that human fatalities within the first year of such an event "can be as large as for a severe reactor accident even if fuel has decayed several years."[8] The radioactive fallout from this type of release could also make tens of thousands of acres of land uninhabitable.

17-k-SF/ST contd.

The concerns raised by these reports find further support in a National Academy of Sciences ("NAS") study regarding the risks posed by spent fuel pools.[9] As the NRC is aware, the NAS Study concluded that a successful terrorist attack on spent fuel pools was possible and recommended an independent assessment of current security measures.

17-l-SF/ST

Accordingly, the environmental evaluation must study the consequences to human health and safety and the environment from an accident or attack on the accumulated

[5] NRC Report February, 2001, NUREG 1738 at 3-1 (internal citation omitted).

[6] *See* US Department of Energy, Health and Environmental Consequences of the Chernobyl Nuclear Power Plant Accident, DOE/ER-0332 (Washington, DC: DOE, June 1987). This report is incorporated by reference.

[7] *See* V. L. Sailor et al, Severe Accidents in Spent Fuel Pools in Support of Generic Safety Issue 82, NUREG/CR-4982 (Washington, DC: NRC, July 1987). This report is incorporated by reference.

[8] *See* NRC Report February, 2001, NUREG 1738 at 3-34.

[9] National Research Council of the Nat'l Academies, Safety and Security of Commercial Spent Nuclear Fuel Storage: Public Report 17, 40 (2006). This report is incorporated herein by reference.

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stored fuel in a storage system, because those possibilities pose obvious risks that were not discussed in the Draft Supplement. Until this evaluation is complete, NEPA has not been met.

17-I- SF/ST contd.

Emergency Evacuation Impacts Not Considered

Emergency planning for Indian Point includes plans covering both a 10-mile radius emergency planning zone ("EPZ") and a separate 50-mile radius ingestion pathway EPZ. The 50-mile radius EPZ includes substantial portions of the State of Connecticut, including its largest city, Bridgeport, and its most populous county, Fairfield. The immediate consequences of an evacuation order would affect approximately one-third of the population of Connecticut.

In 2003, James Lee Witt, the former director of the Federal Emergency Management Agency (FEMA), issued a report detailing the deficiencies in the emergency evacuation plan for the Indian Point EPZ. Mr. Witt concluded that safe evacuation of the area surrounding Indian Point is highly unlikely, if not impossible.[18]

In the past, the NRC has failed to evaluate evacuation protocols as part of the NEPA process for a license extension application. This omission is unacceptable, and would constitute a patent violation of NEPA, if it were allowed in the consideration of Indian Point's relicensing application.

17-m-EP

Under NEPA, a reviewing agency is required to consider the impact on the environment resulting from the total effects of the contemplated action and other past, present, and "reasonably foreseeable" future actions. See 40 C.F.R. 1508.7 (1990). Furthermore, NEPA mandates that federal agencies contemplating "major federal actions

17-n-EP/PA/ ST

[18] James Lee Witt Associates, Review of Emergency Preparedness of Areas Adjacent to Indian Point and Millstone (2003). This report is incorporated by reference.

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significantly affecting the quality of the human environment," 42 U.S.C. § 4332(2)(C), are obligated to include in the recommendation or report on the anticipated action an environmental impact statement ("EIS"), as "evidence that an agency has considered the reasonably foreseeable environmental effects of a proposed major action before making a decision to take the action." *Town of Orangetown v. Gorsuch*, 718 F.2d 29, 34 (2d Cir. 1983), *cert. denied*, 465 U.S. 1099 (1984).

To meet the mandates of NEPA, the Draft Supplement was required to identify and discuss all anticipated adverse impacts in a clear and comprehensive fashion, including any adverse unavoidable environmental effects resulting from the implementation, alternatives to the proposed action, the relationship between short-term uses and the long-term maintenance of the environment, and any irretrievable commitments of resources involved in the proposed action. Such a detailed statement "insures the integrity of the agency process by forcing it to face those stubborn, difficult-to-answer objections without ignoring them or sweeping them under the rug" and serves as an "environmental full disclosure law so that the public can weigh a project's benefits against its environmental costs." *Sierra Club v. United States Army Corps of Eng'rs* (Sierra Club II), 772 F.2d 1043, 1049 (2d Cir. 1985); *see also Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349, (1989).

17-n-EP/PA/ST contd.

The Draft Supplement, however, contains no relevant consideration of the larger scale impacts of an accident or attack on emergency evacuation or response. It is unacceptable for the NRC to say that emergency planning is the domain of another federal agency (FEMA or DHS) and thereby decline to examine the environmental impacts resulting from the need to evacuate millions of citizens from the EPZ or the

17-o-AE/LI/NE

impacts of a deficient evacuation plan and process. The emergency evacuation plan is a central and critical element of the NRC's reactor permit and regulatory program. Thus, the NRC's NEPA review of the potential impacts resulting from operation of two nuclear reactors, two spent fuel pools, and a dry cask storage facility for an additional 20 years must include an analysis of the impacts of the emergency evacuation plan for Indian Point, and whether it is meaningful and effective.

17-o-AL/LI/NE contd.

This requirement is particularly important because an accident or attack at the Indian Point facility would not only result in a potential catastrophe for the local population, but would have far reaching downwind effects. As was demonstrated by the 1986 disaster at Chernobyl nuclear power station in the Ukraine, not only are people in the immediate vicinity affected by a major release of radioisotopes, but vast areas at great distances can become significantly contaminated, creating disastrous public health and environmental consequences for communities many miles from the actual site. Further, these adverse impacts can continue for many years after the event. Consequently, NRC must evaluate the impacts to human health and safety and the environment of an immediate accident or attack on the entire potentially impacted downwind environment, which includes most of Connecticut, as well as the collateral impacts of the long-term relocation of up to 300,000 people who live in the immediate vicinity of Indian Point, as well as the millions more who live within the 50-mile radius in the event of major downwind contamination. [53]

17-p-EP/PA/RI

Missing Data

An environmental impact statement, at a minimum, must contain an analysis of all relevant potential environmental impacts. "NEPA was created to ensure that agencies

17-q-AE/NE/OE

[53] Indian Point Independent Safety Evaluation, July 31, 2008, p.5; Draft Supplement, p. 8-1.

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will base decisions on detailed information regarding significant environmental impacts and that information will be available to a wide variety of concerned public and private actors. *Morongo Band of Mission Indians v. Federal Aviation Administration*, 161 F.3d 569, 575 (9th Cir. 1998)." *Mississippi River Basin Alliance v. Westphal*, 230 F.3d 170, 175 (5th Cir. 2000). As the Ninth Circuit stated:

> When we consider the purposes that NEPA was designed by Congress to serve, what was done here is inadequate. Congress wanted each federal agency spearheading a major federal project to put on the table, for the deciding agency's and for the public's view, a sufficiently detailed statement of environmental impacts and alternatives so as to permit informed decision making. The purpose of NEPA is to require disclosure of relevant environmental considerations that were given a "hard look" by the agency, and thereby to permit informed public comment on proposed action ...

Lands Council v. Powell, 379 F.3d 738 (9th Cir. 2004).

The Draft Supplement does not contain the required impact analysis because important data is missing. For example, one of the major impacts from continued operation of Indian Point is the impact to fish populations in the Hudson River. However, as section 4.1.1. of the Draft Supplement notes, "plant owners did not monitor impingement rates or validate impingement mortality estimates after the new . . . screens were installed at IP2 and IP3 in 1991." Further, section 4.1.3.2 notes that to determine whether continued operation of the plant has the potential to impact certain fish populations it is necessary to conduct a "connection analysis." However, this same section of the Draft Supplement notes that "The strength of connection was unknown for five species (Atlantic menhaden, Atlantic and shortnose sturgeon, gizzard shad, and blue crab) because of a lack of available data. For these species, actual strength of

17-q-AE/NE/ contd.

connection could be low, medium, or high, but the lack of data makes a specific determination impossible."

It is clear that important aquatic impact data is missing. NEPA mandates a full analysis of impacts. Important data is lacking in this case and, until it is made available, this environmental impact document is incomplete.

17-q-AE/NE/ contd.

CONCLUSION

The NRC has not provided a thorough and accurate analysis of all relevant potential impacts and has failed to take a "hard look" at the adverse impacts of this project. Foremost among the critical risks are the problems resulting from an additional 20 years accumulation of spent nuclear fuel and the need to ensure a practically workable evacuation plan. Finally, NRC must provide the missing data regarding impacts to natural resources and evaluate the long-term impact to these resources. NRC must readdress these issues in a satisfactory environmental impact statement before proceeding further in this case.

17-r-EP/GI/RI

Respectfully submitted,

RICHARD BLUMENTHAL
Attorney General, State of Connecticut

Dated: March 13, 2009

ML 090720090

IPRenewalCEmails

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From: Lindsay [lindsay@classicallearning.com]
Sent: Wednesday, March 11, 2009 2:03 PM
To: IndianPointEIS Resource
Subject: Indian Point

To Whom It May Concern,

I believe strongly that the Indian Point nuclear power plant should be closed. Indian Point's #2 spent fuel pool is reaching highly toxic levels. In addition, since there is no off-site place to put all nuclear waste that the plant produces, it is simply stored in above-ground storage tanks. We are talking about 1,500 tons of nuclear waste that is subject to terrorist attacks. Mind you, the Indian Point nuclear plant is 24 miles north of NYC. Some 20 million people live within a 50 mile radius of the plant. Even if there were no safety concerns, Indian Point uses billions of gallons of water from the Hudson annually in order to cool the reactors. In the process, millions of fish and fish eggs get sucked into the plant and die.

18-a-LE/OR
18-b-DE/ST
18-c-AE

I implore you **not to renew the Indian Plant's license.**

18-d-OR

Sincerely,
Lindsay Boorman, Esq.
Vice President of Operations
Classical Learning Universe, LLC
(p) 718-357-3431
(f) 718-357-3432
lindsay@classicallearning.com

MR. BOWMAN: Good afternoon everyone. Good afternoon. How are you? I know that we're all here on different sides, but we are all in this together. My name is Reginald Bowman and I'm the Chairperson of the New York City Housing Authority's Resident Council, which actually represents more than 400,000 New Yorkers that live in public housing in the five boroughs of the city of New York. And all the speakers that have come before me have sort of outlined what I had to say and I just wanted to make sure that when I came up here today looked around this room I encouraged all of us who are here, regardless of which side we are on, to understand that we're all in this together and there's a domino effect that takes place when policy decisions are made about major facilities like this that provide a life source of energy for all of us that live in the State of New York. Last summer, gas and electricity bills skyrocketed for the renters, homeowners, businesses across the country.

In New York City in public housing, people say well, people in public housing don't pay electric bills. That's no longer true. We that live in public housing were hit with rent increases that were directly related to the fact that the energy cost for the New York City Housing Authority have escalated along with the cost for everything else that is provided for people in public housing through those budgets. Those of us

19-a-EC/ SR

that live in those developments were directly impacted by those things. It is vitally important to keep Indian Point open as one of the few sources of energy with reliable output and stable prices. You've heard that over and over again this afternoon and when someone repeats something over and over again, some part of that has to be true. 19-a-EC/SR contd.

During this period of economic insecurity, we cannot afford to make already struggling families and businesses pay more just to keep our houses warm and you know what happened this winter, it was a brutal winter here up-state. It was a brutal winter down-state. We're paying more and more to keep a houses warm. And if we're going to think about the next 10, 15, 20 years of energy provision for this region, we have to really realistically look at the fact that we're going to have to keep Indian Point online if we're going to provide this energy and then do the intelligent type of thinking together to create policy for the future and to keep the energy and businesses in our community alive. The re-licensing of Indian Point will not only protect families from overly expensive energy costs. It will also help the economy stabilize in this difficult economic time. High prices for gas and oil effect costs across the economy from making and shipping products to subway and bus fares. 19-b-EC/SO/SR

Indian Point, however, represents stability in this unpredictable atmosphere. The reliability and stable course of nuclear energy are one of the keys to keeping the economic crisis from spiraling out of control for the people that I represent in public housing in the city of New York. So, as the president of the Council of residents of the New York City Housing Authority, I cannot stand by as opponents of Indian Point threaten to force New York City families to pay higher rents, outrageous energy bills and more for the products and services that we need. New York must move together towards making sure that all families in this state and in the city have access to affordable energy. Re-licensing Indian point is the first step in making that goal a reality. Thank you.

19-c-EC/ SO/SR

MS. BRANCATO: Hello everyone. My name is Deborah Brancato. I'm a staff attorney for Riverkeeper. We will be submitting detailed written comment on the Draft Environmental Impact Statement, but for today I just want to highlight some of the major concerns Riverkeeper sees with the NRC staffs analysis of the environmental impacts of relicensing.

To begin with, the NRC has completely failed to assess the impacts of nuclear waste storage at Indian Point. Currently, Indian Point houses 1500 tons of nuclear waste on site in pools and in dry-cask storage. If the plant is relicensed for an additional 20 years, at least an additional 1000 tons will accumulate. The Draft Environmental Impact Statement has no analysis whatsoever of a long-term impacts of storing all of this waste on site. Security issues continue to evade any kind of site-specific review. Including the vulnerability of the pools and the dry-casks to terrorist attacks or natural disasters. Given that only last week there was an earthquake that registered a magnitude of 3 in New Jersey right near the Ramapo seismic zone and the Ramapo fault-line does run directly underneath Indian Point, it is truly incumbent upon the NRC to provide an analysis of whether the dry-casks and the pools are designed so that they would be able to withstand such natural occurrences or intentional attacks. 20-a-PA/ SF/ST

In addition, we take issue with the NRC staffs 20-b-HH

analysis of the ongoing leaking that is going on from the spent fuel pools. The Unit 1 pools and the Unit 2 pools have been leaking radioactive materials into the groundwater which leaches into the Hudson River for years now. The NRC has concluded in the Environmental Impact Statement that these impacts are not significant. We do not believe they have done a complete analysis. They have merely looked at imminent public health impacts and really have not done any analysis whatsoever of the long-term impacts to the groundwater into the Hudson River ecosystem.

20-b-HH contd.

In addition to their complete failure to adequately look at nuclear waste storage issues, we also take issue with the NRC's analysis of aquatic impacts due to the once-through cooling system. This cooling system slaughters billions of fish eggs and larvae every year contributing to the overall decline in fish species populations in the Hudson River. And yet the NRC is only able to come to the conclusion of large impact as to one species in the river and that's bluefish. We believe based on current data and analyses that a finding of large impacts is warranted across the board for species in the Hudson River. Of particular concern is the NRC's lack of definitive conclusion as to the impacts to the endangered species of short-nosed sturgeon, which there's no data showing that they aren't impinged against the cooling water intake screens and yet the

20-c-AE/ OR

NRC has failed to come to any definitive conclusion as to the impacts to that species. So, those are all the remarks I'll provide today. Again, Riverkeeper will be providing detailed written comments by the March 18th deadline and in conclusion we do not agree with the NRC with the overall conclusion that the impacts of relicensing will be not so significant in the future. Thank you.

20-c-AE/ OR contd.

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IPRenewalCEmails ML090040369

From: chris@brennanboatbuilding.com
Sent: Thursday, February 12, 2009 10:36 PM
To: IndianPointEIS Resource
Subject: Indian Point EIS

To Whom It May Concern:

My name is Chris Brennan and I am a boatbuilder in Nyack, NY on the Hudson River. I attended the Feb. 12th 2009 meeting on the Indian Point SEIS. As a business owner whose livelihood depends on the health and environment of the river and on those that use the river - both commercially and recreationally - I say that I am opposed to the relicensing of the Indian Point power plant. My value of life, human and otherwise, prevents me in good conscience to agree with the antiquated studies and inadequate assessments used in developing this impact statement. The footprint of such a power plant is extremely large and with it comes great environmental, economic, and social risk, all of which necessitate the need for the latest, most accurate, and continued methods of testing and research. There is nothing in nature that can compare to the man made impacts of Indian Point, not the least of which is its cooling system and its storage of nuclear waste. I therefore can hardly believe that any reputable and neutral study/assessment/scientist could come to a conclusion on the harmlessness of these impacts. There is no harm done in heeding Riverkeeper's and other environmental groups' and municipalities' advice, research, and conclusions. I do, however, see enormous risk in granting Indian Point a license renewal and letting it continue based on incomplete studies and obsolete or irrelevant facts. Thank you.

21-a-AE/ OR/SF

21-b-GI/OR

Sincerely,
Chris Brennan
Nyack, NY
914-806-4819

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IPRenewalCEmails ML090700171

From: Nybirddog@aol.com
Sent: Tuesday, March 10, 2009 8:00 PM
To: IndianPointEIS Resource
Subject: (no subject)

All the reports I have read about Indian Point suggest that Indian Point should be shut down as soon as possible To extend the 40 years to 60 years is a travesty driven by greed of the operators to maximize their profits. They are unconcerned about the clearly identified increase in cancer in the region about Indian Point.
Furthermore the record of problems this facility has encountered make it suicidal to continue running the plant. To extend this by 20 more years guarantee a major disaster. Close it down and save lives.

gary c bron

22-a-HH/OR/PA

MR. BURRUSS: Good evening. My name is Melvin Burruss. I'm president of the African-American Men of Westchester. I want to thank the NRC and you folks for coming here today because you could've been somewhere else. The issues here before us are very complex. We can talk about the health issues. We can talk about the energy issues. The environmental issues. Employment issues also. But more importantly, I want to talk about and just briefly say that I support, or my organizations support, Indian Point and Entergy because they are great corporate partners. They are interested in our kids' education and they have helped support educating our young people and getting our young people scholarships to go on to college. 23-a-SE/SR

But the other side of it is Indian Point, as you know, in this recession that we have and people are losing their jobs, do we need or can we afford to lose or close down Indian Point and lose the amount of jobs and the income that folks have there now? Also, Indian Point currently helps New York progress on improving the quality of the air we breathe. You heard before me, people were saying 30% to 70% of the African-Americans and Hispanics have asthma. Which is true. Here in Westchester County, there's 5000 asthmatic young people every year here. Any replacement options would truly increase the pollutants and toxins that this congested region already feels throughout the year. Indian Point also helps the region maintain independence 23-b-SO 23-c-AL/AQ 23-d-EC

from the radically fluctuating oil and gas prices. New York State, in efforts to maintain a clean environment, rely very heavily on natural gas for electricity production. This reliance is beneficial and it produces fewer pollutants than coal. 23-d-EC contd.

As you can see, you can look over to the west side of the Hudson and you can see that coal fed plant over there polluting the air sending many toxins back over here to Westchester County. Do we need any more of that? 23-e-AQ

The economic impacts of closing Indian Point are very real. At this time, there's no feasible alternative of the 2000 Mw that's produced continuously by the plant. This shut down of the facility would truly result in real prices to pay in terms of job losses and increased cost to Westchester residents. Not only the taxes that's being paid here to municipalities which also helps in our cleanup, trash removal, municipality of services that we would lose and as we know, every dollar counts. Besides the large job losses and increase electrical costs, Indian Point has its own economic engine. The taxes paid by Entergy surely are a great benefit to the county as well as to local municipalities. Also, their contributions to emergency response services, now in a time after 9/11. So, I just want to close and say that many Westchester County residents in the Peekskill area are also struggling to keep their houses and pay their electric bills. 23-f-EC/ SO

The close of Indian Point would only compound that area and have an immediate negative impact on all of us. Thank you very much. We support continuing the re-license of Indian Point. Thank you. 23-g-SR

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Melvin Burress, President
African American Men of Westchester

The environmental, economic and health impacts of closing Indian Point would truly hurt Westchester County.

- Indian Point currently helps New York progress on improving the quality of the air we breathe daily. Any replacement options would surely increase the pollutants and toxins that this congested region already faces throughout the year.

- Indian Point also helps the region maintain independence from the radically fluctuating oil and gas prices. New York State, in efforts to maintain a clean environment has relied very heavily on natural gas for electricity production. This reliance is beneficial in that it produces fewer pollutants than coal, but significantly raises our costs. Nuclear power affords us much more stability.

23-h-AL/AQ

- The economic impacts of closing Indian Point are very real. At this time there is no feasible alternative to the 2,000 megawatts of power produced continually by the plant. The shutdown of the facility would result in real prices to pay in terms of job losses and increased costs to Westchester residents.

- Besides the large job losses and increased electricity costs, Indian Point is its own economic engine. The taxes paid by Entergy surely are a great benefit to the county as well as the charitable contributions and contributions to emergency response services.

- Many Westchester County residents are already struggling to keep their houses and pay their electricity bills, the closure of Indian Point would have an immediate negative impact on these people. While the environmental impacts of the plant are important and deserve careful review, the socio-economic impacts of the plants closure need to also be considered. If we shut down the plant to save a few fish but as a consequence decrease the region's electricity reliability, double our electric bills, and increase airborne pollutants, who are we really benefitting?

23-i-EC/SO/SR

MS. BURTON: Thank You. Good afternoon. I'm Nancy Burton and I've come here all the way from Redding, Connecticut with three pales of mine: Cindy-Lou and Luna and The Dude. They are outside in the car for anybody would like to make their acquaintance. I'm here on behalf of the Mother's Milk Project, which was launched this past June involving New York and Connecticut directors.

Our purpose is to collect and sample, at a certified laboratory, milk that is collected from mothers, including human mothers. This has never been done before on a formal basis by citizens near a nuclear power plant. We're also collecting milk from mammals, including goats and cows and sheep and any other mammals, who are willing to share their milk with us. The reason we are doing this is that Entergy is not. Entergy does not engage in any sampling of milk as part of its radiological effluent sampling program at Indian Point. They do in Vermont sample milk from dairy cows near Brattleboro.

24-a-HH/ OR/RI

In addition, the NRC does not independently sample milk for purposes of evaluating environmental contamination by Indian Point, nor does New York state's Department of Health or its environmental agency and neither does Connecticut's Department of Health and environmental agencies. I'm here today specifically to tell you that we have so far collected some 60 samples of milk from the all kinds of mothers and we have

received to date 30 results from our independent laboratory, which is charging us a commercial, competitive rate.

I have with me a statement, which I have left at the front desk to be inserted in the record, but I'd like to share a couple of highlights from our first results with you today. I'll begin with Cindy-Lou. We have guaranteed absolute confidentiality to all of the participants in the project who share their milk unless they choose to go public and they possibly may in the future when we have a large event and invite them all to come and speak. These are preliminary results that we have received and so the only donor so far who has waived confidentiality is my friend Cindy-Lou the goat. She has given seven samples that we have received results for so far and one of those results, in particular, has potentially grave significance for all of us and that is her milk has tested for levels of Strontium-90, 3.4, and Strontium-89, 3.7. Strontium-90 is a potent carcinogen. It's routinely released by Indian Point. It doesn't disappear and go away. Even though you can't see it or smell it or hear it or taste it. Also, the same for Strontium-89. Both are routinely released. Strontium-90 has a half-life of 28 years. It's around for a long time. Strontium-89 decays within 50 days. The significance of that is that if you have a sample that has both radioisotopes, as Cindy-Lou's milk did, then it means that there's a very good probability

24-a-HH/ OR/RI contd.

that the source of the radiation was a recent fission event because otherwise the Strontium-89 would have decayed to a point beyond detectability. 24-a-HH/ OR/RI contd.

MR. RAKOVAN: Ms. Burton --

MS. BURTON: Yes.

MR. RAKOVAN: If you could summarize. We asked everyone to stick to about three minutes.

MS. BURTON: I'm very sorry. To move to the mothers, we have one mother of 11 who gave us samples who tested positively for both Strontium-90 and Strontium-89. She lives about 10 miles from Indian Point and that is extremely troubling. All our goat and dairy cow samples tested positively for Strontium-90. Of the 11 mothers, human mothers, who gave us samples, only two tested clear for Strontium-90. There was no detectable level. The others, nine mothers living within 50 miles and most very close to Indian Point are in the process or recently were feeding their babies breast milk that is radioactive. With these comments, I am asking the NRC to suspend its re-licensing proceedings. To do a thorough investigation of this very, very fundamentally serious issue and new information. To the extent that you are able to verify the preliminary numbers I'm giving you today, I believe it calls for cessation of the operations of this facility. Thank you very much. 24-a-HH/ OR/RI contd.

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MOTHERS MILK PROJECT

www.MothersMilkProject.org

February 12, 2009 130 pm

U.S. Nuclear Regulatory Commission
Washington DC

Re: Draft Supplemental Environmental Impact Statement Concerning Relicensing of the Indian Point Nuclear Power Station

Dear Ladies and Gentlemen:

Please accept these comments for inclusion in the public record of proceedings convened by the United States Nuclear Regulatory Commission ("NRC") today for receipt of public comment on the Draft Supplemental Environmental Impact Statement ("DSEIS") prepared by NRC staff with regard to Entergy's application for relicensing of the Indian Point Nuclear Power Station.

The Mothers Milk Project was launched in June 2008 as an all-volunteer effort to collect and analyze mothers' milk from humans and animals living within 50 miles of Indian Point in New York and Connecticut for levels of strontium-90 and strontium-89, both radioisotopes released into the air and water during routine operations of Indian Point.

Strontium-90 is a long-lived radioisotope with a half-life of 28 years. It is a potent carcinogen known to cause bone cancer, leukemia and diseases of the immune system. It is especially harmful to developing and young children as it mimics calcium and is ingested into their bones and teeth. As strontium-89 has a short half life - half its energy decays in 50 days - its presence in the milk of lactating mothers alongside strontium-90 provides strong evidence that the radioactivity was recently produced from a nearby source and is not a vestige of atmospheric nuclear weapons testing nor can it be attributed to "background radiation."

The Mothers Milk Project is believed to be the only citizen-initiated program to sample the milk of lactating human mothers, living near a nuclear power plant, for radioactivity.

The Mothers Milk Project was instituted in recognition of the fact that Entergy Nuclear Operations, Inc. does not sample milk from any source, human or animal, in the environment as part of its Indian Point sampling program for radiological effluent

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24-b-HH/OR/RI

releases.

The NRC does not sample milk near Indian Point for radioactivity, nor do the New York State or Connecticut Departments of Public Health nor their respective environmental protection agencies.

(In contrast, Entergy does sample milk from numerous dairy farms near its Vermont Yankee Nuclear Power Plant in Vernon, Vermont. At its Millstone Nuclear Power Station in Waterford, Connecticut, owner-operator Dominion Nuclear Connecticut, Inc. samples goat milk for radioactivity.)

It is well recognized that goat milk is a sensitive indicator of the presence of radiation in the environment. Grazing goats may ingest radioactivity from the air, the water and from pasture vegetation. It concentrates in their milk which they feed to their babies and which may enter the human food chain. Cow's milk is also a strong indicator of the presence of radioactivity in the environment.

To date, the Mothers Milk Project has collected 60 samples of milk from breastfeeding mothers and lactating goats, cows and sheep within the region surrounding Indian Point. The milk samples are being analyzed for the presence of strontium-90 and strontium-89 at a certified laboratory. The identity of the laboratory is being kept confidential until we have achieved a broad sampling of milk from many communities.

Today we share preliminary results of the first 30 samples analyzed.

At the outset, we advise you that we have pledged unqualified confidentiality to all of the mothers and animal caretakers who have shared samples of milk for our project. Their names and home addresses will not be publicly revealed unless they specifically request such disclosure. At the present time, we are unable for reasons if confidentiality to provide you with names or addresses or other identifying information with regard to specific donors.

The sole exception is the case of Cindy-Lu, a mixed-breed goat of Nubian and Saanan parentage, whose owner (the undersigned) has waived confidentiality. Cindy-Lu resides in Redding, Connecticut, which is located approximately 30 miles due east of Indian Point. To date, she has provided 7 milk samples for analysis. **A sample collected on July 11, 2008 had concentrations of both strontium-89 (3.7 picoCuries/liter or pCi/l) and strontium-90 (3.4 pCi/l).** Other samples have had concentrations of strontium-90 as high as 5.1 pCi/l (sample collected July 19, 2008) and 3.5 pCi/l (sample collected June 29, 2008). In each of the 7 milk samples Cindy-Lu provided for laboratory analysis, strontium-90 was detected. Strontium-89 levels were given as "zero" in all samples except the July 11, 2008 sample, but with margins of error as high as +/-5.5 pCi/l and +-7.7 pCi/l. Cindy-Lu, who gave birth to two kids on

24-b-HH/OR/RI
contd.

February 9, 2009, will continue to provide samples of her milk to the Mothers Milk Project.

Other goat milk from a location in Yorktown Heights, New York, was tested a full 15 months after it had been collected and frozen for future testing. The strontium-90 concentration was given as 2.3 pCi/l, with strontium-89 given as 0 +-14.5 pCi/l.

A third goat milk sample taken from a location approximately 30 miles due north of Indian Point tested 3.0 pCi/l of strontium-90, with strontium-89 given as 0 +- 3.7 pCi/l.

Cow milk sampled from the same location had a strontium-90 concentration of 1.0 pCi/l, with strontium-89 given as 0 +-2.4 pCi/l.

Our first preliminary results from samples of human breastmilk showed a wide variation.

The highest concentration of strontium-90 was given as 7.1 pCi/l, with strontium-89 given as 0 +- 3.7 pCi/l. The donor resides approximately 10 miles from Indian Point.

The second highest concentration of strontium-90 in human milk was 4.4 (strontium-89 0 +-3.1). The donor resides near the Hudson River approximately 10 miles south of Indian Point.

The breastmilk of a donor residing approximately 15 miles north of Indian Point had a concentration of 2.5 pCi/l (strontium-89 0.1 +-8.7 pCi/l).

The breastmilk of a donor residing approximately 10 miles north of Indian Point had a strontium-90 concentration of 0.3 pCi/l (strontium-89 0 +-2.2 pCi/l).

The breastmilk of a donor residing in Hartsdale, New York, had a strontium-90 concentration of 1.1 pCi/l (strontium-89 0 +-2.0 pCi/l).

The breastmilk of a donor residing in Cortlandt Manor had a strontium-90 concentration of 1.6 pCi/l (strontium-89 0+-1.7 pCi/l).

The breastmilk of a donor residing in Westport, Connecticut had a strontium-90 concentration of 0.7 pCi/l (strontium-89 0 +-9.4 pCi/l).

The breastmilk of a donor residing in Easton, Connecticut had a strontium-90 concentration of 0.1 pCi/l. (strontium-89 0+-2.8 pCi/l).

The breastmilk of a donor residing in New York City had a strontium-90 concentration of 3.8 pCi/l. (strontium-89 0+-4.2 pCi/l).

Altogether, the breastmilk of 11 human mothers was analyzed.

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24-b-HH/OR/RI contd.

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Only two human donors had strontium-90 concentrations of "zero" in their milk, with a margin of error of 2.5 (Cortlandt Manor, strontium-89 0 +-7.2 pCi/l) and 1.2 (10 miles southwest of Indian Point, strontium-89 0+-4.5 pCi/l).

Once we have received results of 100 milk samples we will invite all donors to participate in a press conference to announce the results. Our pledge of confidentiality will continue to guarantee privacy to those who prefer to remain anonymous. We have asked all participants to provide us with completed questionnaires to assist our assessment of the results.

The results we share today are preliminary and represent only the first batch of samples collected. We recognize that it is difficult to draw a conclusion from a small sample such as this.

However, we are very concerned to learn that all but two of 11 mothers who shared their breastmilk with us for this project had concentrations of strontium-90 in their milk.
We are very concerned as well to learn that all animals whose milk was tested had levels of strontium-90 in their milk. We are gravely concerned that two of our samples - one from a human mother, the other from a goat mother - had detectable levels of strontium-89 in their milk.

We believe these results provide cause for belief that radiation releases from the Indian Point Nuclear Power Plant are responsible for contaminating the mothers' milk.

Further, we believe the information contained herein provides cause for suspension of the relicensing proceedings to allow for full investigation by the NRC and the health departments of New York and Connecticut as to strontium-90 and strontium-89 levels in the breastmilk of human mothers and lactating livestock within 50 miles of Indian Point.

Should such an investigation result in findings that the breastmilk of mothers and livestock contributing to the food chain and residing in the region surrounding Indian Point contains strontium-90 and/or strontium-89, we believe a cessation of Indian Point operations and denial of relicensing are called for.

24-b-HH/OR/RI contd.

Respectfully submitted,

Nancy Burton
Co-Director
Mothers Milk Project
147 Cross Highway
Redding Ridge CT 06876
Tel. 203-938-3952

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IPRenewalCEmails ML 907206760

From: lily butler [lilybutler2000@yahoo.com]
Sent: Thursday, March 12, 2009 8:22 PM
To: IndianPointEIS Resource
Subject: Support Riverkeeper's environmental impactconcerns, and opposition to license renewal of Indian Point

Along with Attorney General Andrew Cuomo and NYState Dept. of Conservation I am opposed to granting Indian Point a 20 year extension of its license.

I also support Riverkeeper's environmental impact concerns and opposition to renewig the license of Indian Point.

25-a-OR

Sincerely,
Elizabeth Butler, SC

MR. BYRD: Good afternoon. My name is Ricardo Byrd. I am the executive director of the National Association of Neighborhoods. NAN is one of America's oldest and largest grassroots multi-issue membership organizations. Our mission is to improve the quality of life in America's neighborhoods. Working together with our member organizations, we strive to improve the economic, social, environment, health and safety conditions in neighborhoods.

The National Association of Neighborhoods is here today supporting the of Indian Point Energy Center because the center generates reliable, affordable and clean electric power. We are not experts in the generation, transmission and distribution of electricity. However, our members are expert electric rate payers. Business and residential consumers of electric power. People in homes and small businesses across the state are plugging more and more electric devices into outlets to the point where it is hard to find a home or small business that is not running out of outlets. And if the United States Congress has its way, sooner then later, we will all be plugging in every new car and truck into the outlets outside our homes. The decision that will be made regarding the Indian Point Energy Center has huge economic and social consequences for all of New York's neighborhoods and businesses. Because of our interest in

26-a-EC/ LR

climate change and energy issues, it was important that our Association see a nuclear plant up close and we chose Indian Point. 26-a-EC/ LR contd.

We also brought together six national Black associations of grassroot advocates, print media and elected officials to tour Indian Point Center. The purpose of the tour was to see a plant in operation and talk with the operators. What we saw was a well-maintained facility and an operational team that was focused on their duties and responsibilities in generating power with strict security and safety protocols. In our candid discussions with plant managers, they admitted to having some issues and they were working to improve them. Never being satisfied that they had done enough. 26-b-OP

I am certain that there are people here today that are advocates for shutting down all nuclear power plants, but the question we must ask in making that decision is, if IPEC was shut down, what would be the consequences? None of us can be certain, however, of what will happen. According to a study published by the Westchester Business Council, within five years electrical cost would raise annually by $1500 for the average Westchester resident and $10,000 for the average Westchester small business. These price spikes would be even more dramatic in New York City where electric prices are higher. In closing, Barak Obama has stated in working with the United States 26-c-EC/ SO/SR

Congress words that apply to this important decision. Do not let the perfect become the enemy of the good. Closing IPEC has the potential to disproportionately affect the economic and social health of New York. On behalf of our membership and the residents of neighborhoods in New York and across the country, the National Association of Neighborhoods urges the Nuclear Regulatory Commission to renew the IPEC license.

26-c-EC/ SO/SR contd.

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IPRenewalCEmails ML 090700183

From: Dava Weinstein [d2cairstein@earthlink.net]
Sent: Monday, March 09, 2009 8:31 PM
To: IndianPointEIS Resource
Subject: Opposition to license renewal of Indian Point

Dear NRC,

We would like to register our **opposition to the license renewal of Indian Point**, and are concerned with the following environmental impacts outlined by Riverkeeper:

--The slaughter of billions of fish, eggs and alrvae every year that results from Indian Point's outdated cooling water intake system, which uses billions of gallons of Hudson River water every day to keep the plant running. 27-b-AE
--The killing of shortnose and Atlantic sturgeon when they are trapped against the cooling water intake screens. Shortnose sturgeon are listed as an endangered species under the federal Endangered Species Act. 27-c-AE
--The continuing leak of radioactive water from the Indian Point 2 spent fuel pool into the groundwater and Hudson River, and the residual contamination caused by the plumes of contaminated groundwater that slowly leach toxic strontium-90 and cesium-137 into the Hudson River. 27-d-LE
--The long term storage of thousands of tons of highly toxic nuclear waste on the banks of the Hudson River, currently housed in poorly maintained spent fuel pools and "dry casks" that are vulnerable to terrorist attack. 27-e-SF/ST

27-a-OR

We depend on regulatory bodies like yours to make our New York communities safer and more sustainable. Indian Point is too old with too many insurmountable problems to continue with its license. Thank you for your attention and we await your just action. 27-f-OR

Sincerely, Dorothy Calvani
Dava Weinstein

MS. CAMPBELL: Good afternoon. My name is Joanne Campbell and I am vice-president of Albany Houses Tenants Association in Brooklyn. On behalf of Tenants Association and residents of public housing throughout the borough, I would like to testify today in support of the Indian Point Energy Center. Re-licensing the Indian Point Energy Center is the right move for Brooklyn's public housing families. New York currently has the second-highest energy prices in the nation and in order to secure a future where energy prices are stable and affordable, Indian Point must remain open and operational. 28-a-EC/SR

Independent studies show that closing Indian Point could increase energy bills for families by thousands of dollars a year. At this time of economic uncertainty or, now is not the time to force already struggling families to pay more just to turn the lights on. Although I electricity bills are often included with the rent we pay, make no mistake about it, the families I represent at Albany Houses feel the painful sting of increased energy prices throughout our community. 28-b-EC/SO

The prices families in my neighborhood pay for the milk, corn and other groceries are a direct result of higher energy costs. High energy prices are also felt by those families who rely on New York City's mass transit system because subways and bus fares are similarly increased to keep the pace New York City public housing set last year that if prices continue to

rise that they will be forced to raise rents and eliminate hundreds of community and senior centers in my neighborhood needed to survive. Excuse me y'all. There are too many families in my neighborhood that live below the federal poverty line, and it is those families and countless others who are just getting by who cannot withstand even the slightest increase in our electric bills.

As the economy threatens to plunge my community into further peril, the voice and concerns of low income Brooklyn must be heard in this debate. Tenants Associations and public housing families in Brooklyn stand together in the belief that New York's clean energy future must be affordable for all. The crucial first step for towards securing a affordable energy future is to re-license Indian Point so it can remain open an additional 20 years. Thank you for allowing me to add the concerns of the Brooklyn Tenant Association to this debate. I hope we will be able to reach a decision that keeps Indian Point open.

28-b-EC/ SO contd.

MR. CAPURSO: Hello, my name is Tom Capurso. I'm a business representative with Local 3 here in New York. I'd like to thank the NRC for having this opportunity to come here and stand in favor of the re-licensing of Indian Point. Indian Point provides a lot of good paying construction jobs as well as good paying jobs for the people who work in plant and daily day-to-day. To close the plant would decimate the economy of the local area. On a personal note, I'm a Peekskill resident, I moved to Peekskill over five years ago with my wife and two children. The fact of having a nuclear power plant in a close proximity to where we live did not stop us from making a decision of coming to the area. We feel it's safe. We don't lie in bed at night with our eyes open.

29-a-SO/SR

29-b-OP

If you've taken a look at your heating bill this winter, to close down Indian Point, the electric portion of that bill would probably do the same thing and double. I'm just speaking personally for my heating bill. And your gas in your car. If you remember this past summer when the price of gasoline doubled, you close the Indian Point your price of electricity in this area is going to double. In those are all things we need to consider. It's a safe environment there. A lot of people have never been there. I've been inside the plant. I've been inside the containment building. There are a lot of steps you have to go through to get in there. It's not

29-c-EC/SA

like someone is going to walk in off the street and fool around. So it is safe, and it is vital. We need to have this plant here because we do need the clean electricity. Thank you.

29-c-EC/SA contd.

IPRenewalCEmails ML090700187

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From: gcarmody@ramapo.edu
Sent: Tuesday, March 10, 2009 9:53 PM
To: Andrew Stuyvenberg
Cc: medelste@ramapo.edu
Subject: Comments on DSEIS--Indian Point Nuclear Power Facility
Attachments: Env. Ass.--Comments on DSEIS.doc

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Comments on DSEIS

Drew Stuyvenberg
Project Manager
U.S. Regulatory Commission
andrew.stuyvenberg@nrc.gov
Re: Application for license renewal at Indian Point

As a student at Ramapo College of New Jersey in the environmental program, I have been evaluating the DSEIS for the re-licensing of Indian Point. When the EIS was generated in the late 1990's to begin the re-licensing process for Indian Point 2 and 3, there was no evaluation included in the document on the visual impacts the facility posed to the surrounding view shed. This includes the construction of the proposed cooling tower.

The Indian Point facility is visible from several different elevations and vantage points along the Hudson River Valley, posing different impacts to the communities of varying income and minority populations surrounding Indian Point. In 1975 a study was done by Grant R. Jones evaluating the visual impacts of various cooling tower options at Indian Point Nuclear Facility. This study looked at the visual impacts from the proposed cooling tower, including the height of the concrete structure and varying size and thickness of the moisture plume produced. Both of these elements can be impacted with changes in weather and wind patterns. The study concluded that the construction of a cooling tower at Indian Point would have an even greater adverse affect on the view shed than the facility itself already poses (Jones, Ady & Gray, 1979). The mayor of the Village of Buchanan also expressed his opposition of building the cooling towers at Indian Point, citing that the tower would cause a visual blight and airborne contamination from the moisture plume.

This study and other comments on the visual impacts of Indian Point were simply disregarded in both the late 1990's supplemental EIS and the generic EIS drafted in December of 2008. This document from Jones was site specific to the Indian Point facility, sponsored by the NRC and offered a credible visual impact assessment. Why was this left out of the EIS when the construction of a proposed cooling tower was an important issue?

Communities along the Hudson River Valley are affected differently by the visual impacts of the Indian Point Nuclear Facility. The DSEIS did not take into consideration the relationship between the visual impacts of Indian Point and certain levels of Environmental Justice. Communities with drastically different levels of income and minority populations have varying perceptions of what the Indian Point facility symbolizes to their community. An assessment of the disparity between these views and what affect it has on the license renewal process for Indian Point was not considered by the NRC for the DSEIS. I feel that including a thorough assessment of the visual impacts posed by Indian Point and the construction of cooling tower should be included in future EIS.

--Greg Carmody----

30-a-AL/AQ/AS/EJ/GE

References.

Jones, G. Ady, J. & Gray, B Evolution of a Visual Impact Model to Evaluate Nuclear Plant Siting and Design Option I. *Submitted to the National Conference on Applied Techniques for Analysis and Management of the Visual Resource.* Retrieved March 10th, 2009, from http://www.jonesandjones.com/news/publications_pdf/jones_gray_burnham.pdf

MS. CASTRO: Good evening. My name is Maria Castro and I'm the founding member of the Hispanic Energy Coalition. On behalf of the Latino business and civic organizations, excuse me, including the Manhattan Hispanic Chamber of Commerce and The League of United Latino American Citizens, I'm here this evening in support of the continued operation of Indian Point. Indian Point provides the clean and affordable electricity that homes and businesses, schools and hospitals in New York City rely on. Keeping Indian Point open means that families in the working-class and the low-income neighborhoods represented by the Hispanic Energy Coalition will not be held hostage to rapidly increasing electricity bills. In this age of global warming, and open an operational Indian Point also means were holding true to our promise in fighting climate change by reducing greenhouse gases. The Latino community has been especially vulnerable to poor environmental decisions in the pass. We live daily with the health risks associated with poor air quality and sky-high energy bills that impact the price of everything from gas to groceries. Hispanic Energy Coalition was formed to galvanize and organize the Latino community to ensure that no further poor environmental decisions are made for our community, but are rather made by our community.

31-a-EJ/SR

31-b-EC/EJ/HH

Like a growing number of Americans, including our newly elected President Barack Obama, the Hispanic Energy

31-c-AQ/SR

Coalition has embraced nuclear power as a vital part of our overall clean energy mix and proven to reduce carbon emissions. A safe and secure facility like Indian Point is key to our region's environmental and economic health. As increasing numbers of New Yorkers begin to fully grasp the many environmental, health and economic benefits Indian Point provides, the more will join our call for it to remain open and operational. Thank you for allowing me the opportunity to place the concerns of the Hispanic Energy Coalition and the families and businesses that we represent into this debate. It is our hope that any decision reached ensures a continued supply of reliable, clean and affordable electricity for all New Yorkers. Thank you.

31-c-AQ/ SR contd.

IPRenewalCEmails ML090040574

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From: PATRICIA CHERNOFF [patriciachernoff@verizon.net]
Sent: Friday, February 27, 2009 2:35 PM
To: IndianPointEIS Resource

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I oppose the relicensing of Indian Point because I fear the maintaining of such an aging facility endangers the lives of the millions of residents in the area including those living in New York City. We know that Indian Point because of its age is beyond the point where it can be insured for safety. And we know that Indian Point was unwisely build on a fault which makes it a greater risk in terms of its stability. Entergy has irresponsibly taken it on for what profit they can make from it. Much work has been done by our government representatives to oppose the licensing of Indian Point, yet this struggle goes on. Why? Do we not see the wisdom in insuring the health and safety of the residents of New York by closing this facility down?
I personally have worked to close down Indian Point for 30 years! the accident at Three Mile Island showed us many years ago the folly of building nuclear facilites near heavily populated areas but we seem unable to learn from this and other past errors.

32-a-AM/OP/PA

Patricia A. Chernoff
771 West End Ave. #10K
New York,NY 10025-5539

IPRenewalCEmails ML 090640400

From: ponkies@aol.com
Sent: Sunday, March 01, 2009 7:34 AM
To: IndianPointEIS Resource
Subject: renew indian point licence; we need the non carbon generating power given huge over-population

Sirs,

Although USA is now the second worst carbon polluter in the world, that honour of worst now going to China - it is clear that USA is in dire need of cheap non carbon emitting energy.

The fact is that mafia guys and garbage men from the 1920s onward have been dumping lead, mercury and all sorts of heavy metals into the Hudson. Thos materials will take thousands of years to decay. Radioactive materials like tritium coming from Indian Point, and which OCCUR in nature in any case, will not do much more damage than has already been done.

The fact is that 9 billion on the planet is about 8 billion too *many* and this century will see a massive culling as there is now not enought arable land left to feed so many. China and South Korea cannot feed themsleves and have been trying to buy up land in Africa and USA to produce food for their own people.

In the USA, hard hit by too much credit and its results, call it a depression if you wish, quibling about a few fish in the Hudson iinstead of providing cheap power for the millions in New York City, is frankly like Nero fiddling while Rome burns.

33-a-AE/GL/LE

Pamela Griffiths Clark
Member Hudson River Club

MR. CLEGG: To start off with, my name is Thomas Clegg. I live in Windsor, New York. Grew up in God's country, Brooklyn, New York. I worked at Indian Point. I've worked there for 25 years. I am a nuclear mechanic. I fix things that operators break. I've come here to give you a few numbers. Those who think that wind power can replace Indian Point should really look into their facts. Denmark is your leading producer of wind. It's about the size of Massachusetts and a half. They have a 3 million population. They have 5,500 windmills that produce approximately 16% of their electric. 5,500 windmills can only make up 16% of their electric. It is never going to replace Indian Point. To close Indian Point with numbers, you'll need to have 80,000 barrels of oil a day to replace Indian point or 18,000 tons of coal. We use about 30 pounds of uranium a day. So where all that tremendous waste is, is 30 pounds of uranium a day. Nothing. Now, I'd like to ask you one more fact. There are 16 nuclear power plants on Lake Ontario. As anybody who's lived in New York State knows, Lake Ontario is one of the best fishing places in New York State. Out of the 16 nuclear power plants, only one of them has a cooling tower. So, I would like to know how two nuclear power plants on the Hudson River can effect the fish population worse than 15 nuclear power plants on Lake Ontario. In closing, I like to disagree with the NRC. We have a large impact on the environment at Indian Point.

34-a-AL/EC

34-b-AL/EC

Do you want to see them disappear? We saved the polar bears. Don't let your grandchildren grow up saying what was a polar bear? Thank you very much everyone.

34-b-AL/EC contd.

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IPRenewalCEmails ML090000370

From: Lisa Cohen [lisa@thecohenfamily.net]
Sent: Thursday, February 12, 2009 8:48 PM
To: IndianPointEIS Resource
Subject: relicensing Indian Point

Hello.
I was very happy to attend the meeting for public comments this afternoon. It was very gratifying to see Entergy's supports solely made up of organizations profiting from Entergy's largesse. I wonder if Entergy spent money cleaning up the water leaking into our groundwater from the plant, or perhaps inspecting the domes if that would REALLY make Indian Point a "good neighbor". — 35-a-LE/OM

I live and am raising my family within the early death zone, 5 miles from the plant. Our energy comes from wind power, not the plant. My experience of Indian Point has been a constant state of resignation.
I became resigned to hear the new "improved" emergency siren installed 30' from my childrens' playset go off every twenty minutes during the "silent testing" periods. I am resigned even now to hearing it go off every morning at 8 AM sharp and several other times throughout the day, every day. — 35-b-EP
I am resigned that if there were to be an event and the public were endangered, there would be no way for the members of our community to escape contamination from radiation. The infrastructure is just not there.
I am resigned to having fed my children radioactive breast milk. Will this be studied more thoroughly due to the information presented today by the Mothers Milk Project? — 35-c-AM/RW
I am resigned to hoping my family and I die quickly if an radioactive accident occurs, rather than linger through radiation poisoning.

Please consider the topic of nuclear waste. How is excess waste to be transported from the Indian Point facility? By truck along our highways? By rail along our commuter tracks? How can the NRC in good conscience go forth with a 20 year renewal, knowing the problems the plant has had in the past. Won't problems increase with age? — 35-d-OR

As someone who really lives here, day in and day out, I can only hold onto the hope that if Indian Point cannot be closed, that it is forced to clean up a shamefully messy operation. All the money spent on influence would go a long way towards that. — 35-e-OR/RE

Mrs. Lisa Cohen
179 Old Post Road North
Croton on Hudson, NY 10520

MR. CONNOLLY: Good evening. My name is Jerry Connolly. I am the spokesperson for the Coalition of Labor for Energy and Jobs. I served as business manager of Boilermakers Local-5 from July 1999 to December 2007. My first job at Indian Point was during the summer of 1968. I worked on every major pressure part system in both Units 2 and 3 and worked on the failed attempt to rehabilitate Unit 1 in the 1970s. I have come here tonight as a representative of a coalition of unions who support the re-licensing of these important assets. Indian Point and the 2000 Mw it produces are vital to the economy of the downstate region and it produces no greenhouse gases. Since Entergy has possessed Indian Point, we have seen significant investments made to improve safety and liability. Is there more that should be done to ensure health and safety of the public? Of course there is. That is the reason why we are here today. As important as Indian Point is economically, it is paramount that the safety of the plant is first on the list of priorities. We in the Coalition of Labor for Energy and Jobs urge the NRC to review all the facts carefully and with due diligence for the confidence of the public is at stake. Any outstanding safety or operational issues must be addressed to give assurance to the public that the plant is operating in a safe manner. The Coalition feels that Entergy has the resources and qualified personnel to address any presently unresolved issues. The local

36-a-SR

36-b-OP

building trades have nuclear qualified tradesmen to be used as needed, particularly during scheduled maintenance outages. 36-b-OP contd.

