Table 8-3 (continued)

Impact Category	Impact	Comment
Historic and Archeological Resources	SMALL to MODERATE	Construction at an alternate location would necessitate cultural resource studies; construction would likely avoid highly sensitive areas.
Environmental Justice	SMALL to LARGE	Impacts would vary depending on population distribution and location of the new plant site.

8.3.2 Natural Gas-Fired Combined-Cycle Generation

In this section, the NRC staff examines the environmental impacts of the natural gas-fired alternative at both IP2 and IP3 and at an alternate site. The NRC staff assumed that a natural gas-fired plant would use a closed-cycle cooling system.

This replacement natural gas-fired plant would likely use combined-cycle technology. Compared to simple-cycle combustion turbines, combined-cycle plants are significantly more efficient, and thus provide electricity at lower costs. Combined-cycle gas-fired power plants also tend to operate at markedly higher thermal efficiencies than other fossil-fuel or nuclear power plants, and require less water for condenser cooling than other thermoelectric alternatives. As such, the gas-fired alternative would require smaller cooling towers and substantially less makeup water than the cooling system proposed in Section 8.1.1 of this draft SEIS. Typically, these plants support intermediate loads but they are capable of supporting a baseload duty cycle; thus they provide an alternative to renewing the IP2 and IP3 operating licenses. Levitan and Associates indicated that gas-fired generation was the most likely alternative to take the place of IP2 and IP3 (2005).

The NRC evaluated environmental impacts from gas-fired generation alternatives in the GEIS, focusing on combined-cycle plants (NRC 1996). In a combined-cycle unit, hot combustion gases in a combustion turbine rotate the turbine to generate electricity. Waste combustion heat from the combustion turbine is routed through a heat-recovery steam generator, which then powers a steam turbine electrical generator. The combination of two cycles can be as much as 60 percent efficient.

Combined-cycle gas turbines that are currently on the market can operate at a heat rate as low as 5700 BTU/kWh for units with net output of 400 MW(e) (GE Energy 2005). These units are more efficient than the 408-MW(e) units Entergy considered in its ER, and would consume about 30 percent less fuel, while producing approximately 30 percent fewer emissions per unit of electrical output. Using five, 400-MW(e) units would slightly underestimate the total impact to some resources, but it provides a useful approximation using more-current technology. Other options would include four, 530-MW(e) units with heat rates of approximately 6000 BTU/kWh (GE Energy 2005), resulting in 2120 MW(e) net output.

The NRC staff discusses the overall impacts of the natural gas-fired generating system in the following sections and summarizes them in Table 8-4 of this draft SEIS. The extent of impacts at an alternate site would depend on the location of the site selected.

- **Land Use**

Existing facilities and infrastructure would be used to the extent practicable if a gas-fired complex were to be developed at IP2 and IP3. Specifically, the NRC staff assumed that this alternative would use the existing switchyard, offices, and transmission line ROWs. However, a new mechanical-draft cooling tower would need to be constructed to support the new closed-cycle cooling system.

The GEIS estimated that 45 ha (110 ac) are needed for a 1000-MW(e) natural gas-fired facility. Scaling up for the 2000-MW(e) facility would indicate a land requirement of approximately 90 ha (220 ac). The NRC staff notes that some existing combined-cycle facilities require less space than the GEIS indicates, and may be more on the order of 16 ha (40 ac) per 1000 MW(e). (Entergy's withdrawn proposal for combined-cycle capacity on the IP2 and IP3, for example, required only 2 ha (5 ac) for 330 MW(e) of capacity (as noted in Levitan and Associates 2005)). The IP2 and IP3 site is only 98 ha (239 ac) with some land unsuitable for construction. Also, much of the site is covered by the IP2 and IP3 containment structures, turbine buildings, other IP2 and IP3 support facilities, and AGTC gas pipeline. Land covered by some IP2 and IP3 facilities would not be available until decommissioning, though land covered by some support facilities may be available prior to the end of the current license. The AGTC pipeline ROW would remain unavailable. Based on previous Entergy proposals and experience at other combined-cycle plants, however, the NRC staff finds it possible that a gas-fired alternative could be constructed and operated on the IP2 and IP3 site.

As reported by Levitan and Associates, Inc. (2005), the existing Algonquin pipeline that passes through the IP2 and IP3 site may be adequate for a 330-MW(e) simple-cycle plant that would operate in peaking mode during the summer season, when gas supplies are less constrained by winter-season heating demands. Levitan and Associates (2005) concluded that substantial and expensive pipeline upgrades would probably be necessary to supply natural gas to a combined-cycle alternative throughout the winter heating season and for the additional baseload capacity throughout the year. Given firm demand for natural gas during the winter heating season, it is possible that the gas-fired alternative may need to burn fuel oil during several weeks of the year, should conditions of limited supply emerge. This practice is common at gas-fired power plants in the northeastern United States.

The environmental impacts of locating the gas-fired generation facility at an alternate location would depend on the past use of the location. If the site is a previously undisturbed site the impacts would be more significant than if the site was a previously developed site. Construction and operation of the gas-fired facility at an undeveloped site would require construction of a new cooling system, switchyard, offices, gas transmission pipelines, and transmission line ROWs. A previously industrial site may have closer access to existing infrastructure, which would help to minimize environmental impacts. A gas-fired alternative constructed at the IP2 and IP3 site would have direct access to a transmission system, an existing pipeline ROW, and an existing dock to receive major components.

Regardless of where a gas-fired alternative is built, the GEIS indicates that additional land would be required for natural gas wells and collection stations. According to the GEIS, a 1000-MW(e) gas-fired plant requires approximately 1500 ha (3600 ac) for wells, collection stations, and pipelines, or about 3000 ha (7300 ac) for a 2000-MW(e) facility (NRC 1996).

Overall, land use impacts of the gas-fired alternative are considered SMALL to MODERATE at

the IP2 and IP3 site. Gas-fired generation land use impacts at a new previously industrial site are considered to be SMALL to MODERATE; while gas-fired generation at a new undeveloped site would have MODERATE to LARGE impacts.

- **Ecology**

At the IP2 and IP3 site, there would be terrestrial ecological impacts associated with siting a gas-fired facility. These impacts would be similar to those described in Section 8.1.1.2 of this draft SEIS, which discusses the ecological impacts of the construction of a closed-cycle cooling system to support IP2 and IP3. The gas-fired facility would likely utilizing most previously undeveloped property on site. Improvements to the existing pipeline network would also be necessary, with some impacts along the already-disturbed ROW. Levitan and Associates (2005) indicated that no transmission system improvements would be necessary to accommodate the gas-fired alternative at the IP2 and IP3 site. Overall, construction effects are limited in both scope and duration. Impacts to terrestrial ecology of constructing the gas-fired alternative on site are likely to be SMALL.

Ecological impacts at an alternate site would depend on the nature of the land used for the plant and the possible needs for a new gas pipeline and/or transmission lines. Construction of the transmission line and construction and/or upgrade of the gas pipeline to serve a new plant at an alternate site would have substantial ecological impacts, though these would be temporary. Ecological impacts to the plant site and utility ROWs could include impacts on threatened or endangered species, habitat loss or fragmentation, reduced productivity, and a local reduction in biological diversity. Impacts to terrestrial ecology, however, are likely to be smaller than for a coal-fired facility and would likely be SMALL to MODERATE, depending on site characteristics.

Operation of the gas-fired alternative at the IP2 and IP3 site or another site would likely not introduce new terrestrial ecological effects after construction.

The gas-fired alternative is unlikely to create significant impacts for aquatic ecology during construction, regardless of location. Because the plant has a relatively small footprint, and because crews would likely implement some measures to control site runoff, it is unlikely that impacts to aquatic ecology would be noticeable. Noticeable effects could occur during construction if new transmission line ROWs or gas pipelines would need to cross streams or rivers.

During operations, aquatic ecological resources would experience significantly smaller effects than they would from a comparable nuclear or coal-fired power plant. The combined-cycle gas plant using closed-cycle cooling would require less than half the cooling water of IP2 and IP3 using closed-cycle cooling. Construction of intake and discharge structures at an alternate site could trigger some impacts to aquatic ecology, but because these impacts are very limited in scope and time, they will likely not affect any important resource characteristics. Thus, aquatic ecological impacts of the gas-fired alternative are likely to be SMALL.

At an alternate site, impacts to ecology may range from SMALL to MODERATE, while they are likely to be SMALL if constructed at the existing IP2 and IP3 site.

- **Water Use and Quality**

Surface Water: Combined-cycle gas-fired plants are highly efficient and require less cooling water than other generation alternatives. Plant discharges would consist mostly of cooling

tower blowdown, with the discharge having a slightly higher temperature and increased concentration of dissolved solids relative to the receiving water body, as well as intermittent, low concentrations of biocides (e.g., chlorine). All discharges from a new plant at the IP2 and IP3 site would be regulated through a New York SPDES permit, which would be issued by NYSDEC. Finally, some erosion would probably occur during construction (NRC 1996), though the GEIS indicates this effect would be SMALL. Plant construction crews would employ at least basic runoff control measures. Because crews would likely not have to construct entirely new intake structures, transmission lines, or a gas pipeline, most activities that could affect water use and quality will not occur for an alternative constructed at the IP2 and IP3 site. Like the existing IP2 and IP3, a gas-fired alternative located on the site would likely not rely on ground water. Overall, impacts to water use and quality at the IP2 and IP3 site from a gas-fired alternative would likely be SMALL for both construction and operation.

At an alternate site, a gas-fired alternative would likely rely on surface water for cooling makeup water and blowdown discharge. Intake and discharge would involve relatively small quantities of water compared to once-through cooling and less than the nuclear or coal-fired alternatives. The impact on the surface water would depend on the volume of water needed for makeup water, the discharge volume, and the characteristics of the receiving body of water. If a gas-fired plant discharges to surface water, the plant would have to meet the requirement of a SPDES permit. The NRC staff expects that any new facility would comply with requirements of the discharge permits issued for its operation. Thus discharges from the plant would be legally obligated to conform to applicable water quality standards. Water withdrawals from a small river or cooling pond, however, could lead to potential water use conflicts. The impacts would be SMALL to MODERATE during operations depending on receiving water characteristics. During construction, some erosion would probably occur though the GEIS indicates this would have a SMALL effect (NRC 1996).

Ground Water: IP2 and IP3 currently use no ground water. It is likely that a gas-fired alternative at the IP2 and IP3 site would also use no ground water. Impacts at the IP2 and IP3 site would thus be SMALL. Ground water impacts from operations at an alternate site may vary widely depending on whether the plant uses ground water for any of its water needs, though it would be unlikely that a plant on an alternate site would use ground water for cooling system makeup water given the quantity of water required. Ground water impacts at an alternate site could range from SMALL to MODERATE, depending on the quantity of ground water used and characteristics of aquifers used. Construction-stage impacts at both the existing site and a new site are likely to be SMALL.

- **Air Quality**

Natural gas is a clean-burning fuel relative to coal. The gas-fired alternative would release emissions similar to those from the coal-fired alternative, but in lesser quantities.

The NRC staff calculates that approximate emissions from the five-unit, 2000-MW gas-fired alternative using combined-cycle gas units with a heat rate of about 5700 BTU/kWh would be:

- SO_x—135 MT/yr (148 tons/yr)
- NO_x—444 MT/yr (475 tons/yr)
- CO—93 MT/yr (135 tons/yr)

- Filterable particulates (PM_{10})—75 MT/yr (83 tons/yr)[3]

Gas-fired power plants primarily emit pollutants as a result of combustion conditions. These pollutants include NO_x, CO, and particulates. Regulations in place to reduce potential health effects from air emissions, especially those promulgated in response to the CAA, drive the types of emissions controls this gas-fired alternative would use to limit its effects on air quality. CAA mechanisms like new source performance standards, nonattainment areas, State implementation plans, and specialized programs, including one that limited overall NO_x emissions throughout the Eastern United States, all drive emissions control technologies used in this gas-fired alternative.

NO_x is typically the pollutant of greatest concern for a gas-fired power plant. Given the proper atmospheric conditions, NO_x helps to form ozone, as well as smog. The gas-fired alternative in this case relies on selective catalytic reduction (SCR) to reduce NO_x emissions. As previously discussed, IP2 and IP3 are located within the New Jersey-New York-Connecticut Interstate Air Quality Control Region (40 CFR 81.13). All of the States of New Jersey and Connecticut, as well as several counties in Central and Southeastern New York within a 80-km (50-mi) radius of IP2 and IP3, are designated as nonattainment areas for ozone (8-hour standard) (EPA 2008b). Operators or owners of a gas-fired power plant constructed in a nonattainment area would need to purchase offsets for ozone precursor emissions. In this case, NOx is the major ozone precursor emitted by a coal-fired power plant. In accordance with NYSDEC regulations, "Emission offsets must exceed the net increase in annual actual emissions from the air contamination source project" (NYSDEC, Chapter 3, Parts 231–15). By design, this regulatory requirement should result in a net reduction in ozone emissions in the region.

A new gas-fired generating plant located in a nonattainment area (like that at the IP2 and IP3 site) would need a nonattainment area permit and a Title IV operating permit under the CAA. The plant would need to comply with the new source performance standards for such plants set forth in 40 CFR Part 60, Subpart DA. The standards establish limits for particulate matter and opacity (40 CFR 60.42(a)), SO_2 (40 CFR 60.43(a)), and NO_x (40 CFR 60.44(a)).

In December 2000, EPA issued regulatory findings on emissions of HAPs from electric utility steam-generating units (EPA 2000a). Natural gas-fired power plants were found by EPA to emit arsenic, formaldehyde, and nickel (EPA 2000a). Unlike coal- and oil-fired plants, EPA did not determine that emissions of HAPs from natural gas-fired power plants should be regulated under Section 112 of the CAA.

A natural gas-fired plant would have unregulated CO_2 emissions of about 117 pounds per MMBtu (DOE/EIA 2008a). The NRC staff calculates that a five-unit gas-fired alternative with technologically advanced turbines rated at 5700 BTU/kWh would emit approximately 4,965,000 MT (5,462,000 tons) of CO_2 per year. Section 6.2 of this draft SEIS contains a discussion of current and future relative GHG emissions from several energy alternatives including coal, natural gas, nuclear, and renewables. Other emissions and losses during natural gas production or transportation could also increase the relative GHG impact.

Construction activities also would result in some air effects, including those from temporary fugitive dust, though construction crews likely would employ dust control practices to limit this impact. Exhaust emissions also would come from vehicles and motorized equipment used

[3] Additional particulate emissions associated with the cooling towers were not quantified.

during the construction process, though these emissions are likely to be intermittent in nature and will occur over a limited period of time. As such, construction stage impacts would be SMALL.

The overall air quality impact for operation of a new natural gas-fired plant at the IP2 and IP3 or at an alternate site would be SMALL to MODERATE, depending on air quality in the surrounding airshed. Air quality impacts during construction would be SMALL.

- **Waste**

Burning natural gas fuel generates small amounts of waste. However, a plant using SCR to control NO_X will generate spent SCR catalyst and small amounts of solid waste products (i.e., ash). In the GEIS, the NRC staff concluded that waste generation from gas-fired technology would be minimal (NRC 1996). Waste generation impacts would be minor and would not noticeably alter any important resource attribute.

Constructing a gas-fired alternative would generate small amounts of waste, though many construction wastes can be recycled. Land-clearing debris from construction at an alternate location could be land filled on site. Overall, the waste impacts would be SMALL for a natural gas-fired plant sited at an alternate site.

Cooling towers for a new gas-fired alternative would be much smaller than those proposed in 8.1.1, and would not need to be constructed on slopes near the Hudson. Waste generation from plant construction, then, is much less than in 8.1.1. The waste-related impacts associated with construction of a five-unit gas-fired plant with closed-cycle cooling systems at the IP2 and IP3 site would be SMALL.

- **Human Health**

Human health effects from the operation of a gas-fired alternative with SCR emissions controls would likely not be detected or would be sufficiently minor that they would neither destabilize nor noticeably alter any important attribute of the resource.

During construction activities there would be a risk to workers from typical industrial incidents and accidents. Accidental injuries are not uncommon in the construction industry, and accidents resulting in fatalities do occur. However, the occurrence of such events is mitigated by the use of proper industrial hygiene practices, complying with worker safety requirements, and training. Occupational and public health impacts during construction are expected to be controlled by continued application of accepted industrial hygiene protocols, occupational health and safety controls, and radiation protection practices. Fewer workers would be on site for a shorter period of time to construct a gas-fired plant than other new generation alternatives, and so exposure to occupational risks tends to be lower than other alternatives.

Overall, the impacts on human health of a natural gas-fired alternate sited at IP2 and IP3 or at an alternate site would be considered SMALL.

- **Socioeconomics**

Construction of a natural gas-fired plant would take approximately 3 years (DOE/EIA 2007b). Peak labor force would be approximately 1090 workers (NRC 1996). The NRC staff assumed that construction of an offsite alternative would take place while IP2 and IP3 continue operation and would be completed by the time the plants permanently cease operations. Entergy

indicates that a gas-fired facility could be producing power before IP2 and IP3 shut down (Entergy 2007).

At the end of construction, the local population would be affected by the loss of as many as 1090 construction jobs. However, this loss would be partially offset by a postconstruction permanent employment. An additional construction workforce would be needed for the decommissioning of IP2 and IP3 which could temporarily offset the impacts of the lost construction and IP2 and IP3 jobs at the IP2 and IP3 site. A new gas-fired plant at the IP2 and IP3 site would offset a small portion of lost employment, though, according to Levitan and Associates, it may provide more revenues to the surrounding jurisdictions than IP2 and IP3 do (2005). The large and diverse economic base of the region would help to offset or minimize the significance of job losses.

The NRC staff concludes that the overall socioeconomic impacts from the gas-fired alternative could be SMALL to MODERATE during construction and could be SMALL to MODERATE during operation at most sites, depending largely on tax impacts.

- **Transportation**

Impacts associated with transportation of the construction and operating personnel to the plant site would depend on the population density and transportation infrastructure in the vicinity of the site. During the 3-year construction period of the gas-fired facility, approximately 1090 construction workers may be working at the site. The addition of these workers would increase traffic on highways and local roads that lead to the construction site. The impact of this additional traffic would have a SMALL to MODERATE impact on nearby roadways, depending on road infrastructure and existing traffic demands. Rural areas would typically experience a greater impact than urban or suburban areas. Impacts associated with plant operating personnel commuting to and from work are considered SMALL at all sites. Because the gas-fired alternative relies on pipelined fuel, transportation impacts from natural gas supply are not likely to be noticeable, though plant operators will have to ensure that sufficient gas transportation capacity exists.

- **Aesthetics**

The combustion turbines and the heat-recovery boilers of the gas-fired plant would be relatively low structures compared to existing plant facilities, but could be visible from the Hudson River if located at the current IP2 and IP3 site. Some facility structures could be visible from offsite locations as well. The impact on aesthetic resources of a gas-fired plant is likely less than the impact the current nuclear plant, excepting when cooling towers produce noticeable plumes. Overall, aesthetic impacts from a gas-fired plant constructed at the IP2 and IP3 site would likely be SMALL.

At an alternate site, new buildings, cooling towers, cooling tower plumes, and electric transmission lines would be visible off site. Visual impacts from new transmission lines or a pipeline ROW would also be significant, though these may be minimized by building near existing transmission lines or on previously developed land. Additionally, aesthetic impacts would be minimized if the plant were located in an industrial area adjacent to other power plants. Overall, the aesthetic impacts associated with the gas-fired alternative at alternate site could be SMALL to LARGE.

- **Historic and Archeological Resources**

According to the IP2 and IP3 relicensing case study in the GEIS, archeological sites at or near the power plant were disturbed before construction of the plant, and so the impacts from plant construction and operation were not significant (NRC 1996). Section 2.2.9.2 of this draft SEIS also supports this conclusion.

A cultural resource inventory would be needed for any property at a new site or adjacent to the IP2 and IP3 site that has not been previously surveyed. The survey would include an inventory of field cultural resources, identification and recording of existing historic and archeological resources, and possible mitigation of adverse effects from subsequent ground-disturbing actions related to physical expansion of the plant site. The studies would likely be needed for all areas of potential disturbance at the proposed plant site and along associated corridors where new construction would occur (e.g., roads, transmission corridors, rail lines, or other ROWs).

The impacts to historic and archeological resources for the gas-fired alternative at the IP2 and IP3 site would be similar to those described in Section 8.1.1.2 of this draft SEIS for the closed-cycle cooling alternative, can generally be effectively managed, and are considered SMALL.

Historic and archeological resource impacts can generally be effectively managed and, as such, would be considered SMALL to MODERATE at a new, undeveloped site. For a previously developed site, impact on cultural and historic resources would also be SMALL. Previous development would likely have either removed items of archeological interest or may have included a survey for sensitive resources. Any significant resources identified would have to be handled in accordance with the NHPA.

- **Environmental Justice**

As described in Section 8.1.1.2 of this draft SEIS, impacts to the environment or community from actions at the IP2 and IP3 site, including the construction of a gas-fired plant, are not likely to disproportionately affect minority or low-income populations because these populations in the area around the site are proportionately small compared to the the geographical region's population. Therefore, the gas-fired alternative constructed at the IP2 and IP3 site would have SMALL impacts on environmental justice.

Impacts at an alternate site would depend upon the site chosen, nearby population characteristics, and economic conditions. These impacts would range from SMALL to LARGE, depending on impacts and the distribution of low-income and minority populations.

Table 8-4. Summary of Environmental Impacts of the Natural Gas-Fired Plant Alternative Located at IP2 and IP3 and an Alternate Site

Impact Category	5 Units Located at IP2 and IP3 Site		5 Units Located at Alternative Site	
	Impact	Comments	Impact	Comments
Land Use	SMALL to MODERATE	Onsite land used; most has been previously disturbed.	SMALL to LARGE	About 92 ha (224 ac) needed for plant construction; additional land may be needed for pipeline and transmission line ROWs.

Ecology	SMALL	Both terrestrial and aquatic impacts would be SMALL because the plant uses mostly disturbed land and uses relatively little water.	SMALL to MODERATE	Impacts would depend on the nature of the land used for the plant and whether a new gas pipeline and/or transmission lines are needed; cooling water iwould have SMALL aquatic resource impacts.
Water Use and Quality	SMALL	Minor erosion and sedimentation may occur during construction. The plant would use no groundwater.	SMALL to MODERATE	With closed-cycle cooling, the impact would likely be SMALL. Impact depends on the volume of used and characteristics of the water body; impacts from water use conflicts could be MODERATE.
Air Quality	SMALL to MODERATE	• SO_x: 135 MT/yr (148 tons/yr) • NO_x: 444 MT/yr (475 tons/yr) • PM_{10}: 75 MT/yr (83 tons/yr) • CO: 93 MT/yr (102 tons/yr) • CO_2: 5 million MT/yr (5.5 million tons/yr)	SMALL to MODERATE	Operational impacts are the same as onsite plant but more emissions from additional construction activities.

Table 8-4 (continued)

Impact Category	5 Units Located at IP2 and IP3 Site		5 Units Located at Alternative Site	
	Impact	Comments	Impact	Comments
Waste	SMALL	Small amounts of construction waste would be generated.	SMALL	Small amounts of construction waste with some recycling options; land-clearing debris could be land filled on site.
Human Health	SMALL	Minor risk to workers associated with construction and industrial accidents. Health effects from operational emissions are likely to be SMALL.	SMALL	Same as onsite plant.
Socioeconomics	SMALL to MODERATE	Impacts on housing and jobs in the area surrounding IP2 and IP3 during onsite construction and operation would be relatively minor based on the large population of the area surrounding IP2 and IP3.	SMALL to MODERATE	Construction impacts would likely be no larger than MODERATE at most sites. The largest impacts occur during construction.
Transportation	SMALL to MODERATE	Increased traffic associated with construction could be noticeable, though the number of construction workers is smaller than the number of workers currently at IP2 and IP3.	SMALL to MODERATE	Transportation impacts associated with construction and operating personnel to the plant site would depend on the population density and infrastructure in the vicinity of the site.
Aesthetics	SMALL	The impact is likely less than the impacts of the current nuclear plant; more land would be cleared and new structures built.	SMALL to LARGE	The greatest impacts would be from new transmission lines, gas line ROW, and plant structures. Impacts depend on the nature of the site.

Table 8-4 (continued)

Impact Category	5 Units Located at IP2 and IP3 Site		5 Units Located at Alternative Site	
	Impact	Comments	Impact	Comments
Historical and Archeological Resource	SMALL	A cultural resources inventory would be needed to identify, evaluate, and mitigate potential impacts from construction.	SMALL to MODERATE	An alternate location would necessitate cultural resource studies; construction would likely avoid highly sensitive areas. Impacts likely would be managed or mitigated.
Environmental Justice	SMALL	No significant impacts are anticipated that could disproportion-ately affect minority or low-income communities.	SMALL to LARGE	Impacts would vary depending on population distribution and location of the new plant site.

8.3.3 Purchased Electrical Power

Based on currently scheduled retirements and demand growth projections, the New York Independent System Operator (NYISO) predicted in 2006 that up to 1600 MW(e) from new projects not yet under construction would be needed by 2010 and a total of up to 3300 MW(e) by 2015 (National Research Council 2006).

Within the New York Control Area (NYCA), State power regulators require that load-serving entities (LSE), or power buyers, purchase enough generating capacity to meet their projected needs plus a reserve margin (National Research Council 2006). Entergy is not an LSE. In New York, Entergy owns and operates power plants, but not transmission or distribution systems; therefore, Entergy does not purchase power from other power generators. To replace the output from IP2 and IP3, LSEs, like Consolidated Edison, would need to purchase additional electric power from other sources, which could include new coal- and gas-fired power plants or renewable alternatives, or it could purchase power from existing facilities at other sites outside the NYCA (National Research Council 2006).

Power sources within NYCA have an installed capacity of about 38,000 MW(e) and more than 6,300 km (4,000 mi) of high-voltage transmission lines (National Research Council 2006). The current power transmission infrastructure makes it difficult to purchase power from outside the southern regions of the NYCA (namely the New York City and Long Island load zones) because there are power transmission constraints or “bottlenecks” between the southern load zones and other power generating areas to the east and north, including Canada. These neighboring areas would be needed to supply additional purchased power to replace power generated by IP2 and IP3. Because of the bottlenecks in the transmission lines, new transmission capacity would likely be necessary to efficiently move purchased power into the southern load zones and

provide a partial solution to the retirement of IP2 and IP3 (National Research Council 2006). Such new transmission capacity would likely come in the form of either an expansion of the existing high-voltage alternating current transmission system or the addition of new high-voltage direct current transmission facilities (National Research Council 2006).

The National Research Council found that improvements in transmission capability could significantly relieve congestion in the NYCA and increase delivery capacity from existing and potential electric generation resources to the southern load zones. The Council has proposed a 550-MW(e) west-to-east line across the Hudson River and a new north-to-south transmission line (up to 1000 MW) for better access to upstate New York and Canadian electric resources to provide useful capacity in the 2010 and 2015 time period (National Research Council 2006). However, a variety of institutional and financial obstacles often stand in the way of such plans. In 2006, the Council determined that a "concerted, well-managed, and coordinated effort would be required to replace IP2 and IP3 by 2015. Replacement in the 2008–2010 time frame would be considerably more difficult, probably requiring extraordinary, emergency-like measures to achieve" (National Research Council 2006).

As of March 2008, New York Regional Interconnect, Inc. (NYRI), was seeking the approval of the New York Public Service Commission (NYPSC) to build a 306-km (190-mi) transmission line with a rated power flow of 1200 MW(e) from the Town of Marcy in Oneida County to the towns of Hamptonburgh and New Windsor in Orange County, New York. In accordance with the NYRI application to the NYPSC, overhead transmission lines will make up approximately 89 percent of the proposed route, and underground cable will constitute the remainder of the route (NYRI 2008). NYRI has placed the proposed route within or parallel to existing or inactive railroads and energy ROWs for approximately 78 percent of its distance. For the remaining 22 percent of its distance, NYRI will construct the transmission lines in undeveloped areas or areas where there are no existing ROWs. The proposed transmission corridor includes 1155 ha (2855 ac). If approved, NYRI will clear 768 ha (1899 ac) of forested habitat during construction. While the proposed route minimizes the amount of land clearing and habitat destruction necessary, the proposed route also crosses sensitive habitats such as streams and wetlands (NYRI 2008).

While NYRI has proposed to construct additional transmission capacity that could be used to import power into the southern load zones for the NYCA, the proposed 1200-MW(e) capacity is not sufficient to completely replace the generating capacity of IP2 and IP3. Also, the project faces many hurdles before construction can begin. Since the NYRI project is, at this time, the only serious transmission project proposed in the NYCA that would supply additional power to the New York City area, the NRC staff does not consider purchased power as a viable stand-alone replacement option for IP2 and IP3. The NRC staff does, however, recognize that positive steps are being taken toward increasing the transmission capacity into the southern load zones of the NYCA. NYRI has evaluated the environmental impacts of its proposed project in Exhibit 4 of its petition to the NYPSC. Because the NRC staff does not consider purchased power as a viable stand-alone option for replacing IP2 and IP3, the staff did not conduct an independent evaluation of the NYRI findings. The NRC staff does, however, include purchased power across new transmission lines in the combination alternatives addressed in Section 8.3.7 of this draft SEIS.

8.3.4 Other Alternatives

Other generation technologies the NRC staff considered but determined to be individually inadequate to serve as alternatives to IP2 and IP3 are discussed in the following paragraphs.

- **Conservation**

In this section, the NRC staff evaluates conservation[4] as an alternative to license renewal. According to the American Council for an Energy-Efficient Economy (ACEEE) State Energy Efficiency Scorecard for 2006, New York ranks seventh in the country in terms of implementation of energy efficiency programs, suggesting that the State's conservation efforts are significant when compared to other States (ACEEE 2006). New York scored well (2 out of 3) on tax incentives and appliance standards. The State scored low on energy efficiency resource standards (0 out of 5) and utilities' per-capita spending on energy efficiency (5 out of 15), suggesting there is room for improvement in these areas.

The IP2 and IP3 ER (NYSDEC 2003a) dismissed conservation as a replacement alternative for IP2 and IP3 because conservation does not meet the criterion of a "single, discrete source." Also, because Entergy is a generator of electricity and not a distributor, it indicated that it does not have the ability to implement regionwide conservation programs (Entergy 2007). However, because of efforts made by the State of New York, and because additional conservation could be a consequence of the no-action alternative, the NRC staff examines conservation in this draft SEIS as an alternative to replace at least part of the output of IP2 and IP3.

The New York State Energy Research and Development Authority (NYSERDA) is pursuing initiatives in conservation. Within NYSERDA, the Energy Efficiency Services Program and Residential Efficiency and Affordability Program deploy programs and services to promote energy efficiency and smart energy choices (NYSERDA 2007). According to the NYSERDA, implementation of conservation in the following program areas has resulted in significant energy savings.

- existing buildings and structures
- new buildings and structures
- market/workforce development
- distributed generation and renewables
- industrial process
- transportation

In 2006, the National Research Council's Committee on Alternatives to Indian Point for Meeting Energy Needs developed a report that specifically addressed alternatives to IP2 and IP3 for meeting Statewide power needs (National Research Council 2006). The document reports that in 2005, NYSERDA estimated that its energy efficiency programs had reduced peak energy demands in New York by 860 MW(e). NYSERDA further forecasted that the technical potential

[4] The NRC staff notes that conservation typically refers to all programs that reduce energy consumption, while energy efficiency refers to programs that reduce consumption without reducing services. For this section, some conservation measures considered by the NRC staff are also energy efficiency measures.

of its efficiency programs in New York would result in a cumulative 3800 MW(e)-reduction of peak load by 2012 and 7400 MW(e) by 2022 (National Research Council 2006). "Technical potential" refers to the complete deployment of all applications that are technically feasible.

In addition to the currently anticipated peak load reductions resulting from the NYSERDA energy efficiency initiatives, additional conservation measures and demand-side investments in energy efficiency, demand response, and combined heat and power facilities could significantly offset peak demand Statewide. The National Resource Council report estimates that peak demand could be reduced by 1000 MW(e) or more by 2010 and 1500 MW(e) by 2015 (National Research Council 2006).

The National Research Council estimates that economic potential peak demand in the IP2 and IP3 service area could be expanded by approximately 200 MW(e) by 2010 and 300 MW(e) by 2015 assuming a doubling of the program budgets (National Research Council 2006). "Economic potential" is defined as that portion of the technical potential that the National Research Council judged to be cost effective. This estimate is based partly on the experience with three NYSERDA programs that avoided the need for 715 MW(e) of Statewide peak demand in 2004. Cost-effectiveness is based on a conservation option's ability to lower energy costs (consumers' bills) while energy prices continue to increase using EIA price forecasts. The National Research Council concludes that energy efficiency and demand-side management have great economic potential and could replace at least 800 MW(e) of the energy produced by IP2 and IP3 and possibly much more (National Research Council 2006).

The NRC staff notes that while Statewide conservation efforts could result in a peak demand reduction of about 75 percent of the power output of both IP2 and IP3 by 2015, the National Research Council predicted that only about 800 MW(e) could be reduced from the IP2 and IP3 service area (National Research Council 2006). As such, the NRC staff does not expect that conservation efforts alone will be sufficient to replace either of the IP2 or IP3 units and for this reason has not evaluated conservation or efficiency programs as replacements for the full output for IP2 or IP3. The NRC staff has, however, considered conservation as part of a combination of alternatives presented in Section 8.3.5 of this draft SEIS.

- **Wind Power**

New York State is recognized as having about 5000 MW(e) of land-based wind potential, enough to generate about 13 million MW(h) or equivalent to 10 percent of the State's electricity consumption. There are also substantial offshore wind resources. The NYSERDA New York Energy $mart^{SM} program is currently supporting extensive wind resource prospecting efforts to identify promising new sites for wind development. Furthermore, NYSERDA is currently working with three developers to develop four projects totaling 425 MW (Power Naturally 2008). Wind currently accounts for only about 1 percent of the generating capacity, or 391 MW(e), Statewide (NYISO 2008). The NYSIO is managing wind generation projects that are proceeding through the grid interconnection process. These projects have a potential of generating almost 7000 MW(e) (NYISO 2008); however, there is no assurance that a project in this process will go into service.

Generally, wind power, by itself, is not suitable for large baseload capacity. As discussed in Section 8.2.1 of the GEIS, wind has a high degree of intermittency, and average annual capacity factors for wind facilities are relatively low (on the order of 30 to 40 percent). Wind power, in conjunction with energy storage mechanisms or other readily dispatchable power

sources like hydropower, might serve as a means of providing baseload power. However, current energy storage technologies are too expensive to allow wind power to serve as a large baseload generator.

Areas of class 3 or higher wind energy potential occur throughout much of the northeastern United States (DOE 1986, 2008). The primary areas of good wind energy resources are the Atlantic coast, the Great Lakes, and exposed hilltops, ridge crests, and mountain summits. Winter is the season of maximum wind power throughout the Northeast when all except the most sheltered areas have class 3 or better wind resource; exposed coastal areas and mountain summits can expect class 6 or 7 wind resource. In summer, the season of minimum wind power, class 3 wind resource can be found only on the outer coastal areas and highest mountain summits (DOE 1986).

Wind power of class 3 and higher is estimated for the high elevations of the Adirondack Mountains of northeastern New York (DOE 1986, 2008). Annual average wind power of class 3 or 4 is found along the coastal areas of both Lake Erie and Lake Ontario, while class 5 winds are estimated to exist in the central part of both lakes (DOE 1986, 2008).

The National Research Council estimates that offshore wind could meet most of the IP2 and IP3 load by 2014 (National Research Council 2006). Currently, Winergy Power of Hauppauge, New York, is proposing to complete construction of a wind farm about 19 km (12 mi) off the south shore of Long Island by 2014. Winergy has recently increased the size of its project to 940 MW(e) (WINS 2008). This would mean building as many as 260 wind turbines off the shore of Long Island. Winergy says the number of turbines would decrease if turbine technology improves at the time construction begins in 2012.

It is currently unknown whether the Winergy project will be completed. The proposed 420-MW(e), 130-turbine Cape Wind project off Cape Cod—the East Coast's offshore wind farm project that is farthest along in its approval process—faces opposition.

Because of the scale of a single wind farm project that would be needed to replace the power from IP2 and IP3 and the obstacles that the project would face, the NRC staff does not consider wind power to be a suitable stand-alone alternative that could be implemented before the IP2 and IP3 licenses expire. The staff does, however, recognize that New York has utility-scale wind resources and that NYSERDA is actively pursuing economic potential in wind-derived power supplies. Therefore, the NRC staff includes wind power in the combination alternatives addressed in Section 8.3.7 of this draft SEIS.

- **Wood and Wood Waste**

Wood-burning electric generating facilities can provide baseload power. However, the economic feasibility of a wood-burning facility is highly dependent on the availability of fuel sources and the location of the generating facility. Most wood-fired and other biomass plants are independent power producers and cogenerating stations with capacities on the order of 10 to 25 MW(e), with some plants operating in the 40 to 50 MW(e) range. In the 2006 New York Renewable Electricity Profile (DOE/EIA 2008b), New York's power industry reported only 37 MW(e) of generating capacity for wood or wood waste derived power.

Wood-burning energy generation continues to be developed in the northeastern U.S. In 2005, about 16 percent of the nation's energy derived from wood and wood wastes was generated in the New England and Middle Atlantic census divisions (DOE/EIA 2007). Within the region,

about 12 percent of the generating capacity is from wood and wood wastes. In New York, the Laidlaw Energy Group, Inc. (Laidlaw 2008), is planning to convert a retired gas-fired cogeneration facility into a 7-MW(e) wood-fired power plant in Ellicottville, Cattaraugus County. The plant will supply about 1 MW(e) to a lumber drying business located adjacent to the plant and export about 6 MW(e) to the power grid (Laidlaw 2008). However, the project has not yet been finalized, and the future of the plant is uncertain.

Walsh et al estimated New York's wood resources in a study published in 1999 (Walsh et al 1999). The study presents the amount of resourced available in tons per year given a specified price per dry ton delivered. Wood feedstock categories included forest residues, defined as "logging residues; rough, rotten, and salvable dead wood; excess saplings; and small pole trees," and primary mill residues (Walsh 1999). The annual resources available for each of these categories at a delivery cost of less than $50 per dry ton are 1,746,400 and 1,274,000 tons, respectively (Walsh 1999). These volumes, respectively, account for about 4 percent and 1.5 percent of the total resource available in the 48 contiguous States. The neighboring States of New Jersey, Connecticut, Massachusetts, and Vermont have significantly less wood resource. Pennsylvania, however, has comparable resources to New York available. Assumptions in the analysis include transportation distances of less than 50 mi and accessibility of 50 percent of the forest residues from existing roads.

The NRC staff finds that New York has utility-scale wood waste resources, but given uncertainties in supply estimates, as well as the small size and high number of installed facilities necessary to replace IP2 and IP3, the NRC staff does not find wood biomass to be a suitable alternative to IP2 and IP3 operating license renewals. The NRC staff will include wood waste facilities in combinations of alternatives addressed in Section 8.3.7 of this draft SEIS.

- **Hydropower**

New York State receives an abundant supply of hydroelectric power from Niagara Falls and other sites. Hydropower accounts for 5990 MW(e)—or about 15 percent—of the State's generating capacity (NYISO 2008).

The Idaho National Energy and Environmental Laboratory (INEEL) estimated that the undeveloped hydropower potential total for New York is 1309 MW(e) with 134 undeveloped potential hydroelectric sites in the Hudson River basin (INEEL 1998). Development of these sites could result in more than 300 MW(e) of baseload capacity (INEEL 1998). The Statewide potential is 40 percent less than IP2 and IP3's current capacity, and the regional potential is 86 percent less than the IP2 and IP3 capacity. Therefore, the NRC staff does not consider hydropower to be a viable stand-alone alternative to license renewal.

- **Oil-Fired Generation**

Oil accounts for about 8 percent of the generating capacity—or 3515 MW(e)—Statewide (NYISO 2008). EIA projects that oil-fired plants will account for very little new generation capacity in the United States during the next 20 years, and higher fuel prices will lead to a decrease in overall oil consumption for electricity generation (DOE/EIA 2007a).

EIA had indicated that oil prices are expected to make oil-fired generation an unlikely option for future generation additions (EIA/DOE 2007a), as discussed in Section 8.3. The relatively high cost of oil—even prior to 2008's record high prices—had prompted a steady decline for use in electricity generation. The NRC staff has not evaluated oil-fired generation as an alternative to

the renewal of the IP2 and IP3 operating licenses, though the NRC staff notes that oil may temporarily be burned in a gas-fired alternative should gas capacity become constrained during winter heating season.

- **Solar Power**

New York has enacted demand-side policies aimed at encouraging the adoption of photovoltaic (PV) technology for residents and businesses. These policies had resulted in the installation of more than 1.5 MW(e) of demand-side PV energy as of summer 2005 (National Research Council 2006). Through its Clean Energy Initiative, the Long Island Power Authority had issued rebates for PV systems totaling more than 2.63 MW(e) (National Research Council 2006). The National Research Council indicates that PV systems may be in the economic interests of New York customers because of high retail electricity rates and the falling prices of PV-generated electricity (National Research Council 2006).

The National Research Council reports that PV-generated electricity can provide high-value peak-time distributed generation power with minimal environmental emissions, and PV can contribute significantly to grid stability, reliability, and security (National Research Council 2006). Distributed generation refers to the production of electricity at or close to the point of use. Under an aggressive development scenario, the National Research Council estimates that 70 MW(e) of distributed PV could be installed in the NYCA by 2010 and 335 MW(e) by 2015. However, the National Research Council states that there would have to be "reductions in PV costs and a long-term commitment to expand New York's PV programs" in order to reach these goals (National Research Council 2006). Finally, the National Research Council considers most of the projected PV distributed generation as demand-side reductions in peak energy demands. Therefore, the energy-saving impacts of solar power are included in the conservation estimates described in Section 8.3.4 of this draft SEIS.

The NRC staff does not consider solar power to be a suitable stand-alone alternative to the renewal of the IP2 and IP3 operating licenses. The NRC staff does, however, recognize that solar energy is an important component of the NYSERDA demand-side reductions in peak load demands from generating facilities, including IP2 and IP3. Therefore, the NRC staff includes solar power in the combination alternatives addressed in Section 8.3.7 of this draft SEIS as a part of the conservation-derived demand reductions (as described in Section 8.3.4).

- **New Nuclear Generation**

Given the expressed industry interest in new nuclear construction, the NRC staff has previously evaluated the construction of a new regional nuclear power plant as an alternative to license renewal in SEISs for other nuclear power plant license renewal requests. Based on the NRC's current proposed schedule, no combined license (COL) application review is expected to be complete until the middle of 2010, at the earliest. Necessary reviews include the acceptance review as well as the safety and environmental reviews. Upon completion of the reviews, a public hearing process is initiated that is estimated to take at least 1 year. This brings the earliest approval of the submitted COL applications out to the middle of 2011.

While some plant construction activities can begin before issuing the COL, construction of a new plant is not expected to be completed until several years beyond the date the COL is issued. In late 2007, NRG Energy was the first to submit a full COL application to the NRC for its South Texas Project. The target for completion of the construction of the first of two units is

2014, after the end of the IP2 operating license.

Given the current COL application schedule, the time needed to review an application, and the anticipated length of construction, the NRC staff does not consider the construction and operation of a new nuclear power plant specifically for the purpose of replacing IP2 and IP3 to be a feasible alternative to license renewal at this time.

- **Geothermal Energy**

Geothermal plants are most likely to be sited where hydrothermal reservoirs are prevalent, such as in the western continental United States, Alaska, and Hawaii. There are no feasible eastern locations for geothermal capacity to serve as an alternative to IP2 and IP3 (NRC 1996), and the New York Renewable Electricity Profile did not indicate any geothermal energy production in New York in 2006 (DOE/EIA 2008). As such, the NRC staff concludes that geothermal energy would not be a feasible alternative to renewal of the IP2 and IP3 operating licenses.

- **Municipal Solid Waste**

According to the Integrated Waste Services Association (IWSA), fewer than 90 waste-to-energy plants are operating in the United States, generating approximately 2700 MW(e) of electricity or an average of approximately 30 MW(e) per plant (IWSA 2007). The existing net capacity in the region of IP2 and IP3 is 156 MW(e) generated by six plants, while the technical potential within the region is 1096 MW(e) by 2014 (National Research Council 2006). The 2014 estimate includes production from fuels containing municipal solid waste and construction and demolition wood (a portion likely to be at least partially captured in Walsh et al and referenced in the Wood Waste section of 8.3.4).

Estimates in the GEIS suggest that the overall level of construction impact from a waste-fired plant would be approximately the same as that for a coal-fired plant. Additionally, waste-fired plants have the same or greater operational impacts than coal-fired technologies (including impacts on the aquatic environment, air, and waste disposal). The initial capital costs for municipal solid waste plants are greater than for comparable steam turbine technology at coal facilities or at wood waste facilities because of the need for specialized waste separation and handling equipment.

The decision to burn municipal waste to generate energy (waste-to-energy) is usually driven by the need for an alternative to landfills rather than by energy considerations. The use of landfills as a waste disposal option is likely to increase in the near term; with energy prices increasing, however, it is possible that municipal waste combustion facilities may become attractive. Congress has included waste-to-energy in the Production Tax Credit legislation to encourage development of waste-to-energy and other renewable technologies (IWSA 2008).

Given the small average installed size of municipal solid waste plants, it would take about 70 plants to replace IP2 and IP3. Furthermore, NYSERDA estimates that the Statewide economically achievable potential for summer peak load from municipal solid-waste-derived energy by 2022, well into the relicensing period for IP2 and IP3, is only 190 MW(e) (NYSERDA 2003). Therefore, the NRC staff does not consider municipal solid waste combustion to be a feasible alternative to license renewal.

- **Other Biomass Derived Fuels**

In addition to wood and wood waste fuels, there are several other biomass fuels used for

generating electricity. These include burning crops, converting crops to a liquid fuel such as ethanol, gasifying crops, and biogas. Additionally, the National Research Council identifies animal and avian "manure" and wastewater methane as biomass derived fuel sources. The National Research Council estimates that the NYCA has a potential capacity of 41 MW(e) from biogas by 2014 (National Research Council 2006). NYSERDA estimates that the Statewide economically achievable annual load from biomass-derived energy by 2022, well into the relicensing period for IP2 and IP3, is 1.7 million MW(h) (NYSERDA 2003) or about 190 MW(e). In the period between 2005 and 2007, IP2 and IP3 produced more than 16 million MW(h) annually (Blake 2008). Furthermore, the New York Renewable Electricity Profile did not indicate any energy production in New York from biomass fuels other than wood and wood waste in 2006 (DOE/EIA 2008), which is considered above. For these reasons, the NRC staff concludes that power generation from biomass fuels does not offer a feasible alternative to the renewal of the IP2 and IP3 operating licenses.