Contrary to what some organizations have placed on their web sites, the trades have many members who, like myself, have worked at these facilities since they were owned by ConEdison and the Power Authority. Each trade has training programs to prepare them for working in the nuclear environment. 36-c-AL/ AQ/EC Many tradesmen's spend a majority of their working careers, working within nuclear facilities. Not only Indian Point, many of them travel upstate New York and work up around Oswego in the plants. Some of them even go out of state. Some local and national politicians are here today or sent representatives to oppose the re-licensing of the plant. If the NRC finds safety issues that cannot be resolved, I hope these officials will realize their responsibility in identifying 2000 Mw of immediately available base-load power. I hope they are ready to listen to their constituents who when the price of electricity soars will scream bloody murder. New York State presently has no expedited method or procedure to site new base-load generating facilities of the magnitude of replacing Indian Point. I guess we could put up approximately (700) 3 Mw wind turbines as some suggest. 36-d-OP/ SO

But to meet Indian Point's output, they might be required to run at full capacity for as many as 600 days at a

clip and that's at its 7/24 supply level. It would be interesting to see them strung along the Palisades or stretching over Bear Mountain and up to Storm King. Unfortunately, wind is an intermittent source and could never replace the nuclear facility megawatt for megawatt, hour production for hour production. The only real base-load option is more fossil fuel plants, which translates into increased air pollution. (36-d-OP/SO contd.)

In closing, I would like to add that we believe the NRC has the people and expertise to make a sound decision about the future of Indian Point. We believe the facility can be operated in a safe and secure manner. Entergy's making the right investments to meet requirements for operation. As we speak, a scheduled maintenance outage is beginning with the employer employing many local tradesmen at a time when jobs are badly needed. The work they will perform will improve safety and reliability of this facility. We urge that you, the NRC, be thorough and listen to the concerns of all here present tonight and all the remarks that you receive. I thank you very much for the opportunity to address this group. I wish you good luck in coming to a successful conclusion. (36-e-OP/SO)

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ML091100461

Chief, Rulemaking, Directives and Editing Branch
Division of Administrative Services
Office of Administration, Mailstop T-6D59
U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001

Dear Sir

I am writing this letter in the hope that you will take into consideration the following:

Riverkeeper, along with New York State Attorney General Andrew Cuomo and the State Department of Conservation, are opposed to granting Indian Point a 20 year extension of its license.

Riverkeeper is particularly concerned about the following environmental impacts:

- The slaughter of billions of fish, eggs and larvae every year that results from Indian Point's outdated cooling water intake system, which uses billions of gallons of Hudson River water every day to keep the plant operating.
- The killing of shortnose and Atlantic sturgeon when they are trapped against the cooling water intake screens. Shortnose sturgeon are listed as an endangered species under the Federal Endangered Species Act.
- The continuing leak of radioactive water from the Indian Point 2 spent fuel pool into the groundwater and Hudson River.
- The long term storage of thousands of tons of highly toxic nuclear waste on the banks of the Hudson River, currently housed in poorly maintained spent fuel pools and " dry casks" that are vulnerable to terrorist attack.

37-a-AE/OR

37-b-LE/SF/ST

Sincerely,

Lorraine Cooper

March 25, 2009

MS. CYPSER: This afternoon, we represent the Raging Grannies and their friends of Westchester, New York. The Raging Grannies are in international protest group that works for peace, the environment, social and economic justice. We work to make the world a better place for all the grandchildren and their grandchildren. We express our thoughts on issues through new lyrics to old familiar tunes.

Many people in this country say that nuclear energy is safe enough and green enough, but what does the rest of the world say? What do they say when representatives from all of the countries of the world gather and discuss all the facets of the issue? They refused to give nuclear energy greenhouse gas credits at the U.N. Climate Change in the Hague in November 2000. They refused to label nuclear energy a sustainable technology at the U.N. Sustainable Development Conference in April 2001. We support replacing Indian Point with solar generated by private residences and businesses. New York State allows us to run our electric meters backwards. Europe is moving ahead with sustainable energy and we can too.

38-a-ON

IPRenewalCEmails ML 090490304

From: bcypser [bcypser@bestweb.net]
Sent: Wednesday, February 18, 2009 2:38 PM
To: IndianPointEIS Resource
Subject: Public Comment

Dear NCR,

Please do your job of regulation, and help save the earth for our descendants!

The Indian Point nuclear plant has many environmental problems: (1) it pollutes the environment in the Hudson River and in Peekskill (the unofficial cancer rate is higher around here), (2) its waste pollutes the environment where it is disposed, (3) transportation of its waste is subject to accident which may pollute any area where such an accident might happen, (4) this plant is subject to terrorist tactics which may pollute or destroy the New York City area and 1/3 of Connecticut, (5) its waste contributes to the illegal arms that have been dropped on Iraq and other areas causing pollution and birth defects in those placesand also to our soldiers, (6) and this plant is on an earthquake fault line which may provide a future disaster. 38-b-PA/RW/ST

The specific problem of the disposal of nuclear waste has two problems:(1) There is no place to store it. (2) Some of the waste was sold to weapons-makers to bomb Iraq at the expense of US taxpayers. War heads made with nuclear waste are disapproved by the UN as they penetrate further and destroy more homes and people than regular war heads. For more information on the manufacture and use of depleted uranium, contact <www.NoMoreDU.org>. Also <NoMoreDU@earthlink.net> 38-c-RW/SF/ST

What can you do to transform the world from a nuclear waste disposal site to a vibrant place to bring up children? Solar power has no nuclear waste. Wind power has no nuclear waste. Tidal power has no nuclear waste. Water power has no nuclear waste.

To change present procedures, those in positions of authority, like yourselves, could promote the manufacture of solar panels parts and wind turbine structures. You could change Indian Point into a wind turbine field. You could put solar panels on top of government buildings and other office buildings and even homes. Where can we get so much environmental equipment in a hurry? Job train the inmates in New York State prisons to manufacture solar panels and turbine structures. Turn the shell of the old prison on the SingSing grounds into a manufacturing plant. Turn other New York State prisons into manufacturing plants. 38-d-AL

Leave the iron decaying dome with its damaged rusting ceiling there, as a gigantic memorial stupa for the Iraqi children and non-combatents who were killed by our nuclear-waste tipped bombs, and for those other Iraqis who are still being destroyed by fall-out from those weapons.

Who profits from nuclear power? Who is responsible for the nuclear waste used on warheads? All of us who use the electricity from this plant are guilty. We need forgiveness of our blindness. We must take positive actions to restore our country to wholeness. 38-e-RW/SF

Sincerely,

Betty Cypser 18 Young Road Katonah NY 10536

bcypser@bestweb.net

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I AM AGAINST
NUCLEAR TOXICITY

My complaint is about the destructive power of nuclear waste.

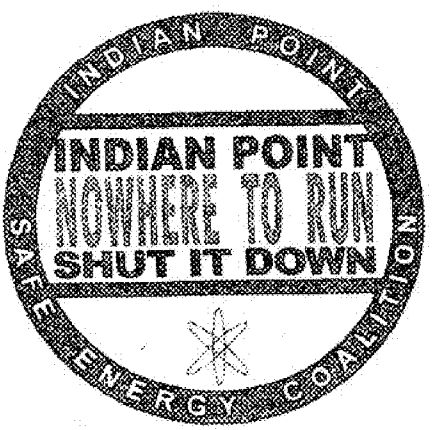
First - There is no guarantee of safety when nuclear waste is in transit. There are no realistic plans for cleanup of a spill or accident of a truck load or train load of nuclear waste. 38-f-RW/SF

Secondly - There is no place to store the waste. The Native Americans don't want it on their lands. No place on earth wants it, and we cannot send it to outer space as it might return. What goes up must come down. 38-g-RW

Thirdly - The worst thing about nuclear waste is that it has been used for hardening the tips of Bunker Bombs and Reliable Replacement Warheads. These weapons have been used against the civilians in Iraq, because they penetrate deeper and kill and maim with more intensity. Can the Iraqi people ever forgive us? 38-h-ST

Do people who make or use electricity from a nuclear power plant ever think about where the waste product goes and about the people who have been destroyed or may be destroyed in the future? 38-i-RW

Granny Betty CYPSER



MR. CYPSER: No problem. Hello everybody. I've been in this kind of study business for all of my life. I'm 85 years old. Former doctor and scientist at MIT. So, I have a real interest in seeing that this is done right. I have a great sympathy for the people who are concerned about their jobs. A great sympathy for the people who have asthma. But I think as we go down an important road like this, we need to know what we're doing. We can't close our eyes to facts. We can't ignore areas that are very, very important, very, very significant. We're tending to look at today's benefits. We're tending not to look at tomorrow's costs. I'd like to ask that we not go forward until we look at all the costs. There are three particular areas that are particularly troublesome. 39-a-RW/SF

First, we've heard quite about them already. First is the spent fuel. This waste is going to last hundreds or thousands of years. What is the cost of maintaining that surveillance? What is the possible cost of leakage over the next 150, 200, 1000 years? What are the costs involved? Or more specifically now, what do we have to do to expend money now to reduce the probability of high-costs down the road of a 100 years or a 1000 years? What are the costs we have to invest to make ourselves sufficiently safe over that longtime period? 39-b-LE

Second subject is the leakage. We've heard again and again there is leakage. Mother's milk is being contaminated. 39-c-PA/ST

Strontium-90 is going out. Cancer is being caused. What is the cost of cancer due to this leakage over the next period of time, 5 years, 10 years?

How many people will die? What number of deaths are we willing to tolerate? What is the long-term cost of that leakage? Then specifically, what do we have to expend today to reduce the probability of that cost escalating in the future? What are the costs? What are the total cost?

39-c-PA/ST contd.

The third element is even more difficult. We are subject to mistakes. We are subject to maliciousness. We are subject to terrorism. All of these things will happen to some degree. We can't close our eyes the fact that a catastrophe is impossible. We can't pretend that. We've got to say, it is possible. Now, we've done many things to prevent it. Have we done enough? What additional costs do we have to expend in order to reduce that to a tolerable level? Is it tolerable the way it is now or is the possibility there because the catastrophe is so horrendous? Granted the probability of small but if the consequences are so horrendous, we've got to invest more and more to reduce the probability still smaller. So, total costs is the answer. What are the total costs on these three items at least? Look at the total cost today. Look at the projected total cost over the time period of the consequences of our decision today. Thank you.

39-d-PA/ST

MR. DACIMO: Good evening. My name is Fred Dacimo. I'm vice-president for License Renewal at Entergy. Formerly site vice-president. I've worked at Indian Point for over 10 years as well as being a resident of the general area. I'm going to submit my comments to you this evening in writing as soon as I'm complete here. First place, I'd like to think the NRC for all the hard work they did in preparing the DSEIS for Indian Point. Entergy agrees with the staff's overall preliminary recommendation in the DSEIS. I'm not going to quote the conclusion, but, in other words, if you look at it, it really says, there is no reason from an environmental perspective not to proceed with the license renewal process. In fact, we believe license renewal will not result in significant environmental impacts. The DSEIS recognizes plant operations result in only small impacts in the areas that you indicated in your slides, and I won't repeat those. But that is a very significant cross-section of the DSEIS. 40-a-SR

I want to focus on those areas that we disagree with. We do disagree with some of the underlying analysis in the DSEIS regarding some portions of impingement and entrainment. Thermal shock and the analysis that was used. And the mitigation alternatives involving closed-cycle cooling. We will submit our comments in writing to the NRC by the due date. In the area of impingement and entrainment, we at Entergy, and our 40-b-AE

predecessors, which actually included the State of New York as a former owner of the plant, have been collecting Hudson River fish data for greater than 30 years. These studies have been approved, directed and overseen by the New York State DEC. The New York State DEC has testified that this data is quote unquote probably the best data set on the planet. With two other owners, we have spent more than $50 million on fish studies. While we commanded the NRC for their review of what was really a voluminous amount of data, we believe that some of the conclusions are in error. Let me give you an example. 40-b-AE contd.

The conclusion on bluefish is one. In Chapter 4 of the DSEIS, it concludes that impingement and entrainment may have a very large impact on bluefish. The DSEIS does not reflect the fact that the New York State DEC, which is charged with overseeing bluefish, has not identified a concerned with bluefish. And has not identified a concerned with bluefish vis-a-vie Indian Point plant operations. As a matter of fact, in Chapter 2, it's acknowledged and I'll quote this, bluefish have not been found in entrainment from power plants along the Hudson River including Roseton 1 and 2, Bowline 1 and 2, Indian Point 2 and 3. Juvenile bluefish may be impinged, but the numbers are relatively small unquote. So the DSEIS offers no credible scientific basis for a large impact finding. So we believe, that the FEIS should list this area as small. 40-c-AE

Little credit has also been given to for the greater than $100 million in today's dollars for retrofits to the plant including variable and dual-speed pumps, state-of-the-art fish screen systems, fish return systems. Based on the success of those systems, the New York State DEC staff eliminated impingement monitoring. We all learned that monitoring was much more harmful than the benefit gained from monitoring and for this and other reasons, impingement should be classified in the final EIS as small. In the area of thermal impacts, the DSEIS states small to moderate based on a model that has flows and temperatures that simply cannot exist in nature. We'll expound on that in our comments to you, but we feel that that also should be reclassified as small.

In regard to mitigation alternatives, the DSEIS treatment of this area is flawed. We will amplify our position in writing. Simply put, the New York State DEC has determined that closed-cycle cooling is either feasible or the best alternative for Indian Point. We actually have until December of `09 to submit a report on the technical feasibility. The DEC assessment of closed-cycle cooling impacts on the electric system reflects incorrect assumptions. These assumptions are contrary to the findings of the New York State Independent System Operator. And contrary to the 2006 independent evaluation conducted by the National Academy of Sciences.

40-d-AE

40-e-AE

40-f-AE

Let me give you this quote before I wrap up. Indian Point is a critical component of both reliability and economics of power for this area, for the New York City area. So obviously, we're going to ask you to reclassify that too. I want to thank you for the opportunity to share our perspective. We will be submitting our detailed comments to you by March 18th. Thank you. 40-g-EC

Entergy

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P.O. Box 249
Buchanan, NY 10511-0249
Tel 914 788 2055

Fred Dacimo
Vice President
License Renewal

12/31/08
73FR 80440

(14)

March 16, 2009

Re: Indian Point Units 2 & 3
Docket Nos. 50-247 & 50-286

NL-09-036

Chief, Rulemaking, Directives and Editing Branch
Division of Administrative Services
Office of Administration, Mailstop T-6D59
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: **Comments on NUREG-1437, Draft Supplement 38**

Reference: Letter from Mr. David J. Wrona, Office of Nuclear Reactor Regulation to Vice President, Operations, Entergy Nuclear Operations, Inc. entitled "Notice of Availability of the Draft Plant-Specific Supplement 38 to the Generic Environmental Impact Statement for License Renewal of Nuclear Power Plants Regarding Indian Point Nuclear Generating Unit Nos. 2 and 3 (TAC NOS. MD5411 and MD5412)," dated December 22, 2008.

Dear Sir or Madam:

In response to the referenced letter, Entergy Nuclear Operations, Inc. (Entergy), is submitting the four enclosed reports and enclosed letter as comments on NUREG-1437, Draft Supplement 38. In addition, Entergy is including the enclosed matrices that summarize the enclosed reports and letter and also provide additional substantive and editorial comments.

As an initial matter, Entergy agrees with the Nuclear Regulatory Commission (NRC) Staff's preliminary recommendation, namely that the Commission determine that the adverse environmental impacts of license renewal for Indian Point Nuclear Generating Units Nos. 2 and 3 are not so great that preserving the option of license renewal for energy planning decision-makers would be unreasonable. Further, Entergy appreciates the tremendous effort that the NRC Staff and its contactors have put forward in order to complete this thorough document. Entergy recognizes that the Staff and its contractors evaluated more than 30 years worth of environmental data and assessment studies in order to make its findings and recognizes the enormity of this undertaking. 40-h-SR

SUNSI Review Complete
Template = ADM-013

E-RIDS = ADM-03
Add = A. Stuyvenberg (AXS3)

As noted below, however, Entergy is providing certain substantive and editorial comments on the Draft Supplemental Environmental Impact Statement (DSEIS). The comments provided are intended to aid the NRC in preparing the Final Supplemental Environmental Impact Statement (FSEIS) to eliminate any errors and inconsistencies that may have been introduced into the DSEIS due to the complexity and volume of data that was considered.

In large measure, Entergy's comments focus on those portions of the DSEIS assessing the potential impacts of entrainment, impingement, thermal shock, and associated mitigation measures evaluated in the DSEIS (collectively, "Aquatic Issues"), based on the efforts of leading consultants whose past work informed Entergy's Environmental Report for Indian Point Unit Nos. 2 and 3. In particular, the following consultants submitted comments on the DSEIS in the attached reports:

40-i-OS

- Dr. Larry Barnthouse of LWB Environmental Services, Inc., Dr. Doug Heimbuch of AKRF, Inc., Dr. Mark Mattson of Normandeau Associates, Inc., and Dr. John Young of Applied Science Associates, Inc., address impingement and entrainment. While their report includes numerous comments, their focus on the potential impacts to Bluefish, characterized as "LARGE" in the DSEIS, deserves mention. The DSEIS accurately reflects that impingement and entrainment of early life stages of Bluefish occurs at Indian Point in only a very limited fashion. As such, impingement and entrainment, alone, could not reasonably be expected to directly impact the area Bluefish population. Further, while the DSEIS mentions potential food-web implications of Indian Point's operations, it mistakenly identifies the composition of the Bluefish diet. Again, therefore, the DSEIS does not support its conclusions of indirect impacts to Bluefish. As a result, the FSEIS should identify potential impacts to Bluefish as "SMALL."

- Dr. Mattson also addresses shortnose sturgeon. Among the several points he makes in the report, Dr. Mattson outlines how the DSEIS calculation of potential impinged shortnose sturgeon is incorrect by approximately an order of magnitude -- that is, the DSEIS significantly overstates potential impacts to shortnose sturgeon. Similarly, the DSEIS does not account for the substantial population increase (i.e., 400% to 500%) in shortnose sturgeon over the period of Indian Point's operations or the retrofitting of the stations' cooling water intake structures with state-of-the-art Ristroph screens and fish return systems designed specifically to reduce potential impacts to fish, including shortnose sturgeon. Finally, the DSEIS does not reflect the New York State Department of Environmental Conservation (NYSDEC) staff's prohibition on impingement sampling for shortnose sturgeon to eliminate sampling-related mortality. In short, there are many and important reasons why Indian Point's potential impacts to shortnose sturgeon, during the license renewal period, should be considered "SMALL" in the FSEIS.

40-j-AE/AL

- Dr. David Harrison of NERA, Inc. addresses electric-system reliability, air emissions, and climate change considerations associated with certain mitigation alternatives addressed in the DSEIS. Based on Dr. Harrison's assessment, which is echoed by the New York Independent System Operator and the National Academy of Sciences, reduced output at Indian Point may have a significant negative impact on electric-system operation, air quality in the region, and New York's climate change goals. Focus on these considerations in the FSEIS is particularly appropriate, given that electric-system reliability and air-quality concerns were prominent in the February 12, 2009 public meetings on the DSEIS.

- Dr. Craig Swanson of Applied Science Associates, Inc., addressed potential thermal impacts. As Dr. Swanson's independent review of the Indian Point thermal record illustrates, a historic NYSDEC-mandated thermal assessment by multiple Hudson River facilities modeled conditions under a specific slack tidal condition that do not and cannot actually exist in the River. In particular, NYSDEC required an assumption of a tidal condition defined as near slack water (specifically the lowest 10th percentile current during the flood tide) at mean-low water, as a conservative condition for thermal dispersion; however, near the Indian Point site, slack water conditions occur near mid-tide, not at mean-low water. Thus, the condition imposed by NYSDEC offers no insight whatsoever into the present or future compliance calculus for Indian Point Units Nos. 2 and 3. Moreover, Indian Point's current SPDES permit confirms its compliance with applicable law. As such, any heat shock assessment in the FSEIS should identify potential thermal impacts as "SMALL."

- Sam Beaver, of Enercon Services, Inc., addresses potential impacts from various cooling tower systems. As the Enercon report underscores, conclusions about the potential impacts of closed-cycle cooling suffer from omissions about site-specific construction and operational hurdles. Thus, for instance, the DSEIS fails to account for known on-site strontium and tritium radiological contamination, and also blasting and excavation activities that would place the Indian Point site among the top three largest mining operations in the nation. When accounted for appropriately, these and other conditions support the conclusion that impacts of the closed-cycle cooling mitigation alternative should be "LARGE" in the FSEIS.

It is Entergy's conclusion, after reviewing the DSEIS and expert reports referenced above, that continued operation through the license renewal periods for Indian Point 2 and Indian Point 3 will not result in any adverse environmental impacts.

40-j-AE/AL contd.

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There are no new commitments identified in this submittal. We look forward to receipt of the FSEIS. If you have any questions regarding the enclosed reports and/or matrices of comments, please contact Ms. Dara Gray, Chemistry Supervisor (914) 736-8414.

Sincerely,

Fred R. Dacimo
Vice President
License Renewal

Enclosure 1: IPEC Draft SEIS Substantive Comments and Stenographic Comment Matrices
Enclosure 2: Letter dated March 17, 2009 from Goodwin Procter to NRC, "Comments on NUREG-1437, Draft Supplement 38"
Enclosure 3: Enercon Services Inc. Report dated March 2009, "Response to the Indian Point Draft Supplemental Environmental Impact Statement"
Enclosure 4: NERA Economic Consulting Report dated March 2009, "Economic Comments on Nuclear Regulatory Commission DSEIS for Indian Point Energy Center"
Enclosure 5: Applied Science Associates, Inc. Report dated March 16, 2009, "Review of Thermal Discharge Issues to the Hudson River in NRC Draft SEIS for Indian Point 2 and 3"
Enclosure 6: Fisheries Expert's Report dated March 16, 2009, "Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3"

cc: w/Enclosures – CD ROM
Mr. John P. Boska, NRC NRR Senior Project Manager
Mr. Samuel J. Collins, Regional Administrator, NRC Region I
Mr. Sherwin E. Turk, NRC Office of General Counsel, Special Counsel
Mr. Drew Stuyvenberg, NRC Environmental Project Manager
IPEC NRC Residents
Mr. Robert Callender, Vice President, NYSERDA
Mr. Paul Eddy, New York State Dept. of Public Service

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ENCLOSURE 1 TO NL-09-036

IPEC Draft SEIS Substantive Comments and Stenographic Comment Matrices

ENTERGY NUCLEAR OPERATIONS, INC
INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 and 3
DOCKETS 50-247 and 50-286

1

Substantive Comments

INDIAN POINT DRAFT SEIS SUBSTANTIVE COMMENTS

	Page #	Line #	Comment	
1	2-13	8-10	Description of fish return system only applies to IP2 fish return system. The FSEIS should state that the IP3 fish return system discharges to the river by the northwest corner of the discharge canal.	40-k-AE
2	2-15	3	The FSEIS should state that IP1 provides waste processing for IP2 only.	40-l-ED
3	2-22	15-18	Replace the paragraph with the following: "IP2 has mixed waste storage facilities covered by a Permit, NYD991304411, and other agreements issued by NYSDEC under 6 NYCRR Part 373, for the accumulation and temporary storage of mixed wastes onsite for more than 90 days. Mixed wastes are temporarily stored onsite for more than 90 days at IP3 based on a mixed waste conditional exemption for Permit NYD085503746, per 6 NYCRR Part 374-1.9."	40-m-ED
4	2-35 2-36	5-42 1-3	There is very little information in the DSEIS about tidal conditions in the Hudson River, yet the importance of tidal processes on the location and extent of the thermal plume is critical. It appears that some entities (NYSDEC, previous modelers, etc.) did not appreciate that the modeled scenarios were not only unrealistic but impossible. The FSEIS should include additional description of the tidal conditions in the Hudson River. (See Section 2 of ASA's DSEIS response.)	40-n-AE/ED
5	2-35	28	If the polyhaline zone begins at RM (river mile) 1, RKM (river kilometer) should also be 1 and not 2 as currently written.	
6	2-37	30 through 2-38, line 6	These data suggest to the NRC staff that variations in sources and the importance of carbon inputs can be influenced by a variety of nonanthropogenic factors and result in changes to food web structure and function that directly impact higher trophic levels. The authors cited in the DSEIS to support this statement, Caraco and Cole (2006), discussed only carbon and primary production. They did not discuss impacts on food web structure and function. Inferences about food-web effects of changes in carbon inputs made by NRC are not supported by known published studies of the Hudson River ecosystem. As such, food-web effects should given a low weight when assessing impacts in the FSEIS, e.g., for bluefish.	
7	2-43	14	In the HRSA, IP2 and IP3 originally agreed to install dual speed pumps (not variable speed). As a result, the FSEIS should be revised to reflect that IP3 has exceeded commitments made to NYSDEC and others in 1981, by installing variable speed pumps.	40-o-ED/RG
8	2-46	18	The distinction made between vertebrates and large vertebrates is not material and there is no basis for distinction. Large vertebrates should be removed and vertebrates used in its place.	
9	2-49	23-24	Change this sentence to read: "Permits for IP2 and IP3, Bowline Point 1 and 2, and Roseton 1 and 2 became effective on October 1, 1987, and have been administratively continued by the NYSDEC since October 1, 1992 (NYSDEC 2003a). This change is necessary to accurately reflect the current state of these permits	

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INDIAN POINT DRAFT SEIS SUBSTANTIVE COMMENTS

	Page #	Line #	Comment	
10	2-60	24-26	Should be changed to: "As it was not required by the NYSDEC no further studies were conducted after the installation of the modified Ristroph system at IP2 and IP3 to determine actual mortality of key species, and no additional impingement monitoring was conducted."	40-o-ED/RG contd.
11	2-61	Table 2-4	The DSEIS has expanded the list of Representative Important Species (RIS) species significantly from prior RIS definitions. NRC's RIS list is intended to "represent the overall aquatic resource and reflect the complexity of the Hudson River ecosystem by encompassing a broad range of attributes, such as biological importance, commercial or recreational value, trophic position, commonness or rarity, interaction with other species, vulnerability to cooling system operation, and fidelity or transience in the local community." However, it is difficult to understand how this definition excludes any of the 200+ species that have been encountered in the estuary from being added to the RIS list. Table 2-4 provides no justification as to why any of the species are actually on the list. Although the NRC is attempting to be more holistic in its analysis, by adding additional species to an RIS list and then analyzing each individually simply increases the probability that some species will be deemed to have large impacts simply by "alpha inflation" due to the number of species being examined and the problems noted below with the classification process. In the FSEIS, the NRC should employ the RIS list established for Indian Point in conjunction with its environmental regulators. If it does so, the NRC should conclude that potential impingement and entrainment impacts to all RIS are SMALL.	40-p-AE
12	2-62	Table 2-4	The Atlantic sturgeon is erroneously labeled as "protected" in Table 2-4. This label should be removed from the FSEIS because the Atlantic sturgeon has merely been added as a "candidate species," which does not carry any procedural or substantive protections under the Endangered Species Act (ESA), including being subject to ESA biological assessments. Moreover, potential impacts to this species should be considered SMALL as detailed in the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP. (See Section VI.A. of the Goodwin Procter comments).	40-q-AE/OE
13	2-60	11-25	The ASMFC (2006) stock assessment for Atlantic menhaden provides more complete information than do the landings statistics cited in the DSEIS. ASMFC (2006) shows that the reproductive capacity of the coastal population is well above the target established by the Atlantic States Marine Fisheries Council ASMFC, indicating that the population is healthy. The importance of including agency stock assessments as lines of evidence in the FSEIS is discussed in Section 5 of Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3. Impacts of entrainment and impingement on Atlantic menhaden should be characterized as SMALL.	

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INDIAN POINT DRAFT SEIS SUBSTANTIVE COMMENTS

	Page #	Line #	Comment	
14	3-61	27-30	The DSEIS states that entrainment mortality has caused a 23.8% annual reduction in juvenile American shad, with most mortality occurring in the Albany region. This historical impact was almost entirely due to the Albany Steam Station, which was shut down 16 years ago. As noted in CHGEC (1999), the same source from which the 23.8% value was obtained, entrainment at IP has been no more than about 1% per year throughout the entire period of operation of IP2 and IP3. Therefore, the FSEIS should state that Indian Point's contribution to entrainment mortality of American shad is very low. The relevance of the quantitative entrainment and impingement mortality estimates (termed conditional mortality rates, or CMRs) from CHGEC (1999) to the DSEIS is discussed in Section 5 and Appendix D of the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3.	40-q-AE/OE contd
15	2-66	30-34	The conclusion in Chapter 4 regarding impacts of entrainment and impingement on bluefish conflict with the information provided on page 2-66. The information summarized on lines 30-34 of page 2-66 supports a SMALL finding concerning impacts of entrainment and impingement on bluefish.	
16	2-70	13-16	The DSEIS states that entrainment mortality has caused a 23.8% annual reduction in juvenile American shad, with most mortality occurring in the Albany region. This historical impact was almost entirely due to the Albany Steam Station, which was shut down 16 years ago. As noted in CHGEC (1999), the same source from which the 23.8% value was obtained, entrainment at IP has been no more than about 1% per year throughout the entire period of operation of IP2 and IP3. Therefore the FSEIS should state that Indian Point's contribution to entrainment mortality of American shad is very low. The relevance of the quantitative entrainment and impingement mortality estimates (CMRs) from CHGEC (1999) to the DSEIS is discussed in Section 5 and Appendix D of Review of the NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3.	
17	2-73	17-20	The DSEIS does not describe a basis for a health advisory being issued for white catfish in this particular stretch of the Hudson River. Because the basis is unknown, it should be noted in the FSEIS that there is no relation between the health advisory and Indian Point.	40-r-AE/OE
18	2-75	10-11	Published data for Hudson River white perch (Barth and O'Connor 1985) show that in the Hudson white perch feed almost exclusively on invertebrates and fish eggs. Therefore, the FSEIS should cite Barth and O'Connor (1985) and state that no evidence has been found that Hudson River white perch consume other fish. See Appendix D of the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3.	40-s-AE/OE
19	2-75	42-43	As there is abundant information available on the Hudson River, there is no reason to include information on the Chesapeake Bay. Therefore, the discussion of the Chesapeake Bay in Section 2.2.5.4 of the DSEIS should be deleted and not included in the FSEIS.	

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INDIAN POINT DRAFT SEIS SUBSTANTIVE COMMENTS

	Page #	Line #	Comment	
20	2-76	42	Section 2.2.5.4 should be clarified that total landings of sturgeon are for the East Coast of the United States and not just for the Hudson River.	40-t-AE/ED
21	2-77	34-35	The following sentence "In 1998, a recovery plan for the shortnose sturgeon was finalized by NMFS (NMFS 1998) not in list." begins on line 34. "Not in the list" appears to be a partially completed sentence and should be completed or removed. In addition, there is no "NMFS 1998" reference shown in the Section 2.3 references.	
22	2-79	14	Zebra mussels are limited to freshwater regions of the Hudson and do not directly affect the food web of the brackish regions of the Hudson, where Indian Point is located (Strayer et al. 2004). Therefore, the FSEIS should be revised to state that impacts of zebra mussels have been limited to freshwater regions of the Hudson that are not influenced by Indian Point.	
23	2-85	13	Change "The three federally listed species…" to "The three federally listed and candidate species…" This is necessary because the cutthroat has not been listed, but is still a candidate species.	40-u-ED/TS
24	2-85	13-26	The bald eagle discussion should be removed, as it is no longer a federally listed species, which is the topic of the paragraph, and is therefore not relevant to this discussion.	
25	2-86	21	The description of the Indiana bat should include recent information on white nose syndrome and its effects on this federally listed species in New York. (See Reference 10.26 cited in Section 7.2 of ENERCON's DSEIS response and attached to the report). If this information is included and Indiana bats are properly assessed, the NRC may conclude in the FSEIS that potential impacts associated with a closed cycle cooling mitigation alternative, if assessed, are LARGE.	40-v-AL/TS
26	4-2	Table 4-1	Eutrophication is not applicable to Indian Point, as this typically deals with facilities discharging to a lake. The FSEIS should delete row 4 of the table.	40-x-AE/ED
27	4-3	1-4	Replace the sentence with the following: "The NRC Staff reviewed information provided from the Entergy ER, the NRC Staff's site visit, the scoping process, the administratively continued New York State Pollutant Discharge Elimination System (SPDES) permits for IP2 and IP3 and the subsequent draft permit, ongoing Hudson River monitoring programs and their results, and other available information."	40-x-ED
28	4-6	6-10	Replace the sentence with the following: "The NRC Staff identified no new and significant information related to these issues during its independent review (including information provided from the Entergy ER, the NRC Staff's site audit, the scoping process, the administratively continued SPDES permits for IP2 and IP3 and the subsequent draft permit, ongoing Hudson River monitoring programs and their results, and other available information)."	

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INDIAN POINT DRAFT SEIS SUBSTANTIVE COMMENTS

	Page #	Line #	Comment	
29	4-6	28-28	Replace the sentence with the following: "The SPDES permit for the Indian Point site, which addresses discharge from the currently operating IP2 and IP3, as well as the shutdown IP1 unit, was administratively continued by NYSDEC since a timely SPDES permit renewal application was filed >90 days prior to the current permit's expiration date of April 3, 1992."	40-x-ED contd.
30	4-7	14-30	Indian Point, and virtually every large scale New York power plant with a recently-renewed SPDES permit, is required by NYSDEC to conduct a future thermal study; this statewide initiative carries no inference of past or future non-compliance. (See Section VII of the Goodwin Procter Comments.) Therefore, the discussion of thermal impacts in the FSEIS should conclude that thermal impacts of license renewal are SMALL.	40-y-AE
31	4-8	7-45	NYSDEC's assessment of the effects of entrainment and impingement has not made any causal connection between the magnitude of mortality and actual effect on the fish community or Hudson ecosystem (FEIS - NYSDEC 2003a). NYSDEC has merely pointed out that there are downward trends in some species, and also stated that entrainment and impingement numerical losses are too large and must be reduced, without drawing a connection between the two conditions. No analysis was proposed to examine likely causes of observed declines or whether reduction of entrainment and impingement losses would reverse them. The Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3 does make these evaluations, employing extensive, verified datasets through 2005; if the NRC considers the data contained in the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3, potential impingement and entrainment impacts to Hudson River species should be considered SMALL in the FSEIS.	40-z-AE
32	4-8	12-13	Replace the sentence with the following: "The last SPDES permit for IP2 and IP3 has been administratively continued under provisions of the New York State Administrative Procedure Act."	40-aa-ED
33	4-8	31-32	NYSDEC quoted comments submitted by Riverkeeper, and performed no independent analyses. The Riverkeeper comments were not supported by any data or analyses. Therefore, the FSEIS should be revised to note that NYSDEC was discussing generalized characteristics of ecosystems, not the specific characteristics of the Hudson River ecosystem.	
			In conducting its analysis of impingement and entrainment impacts in Section 4.1 of the DSEIS, NRC Staff should rely on the current information contained in the AEI Report, rather than more dated information contained in the 2003 generic FEIS for several Hudson River facilities. (Barnthouse et al. 2008) The generic FEIS has been judicially determined to be incomplete. Moreover, the generic FEIS is not site-specific, and does not reflect current, known fisheries information, for Indian Point.	40-bb-AE/ED

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INDIAN POINT DRAFT SEIS SUBSTANTIVE COMMENTS

	Page #	Line #	Comment
34	4-9	Generally	For instance, the generic FEIS entrainment assessment for Indian Point is based on in-plant entrainment sampling from six years in the 1980s, whereas the AEI Report analyzes data generated over three decades from the NYSDEC-approved Hudson River Monitoring Program up to and including 2005. (Barnthouse et. al 2008). Thus, the AEI Report is the more site-specific, complete and current dataset, and should be accorded weight in the DSEIS. (Barnthouse et. al 2008). If NRC Staff gives the AEI Report appropriate weight in its analysis, potential impacts relating to impingement and entrainment in the FSEIS should be classified as SMALL. (See Section III of the Goodwin Procter Comments and the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3.)
35	4-9	15-19	The DSEIS states that undisclosed non-governmental organizations (NGOs) and citizens have "expressed the opinion that many species of fish in the Hudson River are in decline and that the entrainment and impingement ... is contributing to the decline." To our knowledge, these opinions are not supported by any analysis or study to demonstrate causation between entrainment and impingement and the perceived population declines. Only Barnthouse, et. al., 2008 examines possible causation and concludes that other causes are far more likely to be responsible. Two of the species often mentioned as declining by the undisclosed NGOs and citizens are Atlantic sturgeon and American shad, both of which have clearly been overfished and fishery management agencies are correctly focusing on reducing fishing mortality. Prey species currently in decline include bluback herring and alewife, both of which are preyed upon by striped bass and other predatory species.
			This predation could be heavy enough to seriously affect abundance (Hornbuch 2008). The state of Connecticut attributes the decline of river herring in their state to striped bass predation (http://www.ct.gov/dep/lib/dep/fishing/freshwater/herringclosure.pdf).
36	4-9	28-32	Certain statements in Section 4.1 of the DSEIS are inconsistent and conflict with assumptions made in the weight of influence (WOE) approach that the distribution of fish in the immediate vicinity of IP should be given higher weight than the riverside distribution of fish. (See Section 5 of the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3.)

40-bb-AE/ED contd.

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INDIAN POINT DRAFT SEIS SUBSTANTIVE COMMENTS

	Page #	Line #	Comment	
37	4-10	23	The phrase "...using a variety of techniques" requires clarification because impingement sampling was based on a total count of all fish impinged at each unit on each day of the year when at least one circulating water pump was operated during the period from 1975 through 1980, and based on a stratified random sample of 110 days per year during the period from 1981 through 1990. Therefore, the FSEIS should strike "using a variety of techniques." (A complete description of the impingement monitoring studies conducted at IP2 and IP3 appears in Appendix H to this draft SEIS) and replace it with "as summarized in Appendix H of this FSEIS".	40-cc-AE/ED
38	4-12	13	The DSEIS is incomplete with respect to the chronology and extent of impingement data and impingement mitigation studies available for Indian Point. In fact, extensive, peer-reviewed Ristroph screen and fish handling and return system studies were performed from 1989 to 1995. (See the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3, Section 2.2.) This information represents a sound basis for concluding, in the FSEIS, that potential impingement impacts are SMALL.	
39	4-12	19-21	Change to: "As it was not deemed necessary by NYSDEC, no further monitoring of impingement rates or impingement mortality estimates was conducted after the new Ristroph screens were installed at IP2 and IP3 in 1991."	
40	4-12	22	The word "assumed" with the phrase "Observed eight-hour" is not correct as these data were based on empirical studies described in the peer reviewed scientific publication by Fletcher (1990), therefore the data were not assumed. The word "assumed" should be removed in the FSEIS. The complete Fletcher reference is provided in the DSEIS reference list found on page 4-67, lines 37 and 38.	
41	4-12	24-26	In this sentence, "several" should be changed to "4 of the 10" to provide more specific information.	
42	4-13	1-3	Should be changed to: "...return systems to increase the survival rates of impinged organisms, since it was not deemed necessary by NYSDEC the actual improvements in fish survival after installation of these systems at IP2 and IP3 have not been established (impingement monitoring last occurred in 1990)."	
43	4-15	3-7	This statement suggests that the DSEIS's assessment would be based on the likely effects of IP on ecological, commercial, and recreational values. The information developed in the DSEIS does not provide information that sheds light on the likely ecological, commercial, or recreational value of the aquatic losses due to IP and how those values would be reduced with closed-cycle cooling. (See page 23 of the NERA Report.) As such, the DSEIS has not supported the need for mitigation, and the mitigation alternative should be removed from the FSEIS.	40-dd-AE/AL

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INDIAN POINT DRAFT SEIS SUBSTANTIVE COMMENTS

	Page #	Line #	Comment	
44	4-15	11-13	The statement in Section 4.1.3 of the DSEIS that "fish surviving to the YOY stage are at greater risk from the cooling system operation" is not supported by the DSEIS analysis and conflicts with conclusions of previous assessments of IP cooling system impacts. Fish surviving to the YOY stage are susceptible to impingement, but not to entrainment. Section 2.1 and Appendix B of the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3 cite previous assessments demonstrating that impacts of impingement at IP on Hudson River fish populations are very small. Section 2.2 of the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3 shows that even these small impacts have been greatly reduced by the Ristroph screens and fish return system that have operated at IP2 and IP3 since 1990. Therefore, the FSEIS should conclude that impacts to all RIS due to impingement are SMALL.	40-ee-AE/OE
45	4-16	11-24	Eleven attributes were used in the original source of the WOE method (Menzie et al. 1996). However, the DSEIS only used seven of these attributes with no explanation for the effects or rationale for omission of the additional four attributes. All attributes should be accounted for, or their omission explained, in the FSEIS.	40-ff-AE/ED
46	4-16 4-17	36-38 1-6	Using Monte Carlo simulation of populations with expected population changes ranging from a 70% decline over 30 years to a 230% increase over 30 years, and 3 different levels of variability, the NRC decision rules, within the WOE methodology, produced classifications that bore little relationship to the underlying population trend. As such, errors in the NRC WOE decision rules do not support the findings in the DSEIS and impacts for impingement and entrainment in the FSEIS should be SMALL. For example, a LARGE impact generally would be assigned only to declining populations, MODERATE impacts had a 20% to 40% chance of being assigned to population growth ranging from -50% to +230% over 30 years. Classifications for data smoothed with a 3-year moving average were even worse, with populations growing to 50% of original sizing have some probability of being assigned to the LARGE impact category, and MODERATE and SMALL categories nearly equally probable over a range of population growth from 0% to 230%.	
47	4-18	1-8	Absent consideration of the magnitude of population effects, the DSEIS cannot reasonably assess the potential for IP2 and IP3 to "destabilize" or "noticeably alter" attributes of the resource, nor can it provide a basis for a meaningful assessment of the "ecological, recreational, and commercial importance" of the impacts of IP2 and IP3. (See page 27 of the NERA Report.)	40-gg-AE
48	4-18	30-32	The conclusions of Section 4.1.3.1 of the DSEIS conflicts with information summarized in Appendix E, which shows a 400% increase in abundance of shortnose sturgeon in the Hudson since the 1970s. Based on NRC's decision rule, impact determination for shortnose sturgeon should be SMALL.	

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INDIAN POINT DRAFT SEIS SUBSTANTIVE COMMENTS

	Page #	Line #	Comment	
49	4-18 E-98	31 21	The statement about there being a limited amount of impingement data for shortnose sturgeon from IP2 and IP3 for the years before installation of the Ristroph screens is incorrect. A total count of all shortnose sturgeon impinged was obtained for all days of operation of IP2 and IP3 from 1975 through 1990. Viewed properly, zero catch samples are not a lack of available data, but evidence of the absence of impact. Thus, consistent with the references in this comment potential impacts to shortnose sturgeons should be characterized as SMALL in the FSEIS. (See Section 3.0 and Appendix A of the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3 for additional information).	40-gg-AE contd.
50	4-19	1-16	The method used by NRC to assess the "strength of connection" between Indian Point and the RIS, summarized in 4.1.3.2 of the DSEIS reflects certain errors and inconsistencies as documented in Section 4.2 of the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3.	40-hh-AE/OE
51	4-19	7, 34	Effects on bluefish should be SMALL because there is no significant documented impingement or entrainment of bluefish, and the DSEIS misconstrues bluefish consumption. Thus, the FSEIS should show that there are no established potential entrainment or impingement impacts to bluefish. (See Appendix D of the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3.)	
52	4-19 4-51 4-52	35-36 35-36 4-12	The treatment of endangered species in the DSEIS should be revised. First, the DSEIS characterization of impacts to shortnose sturgeon as "UNKNOWN" is incorrect. In 1979, National Marine Fisheries Service (NMFS) concluded that Indian Point operations (even without later-installed technologies intended to reduce impingement mortality) would have a "negligible" impact on this species, and that baseline conclusion, although subject to review by NMFS, presumptively controls, absent credible scientific evidence of increased impact by Indian Point or a more compromised endangered population. Neither is present here. Rather, as detailed in the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3, the shortnose sturgeon population in the Hudson River has increased some 400% since the 1970s. Moreover, the in-place technologies have reduced potential impacts on any such species. As such, impacts to shortnose sturgeon should be SMALL in the FSEIS. (See Section VI of the Goodwin Procter Comments.)	40-ii-AE/AL/TS
			Second, despite evaluating closed-cycle cooling as an alternative, NRC Staff did not consult with the appropriate resource agencies, such as USFWS, to determine whether this alternative would adversely affect a terrestrial endangered species, the Indiana bat. NRC staff should consult with USFWS with regard to this alternative and update the FSEIS to reflect a consistent treatment of aquatic and terrestrial species. (See Section VI of the Goodwin Procter Comments.)	