- **Fuel Cells**

Fuel cells work by oxidizing fuels without combustion and the accompanying environmental side effects. The only byproducts are heat, water, and, if the fuel is not pure hydrogen, CO_2. Hydrogen fuel can come from a variety of hydrocarbon resources by subjecting them to steam under pressure. Natural gas is typically used as the source of hydrogen.

The only current program that was identified as being initiated by one of the three major power providers in downstate New York is a program being conducted by the New York Power Authority that involves nine fuel cell installations totaling 2.4 MW(e) using waste gas produced from sewage plants (National Research Council 2006).

At the present time, fuel cells are not economically or technologically competitive with other alternatives for baseload electricity generation. NYSERDA estimates that the Statewide technical potential for annual supply from fuel cells by 2022 is more than 37 million MW(h); however, NYSERDA indicated that the economical potential for 2022 is zero (NYSERDA 2003). NYSERDA defines economic potential as "that amount of technical potential available at technology costs below the current projected costs of conventional electric generation that these resources would avoid." Therefore, while it may be possible to use a distributed array of fuel cells to provide an alternative to IP2 and IP3, it currently would be prohibitively costly to do so. Since fuel cells are not currently economically feasible on such a large scale, the NRC staff concludes that fuel cell-derived power is not a feasible alternative to the IP2 and IP3 license renewals.

- **Delayed Retirement**

Based on currently scheduled power plant retirements and demand growth projections by the NYISO, 1200 to 1600 MW(e) from new projects that are not yet under construction could be needed by 2010, and a total of 2300 to 3300 MW(e) could be needed by 2015 (National Research Council 2006). In 2006, there were six new generation projects adding 2228 MW(e) of new capacity and scheduled retirements of 2363 MW of generating capacity (National Research Council 2006). Recent or scheduled retirements included the New York Power Authority's 885-MW(e) Poletti Unit 1 and Lovett Units 3, 4, and 5 totaling 431 MW(e). Astoria Units 2 and 3, with a total capacity of 553 MW(e), also are scheduled for retirement before the end of the current IP2 and IP3 license periods.

Plants scheduled for retirement are aging and have higher emissions than newer plants. Keeping older plants online may not be technically or economically achievable when emissions controls or necessary environmental mitigation measures are taken into account. Furthermore, given that the demand for electricity is increasing and, in the near term, planned new sources within the NYCA are just keeping pace with retirements, the NRC staff does not consider additional delays in the retirements of existing plants to be a feasible alternative to compensate for the loss of power from IP2 and IP3.

8.3.5 Combination of Alternatives

Even though individual alternatives to license renewal might not be sufficient on their own to replace the 2158-MW(e) total capacity of the IP2 and IP3 units because of the lack of resource availability, technical maturity, or regulatory barriers, it is conceivable that a combination of alternatives might be sufficient. Such alternatives may also include the continued operation of either IP2 or IP3 combined with other alternatives.

There are many possible combinations of alternatives that could be considered to replace the power generated by IP2 and IP3. In the GEIS, NRC staff indicated that consideration of alternatives would be limited to single, discrete generating options, given the virtually unlimited number of combinations available. In this section, the NRC staff examines two possible combinations of alternatives in part because other efforts to examine alternatives to IP2 and IP3, including Levitan and Associates (2005) and the National Research Council (2006), have addressed combinations of alternatives. The National Research Council (2006) noted, for example, that ". . . the additional 2 GW required if IP2 and IP3 were to be closed could be met by some suitable combination of new generation in the New York City area, efficiency improvements and demand-side management, and new transmission capability from upstate."

The NRC staff presents two possible combinations based partly on analysis by the National Research Council. In one of these combinations, the NRC has included the continued operation of either IP2 or IP3, and the second combination includes only alternative energy sources. The second combination is based entirely on new generation, efficiency improvements or demand-side management (jointly addressed as conservation), and new transmission capacity carrying power from upstate. These combinations include several alternatives that the NRC staff found to be unable to replace the entirety of IP2 and IP3 electrical capacity.

Combination Alternative 1

- continuing operation of either IP2 or IP3
- constructing a 330-MW(e) combined-cycle gas-fired plant at IP2 and IP3
- obtaining 200 to 400 MW(e) from renewable energy sources (primarily wood and wind)
- implementing 300 to 500 MW(e) of conservation programs based on the potential identified by the National Research Council and NYSERDA

Combination Alternative 2

- constructing a 400-MW(e) gas combined-cycle plant at the IP2 and IP3 site
- obtaining 200 to 400 MW(e) from renewable energy sources (primarily wood and wind)

- implementing 500 to 800 MW(e) of conservation programs based on the potential identified by the National Research Council and NYSERDA
- importing a net 800 MW(e) from upstate New York and Canada following the installation of a new transmission line

The following sections analyze the impacts of the two options outlined above. In some cases, detailed impact analyses for similar actions are described in previous sections of this Chapter. When this occurs, the impacts of the combined alternatives are discussed in a general manner with reference to other sections of this draft SEIS. A summary of the impacts from the two combined alternative options is presented in Table 8-5.

8.3.5.1 Impacts of Combination Alternative 1

Each component of the first combination alternative produces different environmental impacts, though several of the options would have impacts similar to—but smaller than—alternatives already addressed in this SEIS. Constructing closed-cycle cooling for one of the existing Indian Point generating units (either IP2 or IP3) would create impacts roughly equal to half of the impacts addressed in 8.1.1. Continued operations of either IP2 or IP3 would incur roughly half the impacts of continued operations described in Chapters 3, 4, and 6. (Decommissioning impacts, as described in Chapter 7 of this SEIS, as well as NUREG-0586, would still occur but may occur later than they would if both units retired at the end of their current Operating Licenses.) Constructing 330 MW(e) of gas-fired capacity would create roughly one-sixth the impacts of the on-site alternative described in 8.3.2, and would likely be able to make use of the AGTC pipeline on site without additional pipeline modifications (Levitan and Associates, Inc. 2005).

The NRC staff has not yet addressed in any depth in this SEIS the impacts of wind power, wood-fired generation, or conservation. A wind installation capable of yielding 100 to 200 MW(e) of capacity would likely entail placing wind turbines off Long Island on the Atlantic coast, in upstate New York, or on Lake Erie or Lake Ontario. A wind installation capable of delivering 100 to 200 MW(e) on average would require approximately 52 to 104 turbines with a capacity of 3.5 to 5 MW (Cape Wind Associates 2007). Because wind power installations do not provide full power all the time, the total installed capacity exceeds the capacity stated here.

As noted in Section 8.3.4, under Wood Waste, the wood-fired alternative would have impacts similar to a coal-fired plant of similar capacity. Unlike a coal-fired plant, however, the wood-fired plant does not release heavy metals (including mercury, uranium, and thorium) in fly ash. Wood-fired plants also tend to be slightly less efficient with slightly lower capacity factors.

Impacts from conservation measures are likely to be negligible, as the NRC staff indicated in the GEIS (1996). The primary concerns NRC staff identified in the GEIS related to indoor air quality and waste disposal. In the GEIS, NRC staff indicated that air quality appeared to become an issue when weatherization initiatives exacerbated existing problems, and were expected not to present significant effects. The NRC staff also indicated that waste disposal concerns related to energy-saving measures like fluorescent lighting could be addressed by recycling programs. The NRC staff considers the overall impact from conservation to be SMALL in all resource areas, though measures that provide weatherization assistance to low-income populations may have positive effects on environmental justice.

- **Land Use**

Impacts from this alternative would include the types of impacts discussed for land use in Section 8.1.1.2 and Section 8.3.2.1 of this draft SEIS. Construction of two hybrid cooling towers would have a SMALL to MODERATE impact on land use, depending on where Entergy disposes of excavated material, and construction of one tower would be expected to have approximately half of the impact. Section 8.3.2 states that the land use impacts from the construction of five gas-fired units at the IP2 and IP3 site would be SMALL to MODERATE. The combined alternative would need only one combined-cycle unit, which would fit on the existing site without purchasing offsite land. If the plant operator constructed a new cooling tower for the remaining IP unit the land use impacts will also be SMALL to MODERATE, depending on where Entergy disposes of excavated material from the one cooling tower. If not cooling tower was constructed for the remaining unit, the land use impact would be SMALL.

The GEIS notes that gathering fuel for wood-fired plants can have significant environmental impacts. However, the NRC staff believes that the operation of 100 to 200 MW(e) of wood-fired generation would have minor impacts, especially if the plants were widely distributed and feedstocks were primarily preexisting waste streams. Construction impacts of the wood-fired plants on land use would be SMALL to MODERATE depending on plant cooling configurations and plant locations. These impacts would be minimized by locating plants on previously disturbed land near other industrial applications, including paper/pulp mills or other forest-product operations where fuels may be readily available. To fully utilize the power generated in these plants, they would need to be constructed inside the transmission bottlenecks leading to the NYCA discussed in Section 8.3.5 of this draft SEIS. Otherwise, new transmission capacity would have to be constructed resulting in additional land use impacts.

Impacts from the wind power portion of this alternative would depend largely on whether the wind facility is located onshore or offshore. Onshore wind facilities will incur greater land use impacts than offshore, simply because all towers and supporting infrastructure will be located on land. NRC observations indicate that onshore installations could require several hundred acres, though turbines and infrastructure would actually occupy only a small percentage of that land area. Land around wind installations could remain in use for activities like agriculture (a practice consistent with wind farm siting throughout the U.S.).

Overall, the NRC staff considers that the land use impacts from the first combination alternative would be SMALL to MODERATE.

- **Ecology**

As described in Section 8.1.1.2 of the draft SEIS, the construction of two hybrid cooling towers would have a SMALL impact on aquatic ecology and a SMALL impact on terrestrial ecology. Because the combined alternative would involve construction and operation of only one cooling tower, the NRC staff considered the resulting impacts from the construction and operation of a single cooling to be SMALL on both the aquatic and terrestrial ecology. (If the remaining IP unit were to continue operating with once-through cooling, the impacts of impingement and entrainment would likely be at least MODERATE for some species, though the NRC staff have not analyzed the specific level of impact for this option. Thermal shock would also be less significant. Not constructing a cooling tower would mean a smaller terrestrial impact.)

The SMALL to MODERATE impacts from the construction of five gas-fired units at the IP2 and

IP3 site (described in Section 8.3.2 of this draft SEIS) would be reduced to SMALL because only one smaller gas-fired unit is proposed under this alternative.

Offsite construction and operation of wood-fired plants may have a SMALL to MODERATE impact on both aquatic and terrestrial ecology, depending heavily on the location of the plants.

The principal ecological impacts of an offshore wind farm as described earlier in this section would be to aquatic ecological resources. An onshore wind farm located in upstate New York would primarily affect terrestrial ecology. Neither wind farm would be likely to destabilize ecological resources. The NRC staff concludes that SMALL to MODERATE ecological impacts could occur during the construction phase but could be managed by choice of construction methods (e.g., avoiding particularly sensitive habitats).

Overall, the NRC staff considers that the ecological impacts, both aquatic and terrestrial, from this combination alternative would be SMALL to MODERATE.

- **Water Use and Quality**

The primary water use and quality issues from this alternative would occur from wood-fired generation and the gas-fired unit. While construction impacts could occur from a wind farm, particularly if located offshore, these impacts are likely to short lived. An offshore windfarm is unlikely to located immediately adjacent to any water users, though construction may increase turbidity. An onshore wind farm could create additional erosion during construction, as would wood-fired plants and a gas-fired unit on the IP2 and IP3 site. In general, site management practices keep these effects to a small level.

During operations, only the wood-fired and gas-fired plants would require water for cooling. Because the wood-fired plants are less efficient than the gas-fired unit and rely on a steam cycle for the full measure of their output, the effects of the wood-fired plant is roughly similar to the effect of the larger gas-fired unit. All of these units would likely use closed-cycle cooling, however, and this would limit the effects on water resources. As the NRC staff indicated for the coal-fired and gas-fired alternatives, the gas-fired and wood-fired portions of this alternative are likely to rely on surface water for cooling (or, as is the case in some locations, treated sewage effluent).

Effects from the continued operation of one IP unit with closed-cycle cooling would be SMALL, as would continued operation of one unit with the existing cooling system.

The NRC staff considers impacts on water use and quality to be SMALL for this combination alternative. The onsite impacts at the IP2 and IP3 facility would be expected to be similar to the impacts described in Sections 8.1.1.2 and 8.3.2 of this draft SEIS.

- **Air Quality**

The first combined alternative will have some impact on air quality as a result of emissions from the wood-fired plants and the onsite gas turbine. Because of the size of the units, an individual unit's impacts would be SMALL. Section 8.1.1.2 of this draft SEIS describes the impacts on air quality from the construction and operation of two hybrid cooling towers to be SMALL. For the construction and operation of a single tower, the impacts would be SMALL. The continued operation of one of the nuclear power units and construction and operation of the wind farm will have only minor impacts on air quality.

Overall, the NRC staff considers that the air quality impacts from the first combination alternative would be SMALL.

- **Waste**

The primary source of waste under this option would be from the construction of the new hybrid cooling tower. Constructing a wind farm, wood-fired generation, and a new gas turbine facility would also create waste, though significantly less than the 2 million cy (1.5 million m^3) created during excavation of two cooling towers (roughly half would be attributable to one cooling tower). Operational wastes would come primarily from the wood-fired power plant. Most of the ash from burned wood waste could be recycled or reused. The waste contribution from the remaining IP2 or IP3 unit would be roughly half of the waste generated by the current plant.

Section 8.1.1.2 of this draft SEIS describes the impacts from waste generated during construction of two towers to be SMALL to LARGE, depending on whether excavation waste could be reused or recycled. Waste impacts could be substantial during construction of the alternatives, and would remain SMALL to LARGE, depending on how the various sites handled wastes. If the remaining IP unit were to continue operation with the existing once-through cooling system, waste impacts would be SMALL. During operations, waste volumes would have only SMALL impacts.

- **Human Health**

The primary heath concerns under this option would be occupational health and safety risks during the construction of the new gas turbine, the new cooling tower, the wood-fired plants, and the wind farm. As described in previous sections (for coal-fired and gas-fired alternatives), if the risks are appropriately managed, the human health impacts from these or similar alternatives are SMALL. Impacts from emissions are uncertain, but considered SMALL as the plants would comply with the CAA health-informed standards and other relevant emissions regulations. Continued operation of one IP unit with the existing once-through cooling system would not change this assessment.

Therefore, the NRC staff concludes that the overall human health impact from the first combination alternative would be SMALL.

- **Socioeconomics**

This combination alternative involves the shutdown of either IP2 or IP3. As detailed in Section 8.2 of this draft SEIS, the socioeconomic impacts of shutting down the plants would be SMALL to MODERATE because of the loss of PILOT payments to local municipalities. Under this option, those payments would be expected to decrease but would not be completely eliminated. Some IP2 or IP3 jobs would be lost, but some would be replaced with jobs associated with the construction and operation of the gas-fired plant. The gas-fired plant may generate additional PILOT payments, which may offset shutdown effects. Levitan and Associates (2005) indicates that PILOT payments from a gas-fired facility smaller than IP2 and IP3 may supply PILOT payments near those provided by the existing plant. Other jobs would be generated by the construction of the offsite power alternatives. Overall, the NRC staff concludes that the socioeconomic impacts from the first combined alternative would be SMALL.

- **Socioeconomics (Transportation)**

As described in Section 8.1.1.2 of this draft SEIS, the construction of two hybrid cooling towers

would have a LARGE impact on transportation in the area around IP2 and IP3 during construction because of the large volume of rock and debris that would need to be transported off site. Approximately half as much excavated material will need to leave the IP2 and IP3 site under this combination alternative (if the IP unit continued to operate with once-through cooling, no excavated material would need to leave the site and transportation impacts would be eliminated). The other aspects of this alternative will create modest transportation effects during construction. Given that the wood-waste facility and wind farm are likely not be located in the same place, construction-stage impacts are less intense than if they were part of one collocated facility. Construction of the gas turbine facility will require fewer workers than the gas-fired alternative considered in Section 8.3.2 of this draft SEIS.

During operation, only the wood-waste facility is likely to create noticeable impacts (in gathering wood wastes), and these may not affect any important aspects of local transportation. No other transportation impacts for this alternative are considered to be as severe. Overall, the impact from this combined alternative would likely be MODERATE.

- **Aesthetics**

As described in Section 8.1.1.2 of this draft SEIS, the construction of two hybrid cooling towers would have a MODERATE impact on aesthetics. Aesthetic impacts from one cooling tower may be slightly smaller, though it would likely still affect the scenic value of the Hudson Valley.

Aesthetic impacts would occur during construction and operation of an offshore wind installation and would depend on its distance from the shore and on its orientation in regard to shoreline communities. The NRC staff estimates that the construction and operational impacts of the facility could be managed, though some may consider the impact to be LARGE, depending on the location of the turbines. An onshore wind facility would also have the potential to create LARGE effects. The aesthetic impacts from new wood-fired generating plants would likely not have a major effect on visual resources, because the plants are small. Impacts would depend on the plants' locations.

The NRC staff concludes that the overall aesthetic impacts from the first combination alternative could range from SMALL to LARGE, depending on the aesthetic effects of the wind power portion.

- **Historic and Archeological Resources**

Onsite impacts to historical and cultural resources from the construction of a hybrid cooling tower and a single gas turbine plant are expected to be SMALL. The offsite impacts from the construction of wood-fired units and a wind farm are also expected to be small given the opportunity to evaluate and select the sites in accordance with applicable regulations and the ability to minimize impacts before construction. Therefore, the NRC staff concludes that the overall impacts on historic and archeological resources from the first combination alternative would be SMALL.

- **Environmental Justice**

No impacts are anticipated in the IP2 and IP3 area that could disproportionately affect minority or low-income communities. Impacts from offsite activities would depend on the location of the activity. Many conservation measures, especially those involving weatherization or efficiency improvements to low-income households, can have disproportionately positive effects for low-

income families. Overall, though, environmental justice impacts from the first combination alternative would depend substantially on the location of the installations and the characteristics of the surrounding populations. Impacts could range from SMALL to LARGE.

Impacts of Combined Alternative 2

The second combination alternative differs from the first in that it completely replaces IP2 and IP3 capacity. In contrast to the first combination alternative, a 400-MW(e) gas-fired plant is considered because it can be constructed on the site, making use of existing transmission lines and the natural gas pipeline that transects the IP2 and IP3 site; however, modifications to the pipeline would be necessary to provide firm year-round service to the site without removing the service rights of other customers in New York and Connecticut served by the pipeline (Levitan and Associates, Inc. 2005). Quantifying pipeline service adequacy and upgrade costs was beyond the scope of the Levitan report.

Like the first combination alternative, the second combination alternative employs 200 to 400 MW(e) from renewable energy sources (primarily wood and wind). The impacts of these sources are described in the discussion of Combination Alternative 1 in Section 8.3.7.1 of this draft SEIS.

This option requires more aggressive energy conservation programs that would result in an energy savings of 500 to 800 MW(e), the maximum potential expected by 2014 (National Research Council 2006). As described in Section 8.3.4 of this draft SEIS and in the GEIS, these conservation efforts would have overall SMALL impacts.

This alternative also includes importing 800 MW(e) from upstate New York or Canada, as described in Section 8.3.5 of this draft SEIS. This power would be purchased by an LSE for distribution in the New York City metropolitan area. However, to support such power imports, new transmission capacity would have to be established.

- **Land Use**

Siting a single 400-MW(e) gas-fired unit with a closed-cycle cooling system at the IP2 and IP3 site would require about 18 ha (45 ac) and would likely have SMALL impacts on land use as the existing site as the unit could likely be constructed on previously-disturbed land.

The construction of new transmission lines to support the purchased-power portion of this alternative would result in MODERATE to LARGE impacts as the lines may be several hundred miles in length. As described in Section 8.3.5 of this draft SEIS, a current plan for new transmission lines would impact 1155 ha (2855 ac).

The GEIS notes that gathering fuel for wood-fired plants can have significant environmental impacts. However, the NRC staff believes that the operation of 100 to 200 MW(e) of wood-fired generation would have minor impacts, especially if the plants were widely distributed and feedstocks were primarily preexisting waste streams. Construction impacts of the wood-fired plants on land use would be SMALL to MODERATE depending on plant cooling configurations and plant locations. These impacts would be minimized by locating plants on previously disturbed land near other industrial applications, including paper/pulp mills or other forest-product operations where fuels may be readily available. To fully utilize the power generated in these plants, they would need to be constructed inside the transmission bottlenecks leading to the NYCA discussed in Section 8.3.5 of this draft SEIS, or in a location to access new

transmission from upstate areas described in the previous paragraph. Otherwise, new transmission capacity would have to be constructed resulting in additional land use impacts.

Impacts from the wind power portion of this alternative would depend largely on whether the wind facility is located onshore or offshore. Onshore wind facilities will incur greater land use impacts than offshore, simply because all towers and supporting infrastructure will be located on land. NRC calculations indicate that onshore installations could require xx ha (xx ac) (reference). Land around wind installations could remain in use for activities like agriculture (a practice consistent with wind farm siting throughout the U.S.).

Overall, the NRC staff considers that the land use impacts from this combination alternative would be MODERATE to LARGE.

- **Ecology**

As described in Section 8.3.2 of this draft SEIS, the impacts from the construction of five gas-fired units at the IP2 and IP3 site would have a SMALL to MODERATE impact on aquatic and terrestrial ecology. Because the second combination alternatives would use only one gas-fired unit, the NRC staff concluded the resulting impacts on both the aquatic and terrestrial ecology to be SMALL.

Offsite construction and operation of wood-fired plants and new transmission lines would have a SMALL to MODERATE impact on both aquatic and terrestrial ecology, depending heavily on the location of the plants and transmission lines. Transmission lines and their associated ROWs may noticeably affect terrestrial habitats if they contribute to habitat fragmentation. They may affect aquatic ecology when they cross water bodies, particularly if it is necessary to construct pylons in the water bodies.

The principal ecological impacts of an offshore wind farm as described earlier in this section would be to aquatic ecological resources. An onshore wind farm located in upstate New York would primarily affect terrestrial ecology. Neither type of wind farm would be likely to destabilize ecological resources. The NRC staff concludes that SMALL to MODERATE ecological impacts could occur during the construction phase but could be managed by choice of construction methods (e.g., avoiding particularly sensitive habitats).

Overall, the NRC staff considers that the ecological impacts from the second combination alternative would be SMALL to MODERATE.

- **Water Use and Quality**

The primary water use and quality issues from this alternative would occur from wood-fired generation and the gas-fired unit. While construction impacts could occur from a wind farm, particularly if located offshore, these impacts are likely to shortlived. An offshore windfarm is unlikely to located immediately adjacent to any water users, though construction may increase turbidity. An onshore wind farm could create additional erosion during construction, as would wood-fired plants and a gas-fired unit on the IP2 and IP3 site. In general, site management practices keep these effects to a small level. Construction of the transmission line would also like have minor, if any effects on water use and quality. Erosion controls would likely minimize sedimentation.