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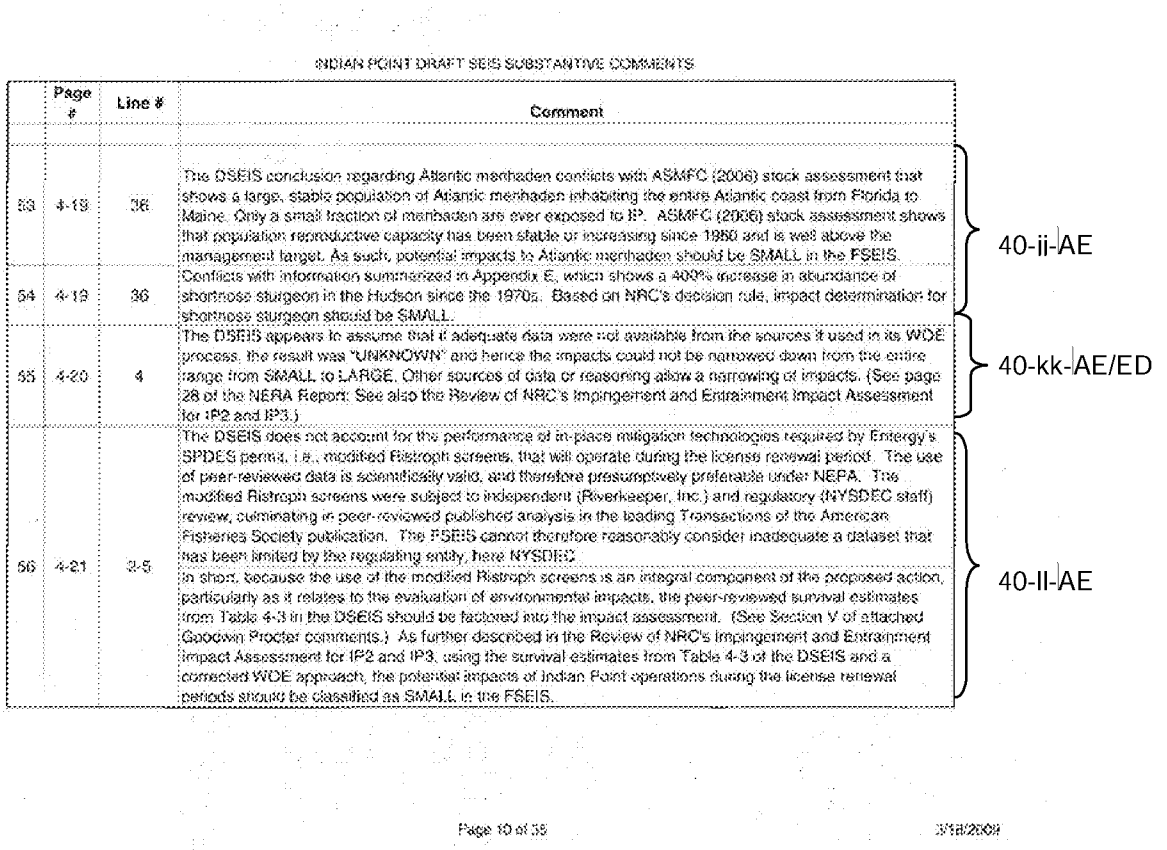

INDIAN POINT DRAFT SEIS SUBSTANTIVE COMMENTS

	Page #	Line #	Comment	
53	4-19	36	The DSEIS conclusion regarding Atlantic menhaden conflicts with ASMFC (2006) stock assessment that shows a large, stable population of Atlantic menhaden inhabiting the entire Atlantic coast from Florida to Maine. Only a small fraction of menhaden are ever exposed to IP. ASMFC (2006) stock assessment shows that population reproductive capacity has been stable or increasing since 1960 and is well above the management target. As such, potential impacts to Atlantic menhaden should be SMALL in the FSEIS.	40-ii-AE
54	4-19	36	Conflicts with information summarized in Appendix E, which shows a 400% increase in abundance of shortnose sturgeon in the Hudson since the 1970s. Based on NRC's decision rule, impact determination for shortnose sturgeon should be SMALL.	
55	4-20	4	The DSEIS appears to assume that if adequate data were not available from the sources it used in its WOE process, the result was "UNKNOWN" and hence the impacts could not be narrowed down from the entire range from SMALL to LARGE. Other sources of data or reasoning allow a narrowing of impacts. (See page 28 of the NERA Report. See also the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3.)	40-kk-AE/ED
56	4-21	2-5	The DSEIS does not account for the performance of in-place mitigation technologies required by Entergy's SPDES permit, i.e., modified Ristroph screens, that will operate during the license renewal period. The use of peer-reviewed data is scientifically valid, and therefore presumptively preferable under NEPA. The modified Ristroph screens were subject to independent (Riverkeeper, Inc.) and regulatory (NYSDEC staff) review, culminating in peer-reviewed published analysis in the leading Transactions of the American Fisheries Society publication. The FSEIS cannot therefore reasonably consider inadequate a dataset that has been limited by the regulating entity, here NYSDEC. In short, because the use of the modified Ristroph screens is an integral component of the proposed action, particularly as it relates to the evaluation of environmental impacts, the peer-reviewed survival estimates from Table 4-3 in the DSEIS should be factored into the impact assessment. (See Section V of attached Goodwin Procter comments.) As further described in the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3, using the survival estimates from Table 4-3 of the DSEIS and a corrected WOE approach, the potential impacts of Indian Point operations during the license renewal periods should be classified as SMALL in the FSEIS.	40-ll-AE

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INDIAN POINT DRAFT SEIS SUBSTANTIVE COMMENTS

	Page #	Line #	Comment	
57	4-21	32-34	Overall, the DSEIS has not provided sufficient evidence to find that the existing cooling system would "destabilize" or "noticeably alter" any of the 18 RIS and thereby adversely impact their ecological, commercial, or recreational value. Therefore, the DSEIS does not adequately support findings of MODERATE or LARGE impacts. (See page 29 of the NERA Report.) If the correct standards were applied, the DSEIS would conclude that impacts are SMALL. (See the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3.)	40-II-AE contd.
58	4-25 4-26	36-45 1-3	The application of the CORMIX model, in calculating the thermal plume across the Hudson River was sufficiently flawed to invalidate results obtained from its use. A close inspection of the modeling presentation in CHGEC (1999) clearly shows that the supplementary work using the CORMIX 3.2 model does more than over-estimate the cross-river extent of the plume, i.e., it was incorrectly applied and its results incorrectly interpreted. The FSEIS should note that the supplementary modeling was disregarded. (See Section 3 of ASA's DSEIS response.)	40-mm-AE/ED
59	4-26	34-36	Replace the sentence with the following: "According to NYSDEC (2003b), the last SPDES permit for the Indian Point facility has been administratively continued under provisions of the NY State Administrative Procedure Act since 1992."	
60	4-27	14-30	The DSEIS states that existing information regarding thermal impacts must be used even though it was pointed out during an independent review of the historic thermal assessments that the thermal modeling previously performed was flawed based on two premises: 1) the hypothetical conditions chosen by NYSDEC for modeling (slack water at low tide) never exist in the Hudson River at the IP site; and 2) the duration of the slack water condition assumed in the previous CORMIX modeling at the site is completely incorrect. (Swanson 2005; NYSDEC 2003). NRC cites the NYSDEC contention that this modeling shows that discharges from IP2 and IP3 could raise water temperatures to a level greater than that permitted by water quality criteria. (NYSDEC 2003) The modeling results presented are erroneous and therefore cannot be used to draw any conclusions, specifically that adverse effects are possible. Based on the fact that there is no valid reported effects of thermal analysis, the FSEIS should conclude that potential heat shock impacts would be SMALL. (See Section 4 of ASA's DSEIS response.)	40-nn-AE

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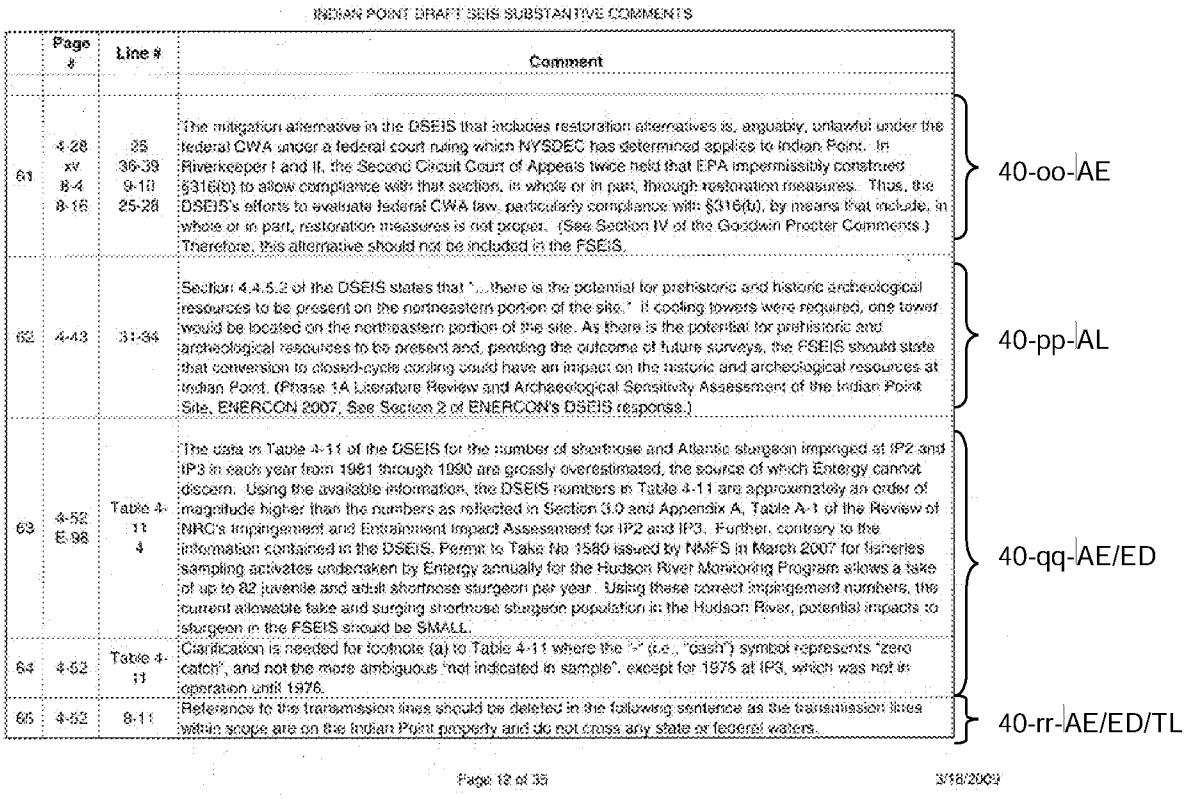

INDIAN POINT DRAFT SEIS SUBSTANTIVE COMMENTS

	Page #	Line #	Comment	
61	4-28 xv 8-4 8-16	25 36-39 9-10 25-28	The mitigation alternative in the DSEIS that includes restoration alternatives is, arguably, unlawful under the federal CWA under a federal court ruling which NYSDEC has determined applies to Indian Point. In Riverkeeper I and II, the Second Circuit Court of Appeals twice held that EPA impermissibly construed §316(b) to allow compliance with that section, in whole or in part, through restoration measures. Thus, the DSEIS's efforts to evaluate federal CWA law, particularly compliance with §316(b), by means that include, in whole or in part, restoration measures is not proper. (See Section IV of the Goodwin Procter Comments.) Therefore, this alternative should not be included in the FSEIS.	40-oo-AE
62	4-43	31-34	Section 4.4.5.2 of the DSEIS states that "...there is the potential for prehistoric and historic archeological resources to be present on the northeastern portion of the site." If cooling towers were required, one tower would be located on the northeastern portion of the site. As there is the potential for prehistoric and archeological resources to be present and, pending the outcome of future surveys, the FSEIS should state that conversion to closed-cycle cooling could have an impact on the historic and archeological resources at Indian Point. (Phase 1A Literature Review and Archaeological Sensitivity Assessment of the Indian Point Site, ENERCON 2007. See Section 2 of ENERCON's DSEIS response.)	40-pp-AL
63	4-52 E-98	Table 4-11 4	The data in Table 4-11 of the DSEIS for the number of shortnose and Atlantic sturgeon impinged at IP2 and IP3 in each year from 1981 through 1990 are grossly overestimated, the source of which Entergy cannot discern. Using the available information, the DSEIS numbers in Table 4-11 are approximately an order of magnitude higher than the numbers as reflected in Section 3.0 and Appendix A, Table A-1 of the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3. Further, contrary to the information contained in the DSEIS, Permit to Take No. 1580 issued by NMFS in March 2007 for fisheries sampling activates undertaken by Entergy annually for the Hudson River Monitoring Program allows a take of up to 82 juvenile and adult shortnose sturgeon per year. Using these correct impingement numbers, the current allowable take and surging shortnose sturgeon population in the Hudson River, potential impacts to sturgeon in the FSEIS should be SMALL.	40-qq-AE/ED
64	4-52	Table 4-11	Clarification is needed for footnote (a) to Table 4-11 where the "-" (i.e., "dash") symbol represents "zero catch", and not the more ambiguous "not indicated in sample", except for 1975 at IP3, which was not in operation until 1976.	
65	4-52	8-11	Reference to the transmission lines should be deleted in the following sentence as the transmission lines within scope are on the Indian Point property and do not cross any state or federal waters.	40-rr-AE/ED/TL

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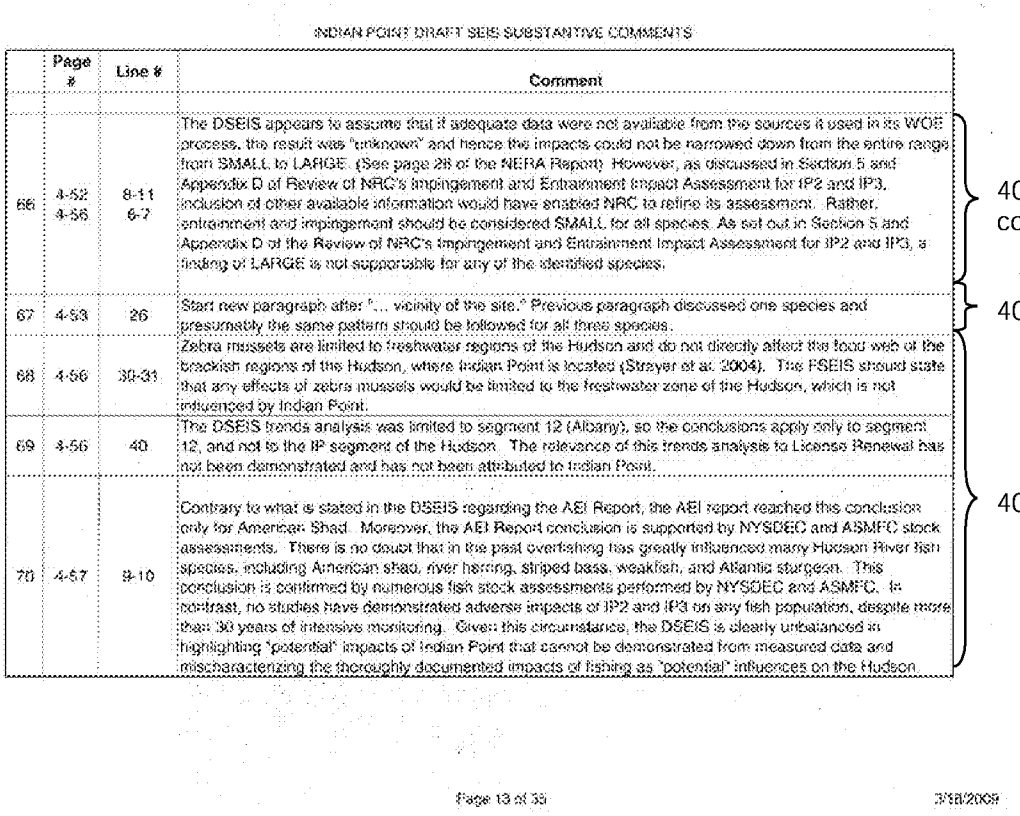

INDIAN POINT DRAFT SEIS SUBSTANTIVE COMMENTS

	Page #	Line #	Comment	
66	4-52 4-56	8-11 6-7	The DSEIS appears to assume that if adequate data were not available from the sources it used in its WOE process, the result was "unknown" and hence the impacts could not be narrowed down from the entire range from SMALL to LARGE. (See page 28 of the NERA Report) However, as discussed in Section 5 and Appendix D of Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3, inclusion of other available information would have enabled NRC to refine its assessment. Rather, entrainment and impingement should be considered SMALL for all species. As set out in Section 5 and Appendix D of the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3, a finding of LARGE is not supportable for any of the identified species.	40-rr-AE/ED/TL contd.
67	4-53	26	Start new paragraph after "... vicinity of the site." Previous paragraph discussed one species and presumably the same pattern should be followed for all three species.	40-ss-ED
68	4-56	30-31	Zebra mussels are limited to freshwater regions of the Hudson and do not directly affect the food web of the brackish regions of the Hudson, where Indian Point is located (Strayer et al. 2004). The FSEIS should state that any effects of zebra mussels would be limited to the freshwater zone of the Hudson, which is not influenced by Indian Point.	40-tt-AE
69	4-56	40	The DSEIS trends analysis was limited to segment 12 (Albany), so the conclusions apply only to segment 12, and not to the IP segment of the Hudson. The relevance of this trends analysis to License Renewal has not been demonstrated and has not been attributed to Indian Point.	
70	4-57	9-10	Contrary to what is stated in the DSEIS regarding the AEI Report, the AEI report reached this conclusion only for American Shad. Moreover, the AEI Report conclusion is supported by NYSDEC and ASMFC stock assessments. There is no doubt that in the past overfishing has greatly influenced many Hudson River fish species, including American shad, river herring, striped bass, weakfish, and Atlantic sturgeon. This conclusion is confirmed by numerous fish stock assessments performed by NYSDEC and ASMFC. In contrast, no studies have demonstrated adverse impacts of IP2 and IP3 on any fish population, despite more than 30 years of intensive monitoring. Given this circumstance, the DSEIS is clearly unbalanced in highlighting "potential" impacts of Indian Point that cannot be demonstrated from measured data and mischaracterizing the thoroughly documented impacts of fishing as "potential" influences on the Hudson.	

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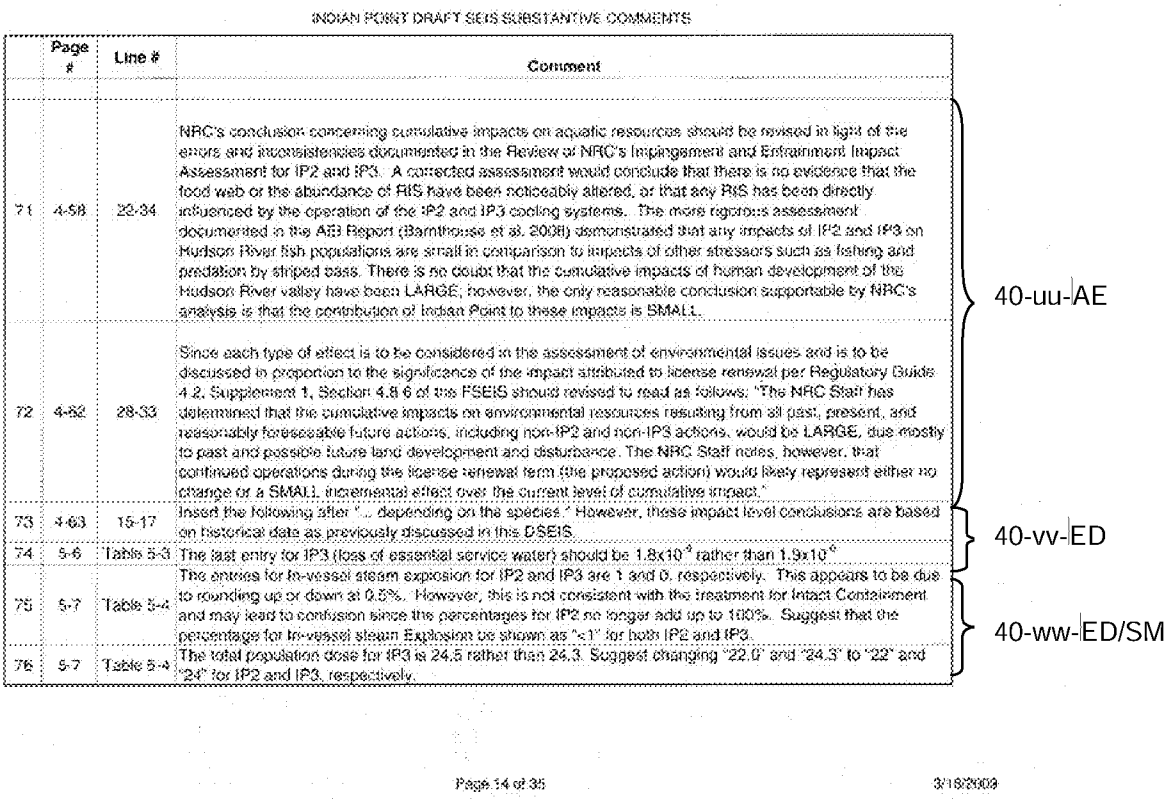

INDIAN POINT DRAFT SEIS SUBSTANTIVE COMMENTS

	Page #	Line #	Comment	
71	4-58	29-34	NRC's conclusion concerning cumulative impacts on aquatic resources should be revised in light of the errors and inconsistencies documented in the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3. A corrected assessment would conclude that there is no evidence that the food web or the abundance of RIS have been noticeably altered, or that any RIS has been directly influenced by the operation of the IP2 and IP3 cooling systems. The more rigorous assessment documented in the AEI Report (Barnthouse et al. 2008) demonstrated that any impacts of IP2 and IP3 on Hudson River fish populations are small in comparison to impacts of other stressors such as fishing and predation by striped bass. There is no doubt that the cumulative impacts of human development of the Hudson River valley have been LARGE; however, the only reasonable conclusion supportable by NRC's analysis is that the contribution of Indian Point to these impacts is SMALL.	40-uu-AE
72	4-62	28-33	Since each type of effect is to be considered in the assessment of environmental issues and is to be discussed in proportion to the significance of the impact attributed to license renewal per Regulatory Guide 4.2, Supplement 1, Section 4.8.6 of the FSEIS should revised to read as follows: "The NRC Staff has determined that the cumulative impacts on environmental resources resulting from all past, present, and reasonably foreseeable future actions, including non-IP2 and non-IP3 actions, would be LARGE, due mostly to past and possible future land development and disturbance. The NRC Staff notes, however, that continued operations during the license renewal term (the proposed action) would likely represent either no change or a SMALL, incremental effect over the current level of cumulative impact."	
73	4-63	15-17	Insert the following after "... depending on the species." However, these impact level conclusions are based on historical data as previously discussed in this DSEIS.	40-vv-ED
74	5-6	Table 5-3	The last entry for IP3 (loss of essential service water) should be 1.8×10^{-9} rather than 1.9×10^{-6}.	
75	5-7	Table 5-4	The entries for In-vessel steam explosion for IP2 and IP3 are 1 and 0, respectively. This appears to be due to rounding up or down at 0.5%. However, this is not consistent with the treatment for Intact Containment and may lead to confusion since the percentages for IP2 no longer add up to 100%. Suggest that the percentage for In-vessel steam Explosion be shown as "<1" for both IP2 and IP3.	40-ww-ED/SM
76	5-7	Table 5-4	The total population dose for IP3 is 24.5 rather than 24.3. Suggest changing "22.0" and "24.3" to "22" and "24" for IP2 and IP3, respectively.	

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INDIAN POINT DRAFT SEIS SUBSTANTIVE COMMENTS

	Page #	Line #	Comment	
77	5-8	30-34	The DSEIS states that Entergy identified 5 potentially cost-beneficial SAMAs for IP2 in the baseline analysis and two additional potentially cost-beneficial SAMAs (44 and 56) when uncertainties are considered. ER Table 4-4 (page 4-74) indicates that SAMA 28 was not cost-beneficial without accounting for uncertainty. The FSEIS should state that Entergy identified 4 potentially cost-beneficial SAMAs for IP2 in the baseline analysis and three additional (28, 44, and 56) when uncertainties are considered.	40-ww-ED/SM contd.
78	5-9	11-14	See comment for pages 5-8, lines 30-34. For consistency with SAMAs 44 and 56, SAMA 28 should be annotated "(cost beneficial with uncertainties)".	
79	6-15	26-28	The FSEIS should make clear that its conclusion regarding comparisons of greenhouse gas emissions for fossil fuels versus nuclear units depends on implementing carbon capture and sequestration (CCS) at fossil sources. The future costs of CCS and the likely time at which CCS would be commercially viable are highly uncertain. Applying current information on the large uncertainties associated with CCS, the FSEIS should conclude that Indian Point is important to stated federal and state climate change goals. (See pages 19-21 of the NERA Report.) See Wald 2008, Mounting Costs Slow the Push for Clean Coal, New York Times, http://www.nytimes.com/2008/05/30/business/30coal.html.	40-xx-AL/AQ
80	6-16	16-20	The DSEIS statement about potential climate change impacts of renewable fuel cycles is incomplete. For example, some types of renewables (in particular, biomass facilities) do involve a fuel cycle and have greenhouse gas emissions associated with production and transportation of energy. Correction of this error should occur in the FSEIS; if corrected, NRC may conclude that renewables options are not as favorable as represented in the DSEIS. (See pages 19-21 of the NERA Report and see Biomass Power, Department of Energy, http://www.eere.energy.gov/de/biomass_power.html.)	
81	8-2	6-7	The DSEIS refers to "The normal design flow rate of 3,180,000 liters per minute (840,000 gallons per minute (gpm) for each unit...." The actual flow rate varies through the use of VSPs and Dual-Speed motors, therefore, the "normal design flow rate" given in the DSEIS is actually the maximum design flow rate." The FSEIS should be revised accordingly. (See Section 6 of ENERCON's DSEIS response.)	40-yy-ED
82	8-2	14	"Has" should be changed to "may potentially have".	

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INDIAN POINT DRAFT SEIS SUBSTANTIVE COMMENTS

	Page #	Line #	Comment
83	8-3 8-4 8-5	On p. 8-3, lines 13-15; on p. 8-4, lines 13-16 and 37-40; on p. 8-6, all	If NRC staff determines the FSEIS should contain a discussion of closed-cycle cooling at Indian Point, the discussion of costs and outage duration for such technology contained in the DSEIS, which is based upon dated and inaccurate information, should be revised. As detailed in the Goodwin Procter Comments, the DSEIS statement that "NYSDEC (2003b) ... indicated that estimates for cooling conversion by the previous owners of IP2 and IP3 overestimated a variety of costs and selected a more expensive technology than was necessary" incorrectly attributes that statement to NYSDEC. Rather, the quote is the NYSDEC administrative tribunal's summary of unsupported statements by the parties from the February 3, 2006 Ruling on Proposed Issues for Adjudication and Petitions for Party Status in the Indian Point SPDES Proceeding (i.e., the NYSDEC (2003b) document referenced in the DSEIS). (See Section II of the Goodwin Procter Comments.) Likewise, the DSEIS statement that "[i]n the Hudson River Utilities FEIS, ... EPA indicated that costs [of cooling towers] may have been somewhat inflated" is incorrect, because EPA never commented on the FEIS. Similarly, the DSEIS statement that "EPA (2004) indicated that estimates for cooling conversion by the previous owners of IP2 and IP3 overestimated a variety of costs and selected a more-expensive technology than was necessary" is incorrect, because, in developing the Phase II Rule, EPA did not examine the estimates for cooling conversion prepared by the previous owners of IP2 and IP3 or infer what those costs might be based on a limited dataset of "retrofit" cases that were not representative of the unique circumstances faced by Indian Point. (See Section II of the Goodwin Procter Comments.) Finally, the DSEIS statement that "EPA (2004) indicated that Entergy's outage duration was likely exaggerated" is incorrect, because Enercon's 2003 estimated outage of 42 weeks (without contingency) is consistent with EPA's final estimated outage time in the Phase II Rule (i.e., 10 months or 40 weeks). (See Section II of the Goodwin Procter Comments.) Moreover, since the 2003 Enercon Report, the discovery of on-site strontium and tritium contamination – well known to the NRC – will unavoidably result in costs and outage durations well in excess of those reported in the 2003 Enercon Report. (See Section II of the Goodwin Procter Comments). In sum, these statements should be removed from the DSEIS, and any cost estimates or outage durations associated with the retrofit of cooling towers at Indian Point presented in the FSEIS should rely on the most recent site-specific information available – namely, the 2003 Enercon Report and information with regard to on-site radiological contamination. (See Section II of the Goodwin Procter Comments.)

40-zz-AL

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INDIAN POINT DRAFT SEIS SUBSTANTIVE COMMENTS

	Page #	Line #	Comment
84	8-3	37-41	The most current cost estimates should be used to evaluate the closed-cycle cooling alternative (ENERCON 2003). If the previous owners' (Con Edison and NYPA) estimates are referenced, a comparison should be provided in the FSEIS between the previous and current estimates. (See Section 5 of ENERCON's DSEIS response.)
85	8-3	39-40	Section 8.1 of the DSEIS states that "...EPA indicated that costs may have been somewhat inflated (EPA 2004)." The most recent cost estimate is a conservative value (ENERCON 2003). The estimate does not account for many significant costs, such as the costs of handling, transporting, and disposing of any contaminated spoils, decommissioning of the cooling towers, and inflation during the five-year construction period. (See Section 5 of ENERCON's DSEIS response.)
86	8-3	39-41	Section 8.1 of the DSEIS states that "...EPA indicated that costs may have been somewhat inflated (EPA 2004). EPA also indicated some uncertainty with regard to outage duration for the plant retrofit." The EPA 2004 reference does not support these claims. (See Sections 4 and 5 of ENERCON's DSEIS response.)
87	8-3 8-4	37-39 13-15	The DSEIS notes that both NYSDEC (2003b) and EPA (2004) indicated that estimates for cooling conversion by the previous owners of IP2 and IP3 overestimated a variety of costs and selected a more-expensive technology than was necessary. Neither reference supports the claims of overestimated costs. In addition, the DSEIS notes that "In the Hudson River Utilities FEIS, NYSDEC indicated that the previous owners' closed-cycle cooling cost estimates were likely generally reasonable" (Page 8-3, lines 37-39). (See Section 5 of ENERCON's DSEIS response.)
88	8-4	3-6	"[C]losed-cycle cooling would result in a loss of generating capacity due to lowered thermal efficiency and parasitic loads related to cooling system pumps and auxiliary systems (an average annual loss of 26 MW(e), per unit) because of power demands of the closed-cycle system (Entergy 2007)." The total average yearly losses due to conversion to closed cycle cooling, when considering both parasitic load and thermal efficiency losses in both units, would be 74 MW(e). The maximum total losses at peak load conditions would be 127 MW(e). (See Section 8 of ENERCON's DSEIS response.) The FSEIS should be corrected to reflect this information and the larger impact of the closed cycle cooling mitigation scenario as a result.
89	8-3 8-4	40-41 15-16	The DSEIS states that EPA (2004) indicated that Entergy's outage duration was likely exaggerated. The outage duration for closed cycle cooling conversion listed in EPA 2004 is 16 months. While not appropriate for use as an estimate for Indian Point, the EPA estimate is approximately equal to the conversion estimate for IP2 and IP3 of 42 weeks and does not indicate an exaggerated outage duration. (See Section 4 of ENERCON's DSEIS response.)

40-zz-AL contd.

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INDIAN POINT DRAFT SEIS SUBSTANTIVE COMMENTS

	Page #	Line #	Comment
90	8-4 4-7 4-28	Section 8.1.1 7-11 27-31	The DSEIS should not include an analysis of closed-cycle cooling as a mitigation measure, as the stated DSEIS justification inadvertently relied on dated (and now inaccurate) material. NYSDEC staff's 2003 draft State Pollutant Discharge Elimination System (SPDES) permit, which tentatively, but without any feasibility or alternatives analysis, identified closed-cycle cooling as a potential "best technology available" (BTA) for Indian Point under §316(b) of the federal Clean Water Act (CWA) and 6 NYCRR §704.5, was vacated by the NYSDEC Assistant Commissioner in August 2008. At this time, NYSDEC staff must re-evaluate BTA for Indian Point based upon feasibility and other studies to be completed by December 2009. Thus, no closed-cycle cooling determination -- draft, conceptual or otherwise -- exists for Indian Point, invalidating the premise for the closed-cycle cooling analysis in the DSEIS. (See Section I.A. of the Goodwin Procter Comments.) The FSEIS should be corrected to reflect this information and the larger impact of the closed cycle cooling mitigation scenario as a result. Removal of the discussion of closed-cycle cooling from the FSEIS is entirely consistent with (1) the United States Environmental Protection Agency (EPA) rulemaking record which rejected closed-cycle cooling on a nationwide basis and on a site-specific basis for Indian Point, (2) NRC precedent in comparable license-renewal proceedings, and (3) the long history of consensus agreements (i.e., agreements including NYSDEC, Riverkeeper, Inc. and other stakeholders) governing operations at Indian Point from 1981 through the present, none of which required closed-cycle cooling at Indian Point. Therefore, the closed-cycle cooling mitigation alternative should not be included in the FSEIS. (See Sections I.B. - I.D. of the Goodwin Procter Comments.)
91	8-4	39-42	The FSEIS assessment should include a full list of reasons for rejecting single-stage mechanical draft cooling towers including: compromises Station equipment, safety, and systems, particularly over time; interferes with plant visual-oriented security systems; dominates the skyline in the area of the plant; creates local fogging and icing conditions in winter; long-term shadow from plume can harm vegetation; associated salt deposition could harm plants in the area; can be ingested into lower intakes (recirculation); degrading performance. (See Section 2 of ENERCON's DSEIS response.)
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40-aaa-AE/AL

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INDIAN POINT DRAFT SEIS SUBSTANTIVE COMMENTS

	Page #	Line #	Comment
93	8-5	19-24	The DSEIS states that the NRC Staff has previously assessed closed cycle cooling with a hybrid cooling tower in the license renewal SEIS for Oyster Creek Nuclear Generating Station (OCNGS) (NRC 2005). The Oyster Creek round hybrid cooling tower assessment is based on the 2006 Determination of Cooling Tower Availability for Oyster Creek Generation Station. The NRC 2006 assessment/decision for Oyster Creek is not appropriate for assessment at Indian Point. At Indian Point, the round tower arrangement offers improved thermal performance due to reduced recirculation potential and requires a smaller site area than the rectilinear towers. Furthermore, the Oyster Creek closed cycle cooling assessment is site-specific and does not provide a basis for the feasibility or availability of closed cycle cooling at Indian Point. (See Section 3 of ENERCON's DSEIS response.)
94	8-5	25-31	Cooling tower configuration (i.e., round vs. rectilinear arrangements) has significant implications regarding construction and performance that were not adequately addressed in the DSEIS. The accuracy of DSEIS statements regarding cooling towers depend on the configuration considered. Thus, the particular configuration considered should be clearly indicated in any cooling tower assessment (e.g., footprint required, plume characteristics, etc.). (See Section 3 of ENERCON's DSEIS response.)
95	8-5	25-31	Should hybrid towers prove prohibitively expensive, the DSEIS notes that single-stage mechanical draft towers will produce similar decreases in impacts to aquatic life. Single-stage mechanical draft towers have been rejected by NYSDEC at Indian Point, due to the negative impacts, and there is no basis for further consideration of the technology. (See Section 2 of ENERCON's DSEIS response.)
96	8-5	26-28	The DSEIS states that "... single-stage mechanical draft towers.... may result in less land-clearing or blasting debris than the hybrid cooling tower option." No land-clearing or blasting debris will be avoided by using round single-stage towers, as they require the same land area as round hybrid towers. (See Section 2 and 3 of ENERCON's DSEIS response.)
97	8-5	28-31	The DSEIS states that for single stage mechanical draft cooling towers "...plumes in highly-saturated atmospheric conditions will impose slightly greater aesthetic impacts..." The aesthetic impacts of a single-stage mechanical draft tower plume are significantly greater than those of the hybrid tower. (See Section 2 of ENERCON's DSEIS response.)
98	8-5	40-41	Crews excavating areas for the cooling tower basins and associated piping will (not "may") "need to blast substantial amounts of rock during the construction process." The ENERCON 2003 report determined that blasting is the only feasible method of large-scale excavation of material (limeod marble) at the site. Additionally onsite blasting would require regulatory approval. (See Section 5 of ENERCON's DSEIS response.)

40-bbb-AL

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	Page #	Line #	Comment	
99	8-6	36-37	Disposal of approximately 2 million cubic yards (CY) of contaminated material from the excavation would (not "may") either create offsite land use impacts or create additional onsite land use impacts if stored at Indian Point. In addition, a portion of the material from the excavation may have been exposed to tritium and/or strontium groundwater contamination (Hydrogeologic Site Investigation Report for the Indian Point Energy Center, GZA 2008). Excavation of this quantity and type of material (limwood marble) would require blasting to be conducted onsite, which would in turn require regulatory approval and introduce the possibility of disturbing current groundwater plumes. During the estimated 30 month excavation schedule, 350,000 round trips would be needed to remove the excavated materials in dump trucks capable of removing 6 CY of material. (See Section 7 of ENERCON's DSEIS response.)	40-bbb-AL contd.
100	8-7	17-20	The DSEIS estimates that the impact on land use would be SMALL to LARGE as the construction of the towers would require approximately 40 acres of land, and waste disposal may require a large amount of offsite land. However, the clear-cutting of approximately 40 acres of forested land and the removal of approximately 2 million cubic yards of potentially contaminated oil, rock, and debris would have a LARGE impact. (See Section 7 of ENERCON's DSEIS response.)	
101	8-8	18-22	The DSEIS estimates the impact on the aquatic ecology would be SMALL as the entrainment of aquatic organisms would be reduced substantially (98 to 95 percent). However, conversion to closed-cycle cooling could only reduce entrainment by an additional 73-percent from the design flow rates, significantly less than the 93-to-95-percent reduction estimated in the DSEIS. Therefore, the improvement over existing conditions is overstated due to comparison with design flow rates rather than actual flow rates. (See Section 6 of ENERCON's DSEIS response.)	40-ccc-AL/TE
102	8-8	28-29	Visible plumes from single stage mechanical draft towers would significantly mute incoming sunlight, producing a shadow in which native vegetation would likely not thrive. As a result, the impact on Terrestrial Ecology due to the plume would greatly increase with the use of single-stage mechanical draft towers. References to single-stage mechanical draft towers in the FSEIS should be revised to account for a more complete list of potential impacts. (See Sections 2 and 7 of ENERCON's DSEIS response.)	

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INDIAN POINT DRAFT SEIS SUBSTANTIVE COMMENTS

	Page #	Line #	Comment	
103	8-9 8-23	7-12 1-3	Given the great threat of high mortality that white nose syndrome is causing to the endangered Indiana bat, the fact that nearly all of Westchester County, including the Indian Point area, is within the predicted range of the Indian bat, that roosting trees may exist on site, that feeding habitat may exist at the river bank on the site, and the proposed construction of cooling towers as a mitigation alternative for impingement and entrainment of fish, it seems inappropriate to classify the Terrestrial Ecology impacts of the New Closed - Cycle Cooling Alternative as SMALL. (See Section 7.2 of ENERCON's DSEIS response.) This is an inconsistent treatment of aquatic species versus terrestrial species.	40-ddd-AL/TS
104	8-9	13-17	The DSEIS estimates the impact on the terrestrial ecology would be SMALL to MODERATE as the onsite forest habitats would be disturbed and drift from towers may affect vegetation. As 38% of the onsite forest would be destroyed completely and the remaining vegetation would be damaged by cooling tower plume drift, conversion to closed-cycle cooling is likely to have a LARGE impact on terrestrial ecology. This loss of woodland area will affect a potentially environmentally-sensitive area (e.g., the site is a potential habitat for terrestrial endangered and threatened species, specifically the Indiana bat). (See Section 7.2 and Attachment A of ENERCON's DSEIS response.)	
105	8-10	34-36	Air quality based on replacement power for parasitic loads and power losses due to thermal inefficiencies is not quantified. The FSEIS should include the quantification of air quality impacts based on the parasitic loads and power losses provided in ENERCON's DSEIS response. (See Section 8 of ENERCON's DSEIS response.)	40-eee-AL/AQ
106	8-10 8-11	33-36 33-34	Fossil-fired plants are likely to be the source of replacement power for IP. Rough quantitative estimates of the air emissions increases due to the cooling towers indicate that the cooling tower installation/operation would increase emissions of CO2 in the year of installation by more than NYS's annual reduction target in 2018 under the Regional Greenhouse Gas Initiative (RGGI) carbon dioxide cap-and-trade program. Also in the year of installation, NOx emissions would increase by 60 percent of the projected level of NOx reductions in NYS under the Clean Air Interstate Rule (CAIR) in 2015. These increases would make it substantially more difficult for NYS to achieve its goals under RGGI and CAIR. (See pages 19-21 of the NERA Report.) By DSEIS criteria, air emissions impacts should be characterized as LARGE based on their implications for state air emissions policy initiatives. (See pages 21-22 of the NERA Report.)	

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INDIAN POINT DRAFT SEIS SUBSTANTIVE COMMENTS

	Page #	Line #	Comment	
107	8-10	34-36	Thermal efficiency losses will continue in addition to parasitic load losses. As a result of cooling tower operations (i.e., operation of additional pumps and cooling tower fans) average parasitic load losses for both units combined would be 53 MW(e). The conversion to closed cycle cooling would also result in thermal efficiency losses, which would be significant and should be included in the FSEIS. For both units combined, the average yearly thermal efficiency losses would be 21 MW(e), but the maximum thermal efficiency losses would increase to 74 MW(e) at peak load conditions. Therefore, the average total losses would be 74 MW(e), but would reach a maximum of 127 MW(e) at peak load conditions. (See Section 8 of ENERCON's DSEIS response.)	40-fff-AL/AQ
108	8-11	29-34	The DSEIS estimates the impact on air quality would be SMALL as the primary impacts would be from vehicles and equipment emissions during construction, and from replacement power, which should be limited by existing regulations. However, emissions would increase due to construction (5 years) and replacement power (permanent). As Westchester County already violates existing air quality regulations, the impact of conversion to closed-cycle cooling on air quality is understated and is evaluated in detail in the NERA 2009 economic analysis. (See Section 8 of ENERCON's DSEIS response.)	
109	8-11	38-42	The DSEIS states, "Whether reused, recycled, or disposed of, the material will have to be transported off site. If disposed of, the waste will require additional offsite land use." Tritium and strontium site contamination increase the likelihood that excavated material must be properly treated as low-level radioactive waste and therefore would have to be disposed of or recycled at a considerable cost which should be considered in the FSEIS. The scale of excavation coupled with strontium and tritium site contamination would significantly increase waste disposal processing, resulting in a LARGE impact. (See Section 7 of ENERCON's DSEIS response.)	
110	8-12	7-10	The DSEIS estimates the impact on waste would be SMALL to LARGE as the construction would generate approx. 2 million CY of soil, rock, and debris requiring offsite disposal. The scale of excavation coupled with strontium and tritium site contamination would significantly increase waste disposal processing, resulting in a LARGE impact. (See Section 7 of ENERCON's DSEIS response.)	40-ggg-AL

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INDIAN POINT DRAFT SEIS SUBSTANTIVE COMMENTS

	Page #	Line #	Comment
111	8-13	27-32	The DSEIS understates or does not fully consider electricity price impacts of cooling towers, which, according to existing analyses, would be substantial. (See pages 14-15 of the NERA Report.) Existing engineering analyses indicate that the outage would need to occur, at least in part, during the peak summer demand period. The reliability impacts of removal of IP during this period would, according to existing analyses by NYISO, NERA, and others, be highly significant, including potential substantial violations of New York reliability requirements. (See pages 11-15 of the NERA Report.) Socioeconomic impacts of cooling towers related to the electric system should be characterized as LARGE based on the above-described reliability and price impacts. (See page 15 of the NERA Report.)
112	8-14	15	The DSEIS states "As noted previously, fogging and icing is not expected to be significant." This statement would not be true or applicable if single-stage mechanical draft towers were used. References to single-stage mechanical draft towers in the FSEIS should be revised to account for a more complete list of potential impacts. (See Sections 2 and 3 of ENERCON's DSEIS response.)
113	8-14	16-21	The DSEIS estimates that the impact on transportation would be SMALL to LARGE as the increased traffic associated with construction (workers and waste disposal) would be significant, though of little effect during operations. Per engineering analyses, the increase in traffic would be significant during the construction period (5 years) (ENERCON 2008). During the estimated 30 month excavation schedule, 350,000 round trips would be needed to remove the excavated materials in dump trucks capable of carrying 8 cy of material (brwood marble). Assuming continuous excavation for 12 hours in every day of the 30 month excavation period, approximately 32 filled dump trucks would have to leave the site every hour (one truck every 2 minutes) to achieve this rate of excavation. In addition, a significant number of temporary workers will be required for the construction of cooling towers. The overall impact on transportation would be MODERATE to LARGE. (See Section 8 of ENERCON's DSEIS response.)
114	8-15	21-25	Section 4.4.5.2 of the DSEIS states that "...there is the potential for prehistoric and historic archeological resources to be present on the northeastern portion of the site." (DSEIS Pg. 4-43 / Lins. 31-34) If cooling towers were required, one tower would be located on the northeastern portion of the site. As there is the potential for prehistoric and archeological resources to be present and, pending the outcome of future surveys, conversion to closed-cycle cooling could have an impact on the historic and archeological resources at Indian Point. (Phase 1A Literature Review and Archaeological Sensitivity Assessment of the Indian Point Site, ENERCON 2007; See Section 2 of ENERCON's DSEIS response.)

40-ggg-AL contd.

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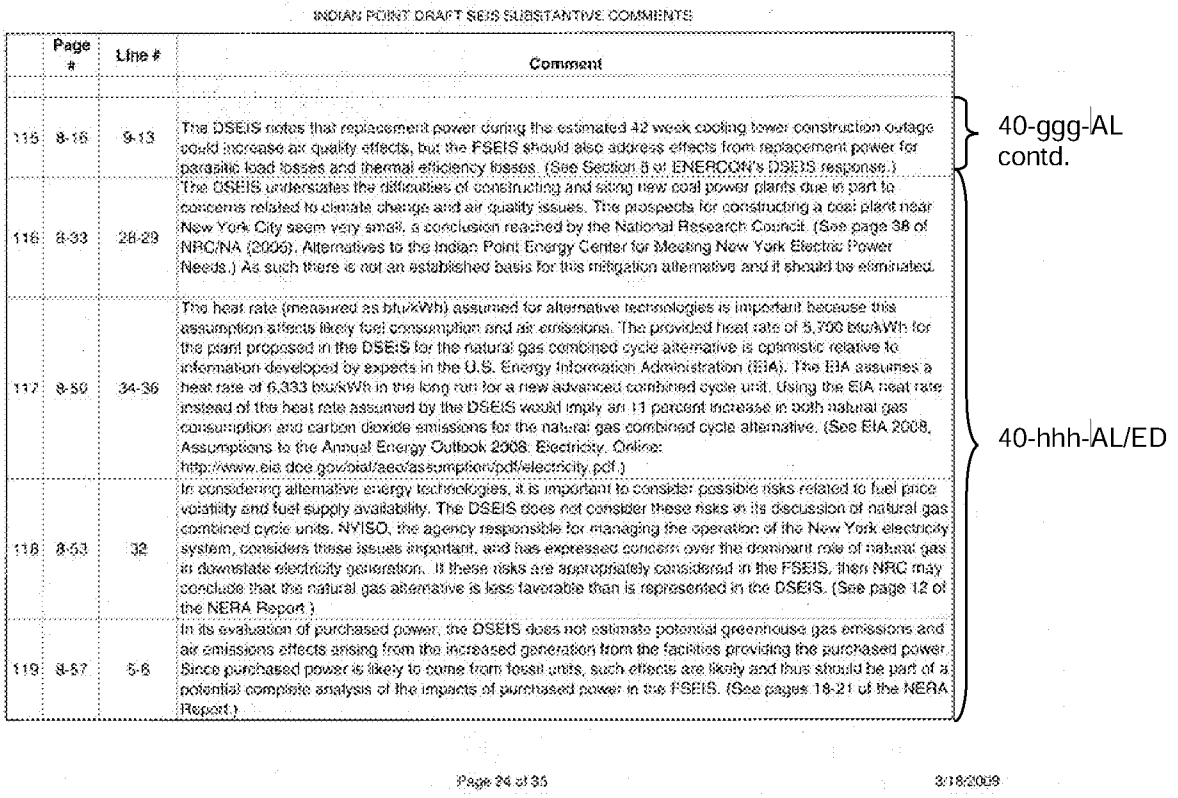

INDIAN POINT DRAFT SEIS SUBSTANTIVE COMMENTS

	Page #	Line #	Comment	
115	8-16	9-13	The DSEIS notes that replacement power during the estimated 42 week cooling tower construction outage could increase air quality effects, but the FSEIS should also address effects from replacement power for parasitic load losses and thermal efficiency losses. (See Section 5 of ENERCON's DSEIS response.)	40-ggg-AL contd.
116	8-33	28-29	The DSEIS understates the difficulties of constructing and siting new coal power plants due in part to concerns related to climate change and air quality issues. The prospects for constructing a coal plant near New York City seem very small, a conclusion reached by the National Research Council. (See page 38 of NRC/NA (2009). Alternatives to the Indian Point Energy Center for Meeting New York Electric Power Needs.) As such there is not an established basis for this mitigation alternative and it should be eliminated.	40-hhh-AL/ED
117	8-50	34-36	The heat rate (measured as btu/kWh) assumed for alternative technologies is important because this assumption affects likely fuel consumption and air emissions. The provided heat rate of 5,700 btu/kWh for the plant proposed in the DSEIS for the natural gas combined cycle alternative is optimistic relative to information developed by experts in the U.S. Energy Information Administration (EIA). The EIA assumes a heat rate of 6,333 btu/kWh in the long run for a new advanced combined cycle unit. Using the EIA heat rate instead of the heat rate assumed by the DSEIS would imply an 11 percent increase in both natural gas consumption and carbon dioxide emissions for the natural gas combined cycle alternative. (See EIA 2008, Assumptions to the Annual Energy Outlook 2008: Electricity. Online: http://www.eia.doe.gov/oiaf/aeo/assumption/pdf/electricity.pdf.)	
118	8-53	32	In considering alternative energy technologies, it is important to consider possible risks related to fuel price volatility and fuel supply availability. The DSEIS does not consider these risks in its discussion of natural gas combined cycle units. NYISO, the agency responsible for managing the operation of the New York electricity system, considers these issues important, and has expressed concern over the dominant role of natural gas in downstate electricity generation. If these risks are appropriately considered in the FSEIS, then NRC may conclude that the natural gas alternative is less favorable than is represented in the DSEIS. (See page 12 of the NERA Report.)	
119	8-57	5-6	In its evaluation of purchased power, the DSEIS does not estimate potential greenhouse gas emissions and air emissions effects arising from the increased generation from the facilities providing the purchased power. Since purchased power is likely to come from fossil units, such effects are likely and thus should be part of a potential complete analysis of the impacts of purchased power in the FSEIS. (See pages 18-21 of the NERA Report.)	

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INDIAN POINT DRAFT SEIS SUBSTANTIVE COMMENTS

	Page #	Line #	Comment	
120	8-68	38-41	Assessing impacts on air emissions and greenhouse gas emissions is important for a complete evaluation of alternatives. In its evaluation of combination alternative 1, the DSEIS does not quantify estimates of increased emissions arising from the alternative, though it acknowledges "some impact on air quality." The DSEIS then concludes that air quality impacts from combination alternative 1 would be SMALL. This conclusion is not justified given the likelihood of air emissions and greenhouse gas emissions from fossil fuel generation and should be MODERATE. (See pages 18-21 of the NERA Report.)	40-hhh-AL/ED contd.
121	8-72	6-7	The following sentence has incomplete information: NRC calculations indicate that onshore installations could require xx ha (xx ac) (reference).	
122	8-73	10-14	Assessing impacts on air emissions and greenhouse gas emissions is important for a complete evaluation of alternatives. In its evaluation of combination alternative 2, the DSEIS does not quantify estimates of increased emissions arising from the alternative, though it acknowledges "some impact on air quality." The DSEIS then concludes that air quality impacts from combination alternative 2 would be SMALL to MODERATE. This conclusion is not justified given the likelihood of air emissions and greenhouse gas emissions from fossil fuel generation and should be MODERATE to LARGE. (See pages 18-21 of the NERA Report.)	
123	9-9	Table 9-1	Based on Table 8-3, Page 2-45, change "SMALL to LARGE" under Coal-Fired Plant Alternate Site column to "MODERATE".	40-iii-ED
124	E-3	Table E-2	Add footnote for IP2 Hazardous Solid Waste Amendment Permit Hazardous Solid Waste Amendment Permit that states: "Permit has been administratively continued based on conditional mixed waste exemption."	
125	E-3	Table E-2	Add footnote for IP3 Hazardous Solid Waste Amendment Permit that states: "Permit has been administratively continued based on conditional mixed waste exemption."	
126	E-4	Table E-2	Add footnote for IP1, 2, and 3 SPDES Permit that states, "Timely renewal application was submitted; therefore, permit is administratively continued under New York State Administrative Procedures Act."	
127	E-4	Table E-2	IP2 Hazardous Substance Bulk Storage Registration Certificate was renewed and now expires 09/04/09.	
128	E-4	Table E-2	IP3 Hazardous Substance Bulk Storage Registration Certificate was renewed and now expires 08/16/2013.	
129	E-4	Table E-2	Simulator Transformer Vault SPDES Permit was renewed and now expires 2/28/13.	
130	E-4	Table E-2	Tank Farm SPDES Permit has been allowed to expire as it is no longer needed.	

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INDIAN POINT DRAFT SEIS SUBSTANTIVE COMMENTS

	Page #	Line #	Comment
131	E-4	Table E-2	Buchanan GT SPDES Permit was renewed and now expires 3/28/13.
132	E-4	Table E-2	ISFSI Stormwater SPDES General Permit for Construction Activities has been cancelled and replaced with the ISFSI Project SPDES Multi-Sector General Permit NYR 00E 125 which has no expiration date.
133	E-5	Table E-2	IP2 Hazardous Waste Generation Identification number is NYD991304411.
134	E-5	Table E-2	IP3 Hazardous Waste Generation Identification number is NYD085503746.
135	E-5	Table E-2	Add a footnote for IP2 Major Oil Storage Facility and IP2 Hazardous Waste Part 373 Permit that states, "Timely renewal application was submitted, therefore, permit is administratively continued under New York State Administrative Procedures Act."
136	E-5	Table E-2	IP2 WCDOH GT1 Air Permit was renewed and now expires 12/31/09.
137	E-5	Table E-2	IP2 WCDOH GT2 Air Permit was renewed and now expires 12/31/09.
138	F-2	Table E-2	IP2 WCDOH Vapor Extractor Air Permit was renewed and now expires 12/31/09.
139	E-6	Table E-2	Add footnote for IP3 Vapor Extractor Air Permit that states, "Application has been submitted to WCDOH, but a permit has not yet been issued"
140	E-6	Table E-2	IP3 WCDOH Petroleum Bulk Storage Registration Certificate was renewed and now expires 09/07/2010.
141	E-6	Table E-2	IP2 South Carolina Radwaste Transport Permit is no longer needed as Barnwell is closed to non-compact members.
142	E-6	Table E-2	IP3 South Carolina Radwaste Transport Permit is no longer needed as Barnwell is closed to non-compact members.
143	E-6	Table E-2	IP2 Tennessee Radioactive Waste License for Delivery is now # T-NY010-L09 and expires 12/31/09.
144	E-6	Table E-2	IP3 Tennessee Radioactive Waste License for Delivery is now # T-NY005-L09 and expires 12/31/09.
145	E-89	27	Only Roseton has River Miles (RMs) noted when other power plants on river do not. There is no reason to identify and single out particular plants other than Indian Point.

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40-iii-ED contd.