During operations, only the wood-fired and gas-fired plants would require water for cooling. Because the wood-fired plants are less efficient than the gas-fired unit and rely on a steam cycle

for the full measure of their output, the effects of the wood-fired plant is roughly similar to the effect of the larger gas-fired unit. All of these units would likely use closed-cycle cooling, however, and this would limit effects on water resources. As the NRC staff indicated for the coal-fired and gas-fired alternatives, the gas-fired and wood-fired portions of this alternative are likely to rely on surface water for cooling (or, as is the case in some locations, treated sewage effluent).

The overall effects on water use and quality of the second combination alternative would likely be SMALL.

- **Air Quality**

The second combination alternative will have some impact on air quality as a result of emissions from the wood-fired plants and the onsite gas-fired unit. Because of the size of the wood-fired units and the gas-fired unit, an individual unit's impacts would be SMALL. However, the NRC staff concludes that the cumulative impacts from all of the new plants would be SMALL to MODERATE.

- **Waste**

The primary source of waste under the second combination alternative would be from the construction of the new power generation facilities, both on site and off site. Waste could include land clearing debris from all aspects of this combination alternative, excepting the wind farm if built offshore. Additional wastes would result from operation of the wood-fired plants. Additional wastes could be generated during operations of the gas-fired plants, or during maintenance at the wind power installations and the new transmission line. Overall, the NRC staff concludes that the impacts will be SMALL to MODERATE.

- **Human Health**

The primary heath concerns under this option would be occupational health and safety risks during the construction of the new gas turbine, transmission lines, the wood-fired plants, and the wind farm. As described in previous sections (for coal-fired and gas-fired alternatives), if the risks are appropriately managed, the human health impacts from these or similar alternatives are SMALL. Impacts from emissions are uncertain but considered SMALL because the plants would comply with health-informed standards in the CAA and other relevant emissions regulations.

Therefore, the NRC staff concludes that the overall human health impact from the second combination alternative would be SMALL.

- **Socioeconomics**

The second combination alternative involves the complete shutdown of IP2 and IP3. As detailed in Section 8.2 of this draft SEIS, the socioeconomic impacts of shutting down the plants would be MODERATE because of the loss of PILOT payments to local municipalities. Under this option, those payments would be lost, but because of the gas plant that would be constructed on site, some new tax revenues would replace the PILOT payments. Levitan and Associates (2005) indicated that a smaller gas-fired plant may replace a significant portion of the PILOT payments currently provided by IP2 and IP3. Some IP2 and IP3 jobs would be lost but replaced with decommissioning jobs and jobs associated with the construction and operation of the gas turbine plant. Other jobs would be generated by the construction of the

offsite power alternatives as well as the transmission line. While many of these jobs would cease at the end of construction, a fraction would remain during operation. Overall, the NRC staff concludes that the socioeconomic impacts from the second combination alternative would be SMALL to MODERATE because of the significant loss in revenues from the PILOT payments and the loss of IP2 and IP3 jobs.

- **Socioeconomics (Transportation)**

The aspects of this alternative will create modest transportation effects during construction. Given that the wood-waste facility and wind farm are likely not be located in the same place, construction-stage impacts are less intense than if they were part of one collocated facility. Similarly, impacts associated with constructing the transmission line will be spread over a large area, and are not likely to be intense in any location. Also, construction of the gas turbine facility will require fewer workers than the gas-fired alternative considered in Section 8.3.2 of this draft SEIS.

During operation, only the wood-waste facility is likely to create noticeable transportation impacts (in gathering wood wastes), and these may not affect any important aspects of local transportation. The gas-fired unit may create noticeable impacts on gas transmission, but upgrades to the pipeline system should compensate for these effects. Because winter heating customers take priority over utility generation customer, the plant is unlikely to have noticeable effects for others, though it may need to burn fuel oil during peak demand periods.

Transportation impacts for this alternative would be minimal because the construction and operation workforce would be spread over multiple locations. No single project would have a significant long-term impact. Overall, the NRC staff concludes that the impact would be SMALL.

- **Aesthetics**

As described in Section 8.3.5 of this draft SEIS, new transmission lines would be 305 km (190 mi) long or longer. Transmission lines have a significant impact on visual aesthetics.

Aesthetic impacts would occur during operation of the wind farm installation and would depend on its distance from the shore and on its orientation in regard to shoreline communities. The NRC staff estimates that the construction and operational impacts of the facility could be managed, though some may consider the impact to be LARGE, depending on the location of the turbines. An onshore wind facility would also have the potential to create LARGE effects. . The aesthetic impacts from new wood-fired generating plants could also be MODERATE, depending on the plants' locations.

Therefore, the NRC staff concludes that the overall aesthetic impacts from the second combination alternative would be MODERATE to LARGE, depending on the locations of transmission lines and the wind farm.

- **Historic and Archeological Resources**

Onsite impacts to historical and cultural resources from the construction of a single gas turbine plant are expected to be SMALL. The offsite impacts from the construction of wood-fired units, a wind farm, and new transmission lines are also expected to be SMALL given the opportunity to evaluate and select the sites in accordance with applicable regulations and the ability to minimize impacts before construction. Therefore, the NRC staff concludes that the overall impacts on historic and archeological resources from the second combination alternative would

be SMALL.

- **Environmental Justice**

No impacts are anticipated in the IP2 and IP3 area that could disproportionately affect minority or low-income communities. Impacts from offsite activities would depend on the location of the activity. Many conservation measures, especially those involving weatherization or efficiency improvements to low-income households, can have disproportionately positive effects for low-income families. Overall, though, environmental justice impacts from the second combination alternative would depend substantially on the location of the installations and the characteristics of the surrounding populations. Impacts could range from SMALL to LARGE.

Table 8-5. Summary of Environmental Impacts of Combination Alternatives

Impact Category	Combination 1		Combination 2	
	Impact	Comments	Impact	Comments
Land Use	SMALL to MODERATE	Impacts would depend on location of wind farm and the site selection for the wood-fired plants, as well as land-disposal if a cooling tower is constructed at the remaining IP unit.	MODERATE to LARGE	Impacts would depend on the site selection for the wood-fired plants, and the placement of new transmission lines and the wind farm.
Ecology	SMALL to MODERATE	Impacts would depend on location of wind farm and the site selection for the wood-fired plants.	SMALL to MODERATE	Impacts would depend on site selection for the wood-fired plants, the wind farm, and transmission line.
Water Use and Quality	SMALL	Minor impacts occur if the wind farm is located offshore.	SMALL	SMALL impacts at the IP2 and IP3 site because of less onsite power production; minor impacts at offshore wind farms, and locations of wood-fired plants and transmission lines.
Air Quality	SMALL	Air emissions of the small wood-fired plants and gas-fired unit would be minor considering their size and possible multiple locations. A wind farm would not impact air quality. A cooling tower could have a minor effect on air quality.	SMALL to MODERATE	Emissions estimated in Table 8-4 reduced about 80 percent because only one gas-fired unit would operate at the IP2 and IP3 site. Air emissions of the small wood-fired plants would be minor considering their size and possible multiple locations. A wind farm would not impact air quality.

Table 8-5 (continued)

Impact Category	Combination 1		Combination 2	
	Impact	Comments	Impact	Comments
Waste	SMALL to LARGE	There would be construction waste from the IP2 and IP3 site if a cooling tower is constructed; construction of other alternatives would increase waste volumes. Operational wastes are SMALL.	SMALL to MODERATE	There would be far less construction waste from the IP2 and IP3 site. The other alternatives would not generate significant waste volumes except during construction.
Human Health	SMALL	Emissions and occupational risks would be managed in accordance with applicable regulations.	SMALL	Emissions and occupational risks would be managed in accordance with applicable regulations.
Socioeconomics	SMALL	Some PILOT payments and jobs may be lost.	SMALL to MODERATE	IP2 and IP3 jobs and PILOT payments lost; some new jobs and taxes; minimum impacts from other power alternatives.
Socioeconomics (Transportation)	MODERATE	Minor impacts from commuting plant personnel. More significant short-tem impacts from offsite transportation of construction waste, including large volumes of soil and rock.	SMALL	Minor impacts from commuting plant personnel. Short-tem impacts from offsite transportation of construction waste.
Aesthetics	SMALL to LARGE	Visual impacts from new wind turbines, depending on the location. Limited impact from wood-fired and gas plants.	MODERATE to LARGE	Visual impacts from new wind turbines and visual impacts of new transmission lines, depend on the location chosen. Limited impact from wood-fired and gas plants.
Historic and Archeological Resources	SMALL	Cultural resources inventories would be needed to identify, evaluate, and mitigate potential impacts from construction.	SMALL	Cultural resources inventories would be needed to identify, evaluate, and mitigate potential impacts from construction.

Table 8-5 (continued)

Impact Category	Combination 1		Combination 2	
	Impact	Comments	Impact	Comments
Environmental Justice	SMALL to LARGE	Impacts would depend on plant locations.	SMALL to LARGE	Impacts would depend on plant and transmission line locations.

8.4 Summary of Alternatives Considered

In this 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 8.3.5), alternative power-generating technologies (discussed in Section 8.3.6), and two combinations of alternatives (discussed in Section 8.3.7).

As established in the GEIS, the need for power from IP2 and IP3 is assumed by the NRC in the license renewal process. Should the NRC not renew the IP2 and/or IP3 operating licenses, their generating capacity or load reduction (e.g., by conservation) would have to come from an alternative to license renewal.

Furthermore, even if the NRC renews the operating licenses, Entergy could elect not to operate either IP2 or IP3 for the full terms of the renewed licenses. Decisions about which alternative to implement, regardless of whether or not the NRC renews the IP2 and IP3 operating licenses, are outside the NRC's authority and are subject to consideration by Entergy, other power producers, and State-level decisionmakers (or non-NRC Federal-level decisionmakers where applicable).

The environmental impact levels of the alternatives considered by the NRC staff in this draft SEIS are similar to the impact levels of continued IP2 and IP3 operation under a renewed license with or without modifications to the existing once-through cooling system combined with aquatic ecology restoration activities designed to comply with the site's draft SPDES permit, though impacts differ significantly across resource areas.

Impacts from combinations of alternatives including conservation and generation technologies (e.g., coal, gas, wind) are also likely to be similar to the impacts of renewing the IP2 and IP3 operating licenses and implementing modifications to the open-cycle cooling system and participating in and/or funding aquatic resource restoration activities.

8.5 References

10 CFR Part 50. Code of Federal Regulations, Title 10, *Energy,* Part 50, "Domestic Licensing of Production and Utilization Facilities."

10 CFR Part 51. Code of Federal Regulations, Title 10, *Energy,* Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions."

40 CFR Part 50. Code of Federal Regulations, Title 40, *Protection of Environment*, Part 50, "National Primary and Secondary Ambient Air Quality Standards."

40 CFR Part 51. Code of Federal Regulations, Title 40, *Protection of Environment*, Part 51, "Requirements for Preparation, Adoption, and Submittal of Implementation Plans."

40 CFR Part 60. Code of Federal Regulations, Title 40, *Protection of Environment*, Part 60, "Standards of Performance for New Stationary Sources."

40 CFR Part 81. Code of Federal Regulations, Title 40, *Protection of Environment*, Part 81, "Designation of Areas for Air Quality Planning Purposes."

40 CFR Part 122. Code of Federal Regulations, Title 40, *Protection of Environment*, Part 122, "EPA Administered Permit Programs: National Pollutant Discharge Elimination System."

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9.0 SUMMARY AND CONCLUSIONS

Entergy Nuclear Operations, Inc. (Entergy), Entergy Nuclear Indian Point 2 (IP2), LLC, and Entergy Nuclear Indian Point 3 (IP3), LLC, are joint applicants for the renewal of the IP2 and IP3 operating licenses (joint applicants will be referred to as Entergy). On April 30, 2007, Entergy submitted an application to the U.S. Nuclear Regulatory Commission (NRC) to renew the IP2 and IP3 operating licenses for an additional 20 years each under Title 10, Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants," of the *Code of Federal Regulations* (10 CFR Part 54) (Entergy 2007a). If the operating licenses are renewed, State and Federal (other than NRC) regulatory agencies and Entergy would ultimately decide whether the plant will continue to operate based on factors such as the need for power, power availability from other sources, regulatory mandates, or other matters within the agencies' jurisdictions or the purview of the owners. If the NRC decides not to renew the operating licenses, then the units must be shut down upon the expiration of the current operating licenses, subject to the conclusion of the license renewal process. If the license renewal review is ongoing at the time of license expiration, the units will be allowed to continue operating until the NRC makes a determination. The IP2 operating license will expire on September 28, 2013; the IP3 operating license will expire on December 12, 2015.

Section 102 of the National Environmental Policy Act of 1969, as amended (NEPA), requires an environmental impact statement (EIS) for major Federal actions that significantly affect the quality of the human environment. The NRC has implemented Section 102 of NEPA in 10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions." As identified in 10 CFR Part 51, certain licensing and regulatory actions require an EIS. In 10 CFR 51.20(b)(2), the NRC requires preparation of an EIS or a supplement to an EIS for renewal of a reactor operating license. Furthermore, 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) (NRC 1996, 1999).[1]

Upon acceptance of the license renewal application, the NRC began the environmental review process described in 10 CFR Part 51 by publishing, on August 10, 2007, a Notice of Intent to prepare an EIS and conduct scoping (Volume 72, page 45075, of the *Federal Register* (72 FR 45075)). The NRC staff held two public scoping meetings on September 19, 2007, and visited the IP2 and IP3 site to conduct site audits on September 10–14, 2007, and September 24–27, 2007. The NRC staff reviewed the Entergy environmental report (ER) (Entergy 2007b) and compared it to the GEIS, consulted with other agencies, and conducted an independent review of the issues following the guidance set forth in NUREG-1555, Supplement 1, "Standard Review Plans for Environmental Reviews for Nuclear Power Plants, Supplement 1: Operating License Renewal" (NRC 2000). The NRC staff also considered the public comments received during the scoping process for preparation of this draft supplemental environmental impact statement (SEIS) for IP2 and IP3. Public comments and NRC staff responses are available in the Scoping Summary Report prepared by the NRC staff (ADAMS

[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.

Accession Number ML083360115).

The NRC staff plans to hold public meetings in Cortlandt Manor, New York, in February of 2009 to present the preliminary results of the NRC environmental review, answer questions from the public, and receive comments on this draft SEIS. When the comment period ends, the NRC staff will consider and address all of the comments received. These comments will be addressed in Part 2 of Appendix A to the final SEIS.

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

The NRC 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) decisionmakers.

The evaluation criterion for 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 decisionmakers 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 would contribute to the NRC's ultimate determination of whether an existing nuclear power plant continues to operate beyond the period of the current operating 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) and in accordance with

10 CFR 51.23(b).[2]

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 on the basis of the Council on Environmental Quality guidelines. The following definitions of the three significance levels are set forth in the footnotes to Table B-1 of Appendix B to Subpart A, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant," of 10 CFR Part 51:

> 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 environmental issues considered in the GEIS, the NRC staff analysis in the GEIS shows the following:

(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 (i.e., 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 likely not to be sufficiently beneficial to warrant implementation.

[2] The title of 10 CFR 51.23 is "Temporary Storage of Spent Fuel after Cessation of Reactor Operations—Generic Determination of No Significant Environmental Impact."

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

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 SEIS. The remaining two issues, environmental justice and chronic effects of electromagnetic fields, were not categorized.

This draft 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. When possible, these alternatives were evaluated assuming that the replacement power generation plant, if any, could be located at either the IP2 and IP3 site or some other unspecified location.

9.1 Environmental Impacts of the Proposed Action—License Renewal

The NRC staff has established an independent process for identifying and evaluating the significance of any new information on the environmental impacts of license renewal. The NRC staff has not identified any information that is both new and significant related to Category 1 issues that would call into question the conclusions in the GEIS. In the IP2 and IP3 ER, Entergy identified leakage from onsite spent fuel pools as potentially new and significant information (Entergy 2007a). The NRC staff has reviewed Entergy's analysis of the leakage and has conducted an extensive onsite inspection of leakage to ground water, as identified in Section 2.2.7 of this draft SEIS. Based on the NRC staff's review of Entergy's analysis, the NRC staff's adoption of the NRC inspection report findings in this SEIS, and Entergy's subsequent statements (all discussed in Section 2.2.7), the NRC staff concludes that the abnormal liquid releases discussed by Entergy in its ER, while new information, are within the NRC's radiation safety standards contained in 10 CFR Part 20 and are not considered to have a significant impact on plant workers, the public, or the environment (i.e., while the information related to spent fuel pool leakage is new, it is not significant). Therefore, the NRC staff relied upon the conclusions of the GEIS for all Category 1 issues that are applicable to IP2 and IP3.

Entergy's license renewal application contains an analysis of the Category 2 issues that are applicable to IP2 and IP3, plus environmental justice and chronic effects from electromagnetic fields for 23 total issues. The NRC staff has reviewed the Entergy analysis and has conducted an independent review of each issue. Six of the Category 2 issues are not applicable because they are related to cooling systems, water use conflicts, and ground water use not found at IP2 and IP3.

As discussed in Chapter 3, scoping comments revealed—and Entergy indicated—that Entergy may replace reactor vessel heads and control rod drive mechanisms in both units. As a result, the NRC staff addressed the impacts of these replacement activities in Chapter 3. This includes three Category 2 issues that apply only to refurbishment, six Category 2 issues that apply to

refurbishment and continued operation, and one uncategorized issue, environmental justice, that applies to both refurbishment and continued operations. The NRC staff determined that all effects from refurbishment are of SMALL significance.

The NRC staff addresses twelve Category 2 issues related to impacts from continued operations and postulated accidents during the renewal term, as well as environmental justice and chronic effects of electromagnetic fields. Research is continuing in the area of chronic effects on electromagnetic fields, and a scientific consensus has not been reached. Therefore, no further evaluation of this issue is required. The NRC staff concludes that the potential environmental effects for 8 of the 12 categorized issues are of SMALL significance in the context of the standards set forth in the GEIS. The NRC staff concludes that the combined impacts from impingement and entrainment (each a separate issue) range from SMALL to LARGE, depending on fish species affected. Impacts from heat shock could range from SMALL to MODERATE. Finally, given a lack of current impingement monitoring data, impacts to the endangered shortnose sturgeon could range from SMALL to LARGE (see Chapter 4 of this draft SEIS).

For severe accident mitigation alternatives (SAMAs), the NRC staff concludes that a reasonable, comprehensive effort was made by Entergy 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 candidate SAMAs may be cost-beneficial. However, these SAMAs do not relate to adequately managing the effects of aging during the period of extended operation. Therefore, they need not be implemented as part of license renewal pursuant to 10 CFR Part 54.

Mitigation measures were considered for each Category 2 issue. For all issues of SMALL significance, current measures to mitigate the environmental impacts of plant operation were found to be adequate. For issues of MODERATE or LARGE significance (i.e., issues related to aquatic ecology), mitigation measures are addressed both in Chapter 4 and in Chapter 8 as alternatives based on determinations in the draft New York State Department of Environmental Conservation (NYSDEC) State Pollutant Discharge Elimination System (SPDES) permit. These alternatives included plant operation with a new closed-cycle cooling system (Section 8.1.1) and operation of the existing once-through cooling system with enhanced controls and restoration efforts (Section 8.1.2).

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. The NRC staff concludes that the cumulative impacts to the environment around IP2 and IP3 license renewal would be LARGE for some affected resources, given historical environmental impacts, current actions, and likely future actions. With the exception of aquatic resources, the contribution of IP2 and IP3 to cumulative impacts is SMALL.

The following sections discuss unavoidable adverse impacts, irreversible or irretrievable commitments of resources, and the relationship between local short-term use of the environment and long-term productivity.

9.1.1 Unavoidable Adverse Impacts

An environmental review conducted at the license renewal stage differs from the review conducted in support of a construction permit because the plant is in existence at the license renewal stage and has operated for a number of years. As a result, adverse impacts associated with the initial construction have already occurred, have been mitigated, or have been avoided. The environmental impacts to be evaluated for license renewal are those associated with refurbishment and continued operation during the renewal term.

Unavoidable adverse impacts of continued operation from heat shock and the combined effects of entrainment and impingement of fish and shellfish are considered SMALL to MODERATE and SMALL to LARGE, respectively. Unavoidable adverse impacts from license renewal may be SMALL to LARGE for the endangered shortnose sturgeon as a result of limited data. Other unavoidable adverse impacts are considered to be of SMALL significance.

Unavoidable adverse impacts of likely alternatives to the operation of IP2 and IP3 vary greatly. All have smaller impacts to aquatic resources than the current IP2 and IP3, though all also have larger impacts than the current IP2 and IP3 in at least one other resource area.

9.1.2 Irreversible or Irretrievable Resource Commitments

The commitment of resources related to construction and operation of IP2 and IP3 during the current license period was made when the plant was built. The resource commitments to be considered in this draft SEIS are associated with continued operation of the plant for an additional 20 years. These resources include materials and equipment required for plant maintenance, operation, and refurbishment; the nuclear fuel used by the reactors; and ultimately, permanent offsite storage space for the spent fuel assemblies.

Entergy may be required to commit additional resources should the final NYSDEC SPDES permit require closed-cycle cooling (as the draft SPDES permit does in its current form) and Entergy decides to (1) build and operate a closed-cycle cooling system to meet the permit's required reductions in impacts to aquatic ecology, or (2) to invest in cooling water intake modifications and restoration activities. However, regardless of the future status of the SPDES permit, significant resource commitments will be required during the renewal term for additional fuel and the permanent spent fuel storage space. IP2 and IP3 replace a portion of their fuel assemblies during every refueling outage, which typically occurs on a 24-month cycle (Entergy 2007a). Additional resources may also be committed to constructing and installing new reactor vessel heads and control rod drive mechanisms.

The likely energy alternatives would also require a commitment of resources for construction of the replacement facilities, implementation of conservation measures, and in some cases, fuel to run plants. Significant resource commitments would also be required for development of transmission capacity. These resource commitments, however, would not necessarily come from Entergy because Entergy currently has no obligation to support power production in the New York area should IP2 and IP3 shut down.

9.1.3 Short-Term Use Versus Long-Term Productivity

An initial balance between local short-term uses of the environment and maintenance and enhancement of long-term productivity at IP2 and IP3 was set when the plant was approved and construction began. Renewal of the operating licenses for IP2 and IP3 and continued operation of the plant would not alter the existing balance, but may postpone the availability of the site for other uses. Denial of the application to renew the operating licenses would lead to a shutdown of the plant that will alter the balance in a manner that depends on subsequent uses of the site. Furthermore, new replacement energy sources or conservation options will establish new balances at their respective locations.

9.2 Relative Significance of the Environmental Impacts of License Renewal and Alternatives

The proposed action is renewal of the operating licenses for IP2 and IP3. Chapter 2 describes the site, power plant, and interactions of the plant with the environment. Chapters 3 through 7 discuss environmental issues associated with renewal of the operating licenses. Environmental issues associated with the no-action alternative and alternatives such as new power generation, purchased power, conservation, and cooling system modifications are discussed in Chapter 8.