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INDIAN POINT DRAFT SEIS SUBSTANTIVE COMMENTS

	Page #	Line #	Comment	
146	E-98	22-24	Replace sentence with: Entergy Nuclear Operations, Inc. (Entergy) currently conducts no monitoring program to record entrainment at IP2 and IP3, as no NYSDEC current monitoring requirements have been imposed; therefore, any entrainable life stages of the shortnose sturgeon taken in recent years would go unrecorded.	40-iii-ED contd.
147	E-98	16-20	Survival of shortnose sturgeon would be expected to be comparable to that observed for striped bass (91%; Fletcher 1990). Moreover, based on field experience with gill nets, a comparatively harsh method of capture, shortnose sturgeon in good condition at the time of first capture by gill nets exhibit high survival, indicating comparably high survival of these fish if impinged on the Ristroph screens and return system installed and operated at Indian Point. As such, and consistent with the information presented in Section 3.0 and Appendix A of the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3 describing the robust population of shortnose sturgeon in the Hudson River, potential impacts to this species in the FSEIS should be SMALL.	40-jjj-AE
148	E-99	21-26	The thermal modeling is not a "worst-case scenario" since that designation implies that it is theoretically possible. In fact, the scenario is impossible to achieve based on the fundamental tidal processes occurring in the river at the site. The FSEIS should state that, without further modeling and disregarding the flawed supplementary modeling, it is not possible to conclude that the SPDES permit conditions would be violated, nor that a negative impact to shortnose sturgeon would occur. As such, potential thermal impacts in the FSEIS should be SMALL. (See Section 5 of ASA's DSEIS response.)	
149	F-2	Table F-1	Change under the Comment column for Ground water quality degradation (saltwater intrusion), "IP2 and IP3 do not use for any purpose" to "IP2 and IP3 do not use groundwater for any purpose".	40-kkk-AL
150	G-3	Table G-1	The last entry for IP3 (loss of essential service water) should be 1.8×10^{-6} rather than 1.9×10^{-6}	
151	G-4	Table G-2	The entries for In-vessel steam explosion for IP2 and IP3 are 1 and 0, respectively. This appears to be due to rounding up or down at 0.5%. However, this is not consistent with the treatment for Intact Containment and may lead to confusion since the percentages for IP2 no longer add up to 100%. Suggest that the percentage for In-vessel steam Explosion be shown as "<1" for both IP2 and IP3.	
152	G-4	Table G-2	The total population dose for IP3 is 24.5 rather than 24.3. Suggest changing "22.0" and "24.3" to "22" and "24" for IP2 and IP3, respectively.	
153	G-14	5-6	Parenthetical information indicates that gas turbine and AFW components are located in "sheet metal clad structures". It should list EDG components rather than AFW components. ER Section E.1.3.3.1 indicates that the high wind analysis resulted in proposal of an enhancement to upgrade the EDG building.	40-III-ED/SM

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INDIAN POINT DRAFT SEIS SUBSTANTIVE COMMENTS

	Page #	Line #	Comment
154	G-17	22-25	Change the text to read "The information was derived from Westinghouse Electric Company, Core Radiation Sources to Support IP2 Power Uprate Project, CN-REA-03-4 (3/7/2005), and Westinghouse Electric Company, Core Radiation Sources to Support IP3 Stretch Power Uprate (SPU) Project, CN-REA-03-40 (5/19/2005)". (See the response to RAI 4a in reference Entergy 2008A.)
155	G-21	32-34	Text states that a modification to replace the existing gas turbines with an IP2 SBO/Appendix R diesel is planned for the near future. In fact, installation of this diesel was made a condition of acceptance of the LRA for review. The diesel was installed and operational prior to 4/30/08. See Entergy letter NL-08-074, Indian Point, Units 2 and 3, Amendment 4 to License Renewal Application (LRA), April 30, 2008 (ML081280491).
156	G-25	Table G-6	Change population dose risk reduction from "18" to "1" for IP2 SAMA 56. The value is 0.45 (see ER Table E.2-2).
157	G-25	Table G-6	Change population dose risk reduction from "20" to "40" for IP2 SAMA 66. The value is 40.45 (see ER Table E.2-2).
158	G-30	10-15	Text states that Entergy identified 5 potentially cost-beneficial SAMAs for IP2 in the baseline analysis and two additional (44 and 56) when uncertainties are considered. ER Table 4-4 (pg 4-74) indicates that SAMA 28 was not cost-beneficial without accounting for uncertainty. FSEIS should state that Entergy identified 4 potentially cost-beneficial SAMAs for IP2 in the baseline analysis and three additional (28, 44, and 56) when uncertainties are considered.
159	G-30	25-28	See comment #158 for page G-30, lines 10-15. For consistency with SAMAs 44 and 56, SAMA 28 should be annotated "(cost beneficial with uncertainties)".
160	G-32	31-33	The overall multiplier shown has been rounded to one decimal place for each unit: "(i.e. 3.8x2.1=8.0 for IP2 and 5.5x1.4=7.7 for IP3)". While not incorrect, this does create a slight apparent disconnect with the description, which states that the multiplier of 8 slightly exceeds the (actual calculated value). Suggest keeping the second decimal (as follows) to provide some clarification: "(i.e. 3.80x2.10=7.98 for IP2 and 5.53x1.40=7.73 for IP3)".

40-III-ED/SM contd.

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INDIAN POINT DRAFT SEIS SUBSTANTIVE COMMENTS

	Page #	Line #	Comment
161	H-2	16-17	Evaluations of the prototype and installed Ristroph screens and fish return system at IP2 and IP3 (separately and then together) continued annually at each facility from 1985 through 1998 to validate the performance of the installed return system and verify that installation maximized screen performance and minimized reimpingement. Those survival estimates were obtained from full field studies/testing during normal operations. If this information is accounted for, the FSEIS must find a SMALL impact on all species. Table 1 of the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3 demonstrates projected reductions in annual average impingement losses from 1974-1990 are 82% for IP2 and IP3 at each facility. See chronology of impingement studies presented in Section 2.2 and Table 1 of the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3.
162	H-6 H-17	12-14 38-40	Paragraph indicates that applicant, NYSDEC, and non-governmental groups have evaluated data on fish abundance and the latter two have expressed the opinion that "entrainment of juvenile and adult fish at Indian Point is contributing to the decline, destabilization, and ultimate loss of these important aquatic resources." To our knowledge, neither NYSDEC nor the non-governmental groups have produced any analysis that supports this statement.
163	H-8	33	The statistical statement is in error. If the slope applies to 1985-1990 as stated, "n" could not be 16 because only 6 data points are included in the stated time frame. NRC should check their statistical analysis of the data in Figure 1.
164	H-8	37	NRC mischaracterized the impingement count data from Figure H-1. In addition to low impingement in 1984 and 1990, impingement counts were also approximately 1 million or less in 1976, 1982, 1983, 1985, and 1986. The text should be corrected to present a more accurate description of impingement trends.
165	H-9	19-20	The statement that "decrease in the percent of RIS impinged and total impingement would suggest that RIS and all other taxa within the vicinity of IP2 and IP3 have decreased from a high in 1977..." is not supported by Figures H-1 and H-2. The observed decline in percent RIS and total impingement could be generated by a change in RIS in the Indian Point region without any change in abundance of non-RIS. NRC should not put forth interpretations that are not founded in the data presented.
166	H-10	12-14	The statement attributed to Greenwood is incorrect. Greenwood's reference does not mention Indian Point

40-mmm-AE

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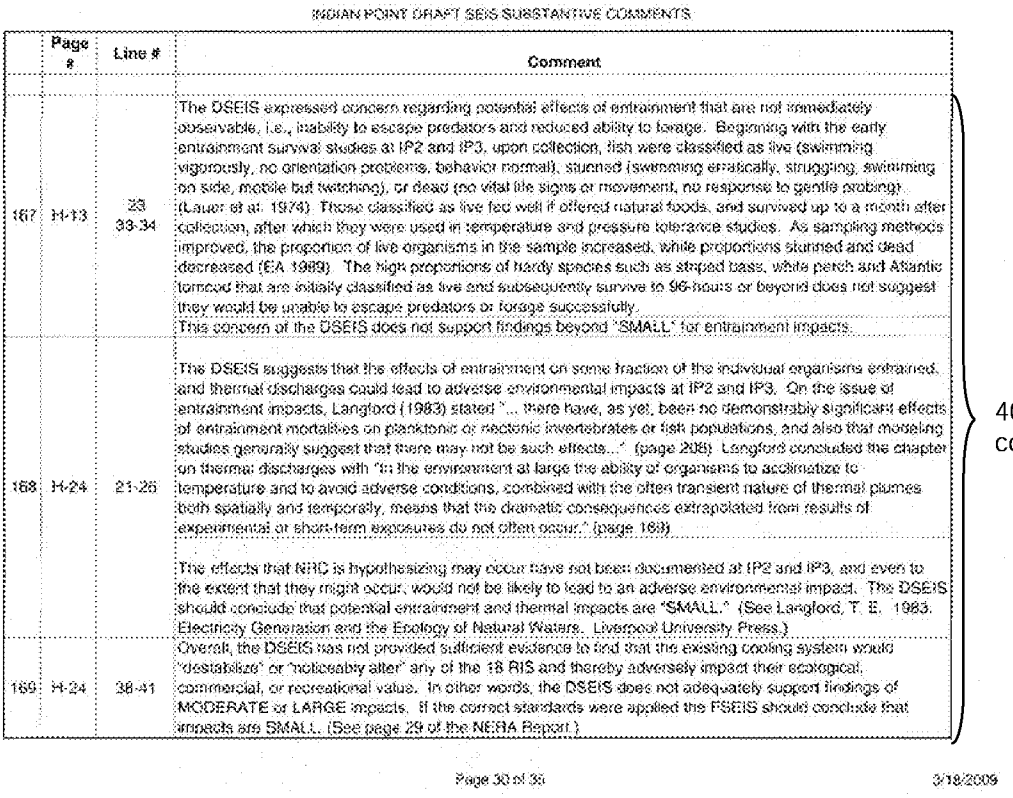

INDIAN POINT DRAFT SEIS SUBSTANTIVE COMMENTS

	Page #	Line #	Comment
167	H-13	23 33-34	The DSEIS expressed concern regarding potential effects of entrainment that are not immediately observable, i.e., inability to escape predators and reduced ability to forage. Beginning with the early entrainment survival studies at IP2 and IP3, upon collection, fish were classified as live (swimming vigorously, no orientation problems, behavior normal), stunned (swimming erratically, struggling, swimming on side, motile but twitching), or dead (no vital life signs or movement, no response to gentle probing) (Lauer et al. 1974). Those classified as live fed well if offered natural foods, and survived up to a month after collection, after which they were used in temperature and pressure tolerance studies. As sampling methods improved, the proportion of live organisms in the sample increased, while proportions stunned and dead decreased (EA 1989). The high proportions of hardy species such as striped bass, white perch and Atlantic tomcod that are initially classified as live and subsequently survive to 96-hours or beyond does not suggest they would be unable to escape predators or forage successfully. This concern of the DSEIS does not support findings beyond "SMALL" for entrainment impacts.
168	H-24	21-26	The DSEIS suggests that the effects of entrainment on some fraction of the individual organisms entrained, and thermal discharges could lead to adverse environmental impacts at IP2 and IP3. On the issue of entrainment impacts, Langford (1983) stated "... there have, as yet, been no demonstrably significant effects of entrainment mortalities on planktonic or nectonic invertebrates or fish populations, and also that modeling studies generally suggest that there may not be such effects..." (page 208) Langford concluded the chapter on thermal discharges with "In the environment at large the ability of organisms to acclimatize to temperature and to avoid adverse conditions, combined with the often transient nature of thermal plumes both spatially and temporally, means that the dramatic consequences extrapolated from results of experimental or short-term exposures do not often occur." (page 168) The effects that NRC is hypothesizing may occur have not been documented at IP2 and IP3, and even to the extent that they might occur, would not be likely to lead to an adverse environmental impact. The DSEIS should conclude that potential entrainment and thermal impacts are "SMALL." (See Langford, T. E. 1983. Electricity Generation and the Ecology of Natural Waters. Liverpool University Press.)
169	H-24	38-41	Overall, the DSEIS has not provided sufficient evidence to find that the existing cooling system would "destabilize" or "noticeably alter" any of the 18 RIS and thereby adversely impact their ecological, commercial, or recreational value. In other words, the DSEIS does not adequately support findings of MODERATE or LARGE impacts. If the correct standards were applied the FSEIS should conclude that impacts are SMALL. (See page 29 of the NERA Report.)

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40-mmm-AE contd.

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INDIAN POINT DRAFT SEIS SUBSTANTIVE COMMENTS

	Page #	Line #	Comment
169	H-25	1-6	Without an operational definition of stability, it is not possible to determine when the ecosystem has been or could be "destabilized". Peters (1991) stated that stability "is a 'pseudo-cognate' because a meaning for the term is grasped intuitively, without the onerous necessity of operational definition. Regrettably, different scientists intuit different meanings and failure to define this term has ended in a terminological and conceptual morass." (pages 95-96) NRC has not defined stability, but instead uses variability, which is typically large in temperate estuarine systems, as a measure of instability. The FSEIS, if it retains stability as part of the classification criteria, should define stability and rigorously apply that definition. Variability alone is not necessarily indicative of instability, and with the statistical problems in NRC's definition (See Section 4.1.3 of the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3.), does not support impingement and entrainment findings greater than SMALL impact. (Peters, R. H. 1991. A Critique for Ecology. Cambridge University Press)
170	H-27 H-29	28-43 8-12	The DSEIS provides no citations to instances where entrainment and impingement "alters food web dynamics and produces indirect effects that may result in decreased recruitment, changes in predator-prey relationships, changes in population feeding strategies, or movements of populations closer or farther away from the cooling system intakes and discharges." Such theoretical potential impacts have not been documented in the established scientific literature. (See Langford 1983, cited in comment 167). As such, reliance on theoretical impacts should be eliminated from the FSEIS.
171	H-28	14-28	NRC has provided no precedent, nor any theoretical justification, for use of the ratio of ranks being proposed as a measure of strength of connection is meaningful to determining potential for adverse impact. The FSEIS should establish a reliable basis for this metric. (See Section 4.2 and Attachment 2 of Appendix D of the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3.)
172	H-29	18	The DSEIS claims that impingement density in proportion to river density is indicative of a medium strength of connection. The assessment of strength of connection should consider the relationship between the entire fish population and IP, not simply the relationship between IP and the small portion of the population in the region adjacent to IP. Not considering the entire population can lead to erroneous conclusions. Correctly accounting for population magnitudes supports that conclusion that impacts are SMALL. (See Section 4.2 and Attachment 2 of Appendix D of the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3.)

40-mmm-AE contd.

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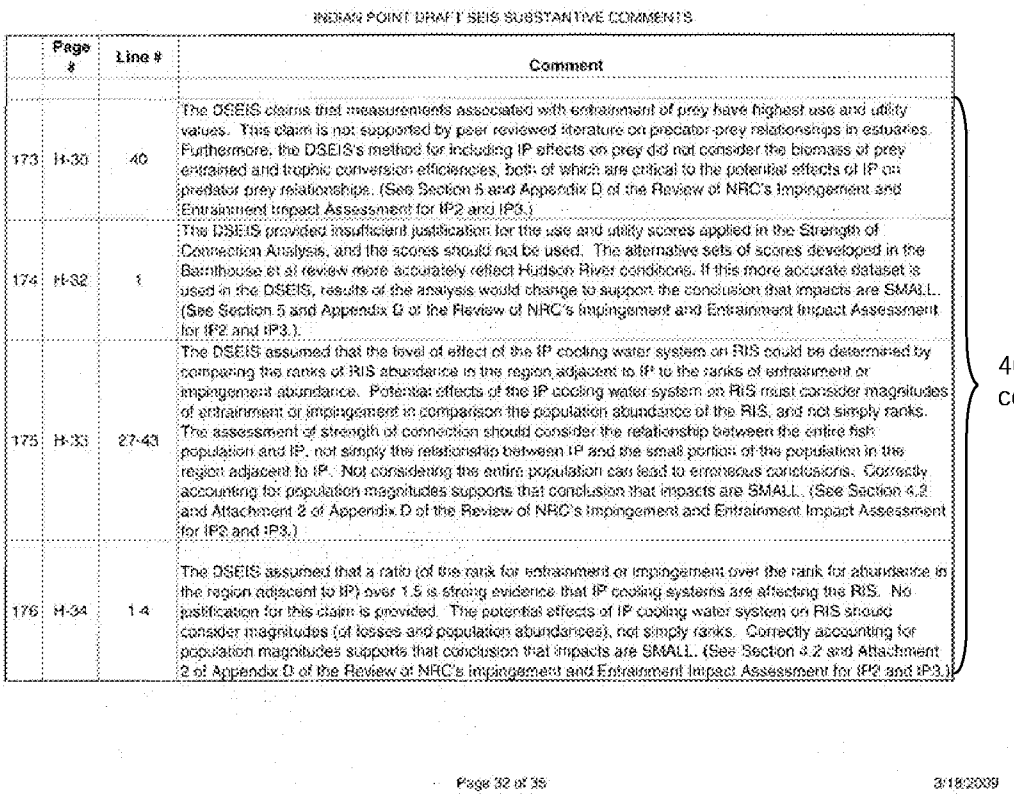

INDIAN POINT DRAFT SEIS SUBSTANTIVE COMMENTS

	Page #	Line #	Comment
173	H-30	40	The DSEIS claims that measurements associated with entrainment of prey have highest use and utility values. This claim is not supported by peer reviewed literature on predator-prey relationships in estuaries. Furthermore, the DSEIS's method for including IP effects on prey did not consider the biomass of prey entrained and trophic conversion efficiencies, both of which are critical to the potential effects of IP on predator prey relationships. (See Section 5 and Appendix D of the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3.)
174	H-32	1	The DSEIS provided insufficient justification for the use and utility scores applied in the Strength of Connection Analysis, and the scores should not be used. The alternative sets of scores developed in the Barnthouse et al review more accurately reflect Hudson River conditions. If this more accurate dataset is used in the DSEIS, results of the analysis would change to support the conclusion that impacts are SMALL. (See Section 5 and Appendix D of the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3.)
175	H-33	27-43	The DSEIS assumed that the level of effect of the IP cooling water system on RIS could be determined by comparing the ranks of RIS abundance in the region adjacent to IP to the ranks of entrainment or impingement abundance. Potential effects of the IP cooling water system on RIS must consider magnitudes of entrainment or impingement in comparison the population abundance of the RIS, and not simply ranks. The assessment of strength of connection should consider the relationship between the entire fish population and IP, not simply the relationship between IP and the small portion of the population in the region adjacent to IP. Not considering the entire population can lead to erroneous conclusions. Correctly accounting for population magnitudes supports that conclusion that impacts are SMALL. (See Section 4.2 and Attachment 2 of Appendix D of the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3.)
176	H-34	1-4	The DSEIS assumed that a ratio (of the rank for entrainment or impingement over the rank for abundance in the region adjacent to IP) over 1.5 is strong evidence that IP cooling systems are affecting the RIS. No justification for this claim is provided. The potential effects of IP cooling water system on RIS should consider magnitudes (of losses and population abundances), not simply ranks. Correctly accounting for population magnitudes supports that conclusion that impacts are SMALL. (See Section 4.2 and Attachment 2 of Appendix D of the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3.)

40-mmm-AE contd.

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INDIAN POINT DRAFT SEIS SUBSTANTIVE COMMENTS

	Page #	Line #	Comment	
177	H-37 I-40	18-25 16-19	The DSEIS strength of connection analysis contained numerous inconsistencies and inappropriate uses of the Hudson River and IP data. The DSEIS used the sum of density (i.e., number of fish per unit volume) from the FJS and catch per haul (i.e., number of fish per unit area) from the BSS as an estimate of population abundance in vicinity of IP. Density (from the FJS) and catch per haul (from the BSS) are not additive metrics of abundance. Correcting those inconsistencies and inappropriate uses of data materially changed the results of the NRC analysis. The corrected results support the conclusion that impacts are SMALL. (See Section 4.2 of the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3.)	40-mmm-AE contd.
178	H-41	15-17	Shortnose sturgeon were caught in sufficient numbers for independent researchers to develop a reliable index of abundance based on the Fall Juvenile Fish Survey (Woodland 2008 and Secor). See the comment on pages 4-18 of the DSEIS and the analysis of shortnose sturgeon presented in the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3.	40-nnn-AE
179	H-45	8-11	The DSEIS stated that the concordance of ranks (entrainment or impingement vs. fish abundance in the region adjacent to IP) can be used to evaluate how efficient the IP water intake structures are at removing RIS from the river. The statement is incorrect. The concordance of ranks provides no information on the proportion of the river abundance of a fish stock that is removed. Correctly accounting for population magnitudes supports the conclusion that impacts are SMALL. (See Section 4.2 and Attachment 2 of Appendix D of the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3.)	
180	H-45	13-16	The DSEIS strength of connection analysis contained numerous inconsistencies and inappropriate uses of the Hudson River and IP data. The DSEIS claims that a higher rank in impingement, compared to abundance rank in river, is strong evidence that the operation of the cooling systems is affecting a species. The statement is incorrect. Because the rank of each RIS is not independent of the ranks of the other RIS, an increase in the river abundance for one species will cause a decrease in the river abundance ranks for other species. Therefore, without any increase in impingement, some species may have a higher rank in impingement than in the river. (See Section 4.2 and Appendix C of the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3.)	
181	H-51	39-41	These were conclusions from the AEI report, supported by rigorous data analysis, not hypotheses. Replace "hypotheses" with "conclusions". (Barnthouse et al. 2008)	40-ooo-AE/ED
182	H-52	14-23	The DSEIS trends analysis was limited to segment 12 (Albany), so the conclusions apply only to segment 12, and not to the IP segment of the Hudson. The relevance to License Renewal has not been demonstrated and has not been attributed to Indian Point.	

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INDIAN POINT DRAFT SEIS SUBSTANTIVE COMMENTS

	Page #	Line #	Comment	
183	H-54	18-19	The conclusion in Barnthouse et. al 2008 regarding the decline in American shad abundance is supported by NYSDEC and ASMFC assessments concluding that excessive mortality of subadult and adult shad is responsible for the decline in shad abundance in the Hudson and other east coast populations.	40-ooo-AE/ED contd.
184	I-11 to I-30	Figures I-3, I-4, I-5, I-12, I-13, I-14	The criteria for deciding to analyze the pre- and post-1985 FSS data is faulty. Any gear effect (difference in catching efficiency of epibenthic sled and beam trawl) would be real and consistent across all FSS data sets. The DSEIS has separated the two gear types inconsistently from one analysis to another, depending on whether CPUE or density was being analyzed and whether data were only for Segment 4 or the whole river. The FSEIS should properly address these important datasets.	40-ppp-AE/CE
185	I-41	3-10	The DSEIS strength of connection analysis contained numerous inconsistencies and inappropriate uses of the Hudson River and IP data. The DSEIS claims that the number impinged divided by sample size was a measure of density. However, that metric of density is confounded by changes in sampling intensity that are unrelated to impingement density. The strength of connection analysis contained numerous inconsistencies and inappropriate uses of the Hudson River and IP data. Correcting these inconsistencies and inappropriate uses of data materially changed the results of the NRC analysis. The corrected results support the conclusion that impacts are SMALL. (See Section 4.2 and Appendix C of the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3.)	
186	I-41	11-15	The DSEIS strength of connection analysis contained numerous inconsistencies and inappropriate uses of the Hudson River and IP data. The DSEIS claims that the number entrained divided by sample size was a measure of density. However, that metric of density is confounded by changes in sampling intensity that are unrelated to impingement density. Furthermore, the actual method used in the DSEIS was also confounded by winter sampling that occurred in one year only. The strength of connection analysis contained numerous inconsistencies and inappropriate uses of the Hudson River and IP data. Correcting those inconsistencies and inappropriate uses of data materially changed the results of the NRC analysis. The corrected results support the conclusion that impacts are SMALL. (See Section 4.2 and Appendix C of the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3.)	

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INDIAN POINT DRAFT SEIS SUBSTANTIVE COMMENTS

	Page #	Line #	Comment
187	I-41	23-36	The DSEIS claims that YOY striped bass are an important prey item for spottail shiner. That claim is not supported by the scientific literature. The reference provided in the DSEIS to support this claim was a laboratory study of starved spottail shiner that were only given striped bass YOY (larvae) to eat. The same study found no striped bass YOY in the stomachs of spottail shiner in the wild. (See Appendix D of the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3.)
188	I-8 I-14	13-15 11-12	The DSEIS has incorrectly applied the Normal distribution to assess instability. The DSEIS stated that for a Normal distribution, 32% of observations would be outside a +/- 1 standard deviation band. 32% is actually an expectation, not a fixed value. Sampling from a Normal distribution might actually have a higher or lower percentage of observations outside the band, and the percentage would be more variable for smaller sample sizes. Thus, for a data set of 25 or so observations, there is a not insignificant probability that at least 40% of the observations would lie outside the +/- 1 SD band even if there is no change in either the mean or level of variation. This probability biases the analysis of potential impacts toward overestimating the degree of potential impact. With proper selection of variability bounds, to the extent that variability can be shown to be useful criterion for assessing impact at all, the FSEIS should produce more accurate information about potential impacts. (See Section 4.1.3 of the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3.)
189	App I		The DSEIS attempted to achieve convergence of their segmented regression estimates by eliminating data points that were outliers or otherwise deemed to be hindering convergence of the algorithm. There are many other actions that could have been taken to see if convergence could be achieved, such as revising initial parameter estimates, using another method for the search, and/or changing search parameters. Even if convergence was not achieved, the estimates might still be valid and useful. However, the DSEIS deleted data points deemed to be outliers, which typically were years of higher abundance. These deleted data points, although statistical outliers, may well have been valid points that reflect the highly variable pattern of recruitment that is seen in many fish species. By deleting these data points, the DSEIS may have biased the slope estimates and also biased the impact classification by achieving significance to the slope as a result of deleting data that don't fit the regression model. The FSEIS should reconsider omission of purported outlying data points.

40-ppp-AE/CE contd.

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Stenographic Comments

1

INDIAN POINT DRAFT SEIS - TYPOGRAPHICAL COMMENTS

	Page #	Line #	Comment
1	General Comment		Inconsistent use of English vs. metric units. In some places, metric units are listed first and in others English units are listed first. In other instances, either the metric or English unit is given, but not the corresponding unit for the other system. Information should be provided in English units with metric units in parentheses. This is throughout the document.
2	General Comment		The degree symbol is shown in the Abbreviations and Acronyms list and should not be written out as degrees. This is throughout the document.
3	General Comment		Inconsistent use of abbreviations, acronyms, and scientific names of species versus common names.
4	General Comment		Both tons and tonnes are used to describe metric tons. The proper usage in the United States is metric tons.
5	General Comment		There are two cooling systems for IP2 and IP3 - one for each unit. The text needs to be changed to reflect that. Both system and systems are used to describe the cooling systems. This is throughout the document.
6	ix	NA	Make the following change: "Figure 2-6 IP3 intake structure".
7	x	NA	Table 2-3 has Table 2-3 in the heading and the title. Title Table 2-3 needs to be removed.
8	xxv	2	R-EMF should be R-EMAF.
9	1-1	27	After 1974, add, "and is currently in SAFSTOR."
10	1-1	28	Change "Entergy, Entergy Nuclear Indian Point 2, LLC " to "Entergy Nuclear Operations, Inc., Entergy Nuclear Indian Point 2, LLC " in the EIS we said that the Entergy Nuclear Operations, Inc. and the two LLC plants would be referred to collectively as Entergy, but not that Entergy Corporation was a joint applicant.
11	1-2	31	Change Table E-1 to "Tables E-1 and E-2".
12	1-6	41-42	There should not be a qualifier on the amount of electricity generated by IP3, as there is not a qualifier for the amount generated by IP2.
13	2-1	13	After shut down, add "and is currently in SAFSTOR."
14	2-5	15	Insert "immediately" after " is located".
15	2-6	4	There is no Entergy "2008a" shown in the Section 2.3 references. Change "Entergy 2008a" to "Entergy 2008" to be consistent with how it's shown in the Section 2.3 references.
16	2-11	NA	Make the following change: "Figure 2-6 IP3 intake structure".
17	2-13	36	The DSEIS contains a math error that inadvertently overstates total service water flows through IP3. Please change 170 m^3/s to 0.378 m^3/sec because 1.1 cfs or 5,000 gpm converts into 0.3786 m3/sec not 170 m3/sec. This should be corrected in the FSEIS.

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40-qqq-ED

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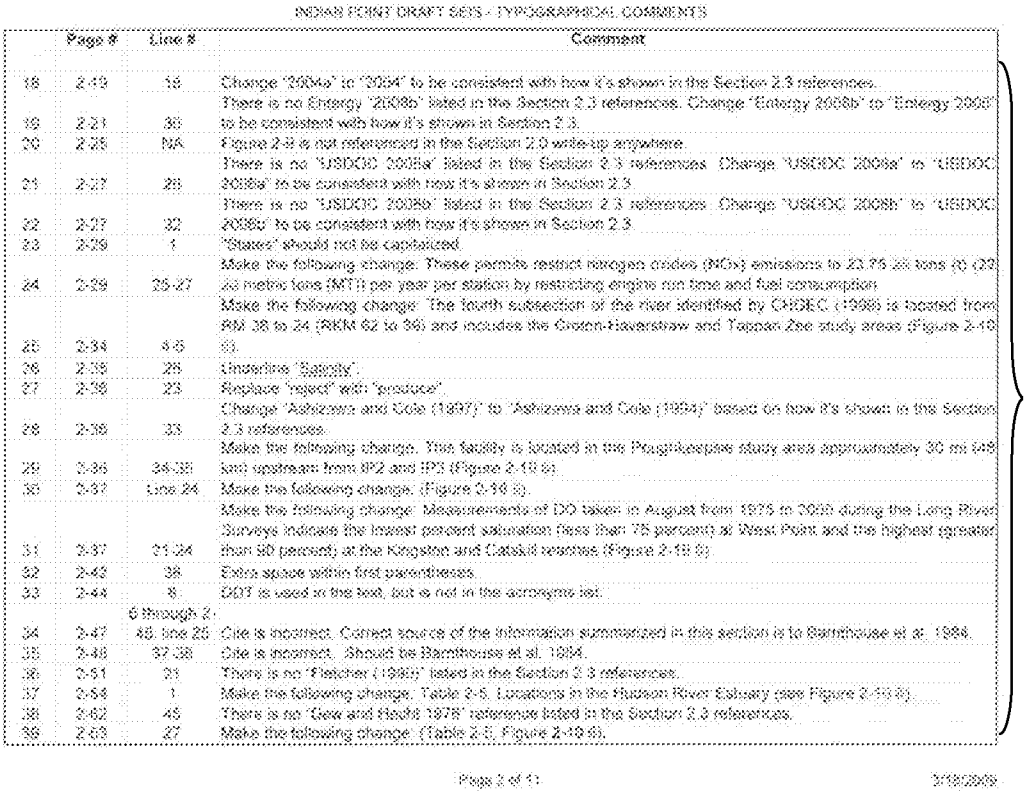

INDIAN POINT DRAFT SEIS - TYPOGRAPHICAL COMMENTS

	Page #	Line #	Comment
18	2-19	18	Change "2004a" to "2004" to be consistent with how it's shown in the Section 2.3 references.
19	2-21	30	There is no Entergy "2008b" listed in the Section 2.3 references. Change "Entergy 2008b" to "Entergy 2008" to be consistent with how it's shown in Section 2.3.
20	2-25	NA	Figure 2-9 is not referenced in the Section 2.0 write-up anywhere.
21	2-27	28	There is no "USDOC 2008a" listed in the Section 2.3 references. Change "USDOC 2008a" to "USDOC 2008" to be consistent with how it's shown in Section 2.3.
22	2-27	32	There is no "USDOC 2008b" listed in the Section 2.3 references. Change "USDOC 2008b" to "USDOC 2008" to be consistent with how it's shown in Section 2.3.
23	2-29	1	"States" should not be capitalized.
24	2-29	25-27	Make the following change: These permits restrict nitrogen oxides (NOx) emissions to 23.75 US tons (0.(22 US metric tons (MT)) per year per station by restricting engine run time and fuel consumption.
25	2-34	4-5	Make the following change: "The fourth subsection of the river identified by CHDEC (1998) is located from RM 38 to 24 (RKM 62 to 39) and includes the Croton-Haverstraw and Tappan Zee study areas (Figure 2-19 6)."
26	2-35	28	Underline "Salinity".
27	2-35	23	Replace "reject" with "produce".
28	2-36	33	Change "Ashizawa and Cole (1997)" to "Ashizawa and Cole (1994)" based on how it's shown in the Section 2.3 references.
29	2-36	34-38	Make the following change: This facility is located in the Poughkeepsie study area approximately 30 mi (48 km) upstream from IP2 and IP3 (Figure 2-19 6).
30	2-37	Line 24	Make the following change: (Figure 2-19 6).
31	2-37	31-34	Make the following change: Measurements of DO taken in August from 1975 to 2000 during the Long River Surveys indicate the lowest percent saturation (less than 75 percent) at West Point and the highest (greater than 90 percent) at the Kingston and Catskill reaches (Figure 2-19 6).
32	2-43	38	Extra space within first parentheses.
33	2-44	8	DOT is used in the text, but is not in the acronyms list.
34	2-47	6 through 2-48, line 25	Cite is incorrect. Correct source of the information summarized in this section is to Barnthouse et al. 1984.
35	2-48	37-38	Cite is incorrect. Should be Barnthouse et al. 1984.
36	2-51	21	There is no "Fletcher (1990)" listed in the Section 2.3 references.
37	2-54	1	Make the following change: Table 2-5, Locations in the Hudson River Estuary (see Figure 2-19 6).
38	2-62	45	There is no "Gear and Haufe 1979" reference listed in the Section 2.3 references.
39	2-63	27	Make the following change: (Table 2-5, Figure 2-19 6).

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40-qqq-ED contd.

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INDIAN POINT DRAFT SEIS - TYPOGRAPHICAL COMMENTS

	Page #	Line #	Comment
40	2-68	27	Make the following change: Figure 2-48 (i).
41	2-68	27	Change runs to run. Stretch is plural.
42	2-74	43-44	Sentence which begins "Juveniles eat larger..." is out of place and should be the last sentence of the previous paragraph.
43	2-75	14	Callinectes sapidus should be in italics.
44	2-76	39 and 34	There is no "NMFS 2007" reference listed in the Section 2.3 references.
45	2-76	44	Extra ")" after 127.
46	2-77	6	There is no "Peterson et al. (2008)" reference listed in the Section 2.3 references.
47	2-78	39	Make the following change: (Figure 2-16 (i).
48	2-80	2	The scientific name of eel grass has been used used on line 37 of page 2-79. The common name should be used from this point on.
49	2-80	3	The scientific name of water chestnut has been used used on line 37 of page 2-79. The common name should be used from this point on.
50	2-83	26-27	Change "EPA 2007" to "EPA 2007a" to be consistent with how it's listed in the Section 2.3 references.
51	2-107	32-33	There is no need for the note in parentheses. Other reports/documents noted within the draft SEIS are available from the NRC, but this is the only one noted as such.
52	2-107	36 and 37	There is no "Entergy 2008c" reference listed in the Section 2.3 references.
53	2-107	44	There is no "NRC 2008" reference listed in the Section 2.3 references.
54	2-108	20-21	There is no "Entergy 2008d" reference listed in the Section 2.3 references.
55	2-108	30	There is no "NYSDEC 2007d" reference listed in the Section 2.3 references.
56	2-111	Table 2-7	The total for the Percentage of Total column equals 100.1 rather than 100.
57	2-113	28 and 29- 29	There is no "CCWD no date" reference listed in the Section 2.3 references. However, Section 2.3 does show a "CCWD 2006" reference. Does the "CCWD no date" need to be changed to "CCWD 2006" or does another reference need to be added to Section 2.3?
58	2-117	NA	Footnote b to Table 2-10 needs a "." at the end of the sentence.
59	2-119	6	Based on the Section 2.3 references, need to change "USDA 2002d" to "USDA 2002e" which pertains to the "Census of Agriculture."
60	2-122	Table 2-12	For Orange county, totals of all percentages equal 99.9%. For Putnam county, totals of all percentages equal 99.9%. For Westchester county, totals of all percentages equal 99.9%.
61	2-123	Table 2-13	For Dutchess county, totals of all percentages equal 99.8%. For Putnam county, totals of all percentages equal 99.9%. For Westchester county, totals of all percentages equal 99.9%.
62	2-124	Table 2-14	In list of New York counties, is there a reason a line is between Rockland and Suffolk? If not, it should be removed.

40-qqq-ED contd.

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INDIAN POINT DRAFT SEIS - TYPOGRAPHICAL COMMENTS

	Page #	Line #	Comment
63	2-126	Table 2-15	In list of New York counties, is there a reason a line is between New York and Orange? If not, it should be removed.
64	2-129	16	"40 percent" should be "39 percent" (See item on Table 2-18)
65	2-129	20	There is no "NYSOSC 2007" reference listed in the Section 2.3 references.
66	2-129	25	There is no "NYSERDA 2007" reference listed in the Section 2.3 references.
67	2-129	35	"43 percent" should be "44 percent" (See item on Table 2-18).
68	2-130	Table 2-18	In column "Percent of Total Revenue", the percentages for Buchanan should be 40, 44, 39, 39. The 2nd and the 4th numbers are being changed.
69	2-131	Table 2-18	For Paleo-Indian Period, it should be 10,000 - 7000 BC as that is what is stated in line 8 on page 2-131
70	2-134	14	Change "&" to "and"
71	2-137	25	There is no "EPA 2008d" reference listed in the Section 2.3 references.
72	2-137	32	Change "NOAA 2007b" to "NOAA 2007" to be consistent with how the reference is listed in Section 2.3
73	2-137	37 and 39	There is no "NYSDOS undated" reference listed in the Section 2.3 references.
74	2-138	15-17 20-21 34-37	The following are not referenced in the Section 2.0 write-up: "40 CFR Part 264", "32 FR 4001" and "72 FR 69033".
75	2-139	38	Change "Atlantic States Marine Fisheries Commission (ASMFC). "2006 Weakfish Stock Assessment....." to "Atlantic States Marine Fisheries Commission (ASMFC). 2006c "2006 Weakfish Stock Assessment..." to be consistent with how it's shown in the Section 2.0 write-up.
76	2-140	3-7	"ASMFC 2007a" is not referenced in the Section 2.0 write-up.
77	2-147	13-17	The following are not referenced in the Section 2.0 write-up: "Hirschberg et al 1996" and "Howard 2001".
78	2-150	11	"NSSI, 2008" is not referenced in the Section 2.0 write-up.
79	2-153	26-31	The following are not referenced in the Section 2.0 write-up: "NRC 2006" and "NRC 2007".
80	2-156	17-18	"Snow 1995" is not referenced in the Section 2.0 write-up.
81	3-5	16	Underline on bulleted text is not complete.
82	3-6	28	Header of line should be underlined - "Public services ... recreation."
83	3-8	29-31	Need to clarify what table is being referred to in this sentence: A table summarizing the attainment status of the counties within the immediate area of IP2 and IP3 shows nonattainment of the National Ambient Air Quality Standards (NAAQS) for 8-hour ozone in Dutchess, Orange, Putnam, Rockland, and Westchester Counties.
84	3-8	40	Delete "Part" after "40 CFR"

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40-qqq-ED contd.

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INDIAN POINT DRAFT SEIS - TYPOGRAPHICAL COMMENTS

	Page #	Line #	Comment
84	3-12	30	There is no "(Enercon 2006)" listed in the Section 3.4 references.
85	3-14	3-6	Make the following change: Entergy Nuclear Operations, Inc. (Entergy). 2007. "Applicant's Environmental Report, Operating as License Renewal Stage." (Appendix E of IP2 and IP3, Units 2 and 3, License Renewal Application"). April 23, 2007. Agency wide Documents Access and Management System (ADAMS) Accession No. ML071210530.
86	4-2	4	Operation should be operations, as the discussion is about 2 separate systems.
87	4-5	28-29	Underline "Losses from predation, parasitism, and disease among organisms exposed to sublethal"
88	4-11	2 and 4	Change the "Entergy 2007b" reference designation to "Entergy 2007c" since there are currently two "Entergy 2007b" references listed in the Section 4.10 references.
89	4-12	26	Change the "Entergy 2007b" reference designation to "Entergy 2007c" since there are currently two "Entergy 2007b" references listed in the Section 4.10 references.
90	4-13	35	Change the "Entergy 2007b" reference designation to "Entergy 2007c" since there are currently two "Entergy 2007b" references listed in the Section 4.10 references.
91	4-14	8	Change the "Entergy 2007b" reference designation to "Entergy 2007c" since there are currently two "Entergy 2007b" references listed in the Section 4.10 references.
92	4-21	39	Insert "Part" after "E NYCRR".
93	4-21	41	Insert "Part" after "E NYCRR".
94	4-22	20	Insert "Part" after "E NYCRR".
95	4-25	32	Extra space after "93"
96	4-27	11-12	Change the "Entergy 2006" reference in the following sentence to "Entergy 2007c" since the Entergy 2006a reference pertains to the 2005 Annual Radiological Environmental Operating Report. "this matter is still under review before NYSDEC, and may not be resolved before NRC issues a final SEIS (Entergy 2006)."
97	4-27	25	Make the following change: IPP IP2
98	4-29	18	Change "EPA 2008" to "EPA 2008a" to be consistent with how the reference is listed in Section 4.10.
99	4-32	10-11	Underline Impacts of electromagnetic fields (EMFs) on flora and fauna (plants, agricultural crops, honeybees, wildlife, livestock).
100	4-34	11	Change the "Entergy 2008" reference designation to "Entergy 2008a" since there is a "Entergy 2008" and "Entergy 2008b" reference listed in the Section 4.10 references.
101	4-37	18	Underline Public services, public safety, social services, and tourism and recreation.
102	4-38	43	There is no "VERY 2008" listed in the Section 4.10 references.
103	4-40	3	Change "NRC 2007a" to "Entergy 2007a" since "NRC 2007a" pertains to protected species.
104	4-41	25	Change "42" to "44"
105	4-42	27	There is no "ACH 2008" listed in the Section 4.10 references.

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40-qqq-ED contd.

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INDIAN POINT DRAFT SEIS - TYPOGRAPHICAL COMMENTS

	Page #	Line #	Comment
106	4-50	10	There is no "NRC 2008" listed in the Section 4.10 references.
107	4-50	37	There is no "Secor (2007)" listed in the Section 4.10 references.
108	4-51	25	Change the "Entergy 2007d" reference designation to "Entergy 2007c" since there are currently two "Entergy 2007d" references listed in the Section 4.10 references.
109	4-52	Table 4-1	The data source in citation Entergy 2007b that was used to produce Table 4-11 should be clarified. There are two entries for this citation in Section 4.10 References on page 4-69, lines 37-41.
110	4-52	2	Change the "Entergy 2007b" reference designation to "Entergy 2007a" since there are currently two "Entergy 2007b" references listed in the Section 4.10 references.
111	4-52	Table 4-11	In IP3 total entrain, 18 should be changed to 19 and the grand total for that column should be changed to 1975. In the grand total column for the same item, 42 should be changed to 43 and the grand total for that column should change to 4659.
112	4-56	27	There is no "Strayer (2007)" listed in the Section 4.10 references.
113	4-57	25	N3O is not on the acronym list. This is the first usage and needs to be fully written out.
114	4-58	5 and 18	There is no "Kennedy (1990)" listed in the Section 4.10 references.
115	4-58	33	Extra space after "populations)".
116	4-59	9	There is no "Swaney et al. 2006" listed in the Section 4.10 references.
117	4-63	22-30 and 40-41 12-13, 21-22	The following are not referenced in the Section 4.0 write-up: "Abood et al. 2008", "Achman et al. 1998", "ASMFC 2006", and "Baird and Ulanowicz 1989".
118	4-64	25-40	The following are not referenced in the Section 4.0 write-up: "Brosnan and O'Shea 1996", "Cochran 1967", "Con Edison 1976a", "Con Edison 1976b", "Con Edison 1976c", "1978", "1983", and "1984a".
119	4-65	1-3, 7-21 and 24-41	The following are not referenced in the Section 4.0 write-up: "Con Edison 1984b", "Con Edison 1976a", "Con Edison and NYPA 1984", "Con Edison and NYPA 1986", "Con Edison and NYPA 1987", "Con Edison and NYPA 1988", "Con Edison and NYPA 1991", "Daniels et al. 2008", "EA 1981a", "EA 1981b", "EA 1982" and "EA 1984".
120	4-66	3-11	The following are not referenced in the Section 4.0 write-up: "EA 1985" and "EA 1986".
121	4-66	40	Change "2007d" designation to "2007c" since there is already a 2007b designation on Line 37 (Page 4-66).
122	4-67	6	Change "2008" designation to "2008a" since there is a 2008b designation on Line 11.
123	4-67	18-21 25-28 30-35 39-42	The following are not referenced in the Section 4.0 write-up: "EPA 2004", "EPA 2008b", "FWS 2007", "Frank et al. 2007", and "Greenwood 2006".
124	4-68	13-17	"Munch and Conover 2000" is not referenced in the Section 4.0 write-up.

40-qqq-ED contd.

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INDIAN POINT DRAFT SEIS - TYPOGRAPHICAL COMMENTS

	Page #	Line #	Comment
125	4-69	2-6, 20-25 and 36-42	The following are not referenced in the Section 4.0 write-up: "New York Power Authority 1986", "NYSDEC 2007", "Normandeau 1987a", and "Normandeau 1987b".
126	4-70	1-7, 11-18, 20-22 and 40-41	The following are not referenced in the Section 4.0 write-up: "Normandeau 1988", "NEFSC 2006", "NRC 1996", "NRC 1999", "NRC 2006a", and "Riverkeeper 2007".
127	4-71	7-16, 24-28 and 38-39	The following are not referenced in the Section 4.0 write-up: "Secor and Houde 1995", "Shepherd 2006 (Atlantic Striped Bass)", "Shepherd 2006 (Bluefish)", "Snedecor and Cochran 1980", "Steinberg et al. 2004", "Ulanowicz 1995", and "Wolfe et al. 1995".
128	5-2	3	Write out definition of DBA. 1st usage.
129	5-6	Table 5-3	Starting with interfacing systems LOCA, the CDF and % contribution values do not line up with the initiating event names. Suggest aligning the line spacing.
130	5-11	24	Make the following change: Entergy Nuclear Operations, Inc. (Entergy). 2008a.
131	5-11	24	Change "2008" to "2008a" for consistency with citations in text.
132	5-11	28-31	The "Entergy 2008b" is not references in the Section 5.0 write-up.
133	6-3	1-2	Underline <u>Off-site radiological impacts (individual effects from other than the disposal of spent fuel and high-level waste)</u>.
134	6-9	11	Government should not be capitalized.
135	6-10	26-27	"10 CFR Part 63" is not referenced in the Section 6.0 write-up.
136	7-3	2-4	Make the following change: ~~The NRC staff addressed this issue~~ The NRC staff addressed this issue in Sections 2.2.7, 4.3, and 4.5 of this draft supplemental environmental impact statement (SEIS).
137	8-4	30	Delete "Part" after "40 CFR"
138	8-5	6	Change (2007) to (Entergy 2007).
139	8-9	5	Change "small" to "SMALL."
140	8-11	24-26	PM_{10} - the 10 is written as regular script, not subscript. $PM_{2.5}$ - the 2.5 is written as regular script, not subscript.
141	8-21	23	Extra space at beginning of line.
142	8-33	12 and 14	There is no "EIA 2007" reference listed in Section 8.5.
143	8-33	16	There is no "EPACT2005" reference listed in Section 8.5.
144	8-37	20	Remove page break.
145	8-42	25	Line 25 number of construction jobs should be consistent with number of construction jobs listed in line 19.

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40-qqq-ED contd.

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INDIAN POINT DRAFT SEIS - TYPOGRAPHICAL COMMENTS

	Page #	Line #	Comment
146	8-45	Table 8-3	Make the following changes under the Comment column for Air Quality based on information contained on Pages 8-37 (Line 14), 8-38 (Line 28) and 8-39 (line 2). SOx: 5228.5428 MT/yr (5764.5746 tons/yr). NOx: 1230.1428 MT/yr (1302.1581 tons/yr). CO: 1230.1428 MT/yr (1302.1581 tons/yr).
147	8-54	Table 8-4	Make the following change under the Comment column for Air Quality based on information contained on Page 8-49 (Line 42). CO: 93 MT/yr (150.155 tons/yr).
148	8-56	3	Insert "and" after scheduled.
149	8-59	36	There is no "Power Naturally 2008" reference listed in Section 8.5.
150	8-60	43	Is the "DOE/EIA 2007" reference listed on this line referring to "DOE/EIA 2007a" or "DOE/EIA 2007b" shown in Section 8.5?
151	8-61	41	There is no "EIA/DOE 2007a" reference listed in Section 8.5.
152	8-66	28	Insert "each" after 5 MW.
153	8-67	11	Delete "not" and replace with "no".
154	8-71	7	Insert "IP2 and IP3" before site.
155	8-71	13	Extra space at beginning of line.
156	8-71	31-32	Make the following change. As described in Section 8.3.3a of the draft SEIS, a current plan for new transmission lines would impact 1150 ha (2855 ac).
157	8-72	7	Insert "or light industrial" after agriculture.
158	8-72	35	Insert "be" after "unlikely to".
159	8-72	39	Change like to likely.
160	8-74	24-25	Make the following change. As described in Section 8.3.3a of this draft SEIS, new transmission lines would be 305 km (380 mi) long or longer.
161	8-78	2-8	Make the following change. In the draft SEIS, the NRC staff has considered alternative actions to license renewal of IP2 and IP3 including the no-action alternative (discussed in Section 8.2), new generation or energy conservation alternatives (supercritical coal-fired generation, natural gas, nuclear, and conservation alternatives discussed in Sections 8.3.1 through 8.3.4), purchased electrical power (discussed in Section 8.3.3b), alternative power-generating technologies (discussed in Section 8.3.4h), and two combinations of alternatives (discussed in Section 8.3.5g).
162	8-79	35	"Coastal Zone Management Act of 1972 (CZMA)" is not referenced in the Section 8.0 write-up.
163	8-79	39	"DOE 2012" is not referenced in the Section 8.0 write-up.
164	8-80		Make the following change: Entergy Nuclear Northeast (ENN) 2007c since it's shown as ENN 2007 on Page 8-6, Line 28.

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40-qqq-ED contd.

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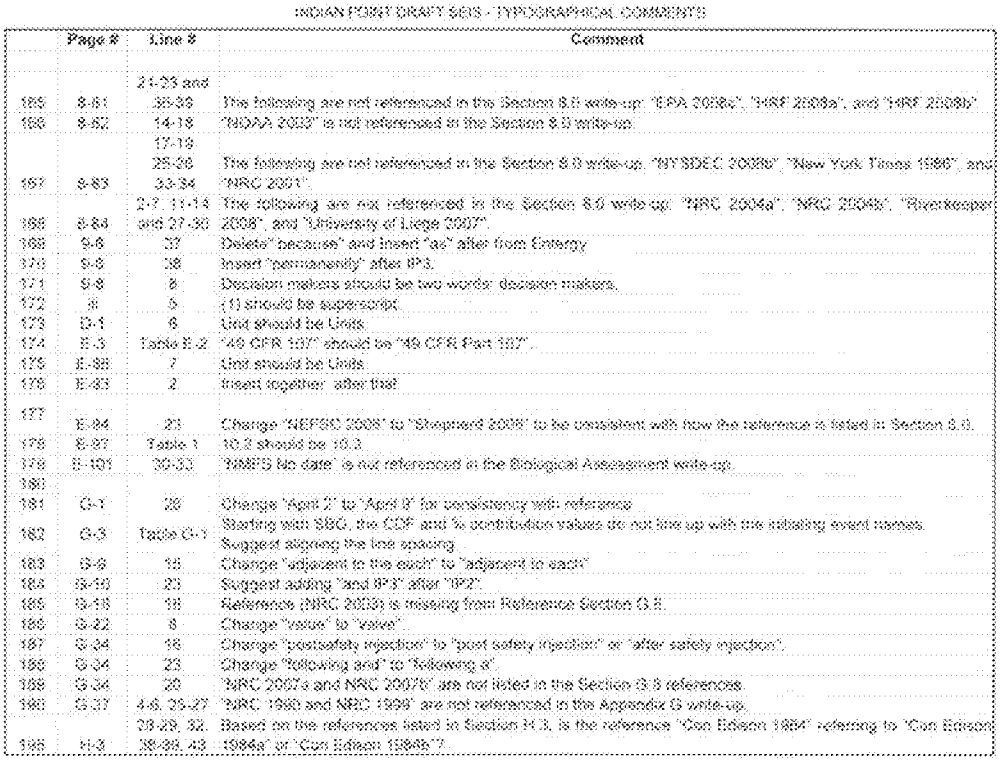

INDIAN POINT DRAFT SEIS - TYPOGRAPHICAL COMMENTS

	Page #	Line #	Comment
		21-23 and	
165	8-61	35-39	The following are not referenced in the Section 8.0 write-up: "EPA 2008c", "HRF 2008a", and "HRF 2008b"
166	8-62	14-16	"NOAA 2003" is not referenced in the Section 8.0 write-up.
		17-19	
		25-26	The following are not referenced in the Section 8.0 write-up: "NYSDEC 2008b", "New York Times 1986", and
167	8-63	33-34	"NRC 2001".
		2-7, 11-14	The following are not referenced in the Section 8.0 write-up: "NRC 2004a", "NRC 2004b", "Riverkeeper
168	8-64	and 27-30	2008", and "University of Liege 2007".
169	9-6	37	Delete" because" and insert "as" after from Entergy
170	9-6	38	Insert "permanently" after IP3.
171	9-8	8	Decision makers should be two words: decision makers.
172	iii	5	(1) should be superscript.
173	D-1	6	Unit should be Units.
174	E-3	Table E-2	"48 CFR 107" should be "49 CFR Part 107".
175	E-86	7	Unit should be Units.
176	E-93	2	Insert together" after that
177	E-94	23	Change "NEPSC 2008" to "Shepherd 2008" to be consistent with how the reference is listed in Section 8.0.
178	E-97	Table 1	10.2 should be 10.3.
179	E-101	30-33	"NMFS No date" is not referenced in the Biological Assessment write-up.
180			
181	G-1	28	Change "April 2" to "April 8" for consistency with reference.
182	G-3	Table G-1	Starting with SBO, the CDF and % contribution values do not line up with the initiating event names. Suggest aligning the line spacing.
183	G-9	16	Change "adjacent to the each" to "adjacent to each"
184	G-16	23	Suggest adding "and IP3" after "IP2".
185	G-18	18	Reference (NRC 2003) is missing from Reference Section G.8.
186	G-22	8	Change "value" to "valve".
187	G-24	16	Change "postsafety injection" to "post safety injection" or "after safety injection".
188	G-24	23	Change "following and" to "following a".
189	G-24	28	"NRC 2007a and NRC 2007b" are not listed in the Section G.8 references.
190	G-37	4-6, 25-27	"NRC 1998 and NRC 1999" are not referenced in the Appendix G write-up.
		28-29, 32,	Based on the references listed in Section H.3, is the reference "Con Edison 1984" referring to "Con Edison
195	H-3	38-39, 43	1984a" or "Con Edison 1984b"?

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INDIAN POINT DRAFT SEIS - TYPOGRAPHICAL COMMENTS

	Page #	Line #	Comment
196	H-5	Tables H-2 and H-3	Based on the references listed in Section H.3, is the reference "Con Edison 1984" referring to "Con Edison 1984a" or "Con Edison 1984b"?
197	H-5	12	Based on the references listed in Section H.3, is the reference "Con Edison 1984" referring to "Con Edison 1984a" or "Con Edison 1984b"?
198	H-6	2	Based on the references listed in Section H.3, is the reference "Con Edison 1984" referring to "Con Edison 1984a" or "Con Edison 1984b"?
199	H-7	18	"ASA 2006" is not listed in the Section H.3 references.
200	H-9	7	"Entergy 2007b" is not listed in the Section H.3 references.
201	H-9	16	Should $26.2 \cdot 10^6$ be 26.2×10^6 ?
202	H-10	2	"Entergy 2007b" is not listed in the Section H.3 references.
203	H-11	8	"Entergy 2007b" is not listed in the Section H.3 references.
204	H-12	8	"Entergy 2007b" is not listed in the Section H.3 references.
205	H-12	8	Con Edison and NYPA 1984 are not listed in the Section H.3 references.
206	H-14	26-27	Scientific names should be in italics.
207	H-15	23	Scientific names should be in italics.
208	H-16	8	IS should be IP3.
209	H-17	30	Insert "of the Draft SEIS" after 4.3.2.2.
210	H-17	38	Insert "of the Draft SEIS" after 4.3.1.2.
211	H-18	8	"ASA" is not listed in the Section H.3 references.
212	H-18	13	Change "proposes" to "purposes".
213	H-20	41-42	"ASA Analysis and Communications 2007" is not listed in the Section H.3 references.
214	H-21	14	"Entergy 2007b" is not listed in the Section H.3 references.
215	H-22	3	"Entergy 2007b" is not listed in the Section H.3 references.
216	H-23	1	"Entergy 2007b" is not listed in the Section H.3 references.
217	H-23	Table H-7	For entire table, columns of percentages do not equal 100 percent. Percentages range from 98.9 to 104.7
218	H-28	19	Make the following change: Figure 2-10b.
219	H-34	24	"EPA 1998" is not listed in the Section H.3 references.
220	H-38	3	"Entergy 2007b" is not listed in the Section H.3 references.
221	H-38	11, 19, 33	Make the following change: CHGEC et al., 1999.
222	H-41	7	Make the following change: Figure 2-10b.
223	H-42	4	Make the following change: Figure 2-10b.
224	H-48	11-12	Change "Shepherd 2006" to "Shepherd 2008a"

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INDIAN POINT DRAFT SEIS - TYPOGRAPHICAL COMMENTS

	Page #	Line #	Comment
226	H-48	27-30	The DSEIS statement about observed survival of striped bass is incorrect, the correct survival is 81% not 9% based on the peer-reviewed study of the IP2 and IP3 Ristroph screens by Fletcher (1990) and summarized in the DSEIS in Table 4-3 on page 4-12.
226	H-51	30	Make the following change: Figure 2-10b.
227	H-55	3	"Normandeau 2008" is not listed in the Section H.3 references.
228	H-56	1	"Normandeau 2008" is not listed in the Section H.3 references.
229	H-57	1	"Normandeau 2008" is not listed in the Section H.3 references.
230	H-58	1	"Normandeau 2008" is not listed in the Section H.3 references.
231	H-60	18, 27-28	"Kennedy 1990" is not listed in the Section H.3 references.
232	H-63	3-16, 25-27, 35-39	The following are not referenced in the Appendix H write-up: Entergy 2003, Entergy 2004, Entergy 2005, Entergy 2006, EPA 1992 and FWS 2007.
233	H-65	12	Change "Shepherd 2005" to "Shepherd 2006a"
234	H-65	15	Change "Shepherd 2005" to "Shepherd 2006a"
235	I-1	19	Is the Con Edison 1986 -- 1991 referring to individual reports? Section I.4 references currently do not show individual reports for 1989 and 1990.
236	I-1	2	Is the Con Edison 1988 -- 1991 referring to individual reports? Section I.4 references currently do not show individual reports for 1989 and 1990.
237	I-1	23	Should $26.2 \cdot 10^6$ be 26.2×10^6 ?
238	I-4	4	"NMFS 1963", "SAI 1985a, 1985b and 2007" are not listed in the Section H.3 references.
239	I-6	25	"CHGE 1999" is not listed in the Section H.3 references.
240	I-23	5-7	"Entergy 2007" is not listed in the Section H.3 references.
241	I-66	17-20	"ASA 2002" is not referenced in the Appendix I write-up.
242	I-67	21-25 and 28-29, 12-18, 27-31	The following are not referenced in the Appendix I write-up: "Con Edison Undated c" and "Con Edison 1983".
243	I-68	37-40	The following are not referenced in the Appendix I write-up: EA 1988, EA 1991 and Entergy 2007.
244	I-69	22-25, 31-43	The following are not referenced in the Appendix I write-up: NMFS 1995, Normandeau 1985a, Normandeau 1985b and Normandeau 1986.
245	I-70	3-7	"Normandeau 1981" is not referenced in the Appendix I write-up.

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ENCLOSURE 2 TO NL-09-036

Letter dated March 17, 2009 from Goodwin Procter to NRC, "Comments on NUREG-1437, Draft Supplement 38"

ENTERGY NUCLEAR OPERATIONS, INC
INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 and 3
DOCKETS 50-247 and 50-286

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March 17, 2009

Chief, Rulemaking, Directives and Editing Branch
Division of Administrative Services
Office of Administration, Mailstop T-6D59
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Re: Comments on NUREG-1437, Draft Supplement 38

Reference: Letter from Mr. David J. Wrona, Office of Nuclear Reactor Regulation to Vice President, Operations, Entergy Nuclear Operations, Inc. entitled "Notice of Availability of the Draft Plant-Specific Supplement 38 to the Generic Environmental Impact Statement for License Renewal of Nuclear Power Plants Regarding Indian Point Nuclear Generating Unit Nos. 2 and 3 (TAC NOS. MD5411 and MD5412)," dated December 22, 2008.

Dear Sir or Madam:

On behalf of Entergy Nuclear Indian Point 2, LLC, Entergy Nuclear Indian Point 3, LLC, and Entergy Nuclear Operations, Inc. (collectively, "Entergy"), we respectfully submit the following comments on those portions of the Draft Supplemental Environmental Impact Statement ("DSEIS"), prepared by consultants to the Nuclear Regulatory Commission ("NRC") Staff for the License Renewal Application for Indian Point Units 2 and 3 (collectively, "Indian Point"), assessing the potential impacts of entrainment, impingement and thermal shock, and associated mitigation measures evaluated in the DSEIS (collectively, "Aquatic Issues"). The comments are intended to identify errors in the DSEIS that should be corrected in the process of generating the Final Supplemental Environmental Impact Statement ("FSEIS").

By way of background, Entergy, and its predecessors, have been collecting and assessing extensive information about fish species in the Hudson River for more than three decades.[1] Major monitoring programs have been ongoing over the operating life of Indian Point, as directed and overseen by New York State Department of Environmental Conservation ("NYSDEC") staff. The dataset has been characterized by NYSDEC staff (to the United States Environmental Protection Agency ("EPA")) as "probably, the best dataset on the planet," and we are aware of no comparable dataset by any NRC-regulated licensee.[2] Numerous analyses of this dataset, including with respect to impingement and entrainment, have been independently reviewed and published in peer-reviewed fisheries journals. Thus, while the NRC staff's consultants are to be commended for their efforts to review this information in drafting the

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Aquatic Issues sections of the DSEIS, given the scope of the information available and the level of biologic expertise required to review it, it is hardly surprising that some of the conclusions reached are not fully reflective of the available information—and are, therefore, in error.

I. There is no basis under the National Environmental Policy Act ("NEPA") for the DSEIS to evaluate closed-cycle cooling at Indian Point.

Closed-cycle cooling is not properly considered as a potential mitigation measure in the DSEIS. As detailed below, its inclusion as a mitigation measure in the DSEIS is not warranted, because: (1) no closed-cycle determination has been reached in the pending NYSDEC State Pollutant Discharge Elimination System Permit ("SPDES") proceeding (the "Proceeding") for Indian Point, (2) the United States Environmental Protection Agency ("EPA") rulemaking record rejected closed-cycle cooling on a nationwide basis, including for Indian Point, and (3) there is no NRC precedent in comparable license-renewal proceedings for the inclusion of a closed-cycle cooling mitigation alternative.[3] Therefore, inclusion of closed-cycle cooling in the DSEIS contravenes NEPA's mandate that such reports be consistent and based upon accurate information. As such, Entergy respectfully requests that NRC staff issue an FSEIS that excludes closed-cycle cooling mitigation alternative.[4]

A. No draft NYSDEC staff BTA determination presently exists.

The DSEIS states that a draft best technology available ("BTA") determination in the now-defunct NYSDEC staff tentative SPDES permit was *the* reason for NRC staff's consideration and evaluation of closed-cycle cooling as an alternative to *status quo* operations during the license renewal period.[5] However, as detailed below, the draft BTA determination on which the DSEIS apparently relies was *vacated* by a decision of NYSDEC's Assistant Commissioner, and NYSDEC staff currently is required to reach a BTA determination based on feasibility and alternative analyses not due to NYSDEC staff until December 2009. Thus, there is no current or effective NYSDEC staff draft BTA determination for Indian Point requiring closed-cycle cooling.

More specifically, the current posture of the SPDES Proceeding has evolved well beyond its characterization in the DSEIS, which appears to be based on documents from 2003.[6] On August 13, 2008, the Assistant Commissioner of NYSDEC issued a decision (the "Interim Decision") clarifying the status of the NYSDEC staff draft SPDES Permit and the issues to be adjudicated in the SPDES Proceeding. That Interim Decision required NYSDEC staff to retract its prior draft BTA determination. The reasons for the retraction were several. First, the Interim Decision revised the New York legal standard governing BTA determinations.[7] This rendered NYSDEC staff's prior BTA determination void, because it was not developed consistent with the

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now-applicable standard. Second, the Interim Decision now requires that the site-specific feasibility and alternatives reports (previously reserved for a future SPDES permit) be submitted by December 2009 and considered by NYSDEC staff in arriving at a new BTA determination which, as necessary, will be subject to adjudication as part of the SPDES Proceeding.[8] NYSDEC staff expressly has acknowledged that its current draft SPDES Permit is void, and also that it must reach a BTA determination that incorporates needed site-specific feasibility and alternatives information.[9] Therefore, there is no NYSDEC staff BTA determination at this time, draft or otherwise, requiring closed-cycle cooling.[10]

Based upon the foregoing, the stated justification for the evaluation of closed-cycle cooling in the DSEIS no longer exists, and the consideration of closed-cycle cooling should be stricken from the FSEIS.

B. There is no other legal basis for considering closed-cycle cooling in the DSEIS.

No other legal basis exists for considering closed-cycle cooling in the DSEIS. To the contrary and as detailed below, the governing SPDES agreements for Indian Point contain no closed-cycle cooling requirements. Thus, the DSEIS evaluation of closed-cycle cooling cannot be grounded on these prior agreements.

In the interest of completeness and to assist NRC staff in preparing the FSEIS, Entergy respectfully submits that neither the Hudson River Settlement Agreement ("HRSA"; effective from May 10, 1981 through May 10, 1991), nor the subsequent judicially approved consent orders (collectively, "Consent Orders"; effective through February 1, 1998, and with which Indian Point voluntarily complies today[11]), require closed-cycle cooling.[12] Rather, the HRSA expressly stated that NYSDEC "will not seek or in any way support a requirement for closed-cycle cooling at any of the Hudson River Plants during the entire ten-year term of this Agreement."[13] Likewise, the judicially approved Consent Orders which followed the expiration of the HRSA in 1991 also have not required the construction of closed-cycle cooling at Indian Point or any other facility.[14] Thus, at no time since the effective date of the HRSA (*i.e.*, May 10, 1981), and to date, has closed-cycle cooling been required at Indian Point.

NYSDEC's approach to Indian Point is consistent with its treatment of other New York facilities: NYSDEC has not required closed-cycle cooling at any other nuclear facility in New York. To the contrary, NYSDEC recently issued renewed SPDES permits for the James A. FitzPatrick, Robert E. Ginna, and Nine Mile Nuclear Power Plants, none of which required closed-cycle cooling. Thus, there is no NYSDEC precedent at other New York nuclear facilities to support inclusion of closed-cycle cooling in the DSEIS.

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C. EPA has not required closed-cycle cooling at Indian Point.

The DSEIS also points to the EPA's Phase II Rule, seemingly as support for consideration of closed-cycle cooling at Indian Point. Although presently suspended, in its Phase II Rule, EPA did not select closed-cycle cooling as the model technology for Indian Point or any other existing facility (listed in the Phase II Rule); rather, EPA rejected closed-cycle cooling nationwide:[15]

> *EPA did not select a regulatory scheme based on the use of closed-cycle,* recirculating cooling systems at existing facilities based on its generally high costs (due to conversions), the fact that other technologies approach the performance of this option, concerns for energy impacts due to retrofitting existing facilities, and other considerations. Although closed-cycle, recirculating cooling water systems serve as the basis for requirements applied to Phase I new facilities, *for Phase II existing facilities, a national requirement to retrofit existing systems is not the most cost-effective approach and at many existing facilities, retrofits may be impossible or not economically practicable.*[16]

Thus, the EPA Phase II Rule also provides no support for inclusion of closed-cycle cooling in the DSEIS.

D. NRC precedent does not support consideration of closed-cycle cooling in the DSEIS.

Finally, NRC staff has not evaluated closed-cycle cooling in the context of any other license renewal application for which no valid BTA determination had been issued. Indeed, NRC staff has evaluated closed-cycle cooling at only one other facility with once-through cooling in the license renewal context – the Oyster Creek Nuclear Generating Station ("OCNGS"). However, for OCNGS, the New Jersey Department of Environmental Protection ("NJDEP") had effectively completed (subject only to final public comment) its administrative SPDES permit process, with a permit that required closed-cycle cooling (or restoration).[17] Thus, OCNGS represents a very different dynamic, and does not support consideration of closed-cycle cooling at Indian Point.

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In sum, while the Council on Environmental Quality's ("CEQ") NEPA regulations expect an agency issuing an environmental impact statement to "[r]igorously explore and objectively evaluate all reasonable alternatives,"[18] CEQ clarifies the meaning of "reasonable alternatives" by

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stating that "reasonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense … ."[19] Because there is no present basis for concluding that closed-cycle cooling is technically and economically feasible at Indian Point, particularly given the fact that a retrofit of this scale has never been implemented at a "like" or comparable facility, there is no legal basis for the DSEIS to explore this alternative. Further, no, NYSDEC or EPA action supports the conclusion that a closed-cycle cooling alternative is reasonable, practical or feasible at Indian Point. Finally, the DSEIS cannot treat Indian Point differently from all other similarly situated license renewal applicants.[20] Accordingly, the discussion of this alternative should not be included in the FSEIS.

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II. The DSEIS misconstrues the NYSDEC's Final Environmental Impact Statement ("NYSDEC FEIS") and EPA Phase II Rulemaking record with respect to closed-cycle cooling.

As discussed above, a closed-cycle cooling alternative should not be included in the FSEIS. However, to the extent closed-cycle cooling is mentioned in the FSEIS, various errors must be corrected to reflect current, site-specific information. In the alternatives section of the DSEIS, the NRC staff asserts that:

> [t]he NRC staff, however, notes that both NYSDEC (2003b) and EPA (2004) indicated that estimates for cooling conversion by the previous owners of IP2 and IP3 *overestimated a variety of costs and selected a more expensive technology than was necessary*. Further, EPA (2004) indicated that Entergy's *outage duration was likely exaggerated*.[21]

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However, the DSEIS' assertion that conversion costs for Indian Point have been inflated lacks factual support and is contradicted by the more current, and accurate, site-specific analysis performed in 2003 by Enercon, a leading national expert in nuclear power plant design and construction, as supplemented by Enercon's comments, which we understand are also being submitted on behalf of Entergy. Therefore, in accordance with NEPA, the site-specific Enercon closed-cycle conversion assessment should be treated as controlling, and any suggestion that the Indian Point Environmental Report has inflated closed-cycle conversion costs and outage duration should be eliminated in the FSEIS.[22]

A. NYSDEC and EPA have never criticized the Enercon Report.

The discussion of conversion costs and outage duration in the DSEIS misconstrues federal and state environmental proceedings. First, the DSEIS states that "NYSDEC (2003b) … indicated that estimates for cooling conversion by the previous owners of IP2 and IP3

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overestimated a variety of costs and selected a more-expensive technology than was necessary."[23] However, this statement does not actually refer to a position asserted by NYSDEC or NYSDEC staff. Rather, the reference to NYSDEC (2003b) in Chapter 8 of the DSEIS appears to be the February 3, 2006 Ruling on Proposed Issues for Adjudication and Petitions for Party Status in the Indian Point SPDES Proceeding[24] (the "Indian Point Issues Ruling"), in which the New York administrative law judge summarized *unsupported* arguments advanced by third parties during the issues conference.[25] These third party statements are not properly referenced in the DSEIS as NYSDEC's conclusions or otherwise deserving of weight, since they are not supported by expert opinion.[26]

In fact, NYSDEC's conclusion in the FEIS was that Entergy's predecessor's conversion cost estimates were reasonable, based upon NYSDEC's consultant's independent review of the conversion analysis contained in the 1999 generic draft environmental impact statement for the Hudson River facilities (the "1999 DEIS").[27] NYSDEC's consultant concluded that the closed-cycle cooling conversion cost estimates in the 1999 DEIS were reasonable with respect to capital costs, but actually understated the economic impacts of any reduction in power generation and capacity.[28] The NYSDEC consultant's report also states that "The projected loss of over 600,000 Mwhr/year is a very significant concern."[29] Thus, NYSDEC could not, on this basis, have concluded that the closed-cycle conversion cost estimate in the 1999 DEIS was overstated, and furthermore, NYSDEC made no such decision.

In any event, Enercon's 2003 closed-cycle cooling conversion analysis, including costs and conversion outage duration, represents the most relevant, currently available, and accurate site-specific information available on these issues, though, as explained in Section III(B)(ii) below and in the Enercon comments, those cost estimates and outage durations are significantly understated based upon additional site-specific information developed since 2003 and of which NRC staff is aware. Moreover, Enercon's 2003 Report, again prepared by leading experts in the field, has not been called into question by NYSDEC in the Indian Point SPDES proceeding or by EPA.

Likewise, the DSEIS also incorrectly asserts that "[i]n the Hudson River Utilities FEIS, ... EPA indicated that costs may have been somewhat inflated. EPA also indicated some uncertainty with regard to outage duration for the plant retrofit."[30] In the FEIS, NYSDEC never asserted that EPA reviewed or commented on the closed-cycle cooling conversion analysis in the DEIS because it did not do so. In fact, EPA did not provide any comments at all on the 1999 DEIS or the NYSDEC FEIS.[31]

In short, Entergy respectfully submits that the FSEIS should rely on the 2003 Enercon Report, and correct the misstatements identified here.

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B. Viewed appropriately, the Phase II Rule record supports Entergy's ER.

The DSEIS also cites to the EPA Phase II Rulemaking in criticizing Entergy's closed-cycle cooling assessment.[32]

First, as EPA itself recognized in the Phase II Rule, the dataset of four so-called "retrofits" that EPA used in determining that closed-cycle cooling was potentially feasible at existing facilities, and in estimating the costs of such conversions, was "not representative of the broader population of facilities and could be too narrow a set from which to develop national costs that would be applicable to a wide range of facilities."[33] Moreover, EPA's "retrofit" dataset does not provide a proper or specific assessment of nuclear facility costs, because nuclear costs routinely exceed those at fossil facilities by substantial margins.[34] Indeed, EPA's only purported "retrofit" involving a nuclear facility was the Palisades Nuclear Plant in Michigan ("Palisades"), which is not comparable to Indian Point, because Palisades is a much smaller nuclear facility (approximately 800 MW(e) of power). More importantly, the cooling system conversion at Palisades cannot fairly be described as a "retrofit," because the conversion was contemplated during the latter stages of the initial construction of the facility, *i.e.*, the cooling towers actually were constructed late in the facility's original construction process.[35] Thus, unlike Indian Point, the initial planning and design of the Palisades facility took into account closed-cycle cooling. Second, each of EPA's four "retrofits" was performed before 1992, and therefore involved dated information and analysis potentially inapplicable today. Third, none of EPA's "retrofits" were conducted in New York, which poses a complex, and potentially more costly, regulatory environment than Ohio, Michigan and South Carolina.

The Phase II Rule's generalized conclusion regarding closed-cycle conversion capital costs is also inapplicable to Indian Point, because Indian Point presents several site-specific constraints expected to significantly affect the cooling system conversion cost estimates. These site constraints include: (1) the Indian Point site requires major (*i.e.*, among the largest mining operations in the United States) blasting operations that will generate substantial volumes of waste material to be properly disposed; (2) tritium/strontium contamination of this material may significantly exacerbate this excavation, and will increase transportation and disposal costs; (3) the presence of a major interstate natural gas pipeline likely complicates the design and construction of the cooling towers. Accordingly, the NRC staff should reconsider the Enercon 2003 Report's cooling tower conversion cost estimates in light of the unique circumstances at the Indian Point site and the fact that no comparable retrofit has ever been completed.

Second, the DSEIS' suggestion that "EPA (2004) indicated that Entergy's outage duration was likely exaggerated" is erroneous, because Enercon's estimated outage of 42 weeks (without contingency) is consistent with EPA's conclusions in the Phase II Rule. In the Phase II

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Rule, EPA implied that outage periods associated with closed-cycle cooling tower retrofits can be significant and that an outage of ten months (or 40 weeks) was reasonable.[36] Therefore, Enercon's estimated conversion outage of 42 weeks, without any level of contingency, is consistent with the ten month (40 week) timeframe for Palisades, a much smaller nuclear station that constructed cooling towers late in its initial construction program.[37] Moreover, as discussed in the Enercon comments and below, the discovery of on-site radiological contamination – well known to the NRC and discussed at length during the Atomic Safety and Licensing Board ("ASLB") hearing – will unavoidably result in costs and outage durations in excess of those reported in the 2003 Enercon Report.

C. Subsurface radiological contamination present at the Indian Point Site, of which the NRC staff was well aware, must be considered in the DSEIS.

As discussed above in Section I(A), there is no legitimate basis for evaluating a closed-cycle cooling analysis in the DSEIS. However, to the extent such an analysis is included in the FSEIS, that analysis requires an accurate and complete assessment of site-specific conditions (where available) pertinent to the feasibility and costs of the alternative.[38] The existence of subsurface radiological contamination at the Indian Point site is well known to NRC staff, because NRC is overseeing the groundwater investigation occurring at the site, as discussed at length in the Indian Point ASLB proceeding.[39] Consistent with Enercon's 2003 Report, and the Enercon comments, the radiological groundwater conditions must be addressed in the context of the closed-cycle cooling alternative, assuming one is considered. Given the import of site-specific analysis, NEPA requires that the DSEIS evaluate the impact of radiological subsurface contamination on feasibility, outage, and cost of the closed-cycle cooling alternative, which has not yet occurred. Therefore, assuming a closed-cycle cooling alternative is considered, NRC staff must include consideration of these conditions in the FSEIS.

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III. The AEI Report is the only current assessment of impacts associated with impingement and entrainment at Indian Point.

The DSEIS states that the justification for independent analysis of impingement and entrainment impacts is the allegedly unresolved competing views of Entergy (as set forth in the AEI Report) and NYSDEC staff (as set forth in the NYSDEC FEIS) on these issues.[40] However, as NYSDEC has clearly acknowledged, the NYSDEC FEIS was prepared before completion of the AEI Report, is based only on dated information and incomplete.[41] By contrast, the AEI Report is site-specific, current and based upon accepted scientific principles of impact assessment performed by leading fisheries experts; as such, it should be afforded substantial weight in the DSEIS.[42] If the DSEIS does give the AEI Report appropriate weight (in

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conjunction with its independent investigation), all impingement and entrainment impacts should be classified as "SMALL."

A. The NYSDEC FEIS is based on limited, dated data.

As it relates to Indian Point, the NYSDEC FEIS provides only a summary of data from six years in the 1980s. Specifically, Table 2 of the NYSDEC FEIS presents the average number of early life stages entrained during the limited period of in-plant entrainment sampling at Indian Point in 1981 and 1983-1987.[43] This dated information should not be given primacy over the AEI Report, which reflects data through 2005.

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B. The NYSDEC FEIS is incomplete.

Moreover, the NYSDEC FEIS is not final with respect to Indian Point. In October 2003, Entergy, among other parties, filed a judicial action challenging the content and legal effect of the NYSDEC FEIS.[44] The Decision and Order in that action recognized that "considerably more environmental review is necessary and ... specifically contemplated."[45] In that action, NYSDEC stated that "detailed, site-specific" information would be necessary before reaching a final BTA determination for Indian Point and assessing the environmental impacts associated with that BTA determination.[46] Moreover, the Interim Decisions also acknowledged the deficiencies in the NYSDEC FEIS and expressly required the preparation of a supplemental environmental impact statement to address those shortcomings following NYSDEC staff's future BTA determination.[47] Thus, the NYSDEC FEIS should not be afforded weight in the DSEIS.

As discussed above, NEPA requires analyses based upon the most recent data available. The NYSDEC FEIS fails that standard; the AEI Report does not and should be afforded weight in the FSEIS.

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IV. The restoration alternative should not be included in the FSEIS.

The DSEIS includes alternatives likely illegal under §316(b) of the federal Clean Water Act ("CWA"); it therefore should be stricken in the FSEIS. Specifically, the DSEIS includes a mitigation alternative that combines the existing once-through cooling system with alternative intake technologies *and additional restoration alternatives*.[48] However, in *Riverkeeper I* and *Riverkeeper II*, the Second Circuit Court of Appeals twice held that EPA impermissibly construed federal law, *i.e.*, CWA §316(b), to allow compliance with that section, in whole or in part, through restoration measures.[49] Thus, NRC staff's efforts to evaluate federal law, particularly compliance with §316(b), by means that include, in whole or in part, restoration measures is not proper.[50]

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As noted above in section I(C), only reasonable alternatives should be considered in a NEPA environmental impact assessment.[51] Reasonable alternatives include those that "are practical or feasible from the technical and economic standpoint and using common sense," which clearly exclude those that have been judicially proscribed (under the applicable statute).[52] Accordingly, the restoration alternative should not be included in the FSEIS.[53]

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V. The DSEIS improperly ignores the performance of in-place CWIS technologies.

Although the DSEIS appropriately characterizes the proposed action as renewal of the NRC operating licenses for Indian Point, without modifications to existing plant operations[54], it does not evaluate certain environmental impacts of that proposed action. In particular, it does not properly account for the well-documented effectiveness of in-place CWIS technologies (that will continue to be operated during the license renewal period) designed to reduce, among other things, impingement impacts. This failure violates, perhaps, a fundamental requirement of NEPA: to evaluate the environmental impacts *of the proposed action*.[55]

The DSEIS properly recognizes that the Indian Point CWISs are configured with modified Ristroph traveling screens and a fish return system designed to collect impinged fish and return them to the Hudson River.[56] The DSEIS also properly recognizes that these in-place screens and fish return systems were developed through extensive testing of various designs installed at Units 2 and 3.[57] Furthermore, the DSEIS accurately reports the results of a comprehensive study, undertaken by a consultant to Riverkeeper, Inc., documenting the substantial reduction in impingement mortality associated with the then-prototype screens now installed at both units.[58] So effective were these screens that NYSDEC adopted "the performance of [the screens] as the state's best available technology [sic] standard for reducing fish impingement at water intake systems."[59] In other words, the Indian Point impingement technology program has defined "state of the art" since its installation. Despite this and the DSEIS' express recognition that "the final design of the [Ristroph] screens appeared to reduce impingement mortality for some species based on a pilot study compared to the original system in place at Indian Point (Fletcher 1990)," NRC staff's consultants chose not to include these peer-reviewed improvements in assessing impingement for the very same system installed at Indian Point (and the very same species likely to be impinged at Indian Point) when evaluating impacts in its independent analysis.[60] As such, the DSEIS cannot be reconciled with NYSDEC's position.

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The DSEIS' stated basis for excluding this information is the purported lack of recent post-Ristroph screen installation impingement monitoring data.[61] However, the DSEIS does not account for the unchallenged validity of the peer-reviewed study conducted by Dr. Fletcher (published in the leading Transactions of the American Fisheries Society publication). The study by Dr. Fletcher evaluated the same screen design as those installed at Indian Point and evaluated

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its effectiveness on those species found in impingement samples collected at Unit 2 over several years.[62] Likewise, the DSEIS does not point to any other evidence in the record to suggest that the survival estimates prepared by Dr. Fletcher and reported in Table 4-3 of the DSEIS are not accurate. Indeed, Dr. Fletcher opined that further changes to the screens likely would not result in any improvement in performance.[63] For those reasons, the Fletcher studies provide more than a reasonable basis to forecast future performance of the screens installed at Indian Point, and the FSEIS should account for that performance.[64] As such, exclusion of peer-reviewed information regarding the effectiveness of the modified Ristroph screens is without support and necessarily results, as the DSEIS concedes, in "overestimates" of impingement impacts in the DSEIS' independent analysis.[65] According to the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3, which we understand is also being submitted on behalf of Entergy, the DSEIS utilizes a 0% impingement survival rate when the appropriate value is 82% survival.[66]

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Because the use of the modified Ristroph screens is an integral component of the proposed action, particularly as it relates to the evaluation of environmental impacts of the proposed action, the survival estimates from Table 4-3 should be factored into the FSEIS impact assessment, as NEPA requires.[67] As further described in the Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3, using the survival estimates from Table 4-3 of the DSEIS and a corrected Weight of Evidence approach, the potential impacts of Indian Point operations during the license renewal periods should be classified as SMALL in the FSEIS.

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VI. The DSEIS' treatment of endangered species deserves reconsideration.

Although the DSEIS correctly states that "[a]s of October 2006, NMFS has listed Atlantic sturgeon as a candidate species for listing under the Endangered Species Act ("ESA")."[68] it also incorrectly labels in one location the Atlantic sturgeon as "protected."[69] While this may have been an inadvertent oversight, given contrary statements in many other locations in the DSEIS, we submit the following comments to underscore the appropriate limits of the analysis of endangered species in the DSEIS. In accordance with its own NEPA regulations, NRC staff is required to evaluate impacts of the proposed action only on species protected under the ESA,[70] and the protections of the ESA extend only to species that are listed or proposed for listing as threatened or endangered.[71]

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A. The DSEIS inadvertently considers species not protected under the ESA.

Atlantic sturgeon is not listed, or proposed to be listed, as a threatened or endangered species under the ESA.[72] Rather, as the DSEIS notes, Atlantic sturgeon has merely been added to the National Marine Fisheries Service ("NMFS") list of "candidate species," *i.e.*, species for

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which NMFS has initiated its formal status review to determine if it should be proposed for listing as a threatened or endangered species.[73] Candidate species do not carry any procedural or substantive protections under the ESA, *e.g.*, are not subject to ESA biological assessments.[74] NMFS expressly states as much, including on its website at http://www.nmfs.noaa.gov/pr/species/concern/. Correction of the erroneous treatment of the Atlantic sturgeon as "protected" is therefore necessary for the FSEIS to comply with 10 C.F.R. §51.53(c)(iii)(2)(E).

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B. The Biological Opinion issued by NMFS should be accorded substantial weight.

Dr. Michael J. Dadswell, on behalf of NMFS, issued a 1979 biological opinion under §7(b) of the ESA on the potential impact to shortnose sturgeon of once-through cooling at, among other facilities, Indian Point (the "1979 Biological Opinion").[75] That opinion concluded that:

> the once through cooling system of [Indian Point] is not likely to jeopardize the continued existence of the shortnose sturgeon because, even assuming 100% mortality of impinged fish, its contribution to the natural annual mortality is negligible. In addition, the biology of the shortnose sturgeon effectively isolates the species from most of the effects of power plant intakes.[76]

Indeed, NYSDEC acknowledged this opinion, and took no issue with it in its own (concededly incomplete) FEIS.[77] Thus, there has never been a finding that Indian Point operations are likely to jeopardize the shortnose sturgeon; in fact, just the opposite is the case.

After the 1979 Biological Opinion was issued, Indian Point installed the modified Ristroph screens and fish return system that reduced potential impacts to impinged fish, as discussed in Section V above, providing even greater protection to the shortnose sturgeon than the screening configuration analyzed by Dr. Dadswell in the 1979 Biological Opinion. Moreover, there is no dispute that the shortnose sturgeon population in the Hudson River has expanded substantially over the period of Indian Point operations.[78] Indeed, the estimated number of spawning-age shortnose sturgeon in the Hudson River population now exceeds 500% of the safe level defined by the National Oceanographic and Atmospheric Administration ("NOAA"), "clearly indicating that this population merits designation as 'recovered' and qualifies for delisting" from the endangered species list."[79] Thus, there is no reason to depart in the FSEIS from the 1979 Biological Opinion absent credible scientific evidence of increased impact by Indian Point or a more compromised endangered population, neither of which exists here.

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C. There is no obstacle to a finding of SMALL impact to shortnose sturgeon.

As discussed above, NYSDEC staff authorized that continued impingement monitoring cease after installation of the modified Ristroph screens, because of the risk of mortality associated with collecting and handling shortnose sturgeon (among other species). As a result, Indian Point was not authorized to conduct impingement monitoring after 1990, both as a matter of NYSDEC directive and as a matter of the ESA's prohibition on the take of endangered species for scientific purposes absent a permit.[80] The absence of post-1990 impingement data therefore should not be used to counter the absence of impacts discussed above.[81]

In light of the foregoing, the FSEIS cannot reasonably conclude that continued operations consistent with the proposed action will result in impacts to Atlantic or shortnose sturgeon.

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D. The DSEIS should reconsider potential impacts to terrestrial species associated with the closed-cycle cooling alternative.

As set forth in Section I above, there is no basis upon which the DSEIS should evaluate closed-cycle cooling as a mitigation alternative to license renewal with *status quo* operations. However, to the extent the DSEIS evaluates the closed-cycle cooling alternative, it should evaluate (or request resource agency input on) the effects of this alternative on endangered terrestrial species, specifically the Indiana bat.

NEPA requires that the NRC "consult with and obtain the comments of any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved" with the proposed action or any alternative.[82] Here, the DSEIS specifically identified the possibility that the Indiana bat, a federally endangered species, may inhabit a portion of the Indian Point site.[83]

Despite this finding, in its request for comment from the U.S. Fish and Wildlife Service ("USFWS") in conjunction with the license renewal application, NRC staff did not mention the closed-cycle cooling alternative under evaluation in the DSEIS.[84] Having not sought or received any input from the USFWS on impacts associated with the closed-cycle cooling alternative, as NEPA requires, NRC staff concluded that the clearing of forested areas, and the construction of cooling towers on the site, not to mention their subsequent operation and emissions of plumes, would not impact the Indiana bat or its habitat.[85] Proper consultation with USFWS and treatment of this terrestrial endangered species, as required under NEPA, should be pursued in conjunction with the FSEIS.[86]

Moreover, as set forth above, the DSEIS identifies potential impacts to the shortnose sturgeon due to a lack of post-1990 impingement monitoring data, in spite of the 1979 Biological

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Opinion and subsequent expansion of the population, but reaches the opposite conclusion for the Indiana bat. The disparate treatment of endangered species should be rectified in the FSEIS.

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VII. The discussion of thermal impacts in the DSEIS should be revised.

The DSEIS proposes a finding of SMALL to MODERATE thermal impacts, purportedly because "NYSDEC modeling in the FEIS (NYSDEC 2003a) indicates that discharges from IP2 and IP3 could raise water temperatures to a level greater than that permitted by water quality criteria."[87] However, as detailed below and in the comments submitted by Applied Science Associates, Inc., there has never been a finding that Indian Point has been out of compliance with its current SPDES Permit. Therefore, no basis exists to assume actual discharges have exceeded applicable thermal discharge criteria. Accordingly, the DSEIS should be revised to conclude that impacts due to thermal discharges are "SMALL."

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A. Entergy holds a currently valid SPDES Permit.

Entergy holds a currently valid SPDES Permit that governs, among other things, thermal discharges from Indian Point.[88] Any NYSDEC-issued SPDES permit must comply with 6 NYCRR Part 704 (Criteria Governing Thermal Discharges).[89] Therefore, compliance with the terms of Entergy's SPDES permit necessarily means that thermal discharges from Indian Point comport with thermal discharge limits contained in 6 NYCRR Part 704.

B. A requirement to conduct future thermal studies does not equate to a finding of thermal impacts.

The DSEIS correctly notes that Entergy will conduct, at the direction of NYSDEC, a three-dimensional study of its thermal discharge. All recently-renewed SPDES permits for power plants in New York of which Entergy is aware have required a similar study; as such, this requirement is not unique to Indian Point or suggestive of any thermal impact.[90] Moreover, the mere requirement to conduct a future study cannot form the basis of an impacts determination. Accordingly, nothing in the record supports a finding in the DSEIS that thermal impacts are anything other than "SMALL."

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Thank you for your attention to these comments. Should you have any comments or questions, please do not hesitate to telephone me (at 617/570-1612).

Very truly yours,

Elise N. Zoli

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[4] Indian Point's owners are responsible for the most significant portion of the costs of the NYSDEC-approved biological monitoring plan, under which $2.0 million dollars annually (in 1981 dollars, escalated) are dedicated to aquatic assessment. Total costs of the program to date exceed $50 million. We are aware of no comparable undertaking by any other NRC licensee.

[2] *See* Letter from William Sarbello (then-a NYSDEC staff person) to Proposed §316(b) Rule Comment Clerk, United States Environmental Protection Agency (November 9, 2000).

[3] DSEIS, at 4-28 ("additional mitigation options that may be available for the existing cooling system include the following: ... closed-cycle cooling using cooling towers (e.g., hybrid wet/dry mechanical draft towers").

[4] *See* Center for Biological Diversity v. U.S. Forest Service, 349 F.3d 1157, 1167 (9th Cir. 2003) (NEPA requires agencies to provide high quality information, including accurate scientific analyses, before decisions are made and actions taken); 40 C.F.R. §1500.1(b) ("NEPA procedures must insure that environmental information is available to the public officials and citizens before decisions are made and before actions are taken. The information must be of high quality. Accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing NEPA. ..."); 40 C.F.R. §1502.24 ("Agencies shall insure the professional integrity, including scientific integrity, of the discussions and analyses in environmental impact statements.").

[5] *See* DSEIS, at 4-7 ("Given NYSDEC's statements in the proposed SPDES permit, the NRC staff decided to consider the environmental impacts that may occur if Entergy institutes closed-cycle cooling at IP2 and IP3 ... in Chapter 8 of the SEIS"); id. at 4-28 ("Because NYSDEC indicated closed-cycle cooling is the best technology available for IP2 and IP3, the NRC staff will review a cooling tower alternative in Chapter 8 ...").

[6] *See* DSEIS, at 4-7 (describing 2003 Draft SPDES Permit and associated Fact Sheet); id. at 4-27.

[7] *See* Interim Decision, p.12 ("Based upon my review of the Second Circuit's construction of section 316(b) and in furtherance of the State's responsibility and authority over its aquatic resources, I am modifying the language in the final step of the State's four-step BTA analysis ...").

[8] *See* Interim Decision, at 24.

[9] *See* NYSDEC staff's Motion to Clarify, at 7 ("it is obvious that NYSDEC staff is now required to reassess its previous BTA determination for Indian Point, as reflected in the current draft SPDES permit."); *see also* id. at 8 ("As recognized in both the Interim Decision and the draft SPDES permit, NYSDEC staff has not had the opportunity to review or determine whether and to what extent closed-cycle cooling or any other as-yet proposed alternatives are actually 'available' at Indian Point.") (internal citations omitted).

[10] *See* Interim Decision, at 20 ("In drafting a SPDES permit for this type of facility, Department staff should first apply the four-step BTA analysis to determine the appropriate BTA technology.").

[11] *See* DSEIS, at 2-24 (discussion of HRSA and consent orders).

[12] *See* DSEIS, at 2-49 (discussion of HRSA and consent orders).

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[13] HRSA, Section 3(C). In addition to NYSDEC and the owners of the facilities subject to the HRSA, the other parties to the HRSA were the United States Environmental Protection Agency ("EPA"), the New York State Attorney General, the Hudson River Fisherman's Association, Inc. (now know as Riverkeeper, Inc.), Scenic Hudson, Inc., and the Natural Resources Defense Council, Inc.

[14] *See* Fourth Amended Stipulation of Settlement and Judicial Consent Order ("Consent Order"), Ninth Whereas Clause (noting expiration of HRSA). In addition to NYSDEC and the owners of the facilities subject to the Consent Order, the parties to the Consent Order were the Hudson River Fisherman's Association, Inc. (now known as Riverkeeper, Inc.), Scenic Hudson, Inc., and the Natural Resources Defense Council, Inc.

[15] *See* Phase II Rule, Appendix A, 69 Fed. Reg. at 41670-79 (listing selected technology for each EPA modeled facility).

[16] Id. at 41685 (emphasis added).

[17] *See* GEIS Supplement No. 28 Regarding Oyster Creek Nuclear Generating Station, Final Report, at 8-2 ("The NJDEP identified two alternatives to the current-cooling water system in the 2005 draft NJPDES permit for OCNGS. The NJDEP's preferred alternative is to 'reduce intake capacity to a level commensurate with the use of a closed-cycle, recirculating cooling system.' This alternative would require replacement of the existing once-through cooling system with a closed-cycle cooling system."). Moreover, the administrative process by which a draft SPDES permit becomes a final permit in New Jersey is far different than the process in New York. In New Jersey, a draft NJPDES permit is subject to public comment and, as necessary, a non-adversarial public hearing to collect additional information. *See* N.J.A.C. §7:14A-15.10(a) (requiring public comment on draft NJPDES permit); §7:14A-15.12 (allowing non-adversarial public hearings on draft NJPDES permits, under certain circumstances). NJDEP then issues a final NJPDES permit, which is thereafter subject to an adversarial adjudicatory hearing. *See* N.J.A.C. §7:14A-15.15(c). In New York, a draft SPDES permit is subject to adversarial adjudicatory hearings *before* the permit is issued as final. *See, generally*, 6 NYCRR Part 624. Thus, the content of a final NJPDES permit is left to the discretion of NJPDES staff, whereas in New York, the content of a final NYSDEC SPDES permit is the result of an adversarial adjudicatory proceeding.

[18] 40 C.F.R. §1502.14(a) and (c).

[19] 48 Fed. Reg. 34263, 34267 (1983); *see also* EPA Policy and Procedures for the Review of Environmental Actions Impacting the Environment, Chapter 4, Section 3(D) ("If significant impacts are associated with the proposal and they cannot be adequately mitigated, EPA's comments should suggest an environmentally preferable alternative, including if necessary, a new alternative. The suggested alternative should be both reasonable and feasible. In this context, such an alternative is one that is practical in the technical, economic and social sense, even if the alternative is outside the jurisdiction of the agency.").

[20] *See, e.g.*, City of New York v. U.S. Dept. of Transp., 715 F.2d 732 (2nd Cir. 1983) (applying the "rule of reason" to the inclusion or exclusion of alternatives).

[21] DSEIS, at 8-4 (emphasis supplied). *See also* id. at 8-3 ("... EPA indicated that [closed-cycle conversion cost estimates] may have been somewhat inflated. EPA also indicated some uncertainty with regard to outage duration for the plant retrofit.").

[22] 40 C.F.R. §1500.1(b) (information informing NEPA analysis must be of "high quality"); id. at §1502.24 ("Agencies shall insure the professional integrity, including scientific integrity, of the discussions and analyses in environmental impact statements.").

[23] DSEIS, at 8-4.

[24] The DSEIS appears to include the wrong date for the Indian Point Issues Ruling. *See* DSEIS, at 8-82 (citing February 3, 2003 rather than February 3, 2006 as the date for Entergy Nuclear Indian Point 2 and 3 - Ruling. *See* In the Matter of a Renewal and Modification of a State Pollutant Discharge Elimination System (SPDES) Discharge Permit Pursuant to Environmental Conservation Law (ECL) Article 17 and Title 6 of the Official Compilation of Codes, Rules, and Regulations of the State of New York (6 NYCRR) Parts 704 and 750 et seq. by

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Entergy Nuclear Indian Point 2, LLC and Entergy Nuclear Indian Point 3, LLC, Permittees, February 3, 2006 ("Indian Point Issues Ruling")).

[25] *See* Indian Point Issues Ruling, at 10-11 ("According to [a third party's counsel], the cost of the cooling towers, and the time necessary for implementation, would be far less than Entergy projected), at 12 ("According to [a third party's counsel], Entergy's estimates of the costs to retrofit the Stations are inflated, because the retrofit can be performed much more efficiently and inexpensively than Entergy predicts.").

[26] 40 C.F.R. §1502.24 ("Agencies shall insure the professional integrity, including scientific integrity, of the discussions and analyses in environmental impact statements.").

[27] *See* NYSDEC, Hudson River Power Plants Cooling Water System Design Analysis, Technical Report, October 20, 2000, prepared by D.B. Grogan Associates, Inc. (the "Grogan Report").

[28] *See* id. at 3-4 ("(3) The cost estimates and economic analysis presented for the replacement system are reasonable when the same stipulated design and pricing criteria are applied. ... (4) ... Because of open market pricing of both fuel and electricity, the economic impacts of any reduction in power generation efficiency and capacity can be expected to be far more costly than the forecast in the DEIS.").

[29] Id. at 3.

[30] DSEIS, at 8-3.

[31] *See* NYSDEC FEIS, at 67 (EPA not included in list of commenters on the DEIS).

[32] As the DSEIS correctly notes, the Phase II Rule has been suspended in response to the U.S. Court of Appeals for the Second Circuit's vacating the rule in Riverkeeper, Inc. v. EPA, 475 F.3d 83, 109-10 (2nd Cir. 2007) ("Riverkeeper II"). Nonetheless, the Phase II Rule contains information of value regarding closed-cycle cooling that contradicts the DSEIS and should be included in the FSEIS.

[33] Phase II Rule, 69 Fed. Reg. at 41605-06. Based upon its analysis of cooling system conversions at existing facilities, EPA also concluded that "[w]hile it is true that the vast majority of the new, greenfield utility and non-utility combined cycle plants built in the past 20 years have wet cooling towers, EPA believes that it is significant that so few existing facilities retrofitted to the technology during the same period. The rarity of this technology as a retrofit further indicates that it is not economically practicable for the vast majority of existing facilities." Id. at 41606.

[34] *See* Enercon Comments.

[35] *See* Technical Development Document for the Proposed Section 316(b) Phase II Existing Facilities Rule, EPA 821-R-02-003, April 2002 ("Proposed TDD"), at 4-4 ("The Palisades plant constructed the main portions of the tower system in 1972 and 1973, while the plant operated in once-through mode. Construction finished by early 1974. In August of 1973 the plant experienced the beginning of a sizable outage (ten months), which according to Consumer's Energy was due primarily to the connection and testing of the recirculating system.").

[36] *See* 69 Fed. Reg. at 41605 (emphasis supplied) ("Some commenters also assert that EPA underestimated the down time that the facility would experience as it converts to cooling towers. This, again, is not an impact that would be experienced by new facilities. EPA agrees that such down time can be significant. *Indeed, one of the four retrofit case studies [for Palisades] EPA developed indicated a down time of 10 months, and EPA believes it is reasonable to infer that many other facilities would experience the same loss.*"); *see also* Proposed TDD, at 4-5 ("Through research into the historical electricity generation of the plant, the Agency confirms that the outage of ten-months occurred .... However, the Agency notes that it was unable to obtain specific records to show the cause(s) of the outage."). In the final Phase II Rule, EPA revised its previous estimate for a closed-cycle cooling conversion outage duration for nuclear facilities upward from 7 months to 10 months. *Compare* Phase II Rule NODA, 68 Fed. Reg. at 13525 ("... EPA is incorporating the new information which suggests that cooling system conversions at nuclear power plants may take seven months."); *with* Phase II Rule, 69 Fed. Reg. at 41605.