The significance of the environmental impacts from the proposed action (approval of the application for renewal of the operating licenses), the no-action alternative (denial of the application), alternatives involving altering plant operations to comply with the NYSDEC draft SPDES discharge permit, construction of coal- or gas-fired generating capacity at alternate sites, gas-fired generation of power at IP2 and IP3, and two combinations of alternatives are compared in Table 9-1. All new fossil-fueled alternatives presented in Table 9-1 are assumed to use closed-cycle cooling systems given current regulations for new power plants.

Table 9-1 shows the significance of the plant-specific environmental effects of the proposed action (renewal of IP2 and IP3 operating licenses) as well as environmental effects of alternatives to the proposed action. Impacts from license renewal would be SMALL for all impact categories except aquatic ecology, which includes the impacts of heat shock, entrainment, and impingement. Chapter 4 of this draft SEIS describes the SMALL to LARGE impacts of plant operation on aquatic ecology through impingement and entrainment (impact levels vary by species), and the SMALL to MODERATE impacts from thermal shock. Overall, impacts to aquatic ecology from continued operation of IP2 and IP3 without cooling system modifications or restoration actions is SMALL to LARGE. A single significance level was not assigned for the collective offsite radiological impacts from the fuel cycle and from high-level radioactive waste spent fuel disposal (see Chapter 6).

NRC staff analysis indicates that the no-action alternative has the smallest effect, but it would necessitate additional actions to replace generation capacity (whether with newly-constructed power plants or purchased power) and/or to institute conservation programs. Impacts of the likely consequences of the no-action alternative would be similar to those of the energy alternatives that the NRC staff considered. All other alternative actions have impacts in at least four resource areas that reach SMALL to MODERATE or higher significance. Often, these

impacts are the result of constructing new facilities or infrastructure.

9.3 Conclusions and Recommendations

Based on (1) the analysis and findings in the GEIS, (2) the ER submitted by Entergy, (3) consultation with Federal, State, and local agencies, (4) the NRC staff's consideration of public scoping comments received, and (5) the NRC staff's independent review, the preliminary recommendation of the NRC staff is that the Commission determine that the adverse environmental impacts of license renewal for IP2 and IP3 are not so great that preserving the option of license renewal for energy planning decisionmakers would be unreasonable.

Table 9-1. Summary of Environmental Significance of License Renewal, the No-Action Alternative, and Alternative Methods of Generation

Impact Category	Proposed Action	No-Action Alternative[b]	License Renewal with		Coal-Fired Plant[d]
	License Renewal	Denial of Renewal	New Closed-Cycle Cooling	Once-Through Cooling with Restoration	Alternate Site
Land Use	SMALL	SMALL	SMALL to LARGE	SMALL to MODERATE	MODERATE to LARGE
Ecology—Aquatic	SMALL to LARGE[a]	SMALL	SMALL	SMALL to MODERATE	SMALL
Ecology—Terrestrial	SMALL	SMALL	SMALL to MODERATE	SMALL to MODERATE	MODERATE to LARGE
Water Use and Quality	SMALL	SMALL	SMALL	SMALL to MODERATE	SMALL to MODERATE
Air Quality	SMALL	SMALL	SMALL	SMALL	MODERATE
Waste	SMALL	SMALL	SMALL to LARGE	SMALL	MODERATE
Human Health	SMALL [c]	SMALL	SMALL	SMALL	SMALL to LARGE
Socioeconomics	SMALL	SMALL to MODERATE	SMALL	SMALL	SMALL to LARGE
Transportation	SMALL	SMALL	SMALL to LARGE	SMALL	MODERATE to LARGE
Aesthetics	SMALL	SMALL	MODERATE	SMALL	SMALL to LARGE
Historical and Archeological Resources	SMALL	SMALL	SMALL	SMALL to MODERATE	SMALL to MODERATE
Environmental Justice	SMALL	SMALL	SMALL	SMALL	SMALL to LARGE

Table 9-1 (continued)

Impact Category	Natural-Gas-Fired Generation[d]		Combination of Alternatives	
	Five 400-MW(e) Units at IP2 and IP3	Five 400-MW(e) Units at Alternate Site	Option 1: One IP unit, onsite gas, offsite renewables, and conservation	Option 2: Onsite gas, offsite renewables, additional imported power, and conservation
Land Use	SMALL to MODERATE	SMALL to LARGE	SMALL to MODERATE	MODERATE to LARGE
Ecology	SMALL	SMALL to MODERATE	SMALL to MODERATE	SMALL to MODERATE
Water Use and Quality	SMALL	SMALL to MODERATE	SMALL	SMALL
Air Quality	SMALL to MODERATE	SMALL to MODERATE	SMALL	SMALL to MODERATE
Waste	SMALL	SMALL	SMALL to LARGE	SMALL to MODERATE
Human Health	SMALL	SMALL	SMALL	SMALL
Socioeconomics	SMALL to MODERATE	SMALL to MODERATE	SMALL	SMALL to MODERATE
Transportation	SMALL to MODERATE	SMALL to MODERATE	MODERATE	SMALL

Table 9-1 (continued)

	Natural-Gas-Fired Generation[d]	Combination of Alternatives		Natural-Gas-Fired Generation[d]
Aesthetics	SMALL	SMALL to LARGE	SMALL to LARGE	MODERATE to LARGE
Historical and Archeological Resources	SMALL	SMALL to MODERATE	SMALL	SMALL
Environmental Justice	SMALL	SMALL to LARGE	SMALL to LARGE	SMALL to LARGE

(a) NRC staff analysis indicates that impingement and entrainment impacts vary by species, and may be SMALL to LARGE. Thermal shock effects may be SMALL to MODERATE, and impacts to the endangered shortnose sturgeon may range from SMALL to LARGE given uncertainties in the data.
(b) The no-action alternative does not, on its own, meet the purpose and need of the GEIS. No-action may necessitate other generation or conservation actions which may include—but are not limited to—the alternatives addressed in this table.
(c) For the collective offsite radiological impacts from the fuel cycle and from high-level waste and spent fuel disposal, a specific significance level was not assigned. See Chapter 6 for details.
(d) Analysis was based on use of a closed-cycle cooling system.

9.4 References

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8. PERFORMING ORGANIZATION - NAME AND ADDRESS *(If NRC, provide Division, Office or Region, U.S. Nuclear Regulatory Commission, and mailing address; if contractor, provide name and mailing address.)*

Division of License Renewal
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

9. SPONSORING ORGANIZATION - NAME AND ADDRESS *(If NRC, type "Same as above"; if contractor, provide NRC Division, Office or Region, U.S. Nuclear Regulatory Commission, and mailing address.)*

Same as 8 Above

10. SUPPLEMENTARY NOTES

Docket Nos. 05000247 and 05000286

11. ABSTRACT *(200 words or less)*

This supplemental environmental impact statement (SEIS) has been prepared in response to an application submitted 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 the NRC 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 draft SEIS contains the NRC staff's analysis that 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 preliminary recommendation regarding the proposed action.

The NRC staff's preliminary recommendation is that the Commission determine that the adverse environmental impacts of license renewal for IP2 and IP3 are not so great that preserving the option of license renewal for energy planning decisionmakers would be unreasonable. This recommendation is based on (1) the analysis and findings in the GEIS, (2) the environmental report submitted by Entergy, (3) consultation with other Federal, State, 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.

12. KEY WORDS/DESCRIPTORS *(List words or phrases that will assist researchers in locating the report.)*

Indian Point Nuclear Generating Unit Numbers 2 and 3
IP2
IP3
IPEC
Supplement to the Generic Environmental Impact Statement
DSEIS
National Environmental Policy Act
NEPA
License Renewal
GEIS
NUREG-1437, Supplement 38

13. AVAILABILITY STATEMENT

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14. SECURITY CLASSIFICATION

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(This Report) unclassified

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

NUREG-1437, Vol. 2
Supplement 38

Generic Environmental Impact Statement for License Renewal of Nuclear Plants

Supplement 38

Regarding Indian Point Nuclear Generating Unit Nos. 2 and 3

Draft Report for Comment Appendices

Office of Nuclear Reactor Regulation

AVAILABILITY OF REFERENCE MATERIALS IN NRC PUBLICATIONS

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   Fax: 202-512-2250
2. The National Technical Information Service
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   1–800–553–6847 or, locally, 703–605–6000

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Rockville, MD 20852–2738

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American National Standards Institute
11 West 42nd Street
New York, NY 10036–8002
www.ansi.org
212–642–4900

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

NUREG-1437, Vol. 2
Supplement 38

Generic Environmental Impact Statement for License Renewal of Nuclear Plants

Supplement 38

Regarding Indian Point Nuclear Generating Unit Nos. 2 and 3

Draft Report for Comment Appendices

Manuscript Completed: December 2008
Date Published: December 2008

Office of Nuclear Reactor Regulation

COMMENTS ON DRAFT REPORT

Any interested party may submit comments on this report for consideration by the NRC staff. Comments may be accompanied by additional relevant information or supporting data. Please specify the report number NUREG-1437, Supplement 38, draft, in your comments, and send them by March 11, 2009, to the following address:

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

Electronic comments may be submitted to the NRC by e-mail at IndianPoint.EIS@nrc.gov.

For any questions about the material in this report, please contact:

Drew Stuyvenberg
Project Manager
U.S. Nuclear Regulatory Commission
Mail Stop O-11E19
Washington, DC 20555-0001
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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 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 the NRC 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 draft 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 preliminary 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 applies 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 draft 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 four exceptions—entrainment,

(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.

impingement, heat shock from the facility's heated discharge, and impacts to aquatic endangered species. Overall effects from entrainment and impingement may be SMALL to LARGE, depending on the species affected. Impacts from heat shock likely range from SMALL to MODERATE depending on the conclusions of thermal studies proposed by the New York State Department of Environmental Conservation (NYSDEC). NRC staff did not find data that suggest the effect of heat shock is likely to rise to LARGE. Given the uncertainties in the data NRC staff reviewed, impacts to the endangered shortnose sturgeon could range from SMALL to LARGE.

The NRC staff's preliminary 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 decisionmakers would be unreasonable. This recommendation is based on (1) the analysis and findings in the GEIS, (2) the environmental report submitted by Entergy, (3) consultation with other Federal, State, 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.

Paperwork Reduction Act Statement

This NUREG does not contain information collection requirements and, therefore, is not subject to the requirements of the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 *et seq.*). These information collections were approved by the Office of Management and Budget, approval numbers 3150-0004, 3150-0155, 3150-0014, 3150-0011, 3150-0021, 3150-0132, and 3150-0151.

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The NRC may not conduct or sponsor, and a person is not required to respond to, a request for information or an information collection requirement unless the requesting document displays a currently valid OMB control number.

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Appendix A

Comments Received on the Environmental Review

Appendix A

Comments Received on the Environmental Review

Comments Received During Scoping and Scoping Summary Adoption

In this appendix, the NRC staff adopts the Scoping Summary Report for Indian Point Nuclear Generating Unit Nos. 2 and 3 as prepared by the NRC staff in response to comments received on the scope of the environmental review. The NRC staff issued the scoping summary report on December 12, 2008. The Scoping Summary Report is available for public inspection in the NRC Public Document Room (PDR), located at One White Flint North, 11555 Rockville Pike, Rockville, Maryland, 20852, or from the NRC's Agencywide Documents Access and Management System (ADAMS).

The ADAMS Public Electronic Reading Room is accessible at http://www.nrc.gov/reading-rm/adams/web-based.html. The scoping summary report is listed under Accession No. ML083360115.

Persons who do not have access to ADAMS or who encounter problems in accessing the documents located in ADAMS should contact the NRC's PDR reference staff by telephone at 1-800-397-4209, or 301-415-4737, or by e-mail at pdr@nrc.gov.

On August 10, 2007, the NRC published a Notice of Intent in the Federal Register (72 FR 45075) to notify the public of the Staff's intent to prepare a plant-specific supplement to the GEIS (SEIS) regarding the renewal application for the IP2 and IP3 operating license. As outlined by NEPA, the NRC initiated the scoping process with the issuance of the Federal Register Notice. The NRC invited the applicant, federal, state, local, and tribal government agencies, local organizations, and individuals to participate in the scoping process by providing oral comments at scheduled public meetings and/or submitting written suggestions and comments no later than October 12, 2007.

The scoping process included two public scoping meetings, which were both held on September 19, 2007, at Colonial Terrace, 119 Oregon Road, Cortlandt Manor, New York. The NRC issued press releases and distributed flyers locally. Both sessions began with NRC staff members providing a brief overview of the license renewal process and the NEPA process. Following the NRC's prepared statements, the meetings were open for public comments. Approximately 50 attendees provided oral comments that were recorded and transcribed by a certified court reporter.

The meeting summary, which was issued on October 24, 2007, and the associated transcripts can be found in the NRC PDR or in ADAMS at Accession No. ML072851079. The transcripts of the meetings can be found in ADAMS at Accession Numbers ML072830682 and ML072890209.

The scoping summary contains all comments received on the review, as well as the NRC staff's responses to those comments. Comments received on the draft SEIS will be included in this Appendix of the final SEIS.

Appendix B

Contributers to the Supplement

Appendix B

Contributors to the Supplement

The Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, had overall responsibility for the preparation of this supplement, assisted by staff from other NRC organizations, AECOM, and Pacific Northwest National Laboratory.

Name	Function or Expertise
U.S. Nuclear Regulatory Commission	
Andrew Stuyvenberg	Environmental Project Manager/Alternatives
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Bo Pham	Branch Chief
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Elizabeth Wexler	Ecology
Dennis Logan	Ecology
Briana Balsam	Ecology
Jeffrey Rikhoff	Socioeconomics/Land Use/Env. Justice
Jennifer Davis	Historical/Archeological Resources
Steve Klementowicz	Radiation Protection/Human Health
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Valerie Cullinan	Aquatic Ecology
Lance W. Vail	Hydrology/Water Use

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Appendix C

Chronology of NRC Staff Environmental Review Correspondence Related to the Entergy Nuclear Operations, Inc.

Application for License Renewal of Indian Point Nuclear Generating Unit Nos. 2 and 3

Appendix C

Chronology of NRC Staff Environmental Review Correspondence Related to the Entergy Nuclear Operations, Inc., Application for License Renewal of Indian Point Nuclear Generating Unit Nos. 2 and 3

This appendix contains a chronological listing of correspondence between the U.S. Nuclear Regulatory Commission (NRC) and Entergy Nuclear Operations, Inc., (Entergy) and other correspondence related to the NRC staff's environmental review, under Title 10, Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," of the *Code of Federal Regulations* (10 CFR Part 51), of Entergy's application for renewal of the operating licenses for Indian Point Nuclear Generating Unit Nos. 2 and 3. All documents, with the exception of those containing proprietary information, have been placed in the NRC's Public Document Room, at One White Flint North, 11555 Rockville Pike (first floor), Rockville, Maryland, and are available electronically from the Public Electronic Reading Room found on the Internet at http://www.nrc.gov/reading-rm.html. From this site, the public can gain access to the NRC's Agencywide Documents Access and Management System (ADAMS), which provides text and image files of NRC's public documents in the Publicly Available Records component of ADAMS. The ADAMS accession numbers for each document are included below.

April 23, 2007	Letter to NRC from Entergy forwarding the application for renewal of operating licenses for Indian Point Nuclear Generating Units 2 and 3, requesting extension of operating licenses for an additional 20 years. (Accession No. ML071207512)
April 23, 2007	Letter to NRC from Entergy forwarding a copy of reference documents used in preparing the Environmental Report (Appendix E) for the Indian Point Nuclear Generating Units 2 and 3 license renewal application. (Accession No. ML071210108)
May 7, 2007	Letter to Entergy from NRC, "Receipt and Availability of the License Renewal Application for Indian Point Nuclear Generating Unit Nos. 2 and 3." (Accession No. ML071080133)
May 7, 2007	Letter to Ms. Patricia Thorsen, White Plains Public Library, from NRC, "Maintenance of Reference Materials at the White Plains Public Library Related to the Review of the Entergy Nuclear Operations, Inc., License Renewal Application." (Accession No. ML071070518)
May 7, 2007	Letter to Ms. Resa Getman, Hendrick Hudson Free Library, from NRC, "Maintenance of Reference Materials at the Hendrick Hudson

	Free Library Related to the Review of the Entergy Nuclear Operations, Inc., License Renewal Application." (Accession No. ML071080080)
May 7, 2007	Letter to Ms. Susan Thaler, The Field Library, from NRC, "Maintenance of Reference Materials at The Field Library Related to the Review of the Entergy Nuclear Operations, Inc., License Renewal Application." (Accession No. ML071080122)
July 25, 2007	Letter to Entergy from NRC transmitting "Determination of Acceptability and Sufficiency for Docketing, Proposed Review Schedule, and Opportunity for a Hearing Regarding the Application from Entergy Nuclear Operations, Inc. for Renewal of Operating Licenses for Indian Point Nuclear Generating Unit Nos. 2 and 3." (Accession No. ML071900365)
August 6, 2007	Letter to Entergy from NRC, "Notice of Intent to Prepare an Environmental Impact Statement and Conduct Scoping Process for License Renewal for Indian Pont Nuclear Generating Unit Nos. 2 and 3," and forwarding *Federal Register* notice. (Accession No. ML071840939)
August 9, 2007	Memorandum on "Forthcoming Meeting to Discuss Environmental Scoping Process for Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application." (Accession No. ML072180296)
August 9, 2007	Letter to New York State Office of Parks, Recreation, and Historic Preservation from NRC, "Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point) License Renewal Application Review (SHPO No. 06PR06720)." (Accession No. ML072130333)
August 9, 2007	Letter to Advisory Council on Historic Preservation from NRC, "Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072130367)
August 16, 2007	Letter to Mr. David Stillwell, U.S. Fish and Wildlife Service (USFWS), "Request for List of Protected Species Within the Area Under Evaluation for the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072130211)
August 16, 2007	Letter to Mr. Peter Colosi, National Marine Fisheries Service (NMFS), "Request for List of Protected Species and Essential Fish Habitat Within the Area Under Evaluation for the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072130388)
August 24, 2007	Letter to Mr. Andy Warrior, Absentee Shawnee Tribe of Oklahoma,

	"Request for Comments Concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072250103)
August 24, 2007	Letter to The Honorable Maurice John, Cattaraugus Reservation, Seneca Nation, "Request for Comments Concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072250171)
August 24, 2007	Letter to Mr. Clint Halftown, Cayuga Nation, "Request for Comments Concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072250394)
August 24, 2007	Letter to Ms. Nikki Owings-Crumm, Delaware Nation, "Request for Comments Concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072250459)
August 24, 2007	Letter to The Honorable Jerry Douglas, Delaware Tribe of Indians, "Request for Comments Concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072250488)
August 24, 2007	Letter to The Honorable C.W. Longlow, Echota Chickamauga Cherokee Tribe of New Jersey, "Request for Comments Concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072250534)
August 24, 2007	Letter to The Honorable Michael Thomas, Mashantucket Pequot Tribe, "Request for Comments Concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072260033)
August 24, 2007	Letter to Ms. Jeanne Schbotte, Mohegan Tribe, "Request for Comments Concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072260047)
August 24, 2007	Letter to Mr. Ray Halbritter, Oneida Indian Nation of New York, "Request for Comments Concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072260201)
August 24, 2007	Letter to Council of Chiefs, Onondaga Nation, "Request for Comments Concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072260245)

August 24, 2007	Letter to The Honorable Dwaine Perry, Ramapough Lenape, "Request for Comments Concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072260491)
August 24, 2007	Letter to Mr. Mike John, Seneca Nation of Indians, "Request for Comments Concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072260519)
August 24, 2007	Letter to Mr. Randy Kind, Shinnecock Tribe, "Request for Comments Concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072270070)
August 24, 2007	Letter to The Honorable Harry B. Wallace, Unkechaug Nation, "Request for Comments Concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072270113)
August 24, 2007	Letter to The Honorable Leo Henry, Tuscarora Nation, "Request for Comments Concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072270548)
August 24, 2007	Letter to The Honorable Roger Hill, Tonawanda Band of Senecas, "Request for Comments Concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072270590)
August 24, 2007	Letter to Ms. Sherry White, Stockbridge-Munsee Community Band of Mohican Indians, "Request for Comments Concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review" (Accession No. ML072270615)
August 24, 2007	Letter to Mr. Ken Jock, St. Regis Mohawk Tribal Council, "Request for Comments Concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML072280045)
August 29, 2007	Letter to NRC from USFWS, "Indian Point Nuclear Generating Unit Nos. 2 and 3 Protected Species Response." (Accession No. ML0732307840)
October 4, 2007	Letter to NRC from NMFS regarding endangered species near Indian Point Nuclear Generating Unit Nos. 2 and 3. (Accession No. ML073340068)

October 5, 2007	Letter to NRC from New York State Department of Environmental Conservation (NYSDEC), "Indian Point Units 2 and 3 Relicensing Extension Request for Scoping Comments on SEIS." (Accession No. ML072820746)
October 10, 2007	Letter to NRC from NYSDEC, "Indian Point Units 2 and 3 Relicensing Extension Request for Scoping Comments on SEIS." (Accession No. ML072900470)
October 11, 2007	Letter to NYSDEC from NRC regarding extension request for scoping comments. (Accession No. ML072840275)
October 24, 2007	"Meeting Summary of Public Environmental Scoping Meetings Related to the Review of the Indian Point Nuclear Generating Unit Nos. 2 and 3, License Renewal Application (TAC nos. MD5411 and MD5412)." (Accession No. ML072851079)
November 8, 2007	Summary of Site Audit Related to the Review of the License Renewal Application for Indian Point Nuclear Generating Unit Nos. 2 and 3. (Accession No. ML073050267)
November 14, 2007	Letter to NRC from Entergy, "Supplement to License Renewal Application (LRA) Environmental Report References." (Accession No. ML073330590)
November 27, 2007	Letter to NYSDEC from NRC, "Request for List of State Protected Species Within the Area Under Evaluation for the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review." (Accession No. ML073190161)
December 5, 2007	Letter to Entergy from NRC, "Request for Additional Information Regarding Environmental Review for Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal (TAC nos. MD5411 and MD5412)." (Accession No. ML073330931)
December 7, 2007	Letter to Entergy from NRC, "Request for Additional Information Regarding Severe Accident Mitigation Alternatives for Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal (TAC nos. MD5411 and MD5412)." (Accession No. ML073110447)
December 20, 2007	Letter to NRC from Entergy, "Supplement to License Renewal Application (LRA)—Environmental Report References." (Accession No. ML080080205)
December 28, 2007	Letter to NRC from NYSDEC regarding rare or State-listed animals and plants, significant natural communities, and other habitats on or in the vicinity of the Indian Point site. (Accession No. ML080070085, withheld from public disclosure per request by NYSDEC)

January 4, 2008	Letter to NRC from Entergy, "Reply to Request for Additional Information Regarding Environmental Review for License Renewal Application." (Accession No. ML080110372)
January 10, 2008	Letter to NRC from Entergy, "Supplemental Response to Request for Additional Information Regarding Environmental Review for License Renewal Application." (Accession No. ML080220165)
January 30, 2008	Letter to NRC from Entergy, "Supplemental Response to Request for Additional Information Regarding Environmental Review for License Renewal Application." (Accession No. ML080380096)
February 20, 2008	Letter to NRC from Entergy, "Document Request for Additional Information Regarding Environmental Review for License Renewal Application—Electronic Copy of Impingement Data—Tables 4-1 and 4-2 of the 1990 Annual Report (EA 1991)." (Accession No. ML080580408)
February 28, 2008	Letter to NRC from NMFS, "Essential Fish Habitat Information Request for Docket Nos. 50-247 and 50-286; Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal; at the Village of Buchanan, Town of Cortlandt, Westchester County, NY." (Accession No. ML080990403)
March 7, 2008	Letter to NRC from Entergy, "Document Request for Additional Information Regarding Environmental Review for License Renewal Application—Hudson River Fisheries Program Data (Year Class Report)." (Accession No. ML080770457)
April 9, 2008	Letter to Entergy from NRC, "Request for Additional Information Regarding the Review of the License Renewal Application for Indian Point Nuclear Generating Unit Nos. 2 and 3 (TAC nos. MD5411 and MD5412)." (Accession No. ML080880104)
April 14, 2008	Letter to Entergy from NRC, "Request for Additional Information Regarding the Review of the License Renewal Application for Indian Point Nuclear Generating Unit Nos. 2 and 3 (TAC nos. MD5411 and MD5412)." (Accession No. ML080940408)
April 23, 2008	Letter to Entergy from NRC, "Revision of Schedule for the Review of the Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application (TAC nos. MD5411 and MD5412)." (Accession No. ML081000441)
April 23, 2008	Letter to NRC from Entergy, "Reply to Document Request for Additional Information Regarding Site Audit Review of License Renewal Application for Indian Point Nuclear Generating Unit Nos. 2 and 3." (Accession No. ML081230243)

May 14, 2008	Letter to NRC from Entergy, "Reply to Request for Additional Information Regarding License Renewal Application—Refurbishment." (Accession No. ML081440052)
May 22, 2008	Letter to NRC from Entergy, "Supplemental Reply to Request for Additional Information Regarding License Renewal Application—Severe Accident Mitigation Alternatives Analysis." (Accession No. ML081490336)

Appendix D

Organizations Contacted

Appendix D

Organizations Contacted

The U.S. Nuclear Regulatory Commission contacted the following Federal, State, regional, and local agencies, and Native American Tribes, during its independent review of the environmental impacts related to the application by Entergy Nuclear Operations, Inc., for renewal of the operating licenses for Indian Point Nuclear Generating Unit Nos. 2 and 3:

Absentee Shawnee Tribe of Oklahoma

Cattaraugus Reservation, Seneca Nation

Cayuga Nation

Delaware Nation

Delaware Tribe of Indians

Echota Chickamauga Cherokee Tribe of New Jersey

National Marine Fisheries Service

New York State Department of Environmental Conservation

New York State Office of Parks, Recreation and Historic Preservation, Historic Preservation Field Services Bureau

Oneida Indian Nation of New York

Onondaga Nation

Ramapough Lenape, Ramapough Tribal Office

Seneca Nation of Indians

Seneca Nation Tribal Historic Preservation

Shinnecock Tribe

St. Regis Mohawk Tribal Council

Stockbridge-Munsee Community Band of Mohican Indians, Tribal Historic Preservation Office

The Mashantucket Pequot Tribe (CT)

The Mohegan Tribe (CT)

Tonawanda Band of Senecas

Tuscarora Nation

Unkechaug Nation

U.S. Environmental Protection Agency, Region 2

U.S. Fish and Wildlife Service

Appendix E

Indian Point Nuclear Generating Unit Numbers 2 and 3 Compliance Status and Consultation Correspondence

Appendix E

Indian Point Nuclear Generating Unit Nos. 2 and 3 Compliance Status and Consultation Correspondence

Consultation correspondence related to the evaluation of the application for renewal of the operating licenses for Indian Point Nuclear Generating Units 2 and 3 (IP2 and IP3, respectively) is identified in Table E-1. Copies of the correspondence are included in this appendix.

The licenses, permits, consultations, and other approvals obtained from Federal, State, regional, and local authorities for SSES are listed in Table E-2.

Table E-1. Consultation Correspondence

Source	Recipient	Date of Letter
U.S. Nuclear Regulatory Commission (R. Franovich)	State Historical Preservation Office (Office of Parks, Recreation, and Historic Preservation, R. L. Pierpont)	August 9, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	Advisory Council on Historic Preservation (D. Klima)	August 9, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	U.S. Fish and Wildlife Service (D. Stillwell)	August 16, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	National Marine Fisheries Commission (P. Colosi)	August 16, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	Absentee Shawnee Tribe of Oklahoma (A. Warrior)	August 24, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	Cattaraugus Reservation, Seneca Nation (The Hon. M. John)	August 24, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	Cayuga Nation (C. Halftown)	August 24, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	Delaware Nation (N. Owings-Crumm)	August 24, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	Delaware Tribe of Indian (The Hon. J. Douglas)	August 24, 2007

Source	Recipient	Date of Letter
U.S. Nuclear Regulatory Commission (R. Franovich)	Echota Chickamauga Cherokee Tribe of New Jersey (The Hon. C.W. Longlow)	August 24, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	Mashantucket Pequot Tribe (The Hon. M. Thomas)	August 24, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	Mohegan Tribe (J. Schbotte)	August 24, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	Oneida Indian Nation of New York (R. Halbritter)	August 24, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	Onondaga Nation (Council of Chiefs)	August 24, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	Ramapough Lenape (The Hon. D. Perry)	August 24, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	Seneca Nation of Indians (M. John)	August 24, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	Shinnecock Tribe (R. Kind)	August 24, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	Unkechaug Nation (The Hon. H. B. Wallace)	August 24, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	Tuscarora Nation (The Hon. L. Henry)	August 24, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	Tonawanda Band of Senecas (The Hon. R. Hill)	August 24, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	Stockbridge-Munsee Community of Mohican Indians (S. White)	August 24, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	St. Regis Mohawk (K. Jock)	August 24, 2007
U.S. Nuclear Regulatory Commission (R. Franovich)	New York State Dept. of Environmental Conservation (J. Pietrusiak)	November 11, 2007
U.S. Fish and Wildlife Service (M. VanDonsell and R. Niver)	U.S. Nuclear Regulatory Commission (R. Franovich)	August 29, 2007
Delaware Nation (D. Nieto)	U.S. Nuclear Regulatory Commission	September 5, 2007
National Marine Fisheries Service (M. A. Colligan)	U.S. Nuclear Regulatory Commission (R. Franovich)	October 4, 2007

Source	Recipient	Date of Letter
New York State Department of Environmental Conservation (T. Seoane)	U.S. Nuclear Regulatory Commission (R. Franovich)	December 28, 2007
National Marine Fisheries Service (P. Colosi)	U.S. Nuclear Regulatory Commission (R. Franovich)	February 28, 2008

Table E-2. Federal, State, Local, and Regional Licenses, Permits, Consultations, and Other Approvals for the Indian Point site

Agency	Authority	Description	Number	Issue Date	Expiration Date	Remarks
NRC	10 CFR Part 50	Possession License, Indian Point Unit 1	DPR-5		09/28/13	Authorizes SAFSTOR for Unit 1
NRC	10 CFR Part 50	Operating license, IP2	DPR-26		09/28/13	Authorizes operation of IP2
NRC	10 CFR Part 50	Operating license, IP3	DPR-64		12/10/15	Authorizes operation of IP3
DOT	49 CFR 107	IP2 Hazardous Materials Certificate of Registration	062706552061 0Q		06/30/09	Radioactive and hazardous materials shipments
DOT	49 CFR 107	IP3 Hazardous Materials Certificate of Registration	062706552069 0Q		06/30/09	Radioactive and hazardous materials shipments
EPA	40 CFR Part 264	IP2 Hazardous Solid Waste Amendment Permit	NYD991304411		10/14/02	Accumulation and temporary onsite storage of mixed waste for >90 days
EPA	40 CFR Part 264	IP3 Hazardous Solid Waste Amendment Permit	NYD085503746		10/17/01	Accumulation and temporary onsite storage of mixed waste for >90 days

Agency	Authority	Description	Number	Issue Date	Expiration Date	Remarks
NYSDEC	6 NYCRR Part 325	IP2 Pesticide Application Business Registration	12696		04/30/09	Pesticide application
NYSDEC	6 NYCRR Part 325	IP3 Pesticide Application Business Registration	13163		04/30/09	Pesticide application
NYSDEC	6 NYCRR Parts 704 and 750	IP1, 2, and 3 SPDES Permit	NY 000 4472		10/01/92	Discharge of wastewaters and stormwaters to waters of the State
NYSDEC	6 NYCRR Part 704	Simulator Transformer Vault SPDES Permit	NY 025 0414		03/01/08	Discharge of wastewaters to waters of the State
NYSDEC	6 NYCRR Part 704	Tank Farm SPDES Permit	NY 025 1135		02/10/10	Discharge of wastewaters to waters of the State
NYSDEC	6 NYCRR Part 704	Buchanan Gas Turbine SPDES Permit	NY 022 4826		03/01/08	Discharge of wastewaters to waters of the State
NYSDEC	6 NYCRR Part 750	ISFSI Stormwater SPDES General Permit for Construction Activities	NYR 10H166		NA	Stormwater discharge during construction of dry cask spent fuel storage
NYSDEC	6 NYCRR Parts 200 and 201	IP2 Air Permit	3-5522-00011/00026		NA	Operation of air emission sources (boilers, turbines and generators)
NYSDEC	6 NYCRR Parts 200 and 201	IP3 Air Permit	3-5522-00105/00009		NA	Operation of air emission sources (boilers, turbines and generators)
NYSDEC	6 NYCRR Part 596	IP2 Hazardous Substance Bulk Storage Registration Certificate	3-000107		09/04/07	Onsite bulk storage of hazardous substances
NYSDEC	6 NYCRR Part 596	IP3 Hazardous Substance Bulk Storage Registration Certificate	3-000071		08/16/08	Onsite bulk storage of hazardous substances

Agency	Authority	Description	Number	Issue Date	Expiration Date	Remarks
NYSDEC	6 NYCRR Part 610	IP2 Major Oil Storage Facility	3-2140		--	Onsite bulk storage of >400,000 gallons of petroleum products
NYSDEC	6 NYCRR Part 372	IP2 Hazardous Waste Generator Identification	NYD000765073		NA	Hazardous waste generation
NYSDEC	6 NYCRR Part 372	IP3 Hazardous Waste Generator Identification	NYD000765073		NA	Hazardous waste generation
NYSDEC	6 NYCRR Part 373	IP2 Hazardous Waste Part 373 Permit	NYD991304411		02/28/07	Accumulation and temporary onsite storage of mixed waste for >90 days
WCDOH	Chapter 873, Article XIII, Section 873.1306.1 of the Laws of Westchester County	IP2 Gas Turbine 1 Air Permit	#00021	NA	12/31/06	Operation of an air contamination source
WCDOH	Chapter 873, Article XIII, Section 873.1306.1 of the Laws of Westchester County	IP2 Gas Turbine 2 Air Permit	#00022	NA	12/31/06	Operation of an air contamination source
WCDOH	Chapter 873, Article XIII, Section 873.1306.1 of the Laws of Westchester County	IP2 Gas Turbine 3 Air Permit	#00023	NA	12/31/06	Operation of an air contamination source
WCDOH	Chapter 873, Article XIII, Section 873.1306.1 of the Laws of Westchester County	IP2 Boiler Permit	52-4493		NA	Operation of an air contamination source
WCDOH	Chapter 873, Article XIII, Section 873.1306.1 of the Laws of Westchester County	IP2 Vapor Extractor Air Permit	52-5682		12/31/06	Operation of an air contamination source
WCDOH	Chapter 873, Article XIII, Section 873.1306.1 of the Laws of Westchester County	IP3 Boiler Permit	52-6497		NA	Operation of an air contamination source

Agency	Authority	Description	Number	Issue Date	Expiration Date	Remarks
WCDOH	Chapter 873, Article XIII, Section 873.1306.1 of the Laws of Westchester County	IP3 Training Center Boiler Permit	52-6498		NA	Operation of an air contamination source
WCDOH	Chapter 873, Article XIII, Section 873.1306.1 of the Laws of Westchester County	IP3 Vapor Extractor Air Permit	--		--	Operation of an air contamination source
WCDOH	Westchester County Sanitary Code, Article XXV	IP3 Petroleum Bulk Storage Registration Certificate	3-166367		09/10/07	Onsite Bulk Storage of Petroleum Products
SCDHEC	Act No. 429 of 1980, South Carolina Radioactive Waste Transportation and Disposal Act	IP2 South Carolina Radioactive Waste Transport Permit	0019-31-07		12/31/07	Transportation of radioactive waste into the State of South Carolina.
SCDHEC	Act No. 429 of 1980, South Carolina Radioactive Waste Transportation and Disposal Act	IP3 South Carolina Radioactive Waste Transport Permit	0072-31-07		12/31/07	Transportation of radioactive waste into the State of South Carolina.
TDEC	Tennessee Department of Environment and Conservation Regulations	IP2 Tennessee Radioactive Waste-License-for-Delivery	T-NY-010-L07		12/31/07	Shipment of radioactive material into Tennessee to a disposal/processing facility.
TDEC	Tennessee Department of Environment and Conservation Regulations	IP3 Tennessee Radioactive Waste-License-for-Delivery	T-NY-005-L07		12/31/07	Shipment of radioactive material into Tennessee to a disposal/processing facility.

Agency	Authority	Description	Number	Issue Date	Expiration Date	Remarks

[(a)]Application pending.

CFR = *Code of Federal Regulations*
DOT = U.S. Department of Transportation
NA = not applicable
NRC = U.S. Nuclear Regulatory Commission
NYCRR = New York Codes, Rules, and Regulations
NYSDEC = New York State Department of Environmental Conservation
SCDHEC = South Carolina Department of Health and Environmental Control
SPDES = State Pollutant Discharge Elimination System
TDEC = Tennessee Department of Environment and Conservation
USC = *United States Code*
WCDOH = Westchester County Department of Health

August 9, 2007

Ms. Ruth L. Pierpont, Director
New York State Office of Parks, Recreation
and Historic Preservation
Historic Preservation Field Services Bureau
Peebles Island, P.O. Box 189
Waterford, NY 12188-0189

SUBJECT: INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 & 3 (INDIAN POINT)
LICENSE RENEWAL APPLICATION REVIEW (SHPO NO. 06PR06720)

Dear Ms. Pierpont:

The U.S. Nuclear Regulatory Commission (NRC) staff is reviewing an application to renew the operating license for Indian Point, which is located in Buchanan, NY, approximately 24 miles north of the New York City boundary line. Indian Point is operated by Entergy Nuclear Operations, Inc. (Entergy). The application for renewal was submitted by Entergy by letter dated April 23, 2007, and supplemented by letters dated May 3, and June 21, 2007, pursuant to Title 10 of the *Code of Federal Regulations* Part 54 (10 CFR Part 54).

The NRC has established that, as part of the staff's review of any nuclear power plant license renewal action, a site-specific Supplemental Environmental Impact Statement (SEIS) to its "Generic Environmental Impact Statement for License Renewal of Nuclear Plants," NUREG-1437, will be prepared under the provisions of 10 CFR Part 51, the NRC's regulation that implements the National Environmental Policy Act of 1969 (NEPA). In accordance with 36 CFR 800.8(c), the SEIS will include analyses of potential impacts to historic and cultural resources.

In the context of the National Historic Preservation Act of 1966, as amended, the NRC staff has determined that the area of potential effect (APE) for a license renewal action is the area at the power plant site and its immediate environs that may be impacted by post-license renewal land-disturbing operations or projected refurbishment activities associated with the proposed action. The APE may extend beyond the immediate environs in those instances where post-license renewal land-disturbing operations or projected refurbishment activities specifically related to license renewal may potentially have an effect on known or proposed historic sites. This determination is made irrespective of ownership or control of the lands of interest.

On September 19, 2007, the NRC will conduct two public NEPA scoping meetings at the Colonial Terrace, located at 119 Oregon Road in Cortlandt Manor, NY. You and your staff are invited to attend. Your office will receive a copy of the draft SEIS along with a request for comments. The staff expects to publish the draft SEIS in July 2008.

If you have any questions or require additional information, please contact Ms. Jill Caverly, Environmental Project Manager, by phone at 301-415-6699 or by email at jmc1@nrc.gov.

Sincerely,

/RA/
Rani Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: See next page

August 9, 2007

Mr. Don L. Klima, Director
Advisory Council on Historic Preservation
Office of Federal Agency Programs
1100 Pennsylvania Ave, NW, Suite 803
Washington, DC 20004

SUBJECT: INDIAN POINT GENERATING UNIT NOS. 2 & 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Mr. Klima:

The U.S. Nuclear Regulatory Commission (NRC and the staff) is reviewing an application to renew the operating licenses for Indian Point Generating Unit Nos. 2 & 3 (Indian Point) which is located in Buchanan, New York, approximately 24 miles north of the New York City boundary line. Indian Point is operated by Entergy Nuclear Operations, Inc. (Entergy). The application for renewal was submitted by Entergy by letter dated April 23, 2007, and supplemented by letters dated May 3, and June 21, 2007, pursuant to Title 10 of the *Code of Federal Regulations* Part 54 (10 CFR Part 54).

The NRC has established that, as part of the staff's review of any nuclear power plant license renewal action, a site-specific Supplemental Environmental Impact Statement (SEIS) to its "Generic Environmental Impact Statement for License Renewal of Nuclear Plants," NUREG-1437, will be prepared under the provisions of 10 CFR Part 51, the NRC's regulation that implements the National Environmental Policy Act of 1969 (NEPA). In accordance with 36 CFR 800.8(c), the SEIS will include analyses of potential impacts to historic and cultural resources.

The NRC staff plans to hold two public NEPA scoping meetings on September 19, 2007, at Colonial Terrace, located at 119 Oregon Road in Cortlandt Manor, New York. The first meeting will convene at 1:30 p.m. and will continue until 4:30 p.m., as necessary. The second meeting will convene at 7:00 p.m., with a repeat of the overview portions of the first meeting, and will continue until 10:00 p.m., as necessary. In addition, staff will conduct a site audit September 10-14, 2007, at Indian Point. You and your staff are invited to attend both the public meetings and the site audit. Your office will receive a copy of the draft SEIS along with a request for comments. The anticipated publication date for the draft SEIS is late July 2008.

D. Klima -2-

If you have any questions or require additional information, please contact the Environmental Project Manager, Ms. Jill Caverly at 301-415-6699 or via e-mail at jsc@nrc.gov.

Sincerely,

/RA/
Rani Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50–268

cc: See next page

August 16, 2007

Mr. David Stilwell
Field Supervisor
U.S. Fish and Wildlife Service
New York Field Office
3817 Luker Road
Cortland, NY 13045

SUBJECT: REQUEST FOR LIST OF PROTECTED SPECIES WITHIN THE AREA UNDER EVALUATION FOR THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 & 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Mr. David Stilwell:

The U.S. Nuclear Regulatory Commission (NRC) is reviewing an application submitted by Entergy Nuclear Operations, Inc., for the renewal of the operating licenses for Indian Point Nuclear Generating Unit Nos. 2 & 3 (Indian Point). Indian Point is located in Buchanan, New York, approximately 24 miles north of the New York City boundary line. As part of the review of the license renewal application (LRA), the NRC is preparing a Supplemental Environmental Impact Statement (SEIS) under the provisions of Title 10 of the *Code of Federal Regulations* Part 51 (10 CFR Part 51), the NRC's regulation that implements the National Environmental Policy Act (NEPA) of 1969. The SEIS includes an analysis of pertinent environmental issues, including endangered or threatened species and impacts to fish and wildlife. This letter is being submitted under the provisions of the Endangered Species Act of 1973, as amended, and the Fish and Wildlife Coordination Act of 1934, as amended.

The proposed action is to renew the facility operating licenses for Indian Point for an additional 20 years beyond the expiration of the current operating licenses. The proposed action would include the use and continued maintenance of existing plant facilities and transmission lines. The Indian Point site covers approximately 239 acres. Indian Point is bordered on the north, south and east by partially wooded privately owned land and on the west by the Hudson River. Enclosures 1 and 2 provide a general overview of the site location and site layout.

Indian Point is equipped with a once-through open-cycle cooling system that withdraws cooling water from and discharges back into the Hudson River. The intake system includes seven bays for each unit located at the shore. Six 96-inch pipes discharge water beneath the water's surface within a 40-foot wide discharge canal.

The transmission lines in the scope of NRC's environmental review for license renewal are those that were originally constructed for the specific purpose of connecting the plant to the transmission system. The transmission line corridor to the Buchanan Substation (approximately 2100 feet southeast from the reactors, just across Broadway from the facility's main entrance) is located in the industrial portion of the site, except for where the lines cross Broadway. This transmission line corridor is being evaluated as part of the environmental review process.

D. Stillwell -2-

The enclosed transmission line map shows the transmission system that is being evaluated in the SEIS. Two 345-kilovolt (kV) lines connect Indian Point to the Buchanan Substation. This corridor also includes 138-kV transmission lines that supply offsite power from the substation into Indian Point.

To support the SEIS preparation process and to ensure compliance with Section 7 of the Endangered Species Act, the NRC requests information on Federally-listed, proposed, and candidate species and critical habitat that may be in the vicinity of Indian Point and its associated transmission line rights-of-way. In addition, please provide any information you consider appropriate under the provisions of the Fish and Wildlife Coordination Act.

The NRC staff plans to hold two public NEPA scoping meetings on September 19, 2007, at Colonial Terrace, located at 119 Oregon Road in Cortlandt Manor, New York. The first meeting will convene at 1:30 p.m. and will continue until 4:30 p.m., as necessary. The second meeting will convene at 7:00 p.m., with a repeat of the overview portions of the first meeting, and will continue until 10:00 p.m., as necessary. In addition, the NRC staff plans to conduct a site audit at Indian Point during the week of September 10, 2007. You and your staff are invited to attend both the public meetings and the site audit. Your office will receive a copy of the draft SEIS along with a request for comments. The anticipated publication date for the draft SEIS is late July 2008.

If you have any questions concerning the NRC staff's review of this LRA, please contact Ms. Jill Caverly, Project Manager, at 301-415-8450 or via e-mail at jsc1@nrc.gov.

Sincerely,

/RA/
Rani Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

Enclosures:
1. Site Location
2. Site Layout

cc w/encls: See next page

August 16, 2007

Mr. Peter Colosi
Habitat Conservation Coordinator
National Marine Fisheries Service
One Blackburn Drive
Glouster, MA 01930

SUBJECT: REQUEST FOR LIST OF PROTECTED SPECIES AND ESSENTIAL FISH HABITAT WITHIN THE AREA UNDER EVALUATION FOR THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Mr. Colosi:

The U.S. Nuclear Regulatory Commission (NRC) is reviewing an application submitted by Entergy Nuclear Operations, Inc. for the renewal of the operating licenses for Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point). Indian Point is located in Buchanan, NY, approximately 24 miles north of the New York City boundary line. As part of the review of the license renewal application (LRA), the NRC is preparing a Supplemental Environmental Impact Statement (SEIS) under the provisions of Title 10 of the *Code of Federal Regulations* Part 51 (10 CFR Part 51), the NRC's regulation that implements the National Environmental Policy Act (NEPA) of 1969. The SEIS includes an analysis of pertinent environmental issues, including endangered or threatened species and impacts to marine resources and habitat. This letter is being submitted under the provisions of the Endangered Species Act of 1973, as amended; the Fish and Wildlife Coordination Act of 1934, as amended; and the Sustainable Fisheries Act of 1996.