[37] *See* Proposed TDD, at 4-3 – 4-4.

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[38] National Audubon Society v. Dept. of Navy, 422 F.3d 174, 205 (4th Cir. 2005) ("It goes without saying that additional site-specific [information] will enhance the environmental consideration that NEPA already requires.").

[39] *See* In the Matter of Entergy Nuclear Operations, Inc. (Indian Point Nuclear Generating Units 2 and 3), ASLBP No. 07-858-03-LR-BD01, July 31, 2008.

[40] *See* DSEIS, at 4-9 ("Because the proposed SPDES permit (which includes NYSDEC's 316(b) determination regarding the cooling water intake structure) is still in draft stage and subject to ongoing adjudication, the NRC staff conducted an independent impact analysis for the purpose of addressing the Category 2 issues identified in Table 4-2 of this draft SEIS.").

[41] *See* Sierra Club v. U.S. Dept. of Agriculture, 116 F.3d 1482, **13-14 (7th Cir. 1997) ("For these reasons, the Court finds that serious questions exist with respect to the scientific accuracy of the FSEIS' projections of population trends for management indicator species. Absent a rational response to the ornithologists' criticisms and an explanation *for the failure to compile more recent data through the monitoring required by the 1986 Plan*, the Court finds that the reliance upon the 10-year-old Graber data to be arbitrary and capricious.") (emphasis supplied).

[42] *See* Center for Biological Diversity v. U.S. Forest Service, 349 F.3d 1157, 1167 (9th Cir. 2003); 40 C.F.R. §1500.1(b); 40 C.F.R. §1502.24 ("Agencies shall insure the professional integrity, including scientific integrity, of the discussions and analyses in environmental impact statements.).

[43] *See* FEIS, at 2, n. 2; Appendix VI-1-D-1 of the DEIS (which provides the annual numbers that are used to calculate the average number which appears in Table 2 of the FEIS).

[44] *See* Entergy Nuclear Indian Point 2, LLC, et al. v. DEC, Civil Index No. 6747/03.

[45] Decision and Order, at 3, 6.

[46] *See* Decision and Order, at 3; FEIS, at 4.

[47] *See* Interim Decision, at 38 ("The [FEIS] expressly contemplated further scrutiny of the environmental impacts associated with the site-specific BTA chosen for the Stations."); id. at 39 ("[t]he specific impacts of closed-cycle cooling at the Stations, as well as such interim measures as flow reductions and fish protection outages proposed in the draft permit, were not fully examined in the FEIS."), id. ("[A]n SEIS should be prepared to examine the significant adverse environmental impacts that are not already addressed in the FEIS ...").

[48] *See* DSEIS, at 8-16 – 8-24.

[49] *See* Riverkeeper, Inc. v. EPA, 358 F.3d 174, 189-91 (2nd Cir. 2004) ("Riverkeeper I").

[50] The DSEIS correctly notes that "[r]egardless of the NRC staff's findings, the NRC does not have the regulatory authority to implement the requirements of the Clean Water Act, and it is not up to the NRC staff to judge the validity of Entergy's or others' claims in the ongoing NYSDEC SPDES permit process." DSEIS, at 8-4. In the Atomic Safety and Licensing Board's ("ASLB") July 31, 2008 decision regarding Indian Point Nuclear Generating Units 2 and 3, the ASLB held that "it is clear that ... (5) in accordance with CWA §511(c)(2), as implemented by the Memorandum of Understanding between [NRC and EPA], the NRC is prohibited from determining whether nuclear facilities are in compliance with CWA limitations, assessing discharge limitations, or imposing additional alternatives to further *minimize* impacts on aquatic ecology that are subject to the CWA ..." In the Matter of Entergy Nuclear Operations, Inc., ASLBP No. 07-858-03-LR-BD01, at 138 (July 31, 2008). Thus, the NRC cannot impose restoration, closed-cycle cooling, or any other CWA requirement as a condition of the license.

[51] 40 C.F.R. §1502.14(a) and (c).

[52] *See* 48 Fed. Reg. 34263, 34267 (1983); *see also* EPA Policy and Procedures for the Review of Environmental Actions Impacting the Environment, Chapter 4, Section 3(D) ("The suggested alternative should be both reasonable and feasible. In this context, such an alternative is one that is practical in the technical, economic and social sense, even if the alternative is outside the jurisdiction of the agency.").

[53] The modified existing once-through cooling system with restoration alternative is also unreasonable because it incorrectly assumes that closed-cycle cooling represents the baseline level of "net impact" that must be

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achieved. For all of the reasons stated in Sections I and III, there is no basis under NEPA to evaluate closed-cycle cooling at Indian Point or assume closed-cycle cooling must serve as the benchmark for all other NEPA alternatives.

[54] *See* DSEIS, at 1-6 to 1-7. *See also* Entergy's Environmental Report ("ER"), at 3-1 (indicating no changes with respect to the operation of Units 2 and 3 during the license renewal period).

[55] *See* 42 U.S.C. §4334(C)(i) (requiring a detailed statement by the responsible federal agency on the environmental impact *of the proposed action*) (emphasis supplied). NRC's regulations implementing NEPA acknowledge this basic principle. *See* 10 C.F.R. §51.71(d) ("the draft environmental impact statement will include a preliminary analysis that considers and weighs the environmental effects *of the proposed action*") (emphasis supplied).

[56] *See* DSEIS, at 2-9, 2-11 to 2-13.

[57] Id. at 2-50.

[58] *See* id. at 4-12 (Table 4-3).

[59] Fletcher, R.I. 1990, Flow dynamics and fish recovery experiments: Water intake systems. Transactions of the American Fisheries Society("Fletcher (1990)"), at 414.

[60] *See* DSEIS, at 4-21 ("The NRC staff did not include the results of this pilot study during or following the application of the WOE approach.").

[61] *See* DSEIS, at 4-21 ("[T]here have been no additional data since 1990 to validate any impingement mortality estimates.").

[62] *See* Fletcher (1990), at 412.

[63] *See* Fletcher (1990), at 414 ("Further refinements to the Ristroph family of screening systems are possible, of course, but I do not believe that improvements beyond those reported here are apt to bring about greatly enhanced reductions in fish kills.").

[64] *See* Scientists' Institute for Public Information, Inc. v. Atomic Energy Commission, 481 F.2d 1079, 1092 (D.C. Cir. 1973) (agency need not "foresee the unforeseeable, but by the same token" agency cannot avoid impact analysis because "describing the environmental effects of ... particular agency action involves some degree of forecasting.").

[65] *See* DSEIS, at 4-13 – 4-13, 4-21.

[66] *See* Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3, section 2.

[67] *See* 42 U.S.C. §4334(C)(i) (requiring a detailed statement by the responsible federal agency on the environmental impact *of the proposed action*); 10 C.F.R. §51.71(d) ("the draft environmental impact statement will include a preliminary analysis that considers and weighs the environmental effects *of the proposed action*") (emphasis supplied).

[68] *See* DSEIS, at 2-77.

[69] DSEIS, at 2-52.

[70] *See* 10 C.F.R. §51.71(a) (requiring DSEIS to address topics covered in, *inter alia*, 10 C.F.R. §51.53); 10 C.F.R. §51.53(c)(3)(ii)(E) (requiring an assessment of the impact of the proposed action on threatened or endangered species in accordance with the Endangered Species Act).

[71] *See* 16 U.S.C. §1536(a)(2) (insuring that federal actions are "not likely to jeopardize the continued existence of endangered or threatened species"); id. at §1538(a)(1) (prohibited acts regarding endangered species); id. at §1539 (authorizing incidental take permits associated with otherwise prohibited acts involving endangered species).

[72] *See* 50 C.F.R. §17.11 (list of all species of wildlife determined to be Endangered or Threatened); http://www.nmfs.noaa.gov/pr/species/esa/other.htm#proposed (list of proposed species under the jurisdiction of the National Marine Fisheries Service ("NMFS")).

[73] *See* 71 Fed. Reg. 61022, 61023 (October 17, 2006) (adding Atlantic sturgeon to list of candidate species).

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[74] *See* 16 U.S.C. §1536(c) (biological assessments must be conducted for species which are listed or proposed to be listed).
[75] *See* Dadswell Biological Opinion; *see also* ER at 4-30.
[76] Id. at 16-17 (emphasis supplied).
[77] *See* FEIS, at 26 ("In testimony to the EPA in 1979, NMFS concluded in a Biological Opinion made pursuant to Section 7 of the Endangered Species Act that the once-through cooling system of the power plants did not pose a threat to the shortnose sturgeon population in the Hudson River.").
[78] *See* DSEIS, at 4-50 ("The population of shortnose sturgeon in the Hudson River has increased 400 percent since the 1970s, according to Cornell University researchers (Bain, et. al. 2007)).
[79] *See* Review of NRC's Impingement and Entrainment Impact Assessment for IP2 and IP3, Appendix A Impacts of IP2 and IP3 on Shortnose Sturgeon and Atlantic Sturgeon in the Hudson River. Moreover, the estimated numbers of impinged shortnose sturgeon reported in Table 4-11 of the DSEIS for the period from 1974 through 1990 is dramatically overstated and should be reduced from 734 to 31. Thus, not only is the dramatic expansion of this population essentially ignored in the DSEIS, but the level of impingement impacts to shortnose sturgeon is erroneously inflated.
[80] *See* 15 U.S.C. §1539(a)(1)(A) (authorizing take permits for scientific purposes).
[81] *See* Sierra Club v. U.S. Dept. of Agriculture, 116 F.3d 1482, **13-14 (7th Cir. 1997) (reliance on historic information not arbitrary where absence of more recent information is rationally explained) (emphasis supplied).
[83] 42 U.S.C. §4332(C) (requiring discussion of appropriate alternatives in impact statements).
[85] *See* DSEIS, at 4-33 ("The NRC staff notes that it is possible that the 70-acre … forest at the north end of the site could provide summer habitat for the Indiana bat because of the presence of suitable foraging habitat and possible roosting trees in the forest and the presence of large hibernacula within migration distance of the site.").
[86] *See* DSEIS, Appendix E, at E-12 –13.
[87] *See* DSEIS, at 8-9 (with respect to the impacts of the closed-cycle cooling alternative on threatened or endangered terrestrial species, including Indiana bats, the DSEIS states "because of both the site-specific environment and the lack of evidence of the species existing at the facility, potential impacts to these threatened or endangered species are considered SMALL.").
[88] *See* 42 U.S.C. §4332(C) (requiring consultation with Federal agencies with special expertise).
[89] DSEIS, at 4-27.
[94] *See* Declaration of William Little, Esq., submitted in ASLB Proceeding, ¶ 20 ("Before the October 1, 1992, expiration date, both Con Ed and NYPA submitted timely applications to renew their respective SPDES permits. By virtue of those timely renewal applications, pursuant to §401.2 of the New York State Administrative Procedures Act (SAPA) and 6 NYCRR §621.11(1), the operation of IP2 and IP3 was lawfully extended pending resolution of the pending SPDES renewal applications.").
[95] 6 NYCRR §750-1.11(a)(1) (listing SPDES permit requirements); 6 NYCRR §750-2.1 ("Upon issuance of a SPDES permit, a determination has been made … that compliance with the specified permit provisions will reasonably protect classified water use and assure compliance with applicable water quality standards.").
[96] *See e.g.*, NYSDEC, Final State Pollutant Discharge Elimination System (SPDES) Permit for the James A. FitzPatrick Nuclear Power Plant, SPDES Number NY-0020109, dated July 23, 2008.

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ENCLOSURE 3 TO NL-09-036

Enercon Services, Inc. Report dated March 2009, "Response to the Indian Point Draft Supplemental Environmental Impact Statement"

ENTERGY NUCLEAR OPERATIONS, INC
INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 and 3
DOCKETS 50-247 and 50-286

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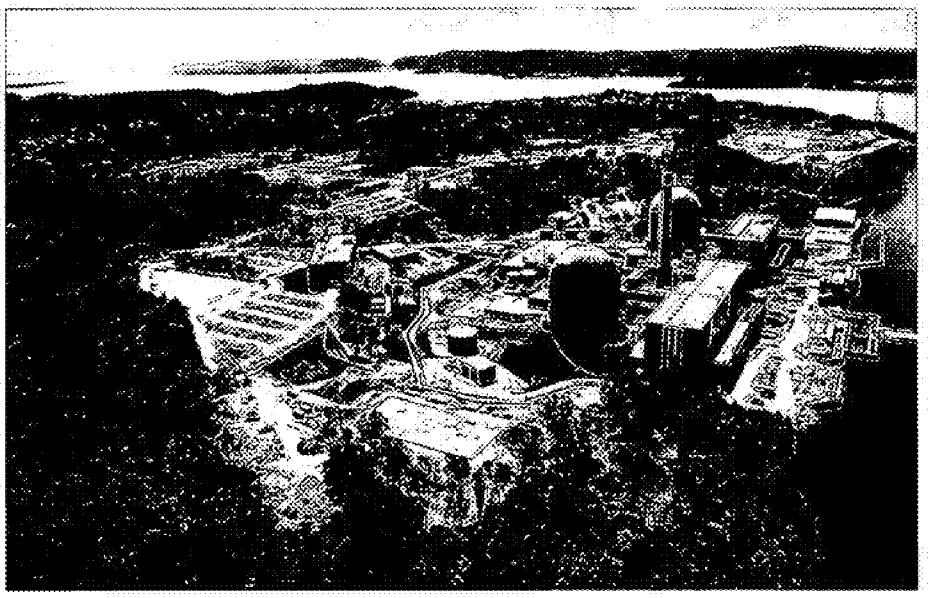
Response to the Indian Point Draft Supplemental Environmental Impact Statement



Prepared for Entergy Nuclear Indian Point 2, LLC, and Entergy Nuclear Indian Point 3, LLC

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March 2009

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Attachments

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EXECUTIVE SUMMARY

Indian Point Energy Center, owned by Entergy Nuclear Indian Point 2, LLC, and Entergy Nuclear Indian Point 3, LLC, are seeking a renewal of the operating licenses for Indian Point Nuclear Generating Units 2 and 3. The Nuclear Regulatory Commission published the draft facility-specific supplemental environmental impact statement for the license renewal application in December 2008. Several conclusions in the draft SEIS are based on inaccurate or misconstrued information. This engineering response to the draft SEIS has been prepared to address the most significant engineering errors and/or misconceptions identified in the draft SEIS.

The draft SEIS has been reviewed by Enercon Services, Inc. from an engineering standpoint, especially with regard to the discussion of closed-cycle cooling in the draft SEIS. This response focuses on seven responses regarding the conclusions presented in the draft SEIS on the potential environmental impact of the closed-cycle cooling alternative. Responses on cooling tower implementation focus on the draft SEIS discussion of the cooling tower technology selection, the outage duration, the capital costs, and the Oyster Creek cooling tower demonstration. Responses on the environmental impacts of constructing cooling towers include responses to the assessments of the impacts of conversion to closed-cycle cooling on the ecology, land use, and air quality at Indian Point.

The impact of conversion of closed-cycle cooling is summarized in the draft SEIS as twelve conclusions, six of which are likely overly conservative: land use, aquatic ecology, terrestrial ecology, air quality, waste, and transportation. Each of these conclusions is impacted by at least one of the seven responses. Each conclusion is assessed using the following criteria from the draft SEIS:

> SMALL—Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.
>
> MODERATE—Environmental effects are sufficient to alter noticeably, but not to destabilize important attributes of the resource.
>
> LARGE—Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

A summary of the original assessments provided in the draft SEIS and the engineering responses are provided below:

- **Land Use** *(Draft SEIS – SMALL to LARGE, Response – LARGE)*
  - Draft SEIS estimates the impact on land use would be *SMALL* to *LARGE* as the construction of the towers would require approximately 40 acres of land, and waste disposal may require a large amount of offsite land.
  - Per engineering analysis, the clear-cutting of approximately 40 acres of forested land and the removal of approximately 2.1 million cubic yards of soil, rock, and debris would have a *LARGE* impact.

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- **Ecology: Aquatic** *(Draft SEIS – SMALL, Response – SMALL)*
  - Draft SEIS estimates the impact on the aquatic ecology would be *SMALL* as the entrainment of aquatic organisms, as well as heat shock, would be reduced substantially.
  - Per engineering analysis, the conversion to closed-cycle cooling could reduce entrainment by an additional 79-percent, at most, significantly less than the 93-to-95-percent reduction predicted. Therefore, the improvement over existing conditions is overstated due to comparison with design flow rates rather than normal operating flow rates.
- **Ecology: Terrestrial** *(Draft SEIS – SMALL to MODERATE, Response – LARGE)*
  - Draft SEIS estimates the impact on the terrestrial ecology would be *SMALL* to *LARGE* as the onsite forest habitats would be disturbed and drift from towers may affect vegetation.
  - Per engineering analysis, 38% of the onsite forest would be destroyed completely and the remaining vegetation would be damaged by cooling tower plume drift, resulting in a *LARGE* impact.
- **Air Quality** *(Draft SEIS – SMALL, Response –* NERA Analysis*)*
  - Draft SEIS estimates the impact on air quality would be *SMALL* as the primary impacts would be from vehicles and equipment emissions during construction and from replacement power. Additionally, these impacts should be limited by existing regulations.
  - Per engineering analysis, emissions would increase due to construction (5 years) and replacement power (permanent). As Westchester County already violates existing regulations, the impact of conversion to closed-cycle cooling is understated and is evaluated in detail in the NERA 2009 economic analysis.
- **Waste** *(Draft SEIS– SMALL to LARGE, Response –LARGE)*
  - Draft SEIS estimates the impact on waste would be *SMALL* to *LARGE* as the construction would generate approximately 2.1 million cubic yards of soil, rock, and debris requiring offsite disposal.
  - Per engineering analysis, the scale of excavation coupled with strontium and tritium contaminated soil and rock would significantly increase waste disposal processing resulting in a *LARGE* impact.
- **Transportation** *(Draft SEIS– SMALL to LARGE, Response – MODERATE to LARGE)*
  - Draft SEIS estimates the impact on transportation would be *SMALL* to *LARGE* as the increased traffic associated with construction (workers and waste disposal) would be significant, though of little effect during operations.
  - Per engineering analysis, the increase in traffic would be significant during the construction period (5 years), resulting in a *MODERATE* to *LARGE* impact.

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1 Draft SEIS Overview

Indian Point Energy Center (Indian Point), owned by Entergy Nuclear Indian Point 2, LLC, and Entergy Nuclear Indian Point 3, LLC (collectively, Entergy), are jointly seeking a renewal of the operating licenses for Indian Point Nuclear Generating Units 2 and 3 (IP2 and IP3) in Buchanan, New York. The Nuclear Regulatory Commission (NRC) published the draft facility-specific supplemental environmental impact statement (SEIS) for the Entergy license renewal application in December 2008 [Ref. 10.1, NRC 2008]. This engineering response to the draft SEIS has been prepared by Enercon Services, Inc. (ENERCON) at the request of Entergy. Several conclusions in the draft SEIS are based on incomplete or misconstrued information; this response aims to provide engineering insight to complete or clarify the relevant information.

The draft SEIS has been reviewed by ENERCON from an engineering standpoint, especially with regard to the discussion of closed-cycle cooling. This response focuses on the correct outage period for conversion to closed-cycle cooling, the blasting and waste-removal complications not anticipated in the draft SEIS relating to on-site radiological conditions, and the suggestions regarding alternative closed-cycle cooling configurations (particularly single-stage mechanical draft cooling towers). Several misconceptions, which lead to inaccurate conclusions in the draft SEIS, are identified and discussed in this response.

Throughout the draft SEIS and this response, each conclusion is assessed using the following criteria [Ref. 10.1, NRC 2008]:

> SMALL—Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.
>
> MODERATE—Environmental effects are sufficient to alter noticeably, but not to destabilize important attributes of the resource.
>
> LARGE—Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

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2 Cooling Tower Technology Selection

2.1 Statement

The draft SEIS notes that "single-stage mechanical draft towers will produce similar decreases [compared to hybrid cooling towers] in impacts to aquatic life" [Ref. 10.1, NRC 2008, Pg. 8-5 / Ln. 26-27] and suggests that single-stage towers are an acceptable alternative if hybrid cooling towers "prove prohibitively expensive" [Ref. 10.1, NRC 2008, Pg. 8-5 / Ln. 25]. The draft SEIS further claims that single-stage towers "may result in less land-clearing or blasting debris than the hybrid cooling tower option" [Ref. 10.1, NRC 2008, Pg. 8-5 / Ln. 27-28]. However, no additional land-clearing or blasting debris would be required by hybrid tower installation. The round hybrid tower configuration selected would minimize the required footprint (discussed in Section 3). In addition, single-stage mechanical draft towers are not a viable option for IP2 and IP3 cooling due to the impacts of the visible plume on the surrounding roads, commercial facilities, and neighborhoods. For these reasons, single-stage towers have been rejected several times [Ref. 10.5, Enercon 2003; Ref. 10.3, Entergy 2007b; Ref. 10.6, NYSDEC 2003a] and there is no basis for further consideration of this technology.

2.2 Analysis

2.2.1 Single-Stage vs. Hybrid Mechanical Draft Towers

A single-stage mechanical draft cooling tower is considered impractical for the Indian Point site because of risks created by its associated plume. Under the dominant atmospheric conditions at the site, a dense visible cloud of water vapor and entrained water droplets would be emitted from the tower. A hybrid cooling tower, also referred to as a "wet/dry" or "plume abated" cooling tower, is designed to eliminate visible plumes in the majority of atmospheric conditions. The reduction in visible plume due to hybrid operation is substantial (see Attachment 1). A hybrid tower is the combination of a single-stage wet tower with a dry heat exchanger section. After the plume leaves the tower "wet" section of the tower it travels upward through a "dry" section where heated, relatively dry air is mixed with the plume in the proportions required to achieve a non-visible plume. A potential exists for increased noise with hybrid towers due to additional fans in the dry section, but attenuation to acceptable levels is possible. Additionally, the round hybrid towers selected would require appreciably less ground area than rectilinear towers, as discussed in Section 3. Ground area is especially significant as there is the potential for prehistoric and historic archeological resources to be present on the northeastern portion of the Indian Point site [Ref. 10.25, ENERCON 2007]. If cooling towers were required, one tower would be located on the northeastern portion of the site. Round hybrid towers would minimize the footprint impacted by construction; however, even round hybrid towers could have an impact on historic and archeological resources at Indian Point.

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2.2.2 Plume Considerations

There are several negative aspects associated with the highly visible plumes of single-stage mechanical draft cooling towers. The following issues are of particular concern at the Indian Point site:

- Degradation of Station equipment, safety, and systems, particularly over time
- Diminished capacity of HVAC systems during periods of plume ingestion
- Interference with plant visually-oriented security systems
- Obscure natural skyline in the area of the plant
- Creation of local fogging and icing conditions in winter
- Long-term shadow from plume can harm vegetation
- Associated salt deposition could harm vegetation in the area
- Deposition of pollutants from the Hudson River
- Public psychological association with smokestack emissions

The invisible plume of the round hybrid tower addresses the negative aspects associated with the visible plume of the single-stage cooling tower (ground fogging, visually-oriented security systems, long-term shadow over area vegetation, and visual blight). However, the plume is not entirely eliminated by the hybrid tower and some negative aspects remain (salt and pollutant deposition, icing conditions, and moisture-related corrosion). The plume produced by the hybrid tower generally contains less moisture content than the plume produced by the single-stage tower, resulting in reductions in icing conditions and moisture-related corrosion. Additional air flow from the dry section of the hybrid cooling tower enhances mixing with the ambient air and increases the cumulative exit velocity of the plume. The end result is a significantly greater plume height which dilutes the plume density and leads to less concentrated depositions. Therefore, although the hybrid tower does not eliminate all the negative aspects of the highly visible plumes of a single-stage mechanical draft cooling tower, it does reduce the impacts of those not eliminated.

The public concern with these negative aspects is also an important consideration, especially at the Indian Point site. In public hearings on the draft SPDES permit [Ref. 10.7, NYSDEC 2006], several members of the surrounding neighborhoods expressed strong sentiments against the installation of cooling towers at Indian Point:

> John Basile, a board member of the New York Affordable Reliable Electricity Alliance, "expressed concern with respect to the plume associated with cooling towers, which could produce ice clouds and rain, leading to hazardous driving conditions and potential damage to homes and other property. Mr. Basile argued that the cooling towers would be a visual blight and would reduce property values in the vicinity of the Stations."
>
> Donald Zern, a local resident and fisherman, said that "if cooling towers were built, a cloud of pollution would kill shrubs, cause frost in the wintertime, and contribute carcinogens to the air."

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Bernard Molloy, President of Hudson Valley Gateway Chamber of Commerce, stated that "cooling towers would have a negative visual impact on area viewsheds, and thus a detrimental effect on tourism and recreation-related businesses."

Mr. Siermarco, an engineer that serves as a volunteer liaison between the Village of Buchanan and Indian Point, "expressed concern both with the visual impact of the proposed cooling towers, as well as the saline plume that would be created by the cooling operation and would fall on the Village and surrounding areas. According to Mr. Siermarco…ten percent of the flora in the area would be killed by such a plume…the plume would also contain PCBs from the Hudson River that would be deposited in the area."

The Honorable Daniel O'Neill, Mayor of the Village of Buchanan, contended that "cooling towers would create visual blight as well as a moisture plume that has the potential for health problems from airborne contamination. … The Village would seek to enforce its zoning laws and other land use laws to prevent cooling towers from devastating the environment in the Village."

The public comments are varied, and range from those with an empirical basis to those brought upon by emotion; however, the comments are representative of the public perception and concerns regarding cooling towers. The hybrid tower would avoid many of the issues raised by local residents and reduce the impact of the others. A plume analysis for the selected hybrid towers was conducted for wet operation only, which conservatively approximates the plume generated by a similarly sized single-stage mechanical draft tower. The analysis indicated a visible plume 100 meters (m) from the towers during 100% of the year. The visible plume would extend over 600 m from the towers (i.e., beyond the eastern Indian Point property line) during 13.5% of the year. Hybrid towers eliminate the visible plume throughout the majority of the year. Additionally, the evaporative water lost from a single-stage plume would be approximately 1.7% of the total flow, while the losses from a hybrid plume would be approximately 1.5% [Ref. 10.5, ENERCON 2003]. The evaporative water loss corresponds to the amount of water drawn from the Hudson River and correlates directly to salt deposition, icing conditions, and corrosion.

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2.3 Response

The dense, highly-visible plume associated with single-stage mechanical draft cooling towers makes the technology inappropriate for the Indian Point site. State-of-the-art plume abatement is necessary to ensure that visually oriented security systems are not obscured, hazardous driving conditions are not created, and public concerns are not increased. In addition, the increased moisture deposition of the single-stage plume may compromise plant reliability due to increased corrosion and result in increased maintenance costs. Hybrid cooling towers address many of the negative aspects of the dense, highly-visible plume, and represent the only theoretically viable option for closed-cycle cooling at the Indian Point site.

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3 Applicability of the Oyster Creek Cooling Tower Demonstration to Indian Point

3.1 Statement

The draft SEIS notes that NRC "previously assessed closed cycle cooling with a hybrid cooling tower in the license renewal SEIS for Oyster Creek Nuclear Generating Station" [Ref. 10.1, NRC 2008, Pg. 8-5 / Ln. 19-20]. The Oyster Creek assessment is based on the *Determination of Cooling Tower Availability for Oyster Creek Generation Station* [Ref. 10.8, URS 2006], which was provided in response to the NRC's request for additional information. First and foremost, closed cycle cooling assessments are site-specific; as such, the conditions determining cooling tower availability at Oyster Creek do not, and cannot, determine or include the full range of conditions that impact the feasibility of closed cycle cooling at Indian Point. Additionally, several of the conclusions concerning round hybrid towers included in the conceptual assessment of cooling towers at Oyster Creek are inconsistent with results from the site-specific cooling tower evaluation performed by ENERCON [Ref. 10.5, ENERCON 2003] for Indian Point. As such, the conclusions regarding Oyster Creek's cooling tower determination should not be considered for assessing the advantages or disadvantages of round hybrid towers at Indian Point.

3.2 Analysis

The 2006 *Determination of Cooling Tower Availability for Oyster Creek Generation Station* conceptually compares six cooling tower options: natural draft, rectilinear mechanical draft, round mechanical draft, rectilinear forced draft wet-dry hybrid, round forced draft wet-dry hybrid, and dry cooling towers. The 2006 determination states that round towers are more susceptible to recirculation and require more land area than rectilinear towers. In addition, the 2006 determination estimated the costs of round hybrid towers to be significantly greater than rectilinear mechanical draft towers. As a result of these assumptions, the round hybrid towers were not fully considered for Oyster Creek. The exclusion of round towers, coupled with the site-specific differences between Oyster Creek and Indian Point, remove the Oyster Creek assessment as an appropriate evaluation basis for either the feasibility or the availability of cooling towers at Indian Point.

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3.2.1 Recirculation (Plume Entrainment)

According to *Recirculation and Interference Characteristics of Circular Mechanical Draft Cooling Towers*, "crossflow circular towers recirculate much less than rectangular cooling towers" [Ref. 10.21, Cooper 1984]. In Cooling Tower Fundamentals [Ref. 10.9, SPX 2006a], SPX notes that the potential for recirculation in a round tower is significantly reduced due to two factors: air flow and plume buoyancy; as such, round towers are shown to be "significantly less affected by recirculation" than rectilinear towers by a factor of 50-80%. SPX Cooling Technologies, a leading cooling tower manufacturer with approximately eighty years in the cooling tower industry, published *Cooling Tower Fundamentals* [Ref. 10.9, SPX 2006a] which provides a basic overview of the cooling tower technologies available to satisfy design and environmental requirements.

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According to SPX's Cooling Tower Fundamentals, as air flows around an obstruction, a low-pressure zone forms on the downwind side of that obstruction. Air then rushes into that low-pressure zone by the shortest route possible. If the obstruction is low, flat, and wide (e.g., in a multi-cellular rectilinear cooling tower), the shortest route is over the top of the obstruction. Therefore, any broadside wind increases potential for recirculation in a rectilinear tower. For this reason, rectilinear cooling towers must be carefully oriented with respect to the prevailing onsite wind. If the obstruction is round, however (e.g., in a round cooling tower), the resulting downwind low-pressure zone is "almost negligible" and creates streamlined flow around the obstruction. In addition, round towers are unaffected by orientation with respect to prevailing winds, which allows for greater flexibility in site placement [Ref. 10.9, SPX 2006a].

SPX notes that the buoyancy of the cooling tower plume affects the rate at which it will rise above the ambient air. A plume of greater buoyancy rises more quickly and will be less susceptible to recirculation. If a rectilinear tower is oriented parallel to the prevailing wind, the plume of each cell combines with the downwind cell plume to create a combined plume of greater buoyancy. However, if the tower is oriented perpendicularly to the prevailing wind, the separate, less-buoyant plumes have greater potential for recirculation [Ref. 10.9, SPX 2006a]. The prevailing winds at the Indian Point site are either north or south through the Hudson River Valley with over 80% of the winds measured within an hourglass-shaped range (northwest to northeast or southwest to southeast) [Ref. 10.5, ENERCON 2003]. As shown in Attachment 1, the Indian Point site would allow for a rectilinear tower orientation nearly parallel to the prevailing winds for IP3; however, due to elevation gradients and the location of the ISFSI, rectilinear towers for IP2 would likely not be oriented parallel to the prevailing wind. As a result, IP3 would experience significant recirculation approximately 20% of the year, while IP2 would likely experience significant recirculation most of the year. With a round tower arrangement, the centralized clustering of the fans would produce a concentrated plume of greater buoyancy, regardless of wind direction [Ref. 10.9, SPX 2006a].

SPX continues by listing another related tower efficiency issue, plume interference between towers. If multiple towers are placed too closely together, the plume from one tower can be recirculated in a downwind tower, thereby resulting in performance degradation. The concentrated plume of the round towers rises more quickly and therefore reduces interference, regardless of wind direction, and allows for greater flexibility in tower placement. Interference considerations may require significant spacing between rectilinear towers to account for the possibility of broadside winds [Ref. 10.9, SPX 2006a].

Air flow and plume buoyancy also affect the occurrence of ground fog and icing due to the cooling tower plume. For the reasons listed above, the round towers reduce ground fog, and thus icing, when compared to the rectilinear towers [Ref. 10.9, SPX 2006a; Ref. 10.12, B&V 1996].

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3.2.2 Land Use

For the cooling of large water flows, round tower arrangements ordinarily require less plant site area than multiple-cell rectangular cooling tower arrangements of equal cooling duty [Ref. 10.12, B&V 1996, Ref. 10.21, Cooper 1984]. According to Cooling Tower Fundamentals, round mechanical draft "towers can handle enormous heat loads with

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considerably less site area impact than that required by multiple rectilinear towers" [Ref. 10.9, SPX 2006a]. The required land use is also reduced when considering hybrid designs: "The circular hybrid tower is a much compacter unit and it therefore requires much less ground space than a cell type tower designed for the same performance" [Ref. 10.10, Streng 2000]. As discussed in Section 3.2.1, rectilinear towers must be oriented carefully with respect to the prevailing wind on the site. Since several rectilinear towers are required to handle the large cooling loads of a nuclear power plant, interference considerations determine the placement of these towers with respect to each other. A suitable arrangement of rectilinear hybrid cooling towers to satisfy the cooling requirements of IP2 and IP3 would cover a greater area than the selected single round tower for each unit (see Attachment 1, Section 2).

As stated in the draft SEIS, clear-cutting of onsite trees for cooling tower construction "would destroy fragments of onsite eastern hardwood forest habitat" [Ref. 10.1, NRC 2008, Pg. 8-8, Ln. 25-26]. The proposed site for the cooling towers is not only environmentally-sensitive (e.g., the site is a potential habitat for terrestrial endangered and threatened species, specifically the Indiana bat (see Attachment 2)), but also costly to build on, due to rocky terrain, steep slopes, and heavy forestation. Thus, minimizing the area required for tower construction is an important consideration.

3.2.3 Commercial Availability of Hybrid Towers

No round hybrid towers have been retrofitted or installed at U.S. nuclear facilities. One round hybrid cooling tower has been constructed at a new nuclear electric-generating facility by Balcke-Dürr (now owned by SPX) in Europe [Ref. 10.10, Streng 2000; Ref. 10.11, SPX 2006b]. This tower, commissioned in 1988, provides cooling for a 1,300 MW nuclear power plant in Neckarwestheim, Germany.

In 2003, ENERCON was provided a budgetary quote by SPX for round hybrid cooling towers designed to best meet the constraints of the Indian Point site (see Attachment 1, Section 1).

3.2.4 Cost

A site-specific cost estimate must account for the specific Indian Point site restrictions. An arrangement of multiple rectilinear towers would be required to provide sufficient cooling for IP2 and IP3 and each of the rectilinear towers must individually be serviced by a separate circulating water inlet pipe train. Compared to the single circulating water inlet pipe train needed for each round cooling tower, the rectilinear piping costs represent a cost increase (i.e., more circulating water pipes are needed and they are typically much longer due to tower placement limitations) [Ref. 10.9, SPX 2006a]. Likewise, as discussed in Section 3.2.3, round cooling towers minimize the area required for tower construction and reduce the required grading and excavation costs, which are of particular significance at Indian Point. While the component cost (tower only) of the round hybrid tower is typically more than the component cost of equivalent rectilinear hybrid towers, the additional piping and excavation costs required for rectilinear tower arrangements are often significant: "When total system costs are considered, the round tower arrangement generally has a comparable, if not lower, total evaluated cost than the rectangular arrangement for units 500 MW and larger" [Ref. 10.12, B&V 1996].

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3.3 Response

The Indian Point draft SEIS cites the Oyster Creek cooling tower assessment, which is in turn based on the 2006 *Determination of Cooling Tower Availability for Oyster Creek Generation Station*. The 2006 determination leads to conclusions about the round hybrid technology that are not appropriate for an assessment of closed cycle cooling for Indian Point. At Indian Point, the round tower arrangement offers improved thermal performance due to reduced recirculation potential and requires a smaller site area than rectilinear towers. Furthermore, the Oyster Creek closed cycle cooling assessment is site-specific and does not provide a basis for the feasibility or availability of closed cycle cooling at Indian Point.

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4 Cooling Tower Outage Duration

4.1 Statement

The draft SEIS states that the 2004 EPA NPDES – Final Regulations to Establish Requirements for Cooling Water Intake Structures at Phase II Existing Facilities (Phase II Rule) [Ref. 10.13, EPA 2004] "indicated some uncertainty with regard to outage duration for the plant retrofit" [Ref. 10.1, NRC 2008, Pg. 8-3 / Ln. 40-41] and "indicated that Entergy's outage duration was likely exaggerated" [Ref. 10.1, NRC 2008, Pg. 8-4 / Ln. 16]. However, the EPA's 2004 Phase II Rule does not support these claims. EPA does not propose closed-cycle cooling tower technology for Indian Point or any site in the 2004 regulations; although, as part of the justification for not recommending the installation of cooling towers, an EPA case study "indicated a down time of 10 months, and EPA believes it is reasonable to infer that many other facilities would experience the same loss" [Ref. 10.13, EPA 2004]. The general EPA estimate of 10 months for the outage required for cooling tower installation is approximately equal to the 42-week duration estimated by Entergy. Considering the unique challenges that the Indian Point site provides, the 42-week outage duration is considered conservative, and unanticipated construction impacts could extend the estimated duration considerably.

4.2 Analysis

4.2.1 EPA Estimate

EPA's 2004 Phase II rule "establishes requirements reflecting the best technology available for minimizing adverse environmental impact, applicable to the location, design, construction, and capacity of cooling water intake structures at Phase II existing power generating facilities" [Ref. 10.13, EPA 2004, Pg. 41582]. In this rule, EPA provides generalized compliance guidance, addressing specific facilities on a very limited basis. In the case of Indian Point, the facility is only discussed in terms of impacts on the aquatic environment of the Hudson River. EPA does provide outage duration estimates for specific facilities based on the technology EPA "modeled as the most appropriate compliance technology" for each facility. EPA does not mention the outage duration estimate for cooling conversion at IP2 and IP3, and therefore does not provide basis or "indicate" such estimates were "uncertain" or "exaggerated."

Since EPA does not recommend cooling towers for any facility in the rule and therefore does not present any site-specific estimates for a conversion to cooling towers. "EPA did not select a regulatory scheme based on the use of closed-cycle, recirculating cooling systems at existing facilities based on its generally high costs (due to conversions), the fact that other technologies approach the performance of this option, concerns for energy impacts due to retrofitting existing facilities, and other considerations" [Pg. 41605]. In the justification for not requiring cooling tower retrofits, EPA mentions a case study which "indicated a down time of 10 months, and EPA believes it is reasonable to infer that many other facilities would experience the same loss" [Pg. 41605]. The generalized EPA estimate of 10 months for the outage required for cooling tower installation is therefore

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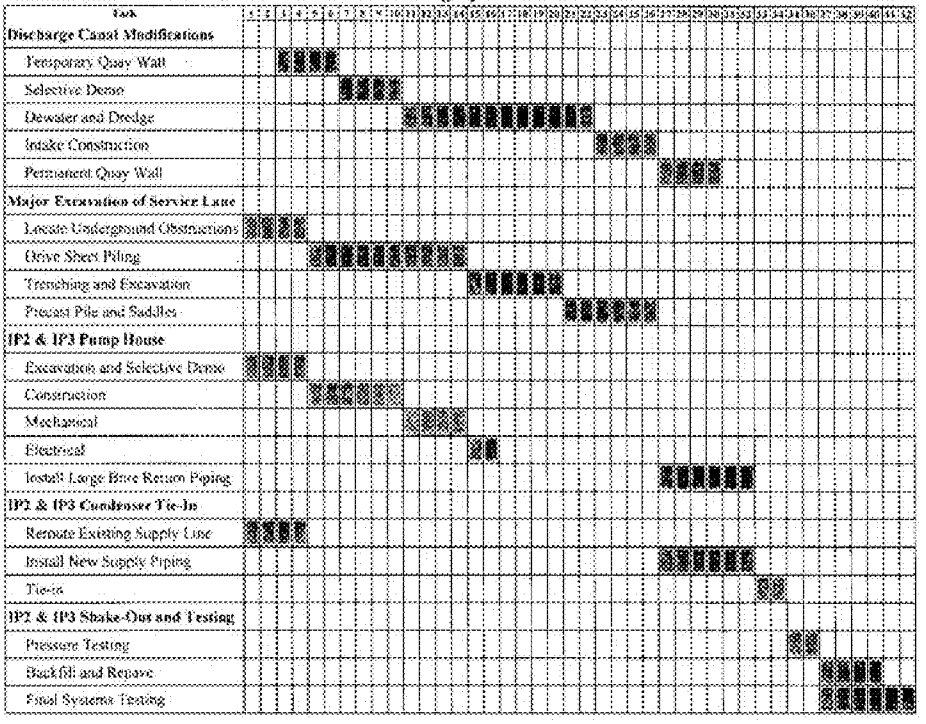
approximately equal to the Entergy estimate of 42-weeks for the IP2 and IP3 conversion to closed-cycle cooling.

4.2.2 Site-Specific Outage Determination

The proposed construction schedule revolves around minimizing the time for which IP2 and IP3 would be off-line. A significant portion of the work, however, cannot be completed while the units are on-line. Construction activities that require the units to be taken off-line include discharge canal modifications, work at or near existing service water lines, tie-in of circulating water supply and return piping, demolition or rerouting of existing systems, and electrical tie-ins. Any modification work involving existing systems will force an outage, as the reactor cannot operate safely without these auxiliary systems intact and functional. Detailed outage considerations are available in ENERCON's 2003 report [Ref. 10.5, ENERCON 2003]. A summary of the proposed outage schedule is shown in Table 1.

Table 1. IP2 and IP3 Cooling System Conversion Schedule



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The 42-week outage duration is a conservative estimate for the Indian Point cooling tower retrofit. Several challenges have been identified for the Indian Point conversion to closed-cycle cooling that may extend the necessary outage duration:

a) The conversion to closed-cycle cooling would require significant modifications and/or tie-ins to the condenser and other core components of the plant. After outage work has begun, the units could not be brought back online until the full range of outage installation work had been completed. A setback in any aspect of construction (including administrative delays) after outage work began would extend the outage.

b) Excavation and piping support operations located within the protected area will be extremely time-consuming, with much of the work performed by hand in order to protect existing buried sub-structures and utilities. Pile-driving at the river's edge poses particular safety hazards in addition to safety hazards associated with working in tight spaces such as transmission line clearances. The outage estimate allows only six weeks for the trenching and excavation of the service lane and ten weeks for driving sheet piling. To ensure the safety of excavation workers, the excavation schedule should not be compressed.

c) Tritium and strontium contaminated soil and rock will require specialized excavation and disposal methods. The extent of the soil and rock contamination was not known at the time of the original outage estimation and will undoubtedly slow the excavation process and extend the necessary outage duration [Ref. 10.20, GZA 2008].

d) A reliable and sufficient craft labor force is assumed in the outage estimate. Availability of craft labor may be limited due to seasonal outage work at other plants, regular maintenance work at the site, and the potential construction of approximately 29 new nuclear reactors in the United States.

e) The outage estimate is based on an aggressive schedule that requires working double shifts to complete construction activities. The plant proximity to the suburban neighborhoods of Buchanan is likely to limit construction activities at night due to sound ordinances.

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4.3 Response

Implementation of cooling towers at Indian Point will require extensive onsite blasting, large bore pipe routing and connection, along with several other activities during an extended outage. The current 42-week duration is detailed within Attachment 6 of ENERCON's 2003 Report [Ref. 10.5, ENERCON 2003] and was determined conservatively to assume as short a time as possible. The EPA estimate for the installation of cooling towers in general, while not appropriate for use as an estimate for Indian Point, is approximately equal to the conversion estimate for IP2 and IP3 and does not indicate an exaggerated outage duration. EPA also acknowledges that site-specific concerns could lengthen the necessary outage duration.

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5 Cooling Tower Capital Costs

5.1 Statement

The draft SEIS states that "both NYSDEC and EPA indicated that estimates for cooling conversion by the previous owners of IP2 and IP3 overestimated a variety of costs and selected a more expensive technology than was necessary" [Ref. 10.1, NRC 2008, Pg. 8-4 / Ln.13-15]. Also, the draft SEIS states that EPA "indicated that [closed-cycle cooling] costs may have been somewhat inflated" [Ref. 10.1, NRC 2008, Pg. 8-3 / Ln. 39-40]. Neither the EPA nor the NYSDEC reference supports the claims of overestimated costs.

5.2 Analysis

5.2.1 NPDES – Final Regulations to Establish Requirements for Cooling Water Intake Structures at Phase II Existing Facilities; Final Rule

EPA's 2004 Phase II rule "establishes requirements reflecting the best technology available for minimizing adverse environmental impact, applicable to the location, design, construction, and capacity of cooling water intake structures at Phase II existing power generating facilities" [Ref. 10.13, EPA 2004, Pg. 41582]. In this rule, EPA provides generalized compliance guidance, addressing specific facilities only on a limited basis. In the case of Indian Point, the facility is only discussed in terms of impacts on the aquatic environment of the Hudson River. EPA does provide compliance cost estimates for specific facilities based on the technology EPA "modeled as the most appropriate compliance technology" for each facility. EPA does not list cost estimates for cooling conversion at IP2 and IP3, and therefore no basis is provided from this reference to indicate such estimates were overestimated or inflated.

Additionally, EPA does not recommend cooling towers for any facility in the rule and does not present any site-specific estimates for a conversion to cooling towers. "EPA did not select a regulatory scheme based on the use of closed-cycle, recirculating cooling systems at existing facilities based on its generally high costs (due to conversions), the fact that other technologies approach the performance of this option, concerns for energy impacts due to retrofitting existing facilities, and other considerations" [Pg. 41605]. As part of the justification for not requiring cooling tower retrofits, EPA "estimates that the total capital costs for individual high-flow plants (i.e. greater than 2 billion gallons per day) to convert to wet towers generally ranged from $130 to $200 million, with annual operating costs in the range of $4 to $20 million" [Pg. 41605]. The EPA estimate is a generalized figure and EPA further acknowledges that "the costs and benefits presented are those developed at proposal…subsequent analyses, such as those presented in the NODA, have resulted in higher costs in general" [Pg. 41604] and that these estimates "may not have anticipated some site-specific costs or the costs for retrofit may exceed those EPA considered" [Pg. 41603]. EPA does not provide a breakdown of the conversion to wet towers cost estimate as EPA rejected the conversion to closed-cycle cooling towers option and the report focused on the cost of options not rejected. Therefore, a direct comparison of the generalized EPA estimate to the IP2 and IP3 estimate is not possible, but the cost

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difference can reasonably be assumed to stem from several site-specific challenges, which are briefly outlined below and presented in detail in ENERCON's 2003 report.

5.2.2 Entergy Nuclear – Ruling

The draft SEIS claims that NYSDEC indicated that estimates for cooling conversion were overestimated in a ruling in the matter of a renewal and modification of the SPDES Discharge Permit for IP2 and IP3 on February 3, 2003 [Ref. 10.1, NRC 2008, Pg. 8-82 / Ln. 36-41]. NYSDEC did not provide the draft permit until November 12, 2003; therefore, a February 3, 2003 ruling on the modifications in the draft would not have been possible. According to the NYSDEC Office of Hearings and Mediation Services, "the administrative proceedings concerning the [SPDES permit renewal] commenced with legislative hearing sessions on January 28, 2004. Therefore, the NYSDEC Office of Hearings and Mediation Services did not issue any rulings prior to the February 3, 2006 ruling issued by Administrative Law Judge Maria E. Villa (see Attachment 1, Section 1)." The correct reference is assumed to be the February 3, 2006 ruling and the remainder of this response will address that reference.

The NYSDEC 2006 ruling documents the concerns raised during public hearings and the issues proposed for adjudication during the issues conference. Presentations were made by NYSDEC and Entergy during the public hearing; however, the presentations by NYSDEC and Entergy are not recorded in the ruling. No statement by NYSDEC regarding the cost of conversion is recorded in the public hearings portion of the ruling. In the issues conference, the estimated conversion costs are addressed in relative terms, namely, whether the costs of conversion are "wholly disproportionate to the environmental benefits to be gained" [Pg. 29]. The issue is not the numerical estimate of the conversion costs, but rather the determination of what value should be considered "wholly disproportionate." In related documents, NYSDEC states that "the projected capital cost to construct hybrid cooling towers is approximately $740 million" [Ref. 10.14, NYSDEC 2003b] and that "the information presented in the DEIS regarding cooling tower design and cost estimates is generally reasonable" [Ref. 10.6, NYSDEC 2003a]. These statements do not support the claim that NYSDEC considers cost estimates to be overestimated.

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5.2.3 IPEC Site Specific Difficulties

ENERCON developed a preliminary construction cost estimate for the proposed round hybrid towers of $739,680,000 [Ref. 10.5, ENERCON 2003]. This site-specific estimate is higher than the generalized estimate presented in the 2004 EPA rule due to the acknowledged underestimation by EPA and several major site-specific costs at the Indian Point facility. The most significant site-specific costs are discussed below:

a) Approximately 40 acres of heavily-wooded land area must be cleared for placement of the cooling towers and the necessary cut back for air intake and safety zone. This means approximately 38% of the total amount of wooded land area on the Indian Point Site must be cleared [Ref. 10.3, Entergy 2007b; Ref. 10.5 ENERCON 2003]. The proposed area for the IP2 cooling tower pad is heavily forested with larger old-growth trees. The tree removal, clearing, and grubbing required prior to the construction of cooling towers will reduce the site's natural

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erosion control. Environmental protection in the form of silt fencing and, if required, a collection basin would be necessary to prevent run-off from operations at both pad locations into the river. The tree removal and environmental protection measures represent additional site-specific costs.

b) The proposed IP3 cooling tower pad is located atop a portion of the Algonquin Gas Transmission pipelines, which is a major supplier of natural gas to the city of New York. This pipeline would have to be relocated approximately 700 feet south of its existing location to accommodate the construction of the IP3 cooling tower. It is likely that Spectra Energy Transmission (Spectra), the owner and operator of the Algonquin Gas Transmission, would require Entergy to bear any costs or expenses related to relocating the pipeline. The estimated cost of this work is approximately $25 million, based on information regarding relocation of existing gas pipelines in the New York City area. Significant additional costs may be introduced in the relocation negotiations with Spectra. Additionally, Spectra may conclude that the relocation is not acceptable; in that case, the proposed siting of the IP3 cooling tower is not likely to be acceptable at any cost. If the relocation of the pipeline were approved, all relocation activities would have to be complete before work related to the IP3 cooling tower could begin.

c) Existing overhead and underground utilities create significant challenges for installation of the large bore piping required for return and supply lines to the towers. A matrix of underground utilities will require relocation and isolation. A significant portion of this work must be performed manually in order to protect remaining sub-structures and utilities; hence it will be time consuming, labor intensive, and expensive.

d) Blast removal is the only feasible excavation method at IPEC, based on the quantities of inwood marble (a crystalline metamorphic rock "made from" limestone with considerable heat and pressure) bedrock requiring removal (approximately 2.1 million cubic yards). Considering the proximity, volume, and overall complexity of this project, the input and guidance of one of the world's leading and most respected precision blasting experts, Dr. Calvin J. Konya was solicited. Dr. Konya's report aptly emphasizes the need to hire a professional blasting company based on a variety of criteria and not simply the lowest bidder (ENERCON 2003). Dr. Konya's initial cost estimate for drilling and blasting is over $62 million.

e) Tritium and strontium contaminated soil and rock will require specialized disposal methods. The soil and rock contamination was not known at the time of the original cost estimation and will undoubtedly be a significant source of increased costs.

f) As discussed in Section 2, selection of the hybrid cooling tower is required to meet Indian Point site restrictions. Hybrid towers are appreciably more expensive than wet towers due to the addition of a "hot" section requiring additional fans and an extensive network of heat exchangers. Because of the brackish water

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present in the Hudson River at the Indian Point site, titanium heat exchangers must be utilized for corrosion control, at significantly increased costs.

g) Industry standard contingency for conceptual design estimates range from 20-30 percent of overall cost according to RS Means and industry experience. This type of contingency relates to typical unknowns such as labor availability and productivity, inclement weather, and additional issues raised with final, detailed engineering designs. The minimum recommended contingency for the IP2 and IP3 conversion to closed-cycle cooling was therefore $123 million (20% of the estimated cost), which was included in the final estimate. This contingency represents a significant cost that is likely underestimated as the Indian Point site is likely to experience more inclement weather and final design issues than the minimum expected for any construction project.

h) The cost of decommissioning the cooling towers is not included in the cost estimate. Financial assurance for decommissioning would be required for license renewal; therefore, the funding for cooling tower decommissioning would need to be secured.

i) As mentioned in Section 2.2.2, Village of Buchanan "would seek to enforce its zoning laws and other land use laws to prevent [the construction of] cooling towers" [Ref. 10.7, NYSDEC 2006]. Local opposition could increase the difficulty of obtaining the necessary permits for conversion to closed-cycle cooling. Any unexpected delays in the schedule would result in increased construction costs.