The proposed action is to renew the facility operating licenses for Indian Point for an additional 20 years beyond the expiration of the current operating licenses. The proposed action would include the use and continued maintenance of existing plant facilities and transmission lines. The Indian Point site covers approximately 239 acres. Indian Point is bordered on the north, south and east by partially wooded privately owned land and on the west by the Hudson River. Enclosures 1 and 2 provide a general overview of the site location and site layout.

Indian Point is equipped with a once-through open-cycle cooling system that withdraws cooling water from and discharges back into the Hudson River. The intake system includes seven bays for each unit located at the shore. Six 96-inch pipes discharge water beneath the water's surface within a 40-foot wide discharge canal.

The transmission lines in the scope of NRC's environmental review for license renewal are those that were originally constructed for the specific purpose of connecting the plant to the transmission system. The transmission line corridor to the Buchanan Substation (approximately 2100 feet southeast from the reactors, just across Broadway from the facility's main entrance) is located in the industrial portion of the site, except for where the lines cross Broadway. This transmission line corridor is being evaluated as part of the SEIS process. The enclosed transmission line map shows the transmission system that is being evaluated in the SEIS. Two 345-kilovolt (kV) lines connect Indian Point to the Buchanan Substation. This corridor also includes 138-kV transmission lines that supply offsite power from the substation into Indian Point.

To support the SEIS preparation process and to ensure compliance with Section 7 of the Endangered Species Act, the NRC requests information on Federally listed, proposed, and candidate species and critical habitat that may be in the vicinity of the Indian Point site. In addition, please provide any information you consider appropriate under the provisions of the Fish and Wildlife Coordination Act. Also, in support of the SEIS preparation and to ensure compliance with Section 305 of the Magnuson-Stevens Fishery Conservation and Management Act, the NRC requests a list of essential fish habitats that have been designated in the vicinity of the Indian Point site.

On September 19, 2007, the NRC staff plans to hold two public NEPA scoping meetings at the Colonial Terrace, located at 119 Oregon Rd. in Cortlandt Manor, NY. The first session will convene at 1:30 p.m. and will continue until 4:30 p.m., as necessary. The second session will convene at 7:00 p.m., with a repeat of the overview portions of the meeting, and will continue until 10:00 p.m., as necessary. The NRC staff plans to conduct a site audit at the Indian Point site during the week of September 10, 2007. You and your staff are invited to attend both the public meetings and the site audit. In addition, your office will receive a copy of the draft SEIS along with a request for comments. The anticipated publication date for the draft SEIS is July 2008.

If you have any questions concerning the NRC staff review of this LRA, please contact Ms. Jill Caverly, Project Manager at 301-415-8699 or jxc1@nrc.gov.

Sincerely,

/RA/
Rani Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

Enclosures:
As stated

cc w/encls: See next page

August 24, 2007

Mr. Andy Warrior
Director, Cultural Preservation
Absentee Shawnee Tribe of Oklahoma
2025 S. Gordon Cooper Drive
Shawnee, OK 74801

SUBJECT: REQUEST FOR COMMENTS CONCERNING THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Mr. Warrior:

The U.S. Nuclear Regulatory Commission (NRC) is seeking input for its environmental review of an application from Entergy Nuclear Operations (Entergy) for the renewal of the operating licenses for the Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point), located in Buchanan, NY, approximately 24 miles north of the New York City boundary line. Indian Point is in close proximity to lands that may be of interest to the Absentee Shawnee Tribe of Oklahoma. As described below, the NRC's process includes an opportunity for public and inter-governmental participation in the environmental review. We want to ensure that you are aware of our efforts and, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51, Section 51.28(b), the NRC invites the Absentee Shawnee Tribe of Oklahoma to provide input to the scoping process relating to the NRC's environmental review of the application. In addition, as outlined in 36 CFR 800.8(c), the NRC plans to coordinate compliance with Section 106 of the National Historic Preservation Act of 1966 through the requirements of the National Environmental Policy Act of 1969.

Under NRC regulations, the original operating license for a nuclear power plant is issued for up to 40 years. The license may be renewed for up to an additional 20 years if NRC requirements are met. The current operating licenses for Indian Point will expire in September, 2013, and December, 2015. Entergy submitted its application for renewal of the Indian Point operating licenses in a letter dated April 23, 2007, as supplemented by letters dated May 3 and June 21, 2007.

The NRC is gathering information for an Indian Point site-specific supplement to its "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (GEIS), NUREG-1437. The supplement will contain the results of the review of the environmental impacts on the area surrounding the Indian Point site related to terrestrial ecology, aquatic ecology, hydrology, cultural resources, and socioeconomic issues (among others), and will contain a recommendation regarding the environmental acceptability of the license renewal action.

A. Warrior -2-

To accommodate interested members of the public, the NRC will hold two public scoping meetings for the Indian Point license renewal supplement to the GEIS on Wednesday, September 19, 2007, at The Colonial Terrace, located at 119 Oregon Rd. in Cortlandt Manor, NY. The first session will convene at 1:30 p.m. and will continue until 4:30 p.m., as necessary. The second session will convene at 7:00 p.m., with a repeat of the overview portions of the meeting, and will continue until 10:00 p.m., as necessary. Additionally, the NRC staff will host informal discussions one hour before the start of each session.

The license renewal application (LRA) is publicly available at the NRC Public Document Room (PDR), located at One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852, or from the NRC's Agencywide Documents Access and Management System (ADAMS). The ADAMS Public Electronic Reading Room is accessible at http://adamswebsearch.nrc.gov/dologin.html. The accession number for the LRA is ML071210507. Persons who do not have access to ADAMS, or who encounter problems in accessing the documents located in ADAMS, should contact the NRC's PDR Reference staff by telephone at 1-800-397-4209 or 301-415-4737, or by e-mail at pdr@nrc.gov.

The Indian Point LRA is also available on the Internet at http://www.nrc.gov/reactors/operating/licensing/renewal/applications/indian-point.html. In addition, the Hendrick Hudson Free Library, located in Montrose, NY, the Field Library, located in Peekskill, NY, and the White Plains Public Library located in White Plains, NY, have agreed to make the LRA available for public inspection.

The GEIS, which documents the NRC's assessment of the scope and impact of environmental effects that would be associated with license renewal at any nuclear power plant site, can also be found on the NRC's website or at the NRC's PDR.

Please submit any comments that the Absentee Shawnee Tribe of Oklahoma may have to offer on the scope of the environmental review by October 12, 2007. Written comments should be submitted by mail to the Chief, Rules and Directives Branch, Division of Administrative Services, Mail Stop T-6D59, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001. Electronic comments may be submitted to the NRC by e-mail at IndianPointEIS@nrc.gov. At the conclusion of the scoping process, the NRC staff will prepare a summary of the significant issues identified and the conclusions reached, and mail a copy to you.

The staff expects to publish the draft supplement to the GEIS in July 2008. The NRC will hold another set of public meetings in the site vicinity to solicit comments on the draft supplemental environmental impact statement (SEIS). A copy of the draft SEIS will be sent to you for your review and comment. After consideration of public comments received on the draft, the NRC will prepare a final SEIS. The issuance of a final SEIS for Indian Point is planned for April 2009. If you need additional information regarding the environmental review process, please contact Ms. Jill Caverly, Environmental Project Manager, at 301-415-6699 or at jsc1@nrc.gov.

Sincerely,

/RA Christian Jacobs for/

Rani L. Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: See next page

August 24, 2007

The Honorable Maurice John, President
Cattaraugus Reservation, Seneca Nation
140 Rt. 438
Irving, NY 14081

SUBJECT: REQUEST FOR COMMENTS CONCERNING THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear President John:

The U.S. Nuclear Regulatory Commission (NRC) is seeking input for its environmental review of an application from Entergy Nuclear Operations (Entergy) for the renewal of the operating licenses for the Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point), located in Buchanan, NY, approximately 24 miles north of the New York City boundary line. Indian Point is in close proximity to lands that may be of interest to the Cattaraugus Reservation, Seneca Nation. As described below, the NRC's process includes an opportunity for public and inter-governmental participation in the environmental review. We want to ensure that you are aware of our efforts and, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51, Section 51.28(b), the NRC invites the Cattaraugus Reservation, Seneca Nation to provide input to the scoping process relating to the NRC's environmental review of the application. In addition, as outlined in 36 CFR 800.8(c), the NRC plans to coordinate compliance with Section 106 of the National Historic Preservation Act of 1966 through the requirements of the National Environmental Policy Act of 1969.

Under NRC regulations, the original operating license for a nuclear power plant is issued for up to 40 years. The license may be renewed for up to an additional 20 years if NRC requirements are met. The current operating licenses for Indian Point will expire in September, 2013, and December, 2015. Entergy submitted its application for renewal of the Indian Point operating licenses in a letter dated April 23, 2007, as supplemented by letters dated May 3 and June 21, 2007.

The NRC is gathering information for an Indian Point site-specific supplement to its "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (GEIS), NUREG-1437. The supplement will contain the results of the review of the environmental impacts on the area surrounding the Indian Point site related to terrestrial ecology, aquatic ecology, hydrology, cultural resources, and socioeconomic issues (among others), and will contain a recommendation regarding the environmental acceptability of the license renewal action.

To accommodate interested members of the public, the NRC will hold two public scoping meetings for the Indian Point license renewal supplement to the GEIS on Wednesday, September 19, 2007, at The Colonial Terrace, located at 119 Oregon Rd. in Cortlandt Manor, NY. The first session will convene at 1:30 p.m. and will continue until 4:30 p.m., as necessary. The second session will convene at 7:00 p.m., with a repeat of the overview portions of the meeting, and will continue until 10:00 p.m., as necessary. Additionally, the NRC staff will host informal discussions one hour before the start of each session.

The license renewal application (LRA) is publicly available at the NRC Public Document Room (PDR), located at One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852, or from the NRC's Agencywide Documents Access and Management System (ADAMS). The ADAMS Public Electronic Reading Room is accessible at http://adamswebsearch.nrc.gov/dologin.html. The accession number for the LRA is ML071210507. Persons who do not have access to ADAMS, or who encounter problems in accessing the documents located in ADAMS, should contact the NRC's PDR Reference staff by telephone at 1-800-397-4209 or 301-415-4737, or by e-mail at pdr@nrc.gov.

The Indian Point LRA is also available on the Internet at http://www.nrc.gov/reactors/operating/licensing/renewal/applications/indian-point.html. In addition, the Hendrick Hudson Free Library, located in Montrose, NY, the Field Library, located in Peekskill, NY, and the White Plains Public Library located in White Plains, NY, have agreed to make the LRA available for public inspection.

The GEIS, which documents the NRC's assessment of the scope and impact of environmental effects that would be associated with license renewal at any nuclear power plant site, can also be found on the NRC's website or at the NRC's PDR.

Please submit any comments that the Cattaraugus Reservation, Seneca Nation may have to offer on the scope of the environmental review by October 12, 2007. Written comments should be submitted by mail to the Chief, Rules and Directives Branch, Division of Administrative Services, Mail Stop T-6D59, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001. Electronic comments may be submitted to the NRC by e-mail at IndianPointEIS@nrc.gov. At the conclusion of the scoping process, the NRC staff will prepare a summary of the significant issues identified and the conclusions reached, and mail a copy to you.

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Sincerely,

/RA Christian Jacobs for/

Rani L. Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: See next page

August 24, 2007

Mr. Clint Halftown
Representative
Cayuga Nation
P.O. Box 11
Versailles, NY 14168

SUBJECT: REQUEST FOR COMMENTS CONCERNING THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Mr. Halftown:

The U.S. Nuclear Regulatory Commission (NRC) is seeking input for its environmental review of an application from Entergy Nuclear Operations (Entergy) for the renewal of the operating licenses for the Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point), located in Buchanan, NY, approximately 24 miles north of the New York City boundary line. Indian Point is in close proximity to lands that may be of interest to the Cayuga Nation. As described below, the NRC's process includes an opportunity for public and inter-governmental participation in the environmental review. We want to ensure that you are aware of our efforts and, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51, Section 51.28(b), the NRC invites the Cayuga Nation to provide input to the scoping process relating to the NRC's environmental review of the application. In addition, as outlined in 36 CFR 800.8(c), the NRC plans to coordinate compliance with Section 106 of the National Historic Preservation Act of 1966 through the requirements of the National Environmental Policy Act of 1969.

Under NRC regulations, the original operating license for a nuclear power plant is issued for up to 40 years. The license may be renewed for up to an additional 20 years if NRC requirements are met. The current operating licenses for Indian Point will expire in September, 2013, and December, 2015. Entergy submitted its application for renewal of the Indian Point operating licenses in a letter dated April 23, 2007, as supplemented by letters dated May 3 and June 21, 2007.

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Please submit any comments that the Cayuga Nation may have to offer on the scope of the environmental review by October 12, 2007. Written comments should be submitted by mail to the Chief, Rules and Directives Branch, Division of Administrative Services, Mail Stop T-6D59, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001. Electronic comments may be submitted to the NRC by e-mail at IndianPointEIS@nrc.gov. At the conclusion of the scoping process, the NRC staff will prepare a summary of the significant issues identified and the conclusions reached, and mail a copy to you.

C. Halftown -3-

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Sincerely,

/RA Christian Jacobs for/

Rani L. Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: See next page

August 24, 2007

Ms. Nikki Owings-Crumm
Environmental Director
Delaware Nation
P.O. Box 825
Andarko, OK 73005

SUBJECT: REQUEST FOR COMMENTS CONCERNING THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Ms. Owings-Crumm:

The U.S. Nuclear Regulatory Commission (NRC) is seeking input for its environmental review of an application from Entergy Nuclear Operations (Entergy) for the renewal of the operating licenses for the Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point), located in Buchanan, NY, approximately 24 miles north of the New York City boundary line. Indian Point is in close proximity to lands that may be of interest to the Delaware Nation. As described below, the NRC's process includes an opportunity for public and inter-governmental participation in the environmental review. We want to ensure that you are aware of our efforts and, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51, Section 51.28(b), the NRC invites the Delaware Nation to provide input to the scoping process relating to the NRC's environmental review of the application. In addition, as outlined in 36 CFR 800.8(c), the NRC plans to coordinate compliance with Section 106 of the National Historic Preservation Act of 1966 through the requirements of the National Environmental Policy Act of 1969.

Under NRC regulations, the original operating license for a nuclear power plant is issued for up to 40 years. The license may be renewed for up to an additional 20 years if NRC requirements are met. The current operating licenses for Indian Point will expire in September, 2013, and December, 2015. Entergy submitted its application for renewal of the Indian Point operating licenses in a letter dated April 23, 2007, as supplemented by letters dated May 3 and June 21, 2007.

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Sincerely,

/RA Christian Jacobs for/

Rani L. Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: See next page

August 24, 2007

The Honorable Jerry Douglas, Chief
Delaware Tribe of Indians
Delaware Tribal Headquarters
170 North East Barbara
Bartlesville, OK 74006

SUBJECT: REQUEST FOR COMMENTS CONCERNING THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Chief Douglas:

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Sincerely,

/RA Christian Jacobs for/

Rani L. Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: See next page

August 24, 2007

The Honorable C.W. Longlow, Chief
Echota Chickamauga Cherokee Tribe
of New Jersey
1164 Stuyvesant Avenue
Irvington, NJ 07111

SUBJECT: REQUEST FOR COMMENTS CONCERNING THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Chief Longlow:

The U.S. Nuclear Regulatory Commission (NRC) is seeking input for its environmental review of an application from Entergy Nuclear Operations (Entergy) for the renewal of the operating licenses for the Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point), located in Buchanan, NY, approximately 24 miles north of the New York City boundary line. Indian Point is in close proximity to lands that may be of interest to the Echota Chickamauga Cherokee Tribe of New Jersey. As described below, the NRC's process includes an opportunity for public and inter-governmental participation in the environmental review. We want to ensure that you are aware of our efforts and, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51, Section 51.28(b), the NRC invites the Echota Chickamauga Cherokee Tribe of New Jersey to provide input to the scoping process relating to the NRC's environmental review of the application. In addition, as outlined in 36 CFR 800.8(c), the NRC plans to coordinate compliance with Section 106 of the National Historic Preservation Act of 1966 through the requirements of the National Environmental Policy Act of 1969.

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Sincerely,

/RA Christian Jacobs for/

Rani L. Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: See next page

August 24, 2007

The Honorable Michael Thomas, Chairman
Mashantucket Pequot Tribe
110 Pequot Trail
P.O. Box 3180
Mashantucket, CT 06339

SUBJECT: REQUEST FOR COMMENTS CONCERNING THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Chairman Thomas:

The U.S. Nuclear Regulatory Commission (NRC) is seeking input for its environmental review of an application from Entergy Nuclear Operations (Entergy) for the renewal of the operating licenses for the Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point), located in Buchanan, NY, approximately 24 miles north of the New York City boundary line. Indian Point is in close proximity to lands that may be of interest to the Mashantucket Pequot Tribe. As described below, the NRC's process includes an opportunity for public and inter-governmental participation in the environmental review. We want to ensure that you are aware of our efforts and, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51, Section 51.28(b), the NRC invites the Mashantucket Pequot Tribe to provide input to the scoping process relating to the NRC's environmental review of the application. In addition, as outlined in 36 CFR 800.8(c), the NRC plans to coordinate compliance with Section 106 of the National Historic Preservation Act of 1966 through the requirements of the National Environmental Policy Act of 1969.

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/RA Christian Jacobs for/

Rani L. Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: See next page

August 24, 2007

Ms. Jeanne Schbotte
Mohegan Tribe
5 Crow Hill Road
Uncasville, CT 06382

SUBJECT: REQUEST FOR COMMENTS CONCERNING THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Ms. Schbotte:

The U.S. Nuclear Regulatory Commission (NRC) is seeking input for its environmental review of an application from Entergy Nuclear Operations (Entergy) for the renewal of the operating licenses for the Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point), located in Buchanan, NY, approximately 24 miles north of the New York City boundary line. Indian Point is in close proximity to lands that may be of interest to the Mohegan Tribe. As described below, the NRC's process includes an opportunity for public and inter-governmental participation in the environmental review. We want to ensure that you are aware of our efforts and, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51, Section 51.28(b), the NRC invites the Mohegan Tribe to provide input to the scoping process relating to the NRC's environmental review of the application. In addition, as outlined in 36 CFR 800.8(c), the NRC plans to coordinate compliance with Section 106 of the National Historic Preservation Act of 1966 through the requirements of the National Environmental Policy Act of 1969.

Under NRC regulations, the original operating license for a nuclear power plant is issued for up to 40 years. The license may be renewed for up to an additional 20 years if NRC requirements are met. The current operating licenses for Indian Point will expire in September, 2013, and December, 2015. Entergy submitted its application for renewal of the Indian Point operating licenses in a letter dated April 23, 2007, as supplemented by letters dated May 3 and June 21, 2007.

The NRC is gathering information for an Indian Point site-specific supplement to its "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (GEIS), NUREG-1437. The supplement will contain the results of the review of the environmental impacts on the area surrounding the Indian Point site related to terrestrial ecology, aquatic ecology, hydrology, cultural resources, and socioeconomic issues (among others), and will contain a recommendation regarding the environmental acceptability of the license renewal action.

To accommodate interested members of the public, the NRC will hold two public scoping meetings for the Indian Point license renewal supplement to the GEIS on Wednesday, September 19, 2007, at The Colonial Terrace, located at 119 Oregon Rd. in Cortlandt Manor, NY. The first session will convene at 1:30 p.m. and will continue until 4:30 p.m., as necessary. The second session will convene at 7:00 p.m., with a repeat of the overview portions of the meeting, and will continue until 10:00 p.m., as necessary. Additionally, the NRC staff will host informal discussions one hour before the start of each session.

The license renewal application (LRA) is publicly available at the NRC Public Document Room (PDR), located at One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852, or from the NRC's Agencywide Documents Access and Management System (ADAMS). The ADAMS Public Electronic Reading Room is accessible at http://adamswebsearch.nrc.gov/dologin.html. The accession number for the LRA is ML071210507. Persons who do not have access to ADAMS, or who encounter problems in accessing the documents located in ADAMS, should contact the NRC's PDR Reference staff by telephone at 1-800-397-4209 or 301-415-4737, or by e-mail at pdr@nrc.gov.

The Indian Point LRA is also available on the Internet at http://www.nrc.gov/reactors/operating/licensing/renewal/applications/indian-point.html. In addition, the Hendrick Hudson Free Library, located in Montrose, NY, the Field Library, located in Peekskill, NY, and the White Plains Public Library located in White Plains, NY, have agreed to make the LRA available for public inspection.

The GEIS, which documents the NRC's assessment of the scope and impact of environmental effects that would be associated with license renewal at any nuclear power plant site, can also be found on the NRC's website or at the NRC's PDR.

Please submit any comments that the Mohegan Tribe may have to offer on the scope of the environmental review by October 12, 2007. Written comments should be submitted by mail to the Chief, Rules and Directives Branch, Division of Administrative Services, Mail Stop T-6D59, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001. Electronic comments may be submitted to the NRC by e-mail at IndianPointEIS@nrc.gov. At the conclusion of the scoping process, the NRC staff will prepare a summary of the significant issues identified and the conclusions reached, and mail a copy to you.

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Sincerely,

/RA Christian Jacobs for/

Rani L. Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: See next page

August 24, 2007

Mr. Ray Halbritter, Nation Representative
Oneida Indian Nation of New York
Genessee Street, Ames Plaza
Oneida, NY 13421

SUBJECT: REQUEST FOR COMMENTS CONCERNING THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Mr. Halbritter:

The U.S. Nuclear Regulatory Commission (NRC) is seeking input for its environmental review of an application from Entergy Nuclear Operations (Entergy) for the renewal of the operating licenses for the Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point), located in Buchanan, NY, approximately 24 miles north of the New York City boundary line. Indian Point is in close proximity to lands that may be of interest to the Oneida Indian Nation of New York. As described below, the NRC's process includes an opportunity for public and inter-governmental participation in the environmental review. We want to ensure that you are aware of our efforts and, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51, Section 51.28(b), the NRC invites the Oneida Indian Nation of New York to provide input to the scoping process relating to the NRC's environmental review of the application. In addition, as outlined in 36 CFR 800.8(c), the NRC plans to coordinate compliance with Section 106 of the National Historic Preservation Act of 1966 through the requirements of the National Environmental Policy Act of 1969.

Under NRC regulations, the original operating license for a nuclear power plant is issued for up to 40 years. The license may be renewed for up to an additional 20 years if NRC requirements are met. The current operating licenses for Indian Point will expire in September, 2013, and December, 2015. Entergy submitted its application for renewal of the Indian Point operating licenses in a letter dated April 23, 2007, as supplemented by letters dated May 3 and June 21, 2007.

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Please submit any comments that the Oneida Indian Nation of New York may have to offer on the scope of the environmental review by October 12, 2007. Written comments should be submitted by mail to the Chief, Rules and Directives Branch, Division of Administrative Services, Mail Stop T-6D59, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001. Electronic comments may be submitted to the NRC by e-mail at IndianPointEIS@nrc.gov. At the conclusion of the scoping process, the NRC staff will prepare a summary of the significant issues identified and the conclusions reached, and mail a copy to you.