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The site-specific estimate of $740 million was determined using direct quotes for vendors (SPX, Johnston Pump, Northwest Pipe, Mercer Rubber) for all major components and standard construction industry costing references (RS Means, Construction Industry Institute, Engineering News Record). A detailed breakdown of the major cost drivers in the estimate is available in ENERCON's 2003 report [Ref. 10.5, ENERCON 2003]. This cost estimate includes only the minimum recommended contingency and assumes the current value of engineering and construction of the project without inflation, labor rate increases, material market impacts, or other escalating criteria. Additionally, the cost of decommissioning is not included. The estimate was prepared with the goal of reflecting the lowest reasonable cost for conversion, and is therefore as conservative as responsibly possible. Historically, as design engineering continues and related concerns and encumbrances are better defined, cost of construction increases.

5.3 Response

The cost estimate for the conversion of IP2 and IP3 to closed-cycle cooling is a conservative calculation, based on several site-specific challenges. The statement in the draft SEIS that EPA and NYSDEC indicate "inflation" and "overestimation" of the conversion costs is unsupported by the provided references. In the 2004 Phase II rule, EPA provided a generalized estimate for existing facilities' conversion to closed-cycle cooling with wet towers. The EPA did not intend for this figure to apply to any specific facility and their estimate is not appropriate to use in that manner. In the 2006 ruling in the matter of the IP2/3

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SPDES permit renewal, the NYSDEC neither stated that Entergy overestimated their costs nor provided a competing estimate. The issue of whether the costs would be "wholly disproportionate" to the expected benefits is the only cost-related matter discussed in the ruling and does not provide sufficient support for the claims of NYSDEC indicating an overestimation. The conversion cost estimate detailed in ENERCON's 2003 report is a conservative, site-specific determination where the actual construction costs are likely to be significantly higher.

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6 Cooling Tower Ecology Assessment

6.1 Statement

It is stated that "during the summer months, when water use is at its highest, service and cooling tower makeup water would be withdrawn at a rate of approximately 250,000 to 314,000 lpm (66,000 to 83,000 gpm) for the combined needs of IP2 and IP3. This would be a 93-to-95-percent reduction in water use compared to the existing IP2 and IP3 once-through systems, which have a normal design flow rate of 3,200,000 lpm (840,000 gpm) for each unit" [Ref. 10.1, NRC 2008, Pg. 8-7 / Ln. 31-36]. The actual flow rate of the IP2 and IP3 once-through systems is significantly lower than the design flow rate. An accurate evaluation of the closed-cycle cooling reduction in water intake must be based on the actual water intake flow at Indian Point, not the design flow rate.

6.2 Analysis

Hudson River intake water is used at Indian Point for circulating water and service water. In order to determine the actual intake flow, the service water intake flows of 30,000 gpm at IP2 and 36,000 gpm at IP3 should be included in total River intake calculations. Additionally, water from the IP1 river water pumps can be used to supplement the IP2 SW System with up to 16,000 gpm of water. This service water intake will not be affected by the conversion to closed-cycle cooling; therefore, the baseline flow (licensed design flow) is 886,000 gpm for IP2 and 876,000 gpm for IP3. Since Entergy purchased Indian Point in 2001, the annual flow reductions from the baseline flows have been approximately 14% for IP2 and 29% for IP3. The greatest reductions in flow occur in February, March, and April at IP2 and January, February, March, and April at IP3. The reductions from baseline flow correspond to planned refueling outages, periods of lesser flows through the service water system due to reduced cooling demands, periods of lesser flows through the circulating water system via the dual-speed and variable speed pumps (VSPs), and unplanned outages.

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6.2.1 Maintenance Outages

At Indian Point, maintenance (refueling) outages are staggered so that IP2 and IP3 are not offline at the same time. There is generally a nominal amount of service water flow entering the CWIS for whichever unit is off-line. Refueling outages occur every 24 months for each unit, which results in an outage each year for one unit or the other. Refueling and maintenance outages typically last approximately 25 days. Outages are scheduled, where reasonably practicable, in a manner sensitive to entrainment considerations, typically during the late spring entrainment period, with the result that only one unit is operating during that outage period each year.

6.2.2 VSP/Dual Speed Pump Operation

The operation of IP2 and IP3 is limited to protect the surrounding aquatic ecological resources. These limits translate to flow reductions that are achieved by dual-speed pumps installed at IP2 and variable-speed pumps installed at IP3. The maximum flows are utilized only when necessary to ensure the safe operation of the facility or to comply with the thermal standards set forth in the SPDES permit [Ref. 10.15, NYSDEC 2003c]. The

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design flow rate is approached only during the hottest months; at all other times flow rates are significantly decreased.

6.2.3 Historic Operational Intake Flow Rate

Both planned and unplanned periods of reduced power decrease the actual amount of flow entering the CWIS. Additionally, periods of reduced flow through the service water and circulating water systems result from reduced cooling needs. These flow reductions are considered reductions in the baseline flow and, therefore, are considered to be operational measures meant to reduce entrainment.

Indian Point supplied eight years (2001-2008) of measured intake flow data for IP2 and IP3. Table 2 shows the monthly and annual average historic flow rate reductions from the baseline design value. The annual average historic (2001-2008) intake flow rate for IP2 is 765,440 gpm, which represents a 14% reduction in flow from the baseline flow value of 886,000 gpm. For IP3, the annual average historic intake flow rate is 624,340 gpm, which represents a 29% reduction in flow from the baseline flow value of 876,000 gpm.

Table 2. Flow Reduction from Baseline
(2001 – 2008)

Month	IP2	IP3
January	22%	52%
February	28%	54%
March	29%	60%
April	26%	51%
May	13%	29%
June	3%	5%
July	2%	3%
August	2%	3%
September	2%	2%
October	5%	7%
November	21%	36%
December	13%	43%
Annual	14%	29%

6.3 Response

Comparison of current once-through to closed-cycle water use must be benchmarked against the actual intake water volume, including the effects of VSPs, dual-speed pumps, and maintenance outages. Based on historical operational flow (2001-2008), IP2 and IP3 utilize only 86% and 71% of their total intake capacity (i.e., circulating water and service water combined), respectively. This corresponds to an existing 21% average reduction from the maximum entrainment at IP2 and IP3. At most, the conversion to closed-cycle cooling could reduce entrainment by an additional 79-percent from on the design flow rates. This reduction is significantly lower than the 93-to-95-percent reduction predicted in the DSEIS.

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7 Cooling Tower Land Use Assessment

7.1 Statement

The draft SEIS estimates the impacts on waste, land use, and the ecology to range from SMALL to LARGE. However, as the draft SEIS acknowledges, the clearing of 16 hectares (ha) (40 acres (ac)) of forested land and the excavation of 2.3 million cubic yards (cy) of soil, rock, and debris represents a significant part of the anticipated environmental impacts of the closed-cycle cooling alternative. The impacts of land clearing and excavation on some resource areas may be underestimated. Reuse and recycling of excavated material is likely to be extremely limited due to soil and rock contamination. The potential for reuse and recycling is sufficiently small that the conclusions in the draft SEIS are overly conservative.

7.2 Analysis

7.2.1 Waste

"Based primarily on the large volume of rock and soil that would require offsite transportation and may require disposal, the draft SEIS concludes that waste-related impacts associated with the closed-cycle cooling alternative at IP2 and IP3 could range from SMALL to LARGE, depending on whether material can be reused or recycled" [Ref. 10.1, NRC 2008, Pg. 8-12 / Ln. 7-10]. This conclusion of the waste-related impact should be reassessed because strontium and tritium contaminated soil and rock have been discovered at Indian Point [Ref. 10.20, GZA 2008]. Due to the discovery of this contamination, excavated materials may need to be tested for contamination and any contaminated spoils must be disposed of properly. Also, additional protective measures may be required to protect workers, the public, and the local ecology.

Currently, there are three commercial low-level waste (LLW) disposal sites in the United States. Only one of these sites will accept waste from Indian Point: EnergySolutions Clive Operations (Clive), located in Clive, Utah. Clive accepts waste from all regions of the United States, but is licensed by the State of Utah for Class A waste only [Ref. 10.16, NRC 2007]. Class A wastes may have a maximum tritium concentration of 40 curies/m^3 or a maximum strontium concentration of 0.04 curies/m^3 [Ref. 10.17, 10 CFR 61] If both tritium and strontium contamination is present, the maximum concentration of both radionuclides is determined by the sum of fractions rule, as described in 10 CFR 61.55. The sum of fractions rule significantly reduces the maximum concentration allowed of both (or either) radionuclide. If the radionuclide concentrations exceed these values, there is currently no disposal site that will accept the contaminated material. In addition to the maximum concentrations, Class A waste must be packaged according to 10 CFR 61.56. The testing and packaging of the materials will slow the excavation process and add significant costs to the construction budget.

The radionuclide concentration in the excavated materials cannot be accurately determined until excavation is underway. The volume of material requiring LLW disposal is expected to be significant. If it is assumed that 5% of the spoils are contaminated, 105,000 cy of LLW would need to be removed from the site.

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Based solely on the large magnitude of excavation required, the impact on waste should be considered LARGE. The additional disposal requirements of any contaminated soil and rock further exacerbates this LARGE impact.

7.2.2 Land Use

The draft SEIS "concludes that construction activates associated with cooling tower installation at IP2 and IP3 would result in SMALL to LARGE land use impacts, depending largely on how much material Entergy is unable to reuse or recycle, and where Entergy disposes of excavated material that cannot be reused or recycled" [Ref. 10.1, NRC 2008, Pg. 8-7 / Ln. 17-20]. Conversion to closed-cycle cooling will require approximately 16 ha (40 ac) of land for cooling tower construction and roughly 305 m (1000 ft) of river bank for the installation of water pipes. The clear-cutting and excavation of these areas will certainly have noticeable effects on land use at Indian Point. NYSDEC requires a Mined Land Reclamation permit for any mining operation from which more than 750 cubic yards of minerals are removed during a twelve month period [Ref. 10.22, 6 NYCRR Part 421]. For each 12 month period of excavation at Indian Point, an average of 420,000 cubic yards of soil, rock, and debris (mostly inwood marble) would need to be removed. Although, as a construction site, the Indian Point excavation would be exempt from obtaining this permit, it is impossible to justify a SMALL impact to land use when the same excavation would be considered a major project under the Mined Land Reclamation Law if cooling towers were not built following excavation [Ref. 10.22, 6 NYCRR Part 421].

Additionally, the potential for reuse and recycling of the excavated materials is much lower than previously thought, due to the soil and rock contamination discussed in Section 7.2.1. The disposal of nearly all 2.1 million cy of excavated soil, rock and debris (mostly inwood marble) is likely to have significant offsite land use impacts. The total disposal volume is greater than 50% of the total crushed marble sold or used in the U.S. in 2005 and if the excavation were operated commercially, Indian Point would be the 3rd largest crushed marble quarry currently in operation in the U.S. [Ref. 10.23, USGS 2007]. It is expected that construction activities associated with cooling tower installation would result in LARGE land use impacts, due to the scale of construction needed and the contamination present at the site.

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7.2.3 Ecology

The draft SEIS "concludes that the aquatic ecological impacts (including those to threatened and endangered species) from the construction and operation of the hybrid mechanical-draft closed-cycle cooling alternative for IP2 and IP3 would be SMALL." [Ref. 10.1, NRC 2008, Pg. 8-8 / Ln. 20-22]. Roughly 305 m (1000 ft) of river bank must be clear-cut and excavated to install large-diameter water pipes. River banks play a significant role in aquatic ecology and the required river bank excavation at Indian Point is likely to have both short-term and long-term effects on the aquatic ecology of the Hudson River. In the short term, excavation will remove most of the vegetation along the affected length of river bank, destroying that section of habitat. In the long term, much of the vegetation is likely to grow back, but the presence of cooling towers and the associated piping and support systems will have a significant impact on the localized run-off and

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groundwater flows. These changes could affect the local stability of the aquatic environment and are not mentioned in the conclusion presented in the draft SEIS.

Additionally, the draft SEIS "concludes that the overall effect on terrestrial ecology would be SMALL to MODERATE" [Ref. 10.1, NRC 2008, Pg. 8-9 / Ln. 16-17). Construction of cooling towers will require approximately 16 ha (40 ac) of land, most of which is presently wooded. The installation of cooling towers will permanently destroy the required area of eastern hardwood forest habitat. Although Indian Point is located near the Blue Mountain Reservation, the portion of forest located at Indian Point is cut off from the reservation by a strip of development and two four-lane highways. Therefore, the relocation of displaced species is extremely limited. It is likely that many of the local terrestrial species, potentially including terrestrial endangered (e.g., Indiana bat (see Attachment 2)) and threatened species [Ref. 10.1, NRC 2008, Pg. 8-9 / Ln. 8-10], are essentially confined to the Indian Point site and construction activities would destroy a significant portion of that localized terrestrial ecosystem. The effects of closed-cycle cooling conversion are likely to have a LARGE effect on the terrestrial resources confined at or very near Indian Point.

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7.3 Response

The clear-cutting and excavation required for closed-cycle cooling conversion at IP2 and IP3 will have long-lasting effects on local environmental resources. These effects may be underestimated in the assessment of conversion effects on waste, land use, and ecology provided in the draft SEIS. Strontium and tritium contamination in the excavated materials will have significant waste-related impacts. The clear-cutting and excavation of 16 ha (40 ac) of wooded area and the disposal of 2.1 million cy of excavated materials will have significant land use impacts. The combination of soil and rock contamination and large areas of clear-cut and excavated habitat (38% of the total wooded area at the site) could have significant impacts on ecological resources. In addition, excavation of this quantity and type of material (inwood marble) would require blasting to be conducted onsite, which would in turn require regulatory approval and introduce the possibility of disturbing current groundwater plumes. It is likely that impacts in any of these environmental resource areas will be LARGE.

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8 Cooling Tower Air Quality Assessment

8.1 Statement

The draft SEIS states that the air quality effects from replacement power would "cease when IP2 and IP3 return to service, with exception of any output lost to new parasitic loads from the closed-cycle cooling system" [Ref. 10.1, NRC 2008, Pg. 8-10, Ln. 35-36]. The output lost to parasitic loads and thermal efficiency losses from the closed-cycle cooling system is not negligible. The draft SEIS also claims that "the amount of pollutants emitted from construction vehicles and equipment and construction worker traffic would likely be small compared with total vehicular emissions in the region" [Pg. 8-10 / Ln. 43 to Pg. 8-11 / Ln. 2].

8.2 Analysis

8.2.1 Replacement Power

The conversion to closed-cycle cooling will decrease the net power output of IP2 and IP3. The reduction in net power output is due to the parasitic loads of cooling tower operation and thermal efficiency losses from condenser and turbine operation at suboptimal conditions. The losses that would result from the conversion to closed-cycle cooling at Indian Point are tabulated in Table 3.

Utilizing mechanical draft cooling towers instead of once-through cooling would introduce significant additional electrical loads, termed "parasitic losses", which reduce Station output. The towers have "wet" and "dry" section fans, 44 in each section, at 300 and 350 horsepower, respectively. Additionally, for the closed-cycle configuration, circulating water system horsepower would also be increased. The net effect would be an annual average parasitic loss of approximately 26 megawatts for each unit.

Moreover, converting the condenser cooling system of an existing plant from once-through to closed-cycle operation presents fundamental design problems. The design of the condenser and turbine is based on the anticipated inlet temperature of the condenser cooling water. If the condenser cooling water is not as cold as the as-built design requires, then the condenser heat rejection is reduced and the backpressure on the turbine increased. With an increase of backpressure on the turbine, performance is significantly affected, and ultimately generator output is reduced. This issue is of significant consequence at Indian Point. River water temperatures are low throughout the year, and the condenser/turbine package was designed accordingly. Cooling towers, through evaporative cooling, cannot match the low temperature of the river intake. In the winter months the impact is lessened, but the summer performance will suffer appreciably. Lost generation due to thermal efficiency losses at maximum load conditions would be approximately 47 megawatts for IP2 and approximately 27 megawatts for IP3. On an annual average basis, the effect is less, but still significant at about 15 megawatts for IP2 and about 6 megawatts for IP3.

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Table 3. Losses due to conversion to closed-cycle condenser cooling at IPEC, in MW(e)

	IP2 (max)	IP2 (avg)	IP3 (max)	IP3 (avg)	IPEC (max)	IPEC (avg)
Parasitic Electrical	26.48		26.48		52.96	
Thermodynamic Efficiency	47	15	27	6	74	21
Total	73.48	41.48	53.48	32.48	126.96	73.96

The total annual average decrease in Indian Point power output, including power lost to parasitic loads and thermal efficiency losses is approximately 74 megawatts (Table 3). At maximum load conditions, the net power output loss is approximately 127 megawatts. Replacement power is likely to come from existing generating facilities within the New York City metropolitan area. Many of these facilities are coal- or natural-gas fired and therefore the generation of the required replacement power is likely to have an impact on local air quality. The African American Environmentalist Association (AAEA) has raised the issue of environmental justice with respect to the required replacement power. According to the AAEA, "there are 24 power plants in the New York metropolitan area, and only a small number of those plants are located in areas not predominantly populated by minorities" [Ref. 10.7, NYSDEC 2006]. The AAEA contends that "restrictions on Indian Point's operations would shift the burden of air pollution to minority communities." The air quality impacts of generating an annual average of approximately 74 megawatts replacement power will be a permanent impact due to the closed-cycle cooling conversion.

8.2.2 Construction Traffic

The construction of cooling towers will require an average work force of 300 and will take an estimated 62 months. During the outage phase of the effort, the work force will peak at approximately 600. It is anticipated that the majority of the workforce will be temporary. Only a small percentage of this work force will look for permanent residence in the area. A work force of approximately 950 is generally on-site during a routine refueling outage. However, a routine refueling outage lasts only about four weeks, compared to over five years for the construction of cooling towers. The increased construction-related vehicle emissions will include workers commuting, running equipment on site, and the vehicles required to remove 2.1 million cy of excavated material. During the estimated 30 month excavation schedule, 350,000 round trips would be needed to remove the excavated materials in 6-cy dump trucks. To achieve this rate of excavation, a loaded truck would have to leave the site every 3.5 minutes, if excavation continued 24 hours a day.

The draft SEIS notes that "the entire States of New Jersey and Connecticut are designated nonattainment areas for ozone (8-hour standard). Several counties in Central and Southeastern New York within a 50-mi radius [of Indian Point] are also in nonattainment status for the 8-hour ozone standard" [Pg. 8-10 / Ln. 23-26]. Westchester County is in nonattainment status, along with every county bordering Westchester and most others in the immediate area [Ref.10.18, EPA 2008a]. A nonattainment status indicates that an area violates a national ambient air quality standard established in the Clean Air Act. The health risks associated with ground-level ozone pollution include lung irritation (wheezing, coughing), permanent lung damage, aggravated asthma, reduced lung capacity, pneumonia

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and bronchitis [Ref. 10.24, TRC 2002]. NO_x and VOC emissions from vehicles are the primary contributors to ground-level ozone formation [Ref. 10.19, EPA 2008b]. NO_x pollution is also associated with respiratory health risks: damage to lung tissue, reduction in lung function, and respiratory illness – bronchitis [Ref. 10.24, TRC 2002]. In addition to the human health effects, ground-level ozone pollution increases susceptibility of plants to disease, reduces crop and forest yields, aesthetically damages leaves and trees, and damages rubber and fabrics. NO_x pollution deteriorates water quality (oxygen depletion) and is a precursor to acid rain formation. Both ground-level ozone and NO_x pollution impair visibility. Though the construction-related vehicle emissions may represent a marginal increase from normal conditions in the area, the nonattainment status indicates that significant air problems already exist and would be exacerbated by any increase in emissions.

8.3 Response

The draft SEIS concludes that overall impact to air quality is likely SMALL because "air quality effects during construction would be controlled by site practices and compensatory measures required to maintain compliance with the Clean Air Act (CAA) (should a conformity analysis show the need to take other action), because replacement power would be required to also comply with CAA requirements (and it would be short lived), and air quality effects during operations would be minor" [Ref. 10.1, NRC 2008, Pg. 8-11 / Ln. 29-33]. The assumption that CAA standards will be met is not reliable, as IP2 and IP3 are located near several areas that currently violate CAA standards. The air quality impact of the construction activities will span a period of five years and are likely to undermine current efforts to reduce ozone pollution in surrounding areas to national standards. The permanent impacts of generating 127 megawatts of replacement power at peak load conditions may be significant, depending on which facilities generate replacement power, and may raise environmental justice issues. In an area with existing air quality issues, the effects of Indian Point conversion to closed-cycle cooling are likely to be noticeable and may even destabilize efforts to address current issues. Therefore, the impact of conversion to closed-cycle cooling on air quality is understated and is evaluated in detail in the NERA 2009 economic analysis [Ref. 10.26, NERA 2009].

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9 Conclusion

The NRC published the draft facility-specific SEIS for the Entergy license renewal application for Indian Point in December 2008 [Ref. 10.1, NRC 2008]. This engineering response to the draft SEIS has been prepared to address the most significant engineering errors and/or misconceptions identified in the draft SEIS.

The draft SEIS presented conclusions on the potential environmental impact of the closed-cycle cooling alternative for twelve impact areas [Ref. 10.1, NRC 2008]. The conclusions of the draft SEIS are likely to be overly conservative for six of the twelve areas considered: land use, aquatic ecology, terrestrial ecology, air quality, waste, and transportation. These conclusions should be reassessed using the most recent information available, particularly regarding groundwater contamination, current operating procedures, and plant net power output losses due to the installation of cooling towers.

These conclusions are assessed using the following descriptions [Ref. 10.1, NRC 2008]:

> SMALL—Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.
>
> MODERATE—Environmental effects are sufficient to alter noticeably, but not to destabilize important attributes of the resource.
>
> LARGE—Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

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Summary of Evaluated Environmental Impacts of a Closed-Cycle Cooling Alternative and ENERCON Responses

Impact Category	Draft SEIS Evaluation		ENERCON Response	
	Impact	Comment	Impact	Comment
Land Use	*SMALL to LARGE*	Construction of towers requires about 16 ha (40 ac). Waste disposal may require much offsite land.	*LARGE*	Clear-cutting of 16 ha (40 ac) of forested land and removal of 2.1 million cubic yards of soil, rock, and debris would have significant impact. (Section 7)
Ecology: Aquatic	*SMALL*	Entrainment and impingement of aquatic organisms, as well as heat shock, would be reduced substantially.	*SMALL*	While the aquatic impact of conversion to closed-cycle cooling would be *SMALL*, the improvements over existing conditions are overstated. (Section 6)

Summary of Evaluated Environmental Impacts of a Closed-Cycle Cooling Alternative and ENERCON Responses

Impact Category	Draft SEIS Evaluation		ENERCON Response	
	Impact	Comment	Impact	Comment
Ecology: Terrestrial	*SMALL to MODERATE*	Onsite forest habitats disturbed while drift from towers may affect vegetation.	*LARGE*	38% of onsite forest would be destroyed completely. Remaining vegetation would be damaged by drift. (Section 7)
Water Use and Quality	*SMALL*	Releases to surface water would be treated as necessary to meet permit requirements. Runoff from construction activities is likely to be controlled.	*No Engineering Response*	
Air Quality	*SMALL*	Primary impacts from vehicles and equipment emissions during construction, as well as replacement power. Existing regulations should limit effects.	*No Engineering Response; NERA Analysis*	Emissions would increase from construction (5 years) and replacement power (permanent). Westchester county already violates existing regulations. (Sections 3, 8)
Waste	*SMALL to LARGE*	Construction would generate about 2 million cubic yards of soil, rock, and debris requiring offsite disposal.	*LARGE*	Scale of excavation coupled with strontium and tritium contaminated soil and rock would increase waste impact. (Section 7)
Human Health	*SMALL*	Workers experience minor accident risk during construction. No impacts on human health during operation.	*No Engineering Response*	

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ENERCON RESPONSE TO IPEC DSEIS

Summary of Evaluated Environmental Impacts of a Closed-Cycle Cooling Alternative and ENERCON Responses				
Impact Category	Draft SEIS Evaluation		ENERCON Response	
	Impact	Comment	Impact	Comment
Socioeconomics	*SMALL*	No impact to offsite housing or public services occurs.	*No Engineering Response*	
Transportation	*SMALL to LARGE*	Increased traffic associated with construction (workers and waste disposal) would be significant, though little effect during operations.	*MODERATE to LARGE*	Significantly increased traffic during construction period of five years. (Section 8)
Aesthetics	*MODERATE*	Construction of two towers, 150 to 165 ft tall, would have a noticeable impact on the aesthetics of the site. Minor noise issues could occur.	*No Engineering Response*	
Historical and Archeological Resources	*SMALL*	Existing procedures are adequate to protect resources on the largely-disturbed site.	*No Engineering Response*	
Environmental Justice	*SMALL*	No significant impacts are anticipated that could disproportionately affect minority or low-income communities.	*No Engineering Response*	

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Attachment 1

Correspondence and Figures

Section 1: Correspondence

Section 2: Figures

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ENERCON RESPONSE TO IPEC DSEIS
Attachment 1, Section 1: Correspondence

NYSDEC OHMS Email Regarding NYSDEC Reference

From: OHMS
To: abrown@enercon.com
Subject: Re: Entergy Nuclear Indian Point 2, LLC and Entergy Nuclear Indian Point 3, LLC - Ruling, February 3, 2003
Date: Thursday, January 15, 2009 10:16:13 AM

Ms. Brown:

The administrative proceedings concerning the referenced electric generating facilities commenced with legislative hearing sessions on January 28, 2004. Therefore, the DEC Office of Hearings and Mediation Services did not issue any rulings prior to the February 3, 2006 ruling issued by Administrative Law Judge Maria E. Villa.

The February 3, 2003 date referenced in the untitled 2008 NRC document mentioned in you e-mail is an unfortuate typographical error.

Daniel P. O'Connell
Administrative Law Judge
Office of Hearings and Mediation Services
NYS Department of Environmental Conservation
625 Broadway, First Floor
Albany, New York 12233-1550
Telephone: 518-402-9003
FAX: 518-402-9037
>>> "Ashlie Brown" <abrown@enercon.com> 01/15/09 9:43 AM >>>
Good morning,

I just spoke with your office on the phone about the following reference in a 2008 NRC document:

New York State Department of Environmental Conservation (NYSDEC). 2003b. Entergy Nuclear Indian Point 2 and 3-Ruling. In the Matter of a Renewal and Modification of a State Pollutant Discharge Elimination System (SPDES) Discharge Permit Pursuant to Environmental Conservation Law (ECL) Article 17 and Title 6 of the Official Compilation of Codes, Rules, and 40 Regulations of the State of New York (6 NYCRR) Parts 704 and 750 et seq. by Entergy Nuclear Indian Point 2, LLC and Entergy Nuclear Indian Point 3, LLC, Permittees. February 3,. 2003.

We were not able to locate this reference, however we did locate a similarly title ruling with a date of February 3, 2006 rather than February 3, 2003. I have accessed the 2006 ruling via the NYSDEC website, and believe it to be the correct reference.

I would like to have a record stating that the 2003 ruling does not appear in your records. I would greatly appreciate a response to this email, simply stating that the 2003 ruling that is referenced above could not be found at the Office of Hearings and Mediation Services for the NYSDEC. Thank you very much.

Sincerely,

Ashlie Brown
Mechanical Engineer
Enercon Services, Inc.
(770) 919-1931 x563

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ENERCON

ENERCON RESPONSE TO IPEC DSEIS
Attachment 1, Section 1: Correspondence

SPX Cooling Technologies Budgetary Quote for Round Hybrid Cooling Towers

Sam Beaver

From: John.Arntson@marleyct.spx.com
Sent: Thursday, June 05, 2003 12:31 PM
To: sbeaver@enercon.com
Cc: JIM.VANGARSSE@marleyct.SPX.COM
Subject: Indian Point Budgetary Pricing

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The main changes are a significant reduction in the cost of the fintube bundles, cost of the exterior structure based upon a preliminary design, and elimination of other costs which were included in other categories in the previous breakdown. I have been working on the cost of the exit cone but so far have not tied this price down (a fabric membrane structure). What we have in now should be very conservative.

The pricing is now in the ballpark of escalated GKNII when adjusted for titanium tubes and labor rates.

Indian Point Study
Budgetary Pricing (6/5/03)

Cooling Tower

Item (Delivered & Installed)		Price
Fin Tube Bundles with titanium tubes	$	27,400,000
Mechanical equipment including VFD's	$	17,250,000
Dry section inlet and return piping	$	3,540,000
Wet tower section and mixing tunnels	$	32,900,000
Sound attenuation	$	10,600,000
Concrete wall @ fans	$	5,725,000
Exterior galv. steel structure with concrete deck incl. Ladders, platforms, stair towers	$	7,460,000
Exit cone (erected)	$	13,300,000
Rolling Doors or Louvers (erected)	$	882,000
Misl. equipment, supervision, & labor	$	5,443,000
Budgetary Total =	**$**	**124,700,000**

Preliminary Material/Labor Breakdown: 2/3 / 1/3

Cooling Tower Basin, Foundations, Misl. Concrete Supports

Concrete:		11400
Rebar:		1140
Budgetary Price =	**$**	**15,800,000.00**

Preliminary Material/Labor Breakdown: 30 % / 70%

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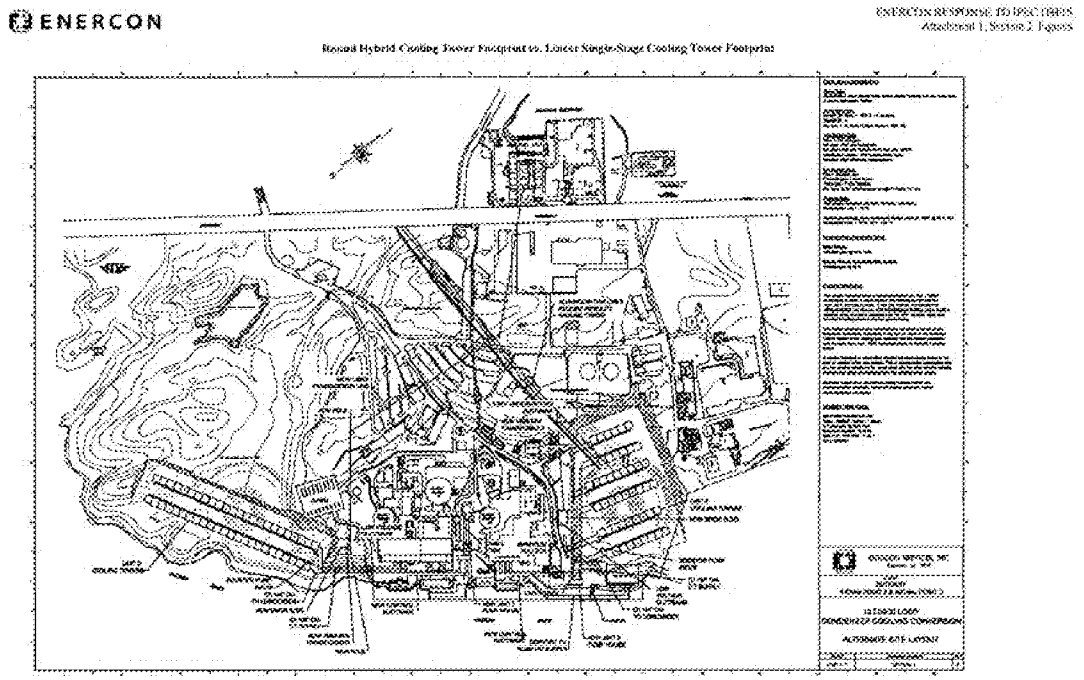

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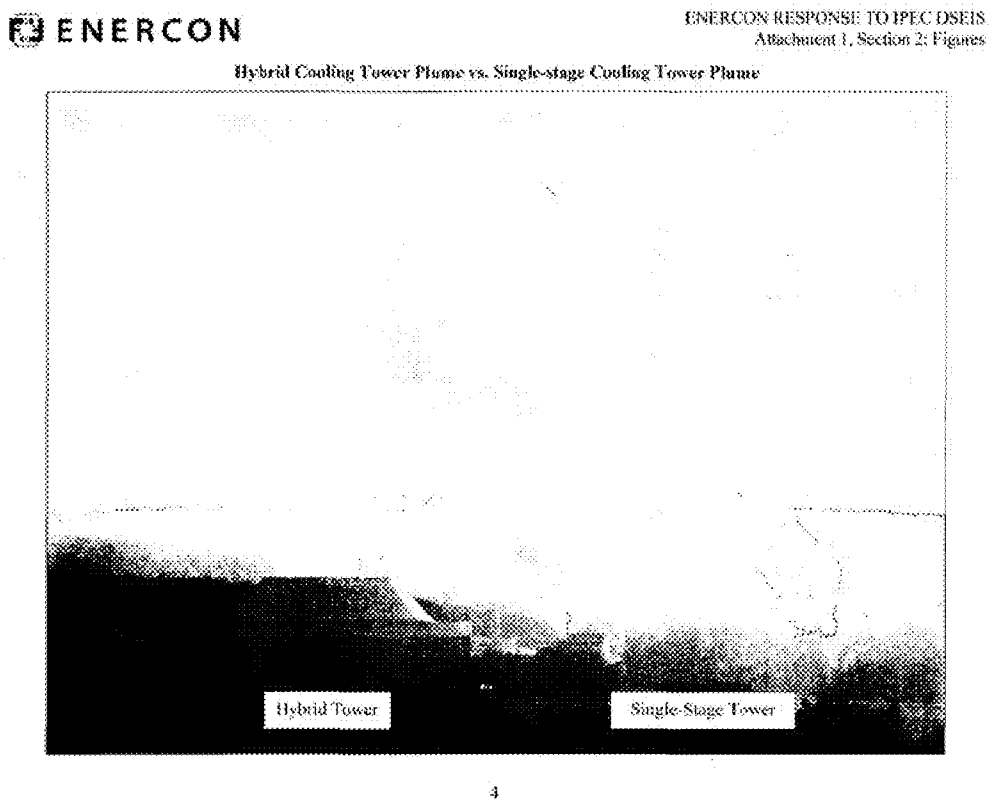

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Attachment 2

**Endangered Species Analysis
for Indiana Bats in Westchester County
(Normandeau Associates, Inc.)**

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ENERCON RESPONSE TO IPEC DSEIS
Attachment 2

ENDANGERED SPECIES ANALYSIS FOR INDIANA BATS IN WESTCHESTER COUNTY, NEW YORK WITH REFERENCE TO THE INDIAN POINT SITE

Prepared for
ENERCON SERVICES, INC.
500 Town Park Lane, Suite 275
Kennesaw, GA 30144

Prepared by
NORMANDEAU ASSOCIATES, INC.
25 Nashua Road
Bedford, NH 03110

R-19998.002/001

March 2008

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INDIANA BATS IN WESTCHESTER COUNTY

DISTRIBUTION

Nearly all of Westchester County, including the Indian Point area, is within the predicted range of the Indiana bat, according to the NY Natural Heritage Program (NYNHP 2008). Although no records of Indiana bat hibernacula, maternity roosts, or other summer roosts are reported from Westchester County as of February, 2008 (NYNHP 2008), the known distribution of Indiana bats in southeastern New York and surrounding states suggests that this species is likely to be present in the county.

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Fifty-eight female bats from the Williams Mine complex were tagged between 2004 and 2007, and 42 were subsequently relocated at maternity colonies in Orange and Dutchess Counties (Hicks, et al. 2008). Tracking efforts were intensive for the 3-week life of the radio tag batteries, and included ground and aerial tracking. Repeated use of the same locations over multiple years during these studies suggests high site fidelity, which has been observed in the results of other Indiana bat maternity roost surveys (USFWS 2007). A limited radio telemetry study of Indiana bats from hibernacula in Morris County, NJ suggests that these bats remain local to their over wintering habitat (Gheogen et al. 2007).

Male Indiana bats and non-reproductive females are generally not present at maternity colonies. Research indicates that they will roost singly or in small groups, and tend to be more dispersed across the landscape, as compared to reproductive females (USFWS 2007). Most of the effort to find Indiana bat summer locations has focused on maternity colonies, and knowledge about the distribution of summer habitat is therefore incomplete. Because Indiana bats have the capability to be highly mobile it is likely, even certain, that some individuals do use Westchester County during the summer, where suitable habitat (roost trees) is present.

ROOST TREE SUITABILITY

In summer, roost reproductive females occupy roost sites under the exfoliating bark of dead trees that retain large, thick slabs of peeling bark. Primary roosts usually receive direct sunlight for more than half the day. Roost trees measured in 15 different studies averaged just under 18 inches in diameter and were typically within canopy gaps in a forest, in a fence line, or along a wooded edge. Habitats in which maternity roosts occur include riparian zones, bottomland and floodplain habitats, wooded wetlands, and upland communities. Because adult males are less energetically constrained than reproductive females, they can accept a wider range of roost conditions, including cooler

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temperatures. Males accept small trees more often than do females, and they may be more tolerant of shaded sites. Like female Indiana bats, adult males roost primarily under bark and less often in narrow crevices. Indiana bats have been recorded using 35 different species of tree for roosting, and the tree species used is generally the species in that particular location most likely to exhibit the characteristics of a preferred roost site, i.e., large, with exfoliating bark and good thermal properties. Indiana bats are only rarely recorded using non-natural roosts, but have been documented using buildings, bat boxes, and highway underpasses (USWFS 2007).

WHITE NOSE SYNDROME

White Nose Syndrome (WNS) is a condition that debilitates cave-hibernating bats during hibernation. Most affected bats are presumed to die, though carcasses are difficult to locate. An 80 to 100% decline in the number of over-wintering bats has been documented at caves known to harbor WNS. The cause and mechanism of spread of WNS remains unknown, and a variety of research efforts are in progress to understand the syndrome (Hicks et al. 2008).

WNS was first identified in 2006, as a single hibernaculum in Schoharie County, NY. In 2007 WNS was identified in five additional NY hibernacula near Albany, out of 23 searched in NY, VT, MA, CT and PA. By 2008, WNS was confirmed in 27 out 65 caves searched in NY, VT, MA, CT, PA, and NJ. All but one of the surveyed locations within 80 miles of the original site were confirmed positive in 2008, and these positive caves were located in NY, VT, MA, and CT (Hicks, et al. 2008). Monitoring is underway throughout the northeast for the 2008-2009 winter season.

Based on the results of the 2008 surveys, all cave-hibernating species appear to be affected by WNS. Little brown bats were most affected, i.e., had the biggest decline in numbers hibernating from 2007 to 2008. Indiana bats also decline severely in some locations, but registered only small declines in other locations (Hicks et al. 2008). Based on these preliminary data, WNS has the potential to have a severe population level impact on Indiana bats, as well as other species.

WHITE NOSE SYNDROME AND ENFORCEMENT OF THE ENDANGERED SPECIES ACT

The Center for Biological Diversity wrote a letter to the U.S. Fish and Wildlife Service on January 29, 2008 (CBD, 2008a). The letter asked the agency to close to recreational use all caves and abandoned mines in the eastern United States where four federally listed endangered bat species are known to hibernate. There has been no apparent action on this request at the federal level. However, at the state and local level, closures are being implemented, as this post from US Caves Forum demonstrates (http://uscavesforum.proboards28.com/index.cgi?board=general&action=display&thread=1226, accessed Feb 2, 2009).

> Apparently many caves are being closed due to the White Nose Syndrome. A few states are sending letters to private cave owners and/or putting out advisories to stay out of caves or mines with bats such as New York, Vermont, and New Jersey. Also Connecticut, New Hampshire and West Virginia are also considering doing the same.
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INDIANA BATS IN WESTCHESTER COUNTY

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The thread continues, listing multiple other closings in caves across the east.

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"The law and common sense require federal agencies to reexamine their activities in light of this horrific threat to bats," said Mollie Matteson, conservation advocate for the Center for Biological Diversity. "Logging and road-building have pushed these bats closer to extinction for decades. White-nose syndrome could be the final blow, which is why action is needed now to prevent the loss of these important species." (CBD 2008a).

[illegible] 3 Normandeau Associates, Inc.

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Center for Biological Diversity. 2008a. Mysterious Disease Threatens the Survival of North American Bats; Conservation Groups Ask for Immediate Protections. Press Release January 29, 2008. http://www.biologicaldiversity.org/news/press_releases/2008/bats-01-29-2008.html

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ENCLOSURE 4 TO NL-09-036

NERA Economic Consulting Report dated March 2009, "Economic Comments on Nuclear Regulatory Commission DSEIS for Indian Point Energy Center"

ENTERGY NUCLEAR OPERATIONS, INC
INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 and 3
DOCKETS 50-247 and 50-286

1

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Attachment 1, Section 1: Correspondence

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Indian Point Study
Budgetary Pricing (6/5/03)

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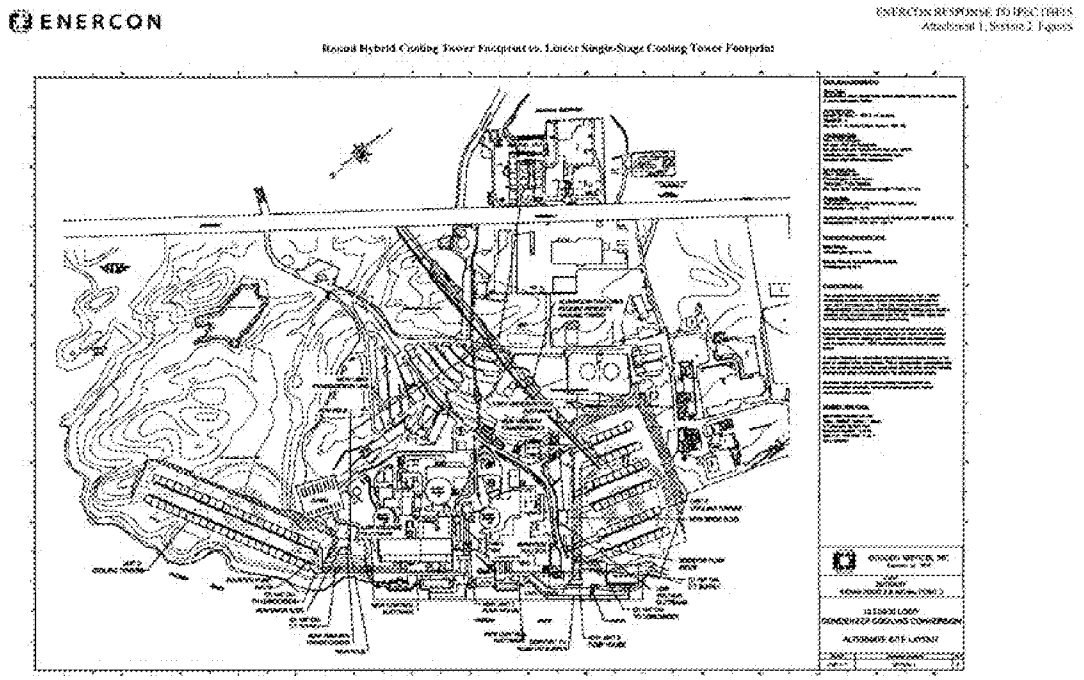

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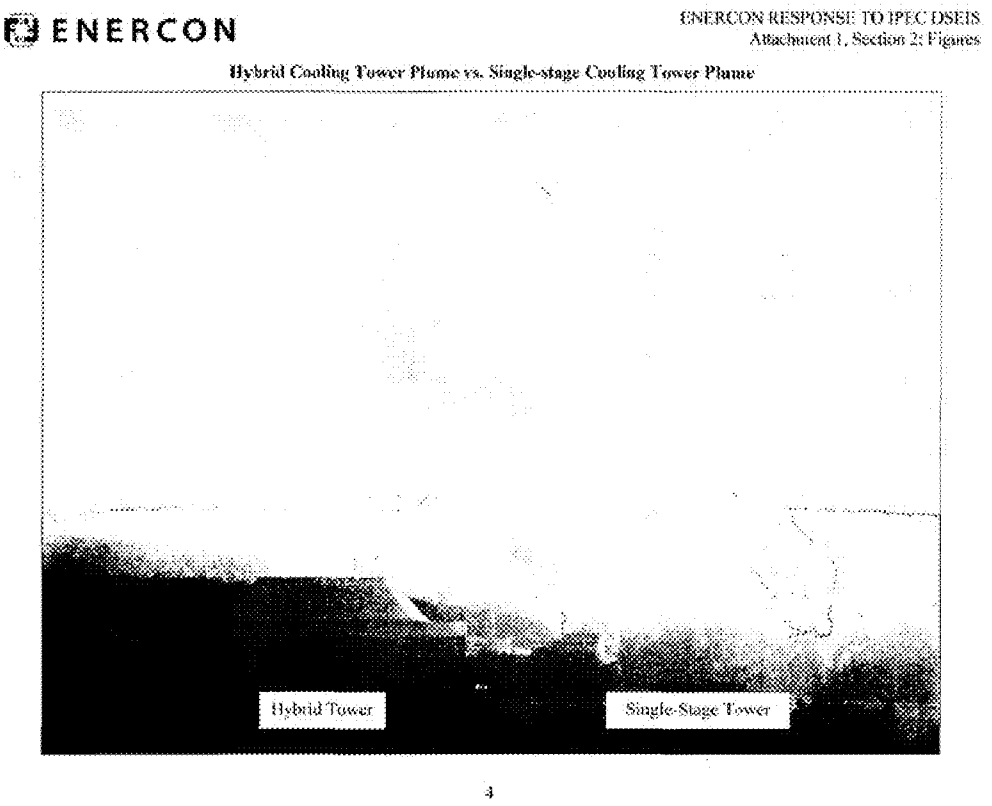

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Attachment 2

**Endangered Species Analysis
for Indiana Bats in Westchester County
(Normandeau Associates, Inc.)**

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ENERCON

ENERCON RESPONSE TO IPEC DSEIS
Attachment 2

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Prepared for
ENERCON SERVICES, INC.
500 Town Park Lane, Suite 275
Kennesaw, GA 30144

Prepared by
NORMANDEAU ASSOCIATES, INC.
25 Nashua Road
Bedford, NH 03110

R-19998.002/001

March 2008

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INDIANA BATS IN WESTCHESTER COUNTY

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REFERENCES

Center for Biological Diversity. 2008a. Mysterious Disease Threatens the Survival of North American Bats; Conservation Groups Ask for Immediate Protections. Press Release January 29, 2008. http://www.biologicaldiversity.org/news/press_releases/2008/bats-01-29-2008.html

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ENCLOSURE 4 TO NL-09-036

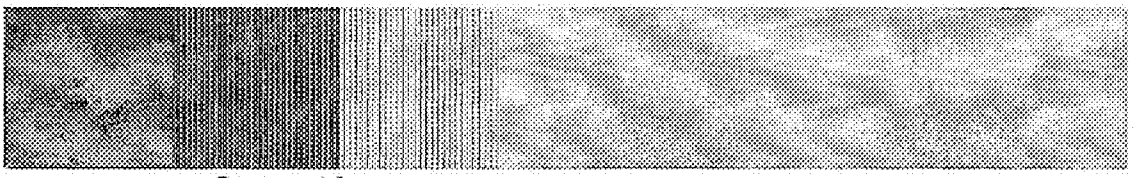
NERA Economic Consulting Report dated March 2009, "Economic Comments on Nuclear Regulatory Commission DSEIS for Indian Point Energy Center"

ENTERGY NUCLEAR OPERATIONS, INC
INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 and 3
DOCKETS 50-247 and 50-286

2

March 2009

Economic Comments on Nuclear Regulatory Commission DSEIS for Indian Point Energy Center



Prepared for

Entergy Nuclear Indian Point 2, LLC
Entergy Nuclear Indian Point 3, LLC

NERA
Economic Consulting

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Project Team

David Harrison, Jr., Ph.D.
Albert L. Nichols, Ph.D.
Meghan McGuinness
David Nagler

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Boston, Massachusetts 02116
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Fax: +1 617 927 4501
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Contents

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Contents

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List of Tables

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Executive Summary

The Nuclear Regulatory Commission ("NRC") in December 2008 released a Draft Supplemental Environmental Impact Statement ("DSEIS") in connection with the license renewal application for Indian Point Energy Center ("IP") Units 2 and 3. This report provides comments outlining corrections of mischaracterizations in the DSEIS from an economic perspective.

The DSEIS considers nine different alternatives or scenarios. NERA Economic Consulting ("NERA") has reviewed the DSEIS from an economic perspective, focusing on two of these scenarios, both of which assume the NRC renews the operating licenses. In one scenario, the two IP units continue to operate with a once-through cooling system. The other scenario assumes that the New York State Department of Environment and Conservation ("NYSDEC") requires retrofit of a closed-cycle cooling system with two cooling towers. The DSEIS rates impacts of each scenario in twelve impact categories using the following three-level qualitative scale:

- SMALL—Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.
- MODERATE—Environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.
- LARGE—Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

We identify corrections related to three impact categories developed in the DSEIS.

1. **Socioeconomic Impacts of License Renewal with Closed Cycle Cooling** (DSEIS – SMALL; Response – LARGE)

- The DSEIS lists socioeconomic impacts, which include electricity system impacts, as SMALL. The DSEIS acknowledges that the need for replacement power during construction may affect electricity prices and reliability, but dismisses this concern because of a contention that plant operators would be able to schedule outages to avoid summer peak demand periods and thus avoid reliability and price impacts.
- Based upon engineering judgment (provided by Enercon) that it would not be feasible to avoid a summer outage and an economic assessment of the existing information on the importance of IP units to the electricity system, the socioeconomic impacts of license renewal with closed cycle cooling should be categorized as LARGE.

2. **Air Emissions (Including Greenhouse Gas Emissions) Impacts of License Renewal with Closed Cycle Cooling** (DSEIS – SMALL; Response – LARGE)

- The DSEIS concludes that air quality impacts would be SMALL, based upon arguments that (a) any air quality effects related to vehicle and equipment emissions during construction

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would require compensatory measures to comply with Clean Air Act ("CAA") requirements, (b) replacement power would be required also to comply with CAA requirements (and would be short lived), and (c) air quality effects during operations would be minor.

- Based upon rough estimates of the likely increase in emissions of nitrogen oxides ("NO_x") and carbon dioxide ("CO_2") from replacement power during the outage and ongoing generation losses, and comparisons of these increases to the relevant New York State reduction targets, the air emissions impacts of license renewal should be categorized as LARGE. (Specifically, the construction outage would counteract more than a year's worth of New York State CO_2 reductions under the Regional Greenhouse Gas Initiative and a majority of a year's worth of NO_x reductions under the Clean Air Interstate Rule.)

3. **Aquatic Ecosystem Effects of License Renewal with Existing Cooling System** (DSEIS – SMALL to LARGE)

- The DSEIS provides an overall rating for aquatic ecosystem effects of license renewal with the existing cooling system of SMALL to LARGE. This overall rating is based upon combining the ranges of ratings for each of the 18 Representative Important Species ("RIS"). The DSEIS notes that these species are "ecologically, commercially, or recreationally important."

- Overall, the DSEIS has not provided sufficient evidence to find that the existing cooling system would "destabilize" or "noticeably alter" any of the 18 RIS and thereby adversely impact their ecological, commercial, or recreational values. In other words, the DSEIS does not adequately support findings of MODERATE or LARGE impacts.

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I. Introduction

This report provides comments from an economic perspective on specific misimpressions and errors in the Nuclear Regulatory Commission ("NRC") December 2008 Draft Supplemental Environmental Impact Statement ("DSEIS") for Indian Point Energy Center ("IP") in connection with Entergy's application for renewal of operating licenses for IP's generating units 2 and 3.

A. Background

The DSEIS considers nine different alternatives or scenarios. We focus on two of those scenarios, both of which assume the NRC renews the operating licenses. In one scenario, the two IP units continue to operate as they do now, with a once-through cooling system. The second scenario assumes that the New York State Department of Environment and Conservation (NYSDEC) would require the installation of a closed-cycle cooling system with two cooling towers.[1] The DSEIS rates the impacts of each scenario in twelve impact categories using a three-level qualitative scale. The NRC scale has three levels based on guidelines from the Council on Environmental Quality:

- SMALL—Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.
- MODERATE—Environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.
- LARGE—Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

Table 1 summarizes the conclusions in the DSEIS regarding the environmental impacts of the two alternative scenarios.

[1] The NRC will decide whether to renew the operating licenses. It will not decide whether to require the installation of a closed-cycle cooling system, which is the purview of the NYSDEC (and the courts). However, the DSEIS evaluates cooling-system options as alternative scenarios should it renew the licenses.

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Table 1. Summary of Results of DSEIS Evaluation for Two Alternatives

Impact category	License renewal with Existing cooling system	License renewal with Closed-Cycle Cooling
Land Use	Small	**Small to Large**
Ecology-aquatic	***Small to Large***	***Small***
Ecology-terrestrial	Small	**Small to Moderate**
Water use & quality	Small	Small
Air quality	Small	Small
Waste	Small	**Small to Large**
Human health	Small	Small
Socioeconomics	Small	Small
Transportation	Small	**Small to Large**
Aesthetics	Small	**Moderate**
Hist. & Arch. Resources	Small	Small
Env. Justice	Small	Small
Better rating	NA	1
Equal rating	NA	6
Worse rating	NA	5

Note: Entries in **bold and non-italics** represent categories in which the rating of the alternative in question is worse than that for License renewal. Entries in ***bold and italics*** represent categories in which the alternative has a better rating.

Source: NRC 2008, Table 9-1 and NERA tabulations.

License renewal with the NYSDEC requiring closed-cycle cooling has worse ratings than license renewal with the existing cooling system in five of the twelve categories, but it has a better rating for ecology-aquatic with a rating of SMALL, as opposed to SMALL to LARGE with the existing system.

B. Objectives of This Report

This report focuses on the following three assessments in Table 1.

1. Socioeconomic impacts (particularly electricity system impacts) of the closed-cycle cooling option, which the DSEIS lists as SMALL;

2. Air emissions (including greenhouse gas emissions) impacts of the closed-cycle cooling scenario, which the DSEIS lists as SMALL; and

3. Ecology-aquatic impacts of license renewal with the existing cooling water system, which the DSEIS lists as SMALL to LARGE.

We focus on these three issues because there is a significant economic component to the assessments and because they affect judgments regarding the relative environmental effects of the existing and closed-cycle cooling systems. The DSEIS appears to conclude that the aquatic impacts would be substantially reduced due to closed-cycle cooling (i.e., a change from

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"SMALL to LARGE" to "SMALL") and that the air quality and socioeconomic impacts and air quality would *not* be substantially affected by closed-cycle cooling (SMALL for both categories in each of the two alternatives).

The available information indicates that both the negative socioeconomic impacts (as reflected in electricity system effects) and the negative air quality impacts (including effects on greenhouse gas emissions) would be substantial if closed-cycle cooling was required. The available information indicates that these impacts would fit the definition of LARGE (i.e., "clearly noticeable and…sufficient to destabilize important attributes of the resource"). We thus conclude that the ratings should be changed to LARGE for both elements in the case of license renewal with closed-cycle cooling.

With regard to aquatic impacts, we conclude that the information developed in the DSEIS is insufficient to support findings of MODERATE or LARGE impacts.

C. Outline of the Report

The report is organized into four additional sections. Sections II, III and IV relate to the three specific issues noted above. Section II considers electricity market impacts (in the context of the socioeconomic impacts) of closed-cycle cooling. Section III considers air emissions and greenhouse gas emissions impacts of the closed-cycle cooling systems, and Section IV considers aquatic impacts of IP license renewal with the existing cooling water system. Section V summarizes our conclusions.

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II. Socioeconomic Impacts of Closed-Cycle Cooling Related to the Electricity System

This section considers the socioeconomic impacts of license renewal with closed-cycle cooling, focusing on impacts on the electricity system.

A. Overview of DSEIS Analysis and Conclusions Regarding Socioeconomic Impacts Related to Electricity Market Effects

1. DSEIS Analysis of Electricity Market Effects

The DSEIS addresses the effects of the closed-cycle cooling systems on the electricity system (within the context of assessments of socioeconomic impacts related to construction and operation of the closed-cycle cooling systems) in only a single paragraph:

> The need for replacement power during construction may affect electricity prices, but the size of this effect depends on the cost of replacement power and the duration of the outages. Plant operators would likely schedule outages to avoid—to the extent possible—summer peak demand periods to avoid affecting grid reliability and power transmission into New York City. (NRC 2008, p. 8-13)

2. DSEIS Conclusions Regarding Socioeconomic Impacts

The NRC staff provides the following conclusion regarding the socioeconomic impacts of closed-cycle cooling:

> The NRC staff concludes that most socioeconomic impacts related to construction and operation of closed-cycle cooling systems at the site would be SMALL. (NRC 2008, p. 8-13).

This conclusion does not explicitly state that the NRC staff has concluded that the socioeconomic impacts related to electricity market effects are SMALL, since it notes only the conclusion that most of the impacts are small. Nevertheless, the statement implies that either the electricity market impacts are small or that, even if they are not small, the electricity market effects are not sufficiently important to lead to a judgment that the overall socioeconomic impacts should be deemed more significant.

3. Limitations of the DSEIS Information on Electricity System Impacts

The information provided in the DSEIS does not provide a sufficient assessment of the potential impacts that construction and operation of the closed-cycle cooling systems could have on the electricity system. The available information indicates the following.

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- The outage for construction of closed-cycle cooling systems would take most of a year (including the summer), so it would cover the period of peak summer demand, when capacity is most highly utilized.

- Such an outage could have substantial impacts both on the reliability of the regional electricity system and on electricity prices.

- These electricity markets effects would be greater if a requirement to install closed-cycle cooling systems made it more economical for the owner to close the IP units permanently rather than to incur the added costs and risks related to installing closed-cycle cooling. The effects would be greater yet if the NYSDEC and other relevant state and federal agencies in the northeast imposed similar requirements on other plants in the region, and they shut down as well.

- As discussed below, the above issues suggest that the DSEIS rating for socioeconomic impacts of closed-cycle cooling (as reflected in electricity market effects) should be changed to LARGE.

B. Information on the Indian Point Outage Period

Enercon concluded in 2003 that the outage period required to connect the closed-cycle cooling systems would be 42 weeks in total, or more than 10 months (Enercon 2003, p. 14). Because of various additional challenges that have been identified, Enercon now believes that estimate is conservative; i.e., likely to be too short (Enercon 2009, p. 8). Moreover, Enercon has concluded that it would not be feasible to stagger the outage schedule to avoid summer months (Enercon 2009, p. 7).

In light of an outage of 10 months or more, it would not be possible to avoid summer peak demand periods, contrary to the assumption made in the DSEIS.[2] Enercon's 2003 analysis of construction of the closed-cycle cooling systems assumes that the outage would occur from March into the early part of the next year, thus covering all of the summer.

Note that if the NYSDEC required the installation of closed-cycle cooling, the prolonged outage and other costs of the system might lead IP's owner to shut down the two generating units permanently. A permanent shutdown would increase the likely effects on electricity system reliability and prices (see GE-NERA 2002).

A one-time construction outage would be unlikely to result in construction of additional generation capacity, and thus the shortfall in generation would have to replaced by increased generation at existing resources. With a permanent shutdown, new capacity could be added, but

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[2] In Section III, in discussing increased air emissions, we net out the four weeks that would overlap with a regularly scheduled refueling period. Here, however, the full length of the outage is relevant to scheduling and consequent impacts on reliability and prices. Refueling outages, which generally are less than four weeks, generally are scheduled in the early spring, when electricity demand is not high.

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it would require substantial lead time (on the order of six to seven years) for planning, permitting, and construction.

C. Information on the Effects of Indian Point Outage on Electricity System Reliability

Available information indicates that a NYSDEC requirement for closed-cycle cooling would lead to substantial negative impacts on electricity system reliability, as a result of either a substantial outage or a premature shutdown. This section summarizes information in the following categories:

- significance of Indian Point to the regional electricity supply;
- reports from the New York Independent System Operator ("NYISO") over many years describing the importance of IP to electricity system reliability;
- a 2006 study by a committee of the National Research Council of the National Academies (which we abbreviate "NRC/NA" to prevent confusion with the Nuclear Regulatory Commission), including a reliability assessment; and
- modeling estimates of potential reliability impacts that were submitted to the NYSDEC.

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All of this information indicates the substantial negative impacts that an outage or premature shutdown of IP units due to a NYDEC requirement for closed-cycle cooling would have on electricity system reliability.

1. Significance of Indian Point to the Electric System

IP accounted for about 19 percent of the annual energy requirement (MWh) and about 11 percent of peak summer demand (MW) in 2007 in the downstate region that it serves (NYISO 2008a).[3] If IP were to be shut down during the summer months, as it would be if closed-cycle cooling was required by the NYSDEC, there could be major impacts on the reliability of the electrical system in the region because transmission congestion limits the extent to which additional power can be imported from outside the area.

As the NRC/NA committee noted it in its 2006 analysis of IP, "[t]he Indian Point generating plant is located in the premium southeastern New York Zone H; hence the consumers in Zones H, I, and J heavily rely on it to meet demand" (NRC/NA 2006, p. 41). Loss of IP's output would have to be made up in significant part by generating units in the area rather than by importing more power from farther away.

[3] Consistent with the NRC/NA committee's work, unless otherwise noted the region in question is defined as zones H-K, which include Westchester County, New York City, and Long Island.

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2. New York Independent System Operator (NYISO) Assessments

NYISO is a not-for-profit corporation regulated by the Federal Energy Regulatory Commission ("FERC") and charged with overseeing New York State's wholesale electric power system, including operation of the region's competitive wholesale power markets and maintenance of regional electric reliability. In this role, NYISO regularly publishes analyses of New York electric reliability, including forecasts of future loss-of-load-expectation ("LOLE") under alternative electricity market scenarios. LOLE is a reliability metric that measures the expected number of days per year during which lack of sufficient available capacity would require involuntarily disconnecting some customers' loads from the grid. The North American Electric Reliability Corporation ("NERC"), Northeast Power Coordinating Council ("NPCC"), and New York State Reliability Council ("NYSRC") require a maximum LOLE of 0.1 in New York—that is, they require an expected frequency of involuntary load disconnection of no more than one day every ten years.

NYISO reliability evaluations have emphasized the importance of Indian Point to meeting State electric system reliability standards. In an assessment of reliability needs in 2006, for example, the NYISO stated that "[t]he NYCA LOLE increases significantly with the retirement of the Indian Point units to well in excess of 3.5 days per year" (NYISO 2005, p. 9). This loss-of-load expectation is 34 times greater than the minimum allowed under the above-described requirement.

In its 2007 report, NYISO noted that IP "is essential to New York City and the Lower Hudson Valley to meet electricity needs,"(NYISO 2007, p. 57).

The NYISO also has analyzed regional electric system reliability from the perspective of fuel diversity, most recently in an October 2008 White Paper. With reference to the NRC/NA report described below, the White Paper states that, "a closure [of IP] could exacerbate New York City's existing dependence on natural gas for power production" (NYISO 2008b, p. 3-6). The paper notes that the "comparatively limited downstate fuel diversity poses certain risks for the New York City and Long Island areas" (NYISO 2008b, p. 3-6), including negative effects related to the dominant role of natural gas prices in setting regional wholesale power prices.

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3. National Research Council Study

In 2003, Congress asked the National Research Council of the National Academies (NRC/NA) to form a committee to evaluate the feasibility and desirability of various alternative means of replacing the output and capacity that IP currently provides to New York. The committee's members were experts in the relevant fields. Their 2006 report provided (among other analyses) an evaluation of the reliability implications of IP shutdowns under alternative scenarios. The NRC/NA modeling "included additional, aggressive programs to improve efficiency of electricity use and stronger demand-side measures to reduce peak demand" (NRC/NA 2006, p. 62), but nonetheless found that closure could result in major reliability problems.

The first modeling case assumed substantial capacity growth prior to and after the hypothetical shutdown of the two IP units, but no incremental new capacity added specifically to address the

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shutdown. Under this case, the committee determined that the IP shutdown would increase reliability risks "to unacceptable levels" (NRC/NA 2006, p. 62), including a LOLE more than 13 times greater than the maximum allowable standard.

The NRC/NA also developed a scenario in which a combination of aggressive demand-side measures and new capacity would be added to maintain an acceptable LOLE. The resulting scenario relied on, among other features, addition of the proposed 1,100-MW TransGas Energy facility proposed for Brooklyn, New York, which has since been cancelled following a permit denial by the New York State Department of Public Service (NYDPS 2008); accelerated addition of significant additional gas and wind-fired capacity in New York City and surrounding zones; and the aggressive demand-reduction assumptions described above. All of these assumptions, though perhaps useful as a hypothetical analysis at the time of publication, do not provide any assurance that reliability could be maintained if the IP units were not operating. As the NRC/NA notes, "[i]dentifying the generation and transmission system capability that must be provided to replace Indian Point is much easier than determining whether it actually would get built when needed. All these measures will take time to implement, and several factors may converge to make it even more difficult" (NRC/NA 2006, p. 73).

In summary, the NRC/NA notes that "Indian Point is a critical component of both the reliability and economics of power for the New York City area," (NRC/NA 2006, p. 14).

4. Modeling Results

In 2002, General Electric Power Systems Energy Consulting ("GE") and NERA Economic Consulting completed a study of the impacts of potential shutdowns of northeastern nuclear units (GE-NERA 2002) that was submitted to the NYSDEC. The study used the GE-MAPS electricity market model, a state-of-the-art modeling system that identifies the least-cost means of meeting demand for electricity given the units in the system.

The 2002 study found that shutting down IP's units would reduce reserve capacity far below the reserve margins deemed adequate by the New York State Reliability Council. It also found that the shutdown would drastically increase the expected number of days per year when NYISO would need to implement emergency operating procedures due to reliability concerns.

The GE-NERA study is based upon an assumed permanent shutdown of IP's generating units, but the analyses also apply to a prolonged construction outage that would include the summer months, as would be required to install closed-cycle cooling at IP. The study suggests that had the construction outage occurred sometime in the 2002-2005 period, it would have caused significant reliability problems.

In addition to the analysis of the impact of an IP shutdown on reliability, the GE-NERA study also analyzed the impact if all nuclear units with once-through cooling systems shut down in response to a policy of the NYSDEC requiring closed-cycle cooling at all relevant units in the state.[4] In that case, the reserve margin would be negative (i.e., there would be insufficient

[4] In addition to analyzing a potential IP shutdown and a shutdown of all relevant units in New York State, the GE-NERA study also evaluated the impacts on reliability and prices if a policy of requiring the retrofit of cooling

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capacity to meet peak summer demands even if all units were available). Although it was not possible to calculate a LOLE, it is clear that the effects on system reliability would be very large.

D. Information on the Effects of Indian Point Outage on Electricity Prices

Available information also provides substantial evidence that an outage at IP units would have substantial effects on electricity prices in New York generally and the downstate New York region in particular. This section summarizes the information contained in the study conducted by the NRC/NA committee and previous modeling results developed by NERA.

1. National Research Council Study

In its 2006 IP study, the NRC/NA performed electricity market modeling using the GE MAPS model. The NRC/NA developed modeling runs based on alternative fuel prices and assumptions regarding the availability of generating units. For its "most likely" case, with IP still in service, the NRC/NA forecasted 2015 statewide average wholesale prices of $59/MWh and average prices in New York City (Zone J) of $67/MWh (NRC/NA 2006, p. 70). With IP removed, statewide average prices were forecasted to increase by about 12 percent, to $66/MWh. In New York City, the increase was even greater, with prices expected to rise about 18 percent to $79/MWh (NRC/NA 2006, p. 70).

2. Modeling Results

The GE-NERA (2002) study described above also estimated the effects of an IP shutdown on wholesale electricity prices. Over the 3.5-year period modeled (June 2002-December 2005), the study found that consumer expenditures on electricity would increase by about $3.4 billion due to an IP shutdown (GE-NERA 2002, p. 3). The underlying price increases measured about 11 to 16 percent in the state as a whole (depending on year) and 10 to 25 percent for the four downstate distribution companies (GE-NERA 2002, p. 17-29). As with reliability effects, these impacts would apply during a prolonged construction outage or during the first several years of a permanent outage, until sufficient time had passed to complete the planning, permitting, and construction of new units to replace the lost capacity. Even after replacement capacity was put in place, costs would be higher because replacement units would likely have higher operating costs as well as greater capital costs.

In the scenario involving the shutdown of all nuclear units in the New York, PJM, and New England regions, the estimated price increases were substantially higher, with New York consumer expenditures increasing by $9.8 billion, or about 40 percent, over the 3.5-year period modeled (GE-NERA 2002, p. 3). The corresponding estimated price increases were about 34 to

towers at all existing nuclear plants in a broader region (New York and the two surrounding control areas, ISO-NE and PJM) were imposed and led to all of those plants closing. It found that simultaneous retirement of those plants would leave the multistate region with negative reserve margins and hence the virtual certainty of massive system failures during peak summer demand periods, as well as large price increases. This larger shutdown also led to estimated wholesale price increases of 29 to 41 percent for the four downstate utilities. However, such a policy is beyond the purview of the NRC and so we do not consider it here.

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43 percent (depending on year) for the state as a whole and 29 to 44 percent for the four downstate distribution companies (GE-NERA 2002, p. 31-42).

E. Conclusions Regarding the Socioeconomic Impacts of Closed-Cycle Cooling

Given the findings of NYISO, the NRC/NA and the GE-NERA report regarding negative electricity system impacts, we are not aware of any basis for the DSEIS conclusion that the socioeconomic impacts of the NYSDEC's requiring closed-cycle cooling would be SMALL. The available information indicates that the negative socioeconomic impacts of closed-cycle cooling would be substantial and would properly be classified as "LARGE" based upon the DSEIS criteria (i.e., that effects are "clearly noticeable and are sufficient to stabilize important attributes of the resource").

- The outage required to complete a closed-cycle cooling system would include summer peak periods and would have significant negative impacts on the reliability of the regional electrical system.

- The likely outage would lead to substantial increases in the wholesale price of electricity for the duration of the outage and thus additional negative socioeconomic impacts.

These negative impacts would be substantially greater if IP's owner found it more economical to shut down IP2 and IP3 rather than install closed-cycle cooling systems. Moreover, if NYSDEC required that all nuclear plants in the state install closed-cycle cooling systems, and all of those plants closed as a result, the negative impacts would be even more extreme.

In sum, the socioeconomic impacts of closed-cycle cooling should be categorized as LARGE.

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III. Impacts of Closed-Cycle Cooling on Air Emissions and Carbon Dioxide Emissions

This section considers the effects of a requirement to install closed-cycle cooling on conventional air emissions and carbon dioxide (CO_2) emissions. These effects result from the replacement electricity generation due to the construction outage and ongoing losses due to closed-cycle cooling.

A. Overview of DSEIS Approach and Conclusions Regarding Air Emissions Effects

The DSEIS does not quantify the increased air emissions that would be associated with the construction and operation of closed-cycle cooling systems at IP. The DSEIS acknowledges that a consultant to Entergy developed quantitative estimates of emission impacts (TRC 2002) and that "to the extent that coal- and natural-gas-fired facilities replace IP2 and IP3 output, some air quality effects would occur" as a result of the required construction outage. However, it then discounts those impacts, without evaluating their magnitude, because they "would cease when IP2 and IP3 return to service" (NRC 2008, p. 8-10). The DSEIS also notes that "new parasitic loads" could generate additional emissions on a continuing basis, but discounts those effects as well without quantifying them (NRC 2008, p. 8-10).

1. DSEIS Conclusions Regarding Air Emissions Effects

The DSEIS concludes that the overall impacts of air emissions (including CO_2 emissions) would be "SMALL." Its reasoning is summarized as follows:

> Because air quality effects during construction would be controlled by site practices and compensatory measures required to maintain compliance with the Clean Air Act (CAA) (should a conformity analysis show the need to take other action), because replacement power would be required to also comply with CAA requirements (and it would be short lived), and air quality effects during operations would be minor, the NRC staff concludes that overall impact to air quality is likely SMALL. (NRC 2008, p. 8-11)

2. Limitations of the DSEIS Information on Air Emissions Effects

The DSEIS does not explain why it chose to not consider TRC's quantitative estimates. In any event, as discussed below, the NRC could have developed rough estimates using readily available information. We made such estimates in four steps:

1. determine the lost output due to cooling towers;
2. determine the likely emission rates for replacement power;
3. determine the likely total emissions due to replacement power;

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4. assess the significance of these additional emissions.

The estimates developed using this simple approach indicate that the potential impacts should be judged LARGE rather than SMALL.

B. Lost Output Due to Closed-Cycle Cooling Systems

The first step is to quantify the amount of electricity output that would be lost if IP2 and IP3 were required by the NYSDEC to install and operate closed-cycle cooling systems. There are two elements: (1) one-time losses associated with the construction outage; and (2) ongoing annual losses associated with increased parasitic losses and losses in gross output. Note that if requiring closed-cycle cooling systems led to the permanent shutdown of IP2 and IP3, the emissions estimated for the construction outage would continue for a much longer period.

For the construction outage, as noted above, Enercon (2003) estimates that the units would have to shut down for a total of 42 weeks (out of a total construction period of about 5 years). Enercon estimates that four of those weeks could overlap with a regularly scheduled refueling outage, leaving a net outage of 38 weeks. Total net capacity of the two units is about 2050 MW. Lost output over 38 weeks would be 13.1 million MWh (Enercon 2003, p. 14).

For the ongoing losses associated with the cooling towers, Enercon (2003) estimated lost output due to two types of losses:

1. *Parasitic losses.* The pumps used to circulate water through the towers and the fans used to help cool the water would increase consumption on average by about 53.0 MW, or 418,000 MWh per year, assuming 90 percent capacity utilization (including prorated refueling outages).

2. *Condenser-related reduced output.* Because the water cooled by the tower will not be as cool as the water drawn from the Hudson most of the year, gross output will be reduced on average by about 21 MW, or about 166,000 MWh per year because the condenser was designed for use with the cooler river water.

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Table 2. Summary of Lost Electricity Output due to Cooling Towers

Reason for Lost Generation	Lost Generation (MWh)
Plant Shutdown	
38-week construction (one time)	13,090,000
Annual rate	16,162,000
Ongoing output losses (annual)	583,000

Source: Enercon (2003) and NERA calculations as discussed in text.

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C. Emission Rates for Replacement Power

During a construction outage, demand normally met by IP would have to be met by increasing output at other generating units. Estimates of the additional emissions resulting from generation to replace this lost output ideally would be based on modeling of the electric system at the likely time of the outage, both with and without IP2 and IP3 in operation. Such modeling could identify which units would generate additional output to make up for IP's lost output during the outage. Source-specific emission factors then could be applied.

1. Likely Sources of Replacement Power

Rough air emissions estimates can be developed based on reasonable assumptions. Although conservation and renewables are likely to play important roles in meeting future demand for electricity, existing requirements are already very ambitious. New York has set a target of 25 percent of generation to be from renewables by 2013. Progress, however, is behind schedule. The 2008 report on the program estimates that even when one includes capacity that is not yet in production but is under contract or has a pending contract, the state fell 25 percent short of its 2008 goal (NYSERDA 2008, Table 5).

For a temporary outage, it would not be practicable to institute additional conservation measures or to build additional renewable capacity. Thus, even to the extent that New York State policies to encourage renewable generation and conservation meet their goals, these sources would not serve as *incremental* replacement for lost output from IP. Existing nuclear and hydro plants similarly would not be expected to replace lost IP generation, since they generally operate as much as possible already. As a result, output from IP lost during the construction outage most likely would be made up by increasing output at fossil-fired units.

To be conservative (i.e., to err on the side of understating emissions), for purposes of our calculations we assume that all of the incremental generation would come from natural gas-fired units. To the extent that coal or oil substituted for lost output from IP some fraction of the time, emissions estimates developed below would be understated. For gas-fired units, the air emissions of primary interest are nitrogen oxides (NO_X) and CO_2.

2. Emission rates

Table 3 summarizes the emission rates used to develop the estimates below. For existing units, we used information from EPA's eGRID database (EPA 2007) to estimate average emission factors for NO_X and heat rates (for calculating CO_2 emission rates) from gas-fired units in the downstate region served by IP.[5]

[5] We include units in eGRID's NYC/Westchester and Long Island sub-regions. We restrict our analysis to units listed as using natural gas as their primary fuel. Many of these units are also capable of burning oil if natural gas is not available or is expensive relative to gas.

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Table 3. Estimated Emission Rates for Existing and New Gas-Fired Replacement Power

Unit	Emission Rates (lbs/MWh) NO_X	CO_2
Existing (average)	0.869	1,189
New combined cycle	0.058	667

Note: Rates shown are pounds/MWh.
Estimates for existing units are based on 2005 data (the most recent available) from EPA's eGRID database (EPA 2007) for downstate New York units powered predominantly by natural gas. NO_X rates are total emissions for those units divided by total generation. CO_2 rates are calculated based on the average heat rate of these same units (total heat input divided by total generation), which is 10,200 Btu/KWh, and an emission rate of 117 lbs/MMBtu (see, e.g., EIA 2008).
The NO_X rate for new units is calculated from NO_X emissions figures in DSEIS for natural gas combined cycle alternative (NRC 2008, p. 8-49). CO_2 emission rate for new units based on the heat rate of 5,700 Btu/KWh assumed in the DSEIS.
Source: EPA (2007) and NRC (2008).

In the longer run there would be time to build new units to generate power needed to replace the ongoing losses in IP's net generation. We compute the emission rates for such units based on the DSEIS analysis of the natural gas-fired alternatives it considered.[6] The units used in the DSEIS assume that would be highly efficient gas-fired combined cycle plants with tight limits on NO_X emissions.

D. Estimated Increases in Emissions

Table 4 reports the estimated increases in emissions of NO_X and CO_2 based on the reduced generation in Table 2 and the emission rates in Table 3.

Table 4. Estimated Emissions Associated with Replacement Power Required by Cooling Tower Installation and Operation

Reason for Increase	Emissions (tons) CO_2	NO_X
Plant Shutdown		
38-week construction (one time)	7,781,000	5,689
Annual rate	9,607,000	7,024
Ongoing output losses (annual):		
Short run (existing units)	347,000	253
Long run (new units)	194,000	17

Note: Emissions are in (English) tons
Source: NERA calculations based on information in Table 2 and Table 3.

[6] The DSEIS alternatives differ in whether the new units would be located on the IP site or elsewhere. However, both alternatives assume the same generation technology and emission rates.

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1. Carbon Dioxide (CO_2)

The IP construction outage would cause a one-time loss of about 13 million MWh of generation. Replacing this output is estimated to increase CO_2 emissions by about 7.8 million tons. If the outage lasted longer than a year, CO_2 emissions would increase by about 9.6 million tons per year until the point at which new, more efficient replacement units could obtain permits and complete construction.

IP generation would decrease by about 580,000 MWh per year because of ongoing parasitic and gross output losses, resulting in increased annual CO_2 emissions of about 347,000 tons in the near-term and about 194,000 tons in the longer-run (when more efficient generation units would be in place).

2. Nitrogen Oxides (NO_x)

Table 4 shows that during the IP construction outage, emissions of NO_X would increase by about 6,000 tons. Once the IP units resumed operation, NO_X emissions initially would increase by about 250 tons per year. Once new, very tightly controlled plants were in place, the increase in NO_x emissions would be much smaller.

E. Significance of the Increased Emissions

These increases in emissions can be compared with regulatory requirements to provide a sense of perspective and provide the basis for determining the appropriate level of impact. Note that the two cap-and-trade programs discussed below both set overall caps on emissions, so increases resulting from replacement generation would have to be offset by reductions in emissions from other covered sources. Nonetheless, the gross increases in emissions provide a useful sense of the extent to which replacing the lost output associated with cooling towers at IP would make achievement of the caps more difficult and/or more costly.

1. Comparisons of Carbon Dioxide Emissions to Required Reductions under RGGI

New York and nine other Northeastern states have joined together in the Regional Greenhouse Gas Initiative ("RGGI") to reduce emissions of greenhouse gases from the electricity sector. When New York announced the completion of enabling rules for RGGI in 2007, then-governor Spitzer stated: "Global warming is the most significant environmental problem of our generation, and by helping lead this regional program, we can reduce emissions from power plants – one of the main sources of carbon dioxide emissions in the Northeast," (Spitzer 2007). When Governor Paterson opened the first RGGI auction of allowances in 2008, he stated: "Global warming is the most pressing environmental issue of our time," and that "by coming together with nine other states, New York is showing that we can take our own bold action in reducing greenhouse gas emissions." (Paterson 2008).

The increased emissions associated with the construction and operation of the cooling towers would make it more difficult for New York to achieve its goals under RGGI. Under RGGI, New

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York electric generators are required to reduce their annual emissions of CO_2 by about 6.4 million tons by 2018.[7] Thus, the potential increase in emissions from just the construction outage (7.8 million tons) would exceed the annual New York RGGI reduction target by more than 20 percent. To put this result another way, the burden on New York sources to reduce emissions would more than double in the year of the outage. Were IP's units to shut down permanently, this burden would continue for many years.

2. Comparisons of Nitrogen Oxide Emissions to CAIR Required Reductions

The Clean Air Interstate Rule ("CAIR") promulgated in 2005 established caps on NO_X emissions that EPA estimated would reduce emissions in New York by about 10,000 tons in 2015 (EPA 2008a).[8] The rule, which also tightened the cap on SO_2 emissions, was designed to address several ambient air problems. Emissions of NO_X and SO_2 both react in the atmosphere to form very fine particles that have been associated with a wide range of effects, including increased mortality and other health effects. (EPA 2005). NO_X also reacts in the atmosphere to from ground-level ozone, which causes a range of adverse effects on health and welfare (EPA 2005). Southeastern New York currently violates the ambient eight-hour ozone standard and the standard for fine particles less than 2.5 micrometers in diameter ("PM-2.5," see EPA 2008b).

The estimated 5,700 tons of increased NO_X emissions resulting from a 38-week construction outage would amount to about 60 percent of the estimated reduction required by CAIR in New York in 2015 (EPA 2008a). Put another way, the reduction required to meet the cap would be 60 percent larger than otherwise.

F. Conclusions Regarding Air Emission and GHG Emission Impacts of Closed-Cycle Cooling

The DSEIS does not provide any information on the likely impacts on emissions of GHGs and other air pollutants of adding a closed-cycle cooling system to IP. Without quantifying emissions, however, it concludes that the impact of emissions would be SMALL. Our rough calculations suggest, however, that the construction outage would counteract more than a year's worth of New York State CO_2 reductions under RGGI and the majority of a year's worth of NO_X reductions under CAIR.

In light of this information, we are aware of no basis that the DSEIS reasonably could conclude that the air emissions impacts of closed-cycle cooling would be SMALL. Based upon the criteria used in the DSEIS for a LARGE impact ("clearly noticeable and…sufficient to destabilize

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[7] New York's official RGGI rule (NYSDEC 2008, pp. 45-46) notes that the state's cap for 2009 through 2014 is 64,310,805 tons; its cap for 2018 and subsequent years is 57,879,725 tons. The difference is 6,431,080 tons.

[8] CAIR was overturned by the DC Circuit Court of Appeals in February 2008, in significant part because of the design of its trading program. However, the court has since modified its ruling to allow EPA to implement CAIR while working on new regulations that would satisfy the original ruling. For our purposes, CAIR provides a useful sense of scale for NO_X emission reductions.

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important attributes of the resource"), the air emissions impacts should be characterized as LARGE.

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IV. Aquatic Ecosystem Impacts of Permit Renewal with Existing Cooling System

This section considers economic issues related to the aquatic ecosystem impact assessment in the DSEIS for permit renewal with the existing cooling system. In particular, we comment on two issues: (1) the extent to which the DSEIS provides information on the environmental component or value affected by the IP cooling system operation (since identification of the environmental value is the first step in its assessment); and (2) the treatment of uncertainty in the DSEIS assessment of aquatic ecosystem effects.

A. Overview of DSEIS Approach and Conclusions Regarding Aquatic Effects

This section provides an overview of the DSEIS approach and conclusions regarding aquatic effects of the existing cooling system.

1. Identification of "Environmental Component or Value to be Protected"

The DSEIS provides the following summary of its identification of the "environmental component or value to be protected," the determination of which is the first step in its "Weight of Evidence" ("WOE") analysis of the impacts of IP2 and IP3 on aquatic ecology:

> For this assessment, the environmental component to be protected is the Hudson River aquatic resources as represented by the 18 RIS [Representative Important Species] identified in Table 2-4. These species represent a variety of feeding strategies and food web classifications and are ecologically, commercially, or recreationally important. (p. 4-15)

This statement suggests that that the DSEIS's assessment would be based on the likely effects of IP on ecological, commercial and recreational values. As discussed below, the information developed in the DSEIS does not provide information that sheds light on the likely ecological, commercial or recreational value of the aquatic losses due to IP and how those values would be reduced with closed-cycle cooling.

2. DSEIS Conclusions Regarding Aquatic Ecosystem Effects

The DSEIS reports a rating for each of the 18 RIS species on the SMALL to MODERATE to LARGE scale, as shown in Table 5. In constructing the overall score for the ecology-aquatic category, the DSEIS simply reported the range of the ratings for individual species, which ranged from SMALL to LARGE for those species rated. For the five species labeled "unknown" because of a lack of data, the DSEIS treats them as if their scores were SMALL to LARGE. As a result, the overall rating for aquatic ecology impacts is SMALL to LARGE.

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Table 5. Impingement and Entrainment Impact Summary from DSEIS

Species	Population Line of Evidence	Strength of Connection Line of Evidence	Impacts of IP2 and IP3 Cooling System on Aquatic Resources
Alewife	Large	Low to Medium	Small to Moderate
Bay anchovy	Moderate	Low to Medium	Small to Moderate
American shad	Large	Low to Medium	Small to Moderate
Bluefish	Large	High	Large
Hogchoker	Large	Medium to High	Moderate to Large
Atlantic menhaden	Moderate to Large	Unknown	Unknown
Blueback herring	Large	Low to Medium	Small to Moderate
R[illegible]ow smelt	Large	Medium	Moderate
Sh[illegible]ose sturgeon	Unknown	Unknown	Unknown
Spottail shiner	Large	Low to Medium	Small to Moderate
Atlantic sturgeon	Large	Unknown	Unknown
Striped bass	Small	High	Small
[illegible]c tomcod	Large	Low to Medium	Small to Moderate
White catfish	Large	Low to Medium	Small to Moderate
White perch	Large	Medium to High	Moderate to Large
Weakfish	Small	Medium to High	Small
Gizzard shad	Unknown	Unknown	Unknown
Blue crab	Small	Unknown	Unknown

Note: Where overall impact is "Unknown," the DSEIS notes that impacts could range from SMALL to LARGE.
Source: NRC 2008, Table 4-4.

3. Method for Developing Species Ratings

a. Lines of Evidence

To develop the overall SMALL-MODERATE-LARGE impact rating for each species, the DSEIS uses a "WOE" approach with two general "lines of evidence" ("LOE"): (1) population trends and (2) a measure labeled "strength of connection." The first LOE uses multiple sources of data to estimate whether the population of a species has been declining. The DSEIS weights results from the individual data sources according to their "use and utility" to derive an overall population trend rating of SMALL, MODERATE, or LARGE for each of the species. The "strength of connection" measure is more complicated, and compares "the rank order of RIS caught in the river to the order observed in impingement and entrainment samples" (p. 4-19). For each species, the DSEIS reports four measures of strength of connection, looking at impingement and entrainment for both the species and its prey, weighting each measure according to its "use and utility" to derive an overall strength of connection rating of LOW, MEDIUM, and HIGH

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b. Overall Rating for Each Species

Based on the scores on the two lines of evidence, the NRC staff assigned an overall rating for the impact of the IP2 and IP3 cooling system on aquatic resources. Equal weight is given to the population and strength of connection lines of evidence, but a SMALL impact on population trends or a LOW strength of connection score requires assigning an overall impact level of SMALL. Striped bass, for example, has a SMALL rating for population trends and a HIGH strength of connection rating. Thus, according to the DSEIS methodology, striped bass is assigned an overall impact rating of SMALL.

B. Lack of Connection between "Environmental Component or Value to be Protected" and Information Developed in DSEIS

The DSEIS begins its assessments with an identification of the "environmental component or value to be protected" and notes that the species considered are "ecologically, commercially, or recreationally important." It would be expected, therefore, that the DSEIS would develop an assessment that provides information on the ecological, recreational or commercial importance of the losses due to IP units. The first step in assessing the impacts of the operation of IP2 and IP3 would be to determine whether there is a causal relationship between the operation of IP2 and IP3 and aquatic impacts of ecological, recreational, or commercial importance.

However, the DSEIS does not provide analysis that adequately assesses whether any species population declines are being caused by operation of IP, or rather result from other stressors. Further, even if the DSEIS were able to show causality, the methods used in the DSEIS do not provide information on the *magnitude* of RIS population impacts from IP2 and IP3 and their implications for ecological, commercial, or recreational values. We understand that information is available that could be used to provide a more meaningful assessment of RIS population impacts and that could also be aggregated more meaningfully across species.

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1. Assessment of Causality

The DSEIS states that a finding of an adverse impact on a species "means that the data show both a measurable response in the RIS population and clear evidence that the RIS is influenced by the operation of the IP2 and IP3 cooling system" (NRC 2008, p. 4-19). In making this statement, the DSEIS is assuming that the 'strength of connection' LOE provides sufficient evidence of causality. However, as comments by Barnthouse et al. (2009) demonstrate, that LOE does not provide a meaningful assessment of the impact of IP2 and IP3 on RIS populations.[9]

Determining if there is a causal relationship between two variables is a standard problem in all fields, including economics as well as biology. Absent controlled experiments, causality can be difficult to determine. Providing statistical evidence of a causal relationship between the operation of IP2 and IP3 and RIS population levels would be the first step in providing a

[9] Barnthouse et al. (2009) provide a complete assessment of the strength of connection LOE, demonstrating flaws in the methodology and its tendency to produce erroneous results.

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connection to the "environmental component or value to be protected." A critical piece of assessing causality is to consider alternative explanations for the observed change in the dependant variable (e.g., decline in the population of an RIS) and to test to see which of those hypotheses are consistent with various aspects of the data. While the DSEIS acknowledges that "Detectable changes in RIS populations may be influenced by natural stressors or may be the result of stressors associated with human activities, which include the operation of IP2 and IP3," (p. 4-9) it makes no attempt to assess the relative impacts of individual potential stressors.

Further, the DSEIS does not adequately consider relevant information from Barnthouse (2008), which evaluates several different possible explanations for declines in the populations of several RIS. Barnthouse et al. find that none of the population declines is consistent with IP being the cause and that most can be explained by one or two other factors, in particular, striped bass predation and overfishing.[10] Although the DSEIS cites the Barnthouse et al. study and includes a table summarizing its findings, the DSEIS does not appear to have incorporated Barnthouse et al.'s results or approach into its analysis or conclusions, and does not attempt to reconcile discrepancies between its own results and those of Barnthouse et al.[11] For example, while the DSEIS finds a HIGH strength of connection for striped bass and a MEDIUM to HIGH strength of connection for white perch, for both species Barnthouse et al. reject the hypothesis that IP has been the cause of population declines.

2. Quantification of Population Impacts

The DSEIS rates the impact on each species as SMALL, MODERATE or LARGE based in theory on whether the operation of IP tends to "destabilize" or "noticeably alter" "any important attributes of the resource" (NRC, 2008 p. 4-18). The two LOE, individually and in combination, fail to tell us whether IP's operation in fact destabilizes or noticeably alters the population of any RIS. The population-trends LOE focuses entirely on whether there is a downward trend, with no attempt to reflect its magnitude, and as comments by Barnthouse et al. (2009) discuss, the strength-of-connection LOE fails to establish causality, let alone provide any estimates of the magnitude of any effect of IP's operation on the population either in absolute terms or in proportional terms.

We understand that quantitative estimates are available of the impacts of IP2 and IP3 on seven of the 18 RIS (ASAAC 2003). Those estimates include not only losses in numbers of organisms, but also in terms of their impacts on numbers of adult equivalents, thus making it possible to make meaningful comparisons across species impinged or entrained at different life stages, from eggs to fish aged one or more years. These estimates also are adjusted for new screens and

[10] For example, they find that striped-bass predation is the primary factor in the recent declines of Atlantic tomcod, river herring, and bay anchovy, and that the decline in American shad has resulted primarily from overfishing, with striped bass predation also a contributing factor. The three species with the highest impingement and entrainment scores in the NRC analysis, bluefish, hogchoker, and rainbow smelt, were not included in this analysis. We understand that comments provided by Barnthouse et al. (2009) will address the DSEIS findings for all three species.

[11] The DSEIS presents some results from Barnthouse et al. in discussing cumulative impacts (section 4.8.1) and in Appendix H, but makes no attempt to consider the whether factors such as fishing pressure or predation, rather than IP2 or IP3, are the primary explanations for population declines.

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operating procedures instituted in the early 1990s to reduce losses to impingement and entrainment. Absent consideration of the magnitude of population effects, the DSEIS cannot credibly assess the potential for IP2 and IP3 to "destabilize" or "noticeably alter" attributes of the resource, nor can it provide a basis for a meaningful assessment of the "ecological, recreational, and commercial importance" of the impacts of IP2 and IP3.

3. Meaningful Aggregation across Species

The DSEIS concludes in section 4.1.3.5 that the "overall impact to aquatic resources from impingement and entrainment ranges from SMALL to LARGE, depending on species affected" (p. 4-21.) Thus, the overall score utilized for comparisons of impacts in chapters 8 and 9 is essentially the range of the minimum to maximum impact across the 18 RIS evaluated. Moreover, because RIS for which the impacts are "unknown" are automatically given a SMALL to LARGE score, it is basically a foregone conclusion, particularly with a large number of RIS, that the overall score will be SMALL to LARGE, making it of little use for decision makers in distinguishing among cases.[12]

To develop a more meaningful aggregate score for the aquatic ecology category, it would be important to assess the relative importance of impacts on different RIS, presumably reflecting their "ecological, recreational, or commercial importance." This effort might include, for example, estimating the quantitative impact on recreational or commercial catches, both directly and indirectly through impacts on prey species.

Note that this process would not require developing full information on the value of the various losses due to IP operation. Rather, information could be developed on the size of the reduced commercial and recreational catch as well as the overall change in the species populations relative to the overall baseline populations.

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C. Limitations of DSEIS Information on the Implications of Uncertainty

The DSEIS notes the importance of addressing uncertainty in studies of ecological risk, citing EPA's (1998) recommendation that "…practitioners review and summarize the major areas of uncertainty in their analyses" (p. 4-20). Unfortunately, the discussion in the DSEIS is limited for two reasons:

- The DSEIS fails to consider evidence that is not part of its WOE process to narrow uncertainty; and
- The DSEIS does not meaningfully evaluate the impact of changes in its assumptions.

[12] Note that of the 18 RIS, 5 were scored "unknown."

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1. Information that Can Narrow Uncertainties

The DSEIS appears to assume that if adequate data were not available from the sources it used in its WOE process, the result was "unknown" and hence the impacts could not be narrowed down from the entire range from SMALL to LARGE. In fact, however, other sources of data or reasoning may allow a narrowing of impacts. For example, the impact on blue crab is listed as "unknown" because of inadequate information on the strength-of-connection LOE. However, because the population LOE score is SMALL, it is clear that regardless of the strength-of-connection score, the overall rating would be SMALL.[13]

The shortnose sturgeon offers another example. In that case, the DSEIS lists the RIS as "unknown" on both LOE. However, the DSEIS discusses several pieces of evidence, all of which point to a SMALL impact. The DSEIS cites a paper (Bain et al. 2007) finding that the population of shortnose sturgeon in the Hudson River has increased about 400 percent since the 1970s (the period during which IP has operated). It also cites another paper (Woodland and Secor 2007) estimating increased sturgeon abundance more broadly. Both of these studies suggest a SMALL score on population trends. If the population-trend score is SMALL, according to the DSEIS methodology the overall score must be as well.

The DSEIS also cites evidence indicating that IP has little impact on the population of the shortnose sturgeon. First, "[b]ased on an evaluation of entrainment data provided by the applicant, there is no evidence that the eggs or larvae of either species are commonly entrained at IP2 or IP3." (p. 4-51). Second, the DSEIS notes that in a 1979 Biological Opinion, the National Marine Fisheries Service (NMFS) estimated that overall mortality from impingement and entrainment for the Hudson River (including plants other than IP) was only 0.3-0.4 percent of the shortnose sturgeon population (NRC 2008, p. E-98). The installation of the Ristroph screens and variable-speed pumps after the 1979 NMFS opinion would have brought the mortality rate even lower, as the DSEIS acknowledges (NRC 2008, p. E-98).

The DSEIS cites all of this evidence that any impacts of IP on shortnose sturgeon are modest but does not reflect this information in the score assigned.

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2. Sensitivity to Alternative Assumptions

The DSEIS acknowledges uncertainty and the overall 'conservativeness' of its assumptions in chapter 4, but it does not attempt to provide any systematic evaluation of the sensitivity of its findings for individual species to the assumptions or decisions made in the analysis. For example, the DSEIS uses the 75[th] percentile of impingement, entrainment, and population densities in calculating its strength-of-connection measures.[14] It would be sensible to see if using the mean or median made a difference. Similarly, the DSEIS has a long discussion of uncertainties about the impact of the Ristroph screens, but does not test the sensitivity of its

[13] E.g., see the scoring for striped bass, where the strength of connection is HIGH but the overall score is LOW because the population-trends LOE is LOW.

[14] Using the 75[th] percentile generally will give greater weight to species with relatively high year-to-year variability. The DSEIS does not explain why it chose to use this percentile.

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results to its very conservative assumption that the Ristroph screens (and variable-speed pumps) made no difference. A systematic listing of key assumptions and analytic decisions that contribute to uncertainty, potential alternatives to these decisions, and the relative implications of these alternatives would provide a useful framework for consideration of uncertainty, and would provide decisionmakers information needed to assess whether the results of the DSEIS are robust.

D. Conclusions Regarding Aquatic Ecology Impacts of Permit Renewal with Existing Cooling System

The approach used in the DSEIS to evaluate aquatic impacts does not provide sufficient information to determine the impact of IP2 and IP3 on the 18 RIS evaluated and the extent to which such impacts are "ecologically, recreationally, or commercially important." The DSEIS does not assess causality, largely ignoring the potential impacts of stressors other than IP2 or IP3. In addition, the DSEIS does not consider available evidence that provides useful information about the magnitude of impacts from IP2 and IP3. Finally, it does not evaluate the sensitivity of its results to important and often conservative assumptions made in the analysis.

Overall, the DSEIS has not provided sufficient evidence to find that the existing cooling system would "destabilize" or "noticeably alter" any of the 18 RIS and thereby adversely impact their ecological, commercial, or recreational value. In other words, the DSEIS does not adequately support findings of MODERATE or LARGE impacts.

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V. Conclusions

The DSEIS for Indian Point evaluates the environmental impacts of IP license renewal and potential alternatives to license renewal, including license renewal with closed-cycle cooling. This report focuses on the DSEIS information with regard to three elements of these two alternatives.

- *Socioeconomic Impacts.* Existing analyses show that IP is critical to the reliability of the electric system in downstate New York, including New York City. Even if the outage for IP were only during construction, it would be long enough (10 months) to create potentially serious reliability problems during summer peak periods. An IP outage also would lead to substantial increases in electricity prices. These changes would be "clearly noticeable" and "sufficient to destabilize important attributes" of a reliable and cost-effective electricity system, and thus would be considered "LARGE" under the definition established in the DSEIS.

- *Air emissions and CO_2 emissions impacts.* The CO_2 emissions related to replacement power would exceed the 2018 annual New York State CO_2 emissions reduction target under RGGI. The increase in NO_X emissions would be more than half of the estimated reduction in New York State emissions under CAIR in 2015. These effects would be "clearly noticeable" and "sufficient to destabilize" desired air emissions and climate change outcomes in New York State. They should thus be categorized as "LARGE."

- *Aquatic ecosystem impacts.* The DSEIS has not provided sufficient evidence to find that the existing cooling system would "destabilize" or "noticeably alter" any of the 18 RIS and thereby adversely impact their ecological, commercial, or recreational value. In other words, the DSEIS does not adequately support findings of MODERATE or LARGE impacts.

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