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Sincerely,

/RA Christian Jacobs for/

Rani L. Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: See next page

August 24, 2007

Council of Chiefs
Onondaga Nation
258 C Route 11a
Onondaga Nation
Nedrow, NY 13120

SUBJECT: REQUEST FOR COMMENTS CONCERNING THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Council Members:

The U.S. Nuclear Regulatory Commission (NRC) is seeking input for its environmental review of an application from Entergy Nuclear Operations (Entergy) for the renewal of the operating licenses for the Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point), located in Buchanan, NY, approximately 24 miles north of the New York City boundary line. Indian Point is in close proximity to lands that may be of interest to the Onondaga Nation. As described below, the NRC's process includes an opportunity for public and inter-governmental participation in the environmental review. We want to ensure that you are aware of our efforts and, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51, Section 51.28(b), the NRC invites the Onondaga Nation to provide input to the scoping process relating to the NRC's environmental review of the application. In addition, as outlined in 36 CFR 800.8(c), the NRC plans to coordinate compliance with Section 106 of the National Historic Preservation Act of 1966 through the requirements of the National Environmental Policy Act of 1969.

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Sincerely,

/RA Christian Jacobs for/

Rani L. Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: See next page

August 24, 2007

The Honorable Dwaine Perry, Chief
Ramapough Lenape
Ramapough Tribal Office
189 Stag Hill Road
Mahwah, NJ 07430

SUBJECT: REQUEST FOR COMMENTS CONCERNING THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Chief Perry:

The U.S. Nuclear Regulatory Commission (NRC) is seeking input for its environmental review of an application from Entergy Nuclear Operations (Entergy) for the renewal of the operating licenses for the Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point), located in Buchanan, NY, approximately 24 miles north of the New York City boundary line. Indian Point is in close proximity to lands that may be of interest to the Ramapough Lenape. As described below, the NRC's process includes an opportunity for public and inter-governmental participation in the environmental review. We want to ensure that you are aware of our efforts and, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51, Section 51.28(b), the NRC invites the Ramapough Lenape to provide input to the scoping process relating to the NRC's environmental review of the application. In addition, as outlined in 36 CFR 800.8(c), the NRC plans to coordinate compliance with Section 106 of the National Historic Preservation Act of 1966 through the requirements of the National Environmental Policy Act of 1969.

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D. Perry -2-

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D. Perry -3-

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Sincerely,

/RA Christian Jacobs for/

Rani L. Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: See next page

August 24, 2007

Mr. Mike John
Conservationist
Seneca Nation of Indians
P.O. Box 231
Salamanca, NY 14479

SUBJECT: REQUEST FOR COMMENTS CONCERNING THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Mr. John:

The U.S. Nuclear Regulatory Commission (NRC) is seeking input for its environmental review of an application from Entergy Nuclear Operations (Entergy) for the renewal of the operating licenses for the Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point), located in Buchanan, NY, approximately 24 miles north of the New York City boundary line. Indian Point is in close proximity to lands that may be of interest to the Seneca Nation of Indians. As described below, the NRC's process includes an opportunity for public and inter-governmental participation in the environmental review. We want to ensure that you are aware of our efforts and, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51, Section 51.28(b), the NRC invites the Seneca Nation of Indians to provide input to the scoping process relating to the NRC's environmental review of the application. In addition, as outlined in 36 CFR 800.8(c), the NRC plans to coordinate compliance with Section 106 of the National Historic Preservation Act of 1966 through the requirements of the National Environmental Policy Act of 1969.

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Sincerely,

/RA Christian Jacobs for/

Rani L. Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: See next page

August 24, 2007

Mr. Randy Kind, Chairman
Shinnecock Tribe
Rte 27-A, Montauk Hwy
Southhampton, NY 11968

SUBJECT: REQUEST FOR COMMENTS CONCERNING THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Chairman Kind:

The U.S. Nuclear Regulatory Commission (NRC) is seeking input for its environmental review of an application from Entergy Nuclear Operations (Entergy) for the renewal of the operating licenses for the Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point), located in Buchanan, NY, approximately 24 miles north of the New York City boundary line. Indian Point is in close proximity to lands that may be of interest to the Shinnecock Tribe. As described below, the NRC's process includes an opportunity for public and inter-governmental participation in the environmental review. We want to ensure that you are aware of our efforts and, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51, Section 51.28(b), the NRC invites the Shinnecock Tribe to provide input to the scoping process relating to the NRC's environmental review of the application. In addition, as outlined in 36 CFR 800.8(c), the NRC plans to coordinate compliance with Section 106 of the National Historic Preservation Act of 1966 through the requirements of the National Environmental Policy Act of 1969.

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R. Kind -2-

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Sincerely,

/RA Christian Jacobs for/

Rani L. Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: See next page

August 24, 2007

The Honorable Harry B. Wallace, Chief
Unkechaug Nation
P.O. Box 86
Mastic, New York 11950

SUBJECT: REQUEST FOR COMMENTS CONCERNING THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Chief Wallace:

The U.S. Nuclear Regulatory Commission (NRC) is seeking input for its environmental review of an application from Entergy Nuclear Operations (Entergy) for the renewal of the operating licenses for the Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point), located in Buchanan, NY, approximately 24 miles north of the New York City boundary line. Indian Point is in close proximity to lands that may be of interest to the Unkechaug Nation. As described below, the NRC's process includes an opportunity for public and inter-governmental participation in the environmental review. We want to ensure that you are aware of our efforts and, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51, Section 51.28(b), the NRC invites the Unkechaug Nation to provide input to the scoping process relating to the NRC's environmental review of the application. In addition, as outlined in 36 CFR 800.8(c), the NRC plans to coordinate compliance with Section 106 of the National Historic Preservation Act of 1966 through the requirements of the National Environmental Policy Act of 1969.

Under NRC regulations, the original operating license for a nuclear power plant is issued for up to 40 years. The license may be renewed for up to an additional 20 years if NRC requirements are met. The current operating licenses for Indian Point will expire in September, 2013, and December, 2015. Entergy submitted its application for renewal of the Indian Point operating licenses in a letter dated April 23, 2007, as supplemented by letters dated May 3 and June 21, 2007.

The NRC is gathering information for an Indian Point site-specific supplement to its "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (GEIS), NUREG-1437. The supplement will contain the results of the review of the environmental impacts on the area surrounding the Indian Point site related to terrestrial ecology, aquatic ecology, hydrology, cultural resources, and socioeconomic issues (among others), and will contain a recommendation regarding the environmental acceptability of the license renewal action.

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Please submit any comments that the Unkechaug Nation may have to offer on the scope of the environmental review by October 12, 2007. Written comments should be submitted by mail to the Chief, Rules and Directives Branch, Division of Administrative Services, Mail Stop T-6D59, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001. Electronic comments may be submitted to the NRC by e-mail at IndianPointEIS@nrc.gov. At the conclusion of the scoping process, the NRC staff will prepare a summary of the significant issues identified and the conclusions reached, and mail a copy to you.

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Sincerely,

/RA Christian Jacobs for/

Rani L. Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: See next page

August 24, 2007

The Honorable Leo Henry, Chief
Tuscarora Nation
5616 Walmore Road
Lewiston, New York 14092

SUBJECT: REQUEST FOR COMMENTS CONCERNING THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Chief Henry:

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Sincerely,

/RA Christian Jacobs for/

Rani L. Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: See next page

DISTRIBUTION: See next page

August 24, 2007

The Honorable Roger Hill, Chief
Tonawanda Band of Senecas
7027 Meadville Road
Bason, New York 14013

SUBJECT: REQUEST FOR COMMENTS CONCERNING THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Chief Hill:

The U.S. Nuclear Regulatory Commission (NRC) is seeking input for its environmental review of an application from Entergy Nuclear Operations (Entergy) for the renewal of the operating licenses for the Indian Point Nuclear Generating Units No. 2 and 3 (Indian Point), located in Buchanan, NY, approximately 24 miles north of the New York City boundary line. Indian Point is in close proximity to lands that may be of interest to the Tonawanda Band of Senecas. As described below, the NRC's process includes an opportunity for public and inter-governmental participation in the environmental review. We want to ensure that you are aware of our efforts and, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51, Section 51.28(b), the NRC invites the Tonawanda Band of Senecas to provide input to the scoping process relating to the NRC's environmental review of the application. In addition, as outlined in 36 CFR 800.8(c), the NRC plans to coordinate compliance with Section 106 of the National Historic Preservation Act of 1966 through the requirements of the National Environmental Policy Act of 1969.

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Sincerely,

/RA Christian Jacobs for/

Rani L. Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: See next page

August 24, 2007

Ms. Sherry White
Tribal Historic Preservation Officer
Stockbridge-Munsee Community Band of
Mohican Indians
W13447 Camp 14 Road
Bowler, WI 54416

SUBJECT: REQUEST FOR COMMENTS CONCERNING THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Ms. White:

The U.S. Nuclear Regulatory Commission (NRC) is seeking input for its environmental review of an application from Entergy Nuclear Operations (Entergy) for the renewal of the operating licenses for the Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point), located in Buchanan, NY, approximately 24 miles north of the New York City boundary line. Indian Point is in close proximity to lands that may be of interest to the Stockbridge-Munsee Community Band of Mohican Indians. As described below, the NRC's process includes an opportunity for public and inter-governmental participation in the environmental review. We want to ensure that you are aware of our efforts and, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51, Section 51.28(b), the NRC invites the Stockbridge-Munsee Community Band of Mohican Indians to provide input to the scoping process relating to the NRC's environmental review of the application. In addition, as outlined in 36 CFR 800.8(c), the NRC plans to coordinate compliance with Section 106 of the National Historic Preservation Act of 1966 through the requirements of the National Environmental Policy Act of 1969.

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S. White -3-

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Sincerely,

/RA Christian Jacobs for/

Rani L. Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: See next page

August 24, 2007

Mr. Ken Jock
Council Member
St. Regis Mohawk Tribal Council
412 State Route 37
Akwesasne, NY 13655

SUBJECT: REQUEST FOR COMMENTS CONCERNING THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Mr. Jock:

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/RA Christian Jacobs for/

Rani L. Franovich, Branch Chief
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

cc: See next page

Delaware Nation

Environmental Programs

P.O. Box 825
Anadarko, OK 73005
405 / 247-2448 x 137
Fax: 405 / 247-9393

9/11/07
72 FR 52850
(2)

September 5, 2007

U.S. Nuclear Regulatory Commission
Chief of Rules and Directives Branch
Division of Administrative Services
Mail Stop T-6D59
Washington, D.C. 20555-0001

Re: Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal Application Review

Dear Sir:

I am writing in regard to your letter dated August 24, 2007 requesting comments concerning the Indian Point Nuclear Generating Unit Nos. 2 and 3 license renewal application review. As mentioned in the environmental report, the Delaware people were one of the aboriginal entities located in the Hudson-Mohawk Basin in the early 17th century and should have been one of the initial consulting parties. As one of the aboriginal entities, we are very interested in being a part of the review process not only for cultural preservation but for environmental protection as well.

In order for Delaware Nation personnel to be thoroughly informed about this project and to provide comments we would like to request status as a consulting party. With this status, we are confident that you would be able to forward a copy of all formal documents sent to all consulting parties prior to the August 24, 2007 letter we received. It is important to the Delaware Nation that all cultural sites are properly maintained and the environmental impacts be reviewed before further action is taken.

Thank you for contacting the Delaware Nation to be included in the review of this application renewal. We look forward to your quick response and receipt of the documents requested to continue a productive relationship with your organization. If you have any questions or require additional information, you may contact Mrs. Daniecla Nieto, Acting Director of Environmental Programs and/or Ms. Tamara Francis, Cultural Preservation Director by telephone at (405) 247-2448 or by fax at (405) 247-9393.

Sincerely,

Daniela Nieto

Daniecla Nieto, Air Program Coordinator and Acting Director
Delaware Nation of Oklahoma Environmental Programs

cc: Tamara Francis, Cultural Preservation Director
Orvel Gibson, Tribal Administrator

E-RIDS = ADM-03
Add = Bo Pham (bwp1)

SUNSI Review Complete
Template = ADM-013

Jill Caverly - Indian Point Nuclear Generating Unit Nos. 2 and 3 Protected Species Response

From: <MaryEllen_VanDonsel@fws.gov>
To: <jsc1@nrc.gov>
Date: 08/29/2007 11:06 AM
Subject: Indian Point Nuclear Generating Unit Nos. 2 and 3 Protected Species Response

Please see the attached file for our response from the U.S. Fish and Wildlife Service.

MaryEllen VanDonsel
U.S. Fish and Wildlife Service
3817 Luker Road
Cortland, NY 13045
Phone: 607-753-9334
Fax: 607-753-9699

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New York Field Office
3817 Luker Road
Cortland, NY 13045
Phone: (607) 753-9334 Fax: (607) 753-9699
http://www.fws.gov/northeast/nyfo

Project Number: 7093

To: Rani Franovich Date: 8-29-07

Regarding: Indian Point Nuclear Generating Units 2 and 3

Town/County: Buchanan / Westchester

We have received your request for information regarding occurrences of Federally-listed threatened and endangered species within the vicinity of the above-referenced project/property. Due to increasing workload and reduction of staff, we are no longer able to reply to endangered species list requests in a timely manner. In an effort to streamline project reviews, we are shifting the majority of species list requests to our website at http://www.fws.gov/northeast/nyfo/es/section7.htm. Please go to our website and print the appropriate portions of our county list of endangered, threatened, proposed, and candidate species, and the official list request response. Step-by-step instructions are found on our website.

As a reminder, Section 9 of the Endangered Species Act (ESA) (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) prohibits unauthorized taking* of listed species and applies to Federal and non-Federal activities. Additionally, endangered species and their habitats are protected by Section 7(a)(2) of the ESA, which requires Federal agencies, in consultation with the U.S. Fish and Wildlife Service (Service), to ensure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat. An assessment of the potential direct, indirect, and cumulative impacts is required for all Federal actions that may affect listed species. For projects not authorized, funded, or carried out by a Federal agency, consultation with the Service pursuant to Section 7(a)(2) of the ESA is not required. However, no person is authorized to "take"* any listed species without appropriate authorizations from the Service. Therefore, we provide technical assistance to individuals and agencies to assist with project planning to avoid the potential for "take," or when appropriate, to provide assistance with their application for an incidental take permit pursuant to Section 10(a)(1)(B) of the ESA.

Project construction or implementation should not commence until all requirements of the ESA have been fulfilled. If you have any questions or require further assistance regarding threatened or endangered species, please contact the Endangered Species Program at (607) 753-9334. Please refer to the above document control number in any future correspondence.

Endangered Species Biologist: Robyn A. Niver RAN

*Under the Act and regulations, it is illegal for any person subject to the jurisdiction of the United States to *take* (includes harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt any of these), import or export, ship in interstate or foreign commerce in the course of commercial activity, or sell or offer for sale in interstate or foreign commerce any endangered fish or wildlife species and most threatened fish and wildlife species. It is also illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. "Harm" includes any act which actually kills or injures fish or wildlife, and case law has clarified that such acts may include significant habitat modification or degradation that significantly impairs essential behavioral patterns of fish or wildlife.

New York State Department of Environmental Conservation
Office of General Counsel, 14th Floor
625 Broadway, Albany, New York 12233-1500
FAX: (518) 402-9018 or (518) 402-9019
Website: www.dec.ny.gov

Alexander B. Grannis
Commissioner

October 5, 2007

Via e-mail and Regular First Class Mail

Mr. Bo Pham
Senior Project Manager - Indian Point Relicensing Application
Division of License Renewal
Mail Stop 0-7B1
United States Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

Re: Indian Point Units 2 and 3 Relicensing
Extension Request for Scoping Comments on SEIS

Dear Mr. Pham:

The State of New York respectfully requests an extension until October 31, 2007, in which to file written Scoping Comments on the draft Supplemental Environmental Impact Statement (SEIS) that the Nuclear Regulatory Commission (NRC) is preparing in conjunction with the relicensing application filed by Entergy Nuclear Operations, Inc., for the Indian Point nuclear power plants (Indian Point 2 and Indian Point 3) in Buchanan, New York.

The State has been working diligently to prepare its comments. As you know, the Department of Environmental Conservation has assumed the role of coordinating with other State Executive Agencies on the relicensing application. The Executive Agencies are also working closely with the State Attorney General's Office on the relicensing application. The additional time will allow for more efficient coordination on the scoping comments.

Moreover, the NRC has extended the deadline until November 30, 2007, in which to file a Request for a Hearing/Petition for Leave to Intervene on the relicensing application. The State is thus in the process of identifying environmental issues to raise as contentions. Without question, that process is related to the drafting of comments on the SEIS. Extending the deadline to file Scoping Comments will more closely coordinate with the State's efforts on the Request for a Hearing/Petition for Leave to Intervene.

Finally, Joan Matthews, the lead counsel for the State Executive Agencies, has had a significant family medical emergency since Labor Day, which only this week appears to be resolving, allowing her to once again devote her full attention to this matter.

Please feel to contact either one of us if you have any questions about this request.

Respectfully submitted,

JOAN LEARY MATTHEWS
Senior Attorney for Special Projects
New York State Department of
Environmental Conservation
518-402-9190
jlmatthe@gw.dec.state.ny.us

JOHN SIPOS
Assistant Attorney General
New York State Department of Law
Environmental Protection Bureau
The Capitol
Albany, NY 12224
518-402-2251
john.sipos@oag.state.ny.us

New York State Department of Environmental Conservation
Office of General Counsel, 14th Floor
625 Broadway, Albany, New York 12233-1500
FAX: (518) 402-9018 or (518) 402-9019
Website: www.dec.ny.gov

Alexander B. Grannis
Commissioner

October 10, 2007

Via e-mail and Regular First Class Mail

Mr. Bo Pham
Senior Project Manager - Indian Point Relicensing Application
Division of License Renewal
Mail Stop 0-7B1
United States Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

Re: Indian Point Units 2 and 3 Relicensing
Extension Request for Scoping Comments on SEIS

Dear Mr. Pham:

Thank you for your telephone call yesterday in response to the State of New York's request to submit scoping comments by October 31, 2007, on the above matter. This letter is to confirm that the State will submit its scoping comments by October 31, 2007, and that the NRC will consider these comments. These written comments will be in addition to the oral comments that the New York Department of Environmental Conservation and the New York Department of Law provided at the scoping session on September 19, 2007. We very much appreciate this accommodation.

Respectfully submitted,

JOAN LEARY MATTHEWS
Senior Attorney for Special Projects
New York State Department of
Environmental Conservation
518-402-9190
jlmatthe@gw.dec.state.ny.us

JOHN SIPOS
Assistant Attorney General
New York State Department of Law
Environmental Protection Bureau
The Capitol
Albany, NY 12224
518-402-2251
john.sipos@oag.state.ny.us

EDMS #280184

October 11, 2007

Joan Leary Matthews
Senior Attorney for Special Projects
New York State Department of Environmental Conservation
Office of General Counsel, 14th Floor
625 Broadway
Albany, NY 12233-1500

Dear Ms. Matthews:

I am responding to your letter of October 5, 2007, in which you requested an extension until October 31, 2007, to file written scoping comments for the environmental impact statement that the U.S. Nuclear Regulatory Commission (NRC) will be preparing as part of its review of the Indian Point Nuclear Generating, Unit Nos. 2 and 3, license renewal application.

The NRC staff has considered your request, but has determined that an extension of the comment period is not warranted. As you know, a Notice was published in the *Federal Register* on August 10, 2007, inviting members of the public to attend the environmental scoping meeting scheduled for September 19, 2007, and providing an opportunity for interested persons to submit written scoping comments during a two-month period following publication of the Notice (72 FR 45075). As stated in the *Federal Register*, written scoping comments should be submitted no later than October 12, 2007, to be considered in the scoping process. Numerous comments have been submitted to the NRC, during the scoping meeting and in writing, and we anticipate further written comments before the end of the comment period. Nonetheless, the NRC will consider comments received after such date, to the extent that it is practicable to do so. We encourage you to submit your written scoping comments at your earliest opportunity.

Thank you for your interest and participation in the license renewal process.

Sincerely,

/RA by Jill Caverly for/
Bo M. Pham, Senior Project Manager
Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation

cc: See next page

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
One Blackburn Drive
Gloucester, MA 01930-2298

OCT -4 2007

Docket 50-247
50-286

Chief, Rules and Directives Branch
Division of Administrative Services
Office of Administration
Mailstop T-6D59
US Nuclear Regulatory Commission
Washington, DC 20555-0001

Re: 72 FR45075-6 (August 10, 2007)

To Whom It May Concern:

These comments are submitted by the Protected Resources Division (PRD) of NOAA's National Marine Fisheries Service (NMFS) regarding the application for renewal of Facility Operating Licenses DPR-26 and DPR-64 for an additional 20 years of operation at Indian Point Nuclear Generating Unit Nos. 2 and 3. A request for comments related to the Nuclear Regulatory Commission's (NRC) intent to prepare an Environmental Impact Statement (EIS) and conduct the scoping process pursuant to the National Environmental Policy Act (NEPA) was published in the Federal Register on August 10, 2007.

A population of federally endangered shortnose sturgeon (*Acipenser brevirostrum*) occurs in the Hudson River. Additionally, Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) are also present in the Hudson River. Atlantic sturgeon are considered a Candidate Species as NMFS has initiated a status review for this species to determine if listing as threatened or endangered under the ESA is warranted. A status review report was completed by the status review team in February 2007. NMFS is currently reviewing the report and other available information to determine if listing under the ESA is warranted. A listing determination, and, if listing is warranted, any accompanying proposed rule(s), is expected to be published by NMFS in 2008. If it is determined that listing is warranted, a listing determination and final rule listing the species could be published within a year from the date of publication of the listing determination or proposed rule. The Status Review report is available at: *http://www.nero.noaa.gov/prot_res/CandidateSpeciesProgram/AtlSturgeonStatusReviewReport.pdf*.

NMFS has several concerns regarding the potential for the continued operation of the Indian Point facility to affect sturgeon. NMFS' primary concern is the likelihood of impingement of

sturgeon on screens or racks at plant intakes. Information provided in the application by Dynegy for an Endangered Species Act (ESA) Section 10(a)(1)(B) permit for their Roseton and Danskammer plants indicated that from 1972-1998, 37 shortnose sturgeon were impinged at Indian Point Unit 2 and from 1976-1998, 26 shortnose sturgeon were impinged at Indian Point Unit 3. It is NMFS understanding that no monitoring of the intakes has occurred since screening and a fish return system were installed in 1998. While the screening and fish return system were designed to minimize entrainment and reduce the levels of injury and mortality associated with impingement, no studies have been conducted to demonstrate the effectiveness of these systems for sturgeon. While NMFS has no information on likely impingement rates since 1998, we also have no information that suggests it no longer occurs. Shortnose sturgeon impinged on intake screens or racks experience high levels of injury and/or mortality.

Sturgeon yolk sac larvae (YSL) and post yolk sac larvae (PYSL) have been documented in the vicinity of Indian Point. Given that two distinct distributions of YSL and PYSL have been identified in the river (above RM 120 and RM 48 to 110), it is assumed that the larvae in the lower river grouping are Atlantic sturgeon. As such, entrainment is a significant concern for Atlantic sturgeon in this area of the river.

The best available information suggests that unauthorized take (as defined in Section 9 of the ESA) has occurred in the past at the Indian Point facility and may continue to occur. Additionally, Atlantic sturgeon eggs and/or larvae are likely to be present in this region of the river and may be subject to entrainment in the facility's intakes. Both shortnose and Atlantic sturgeon may also be affected by the discharge of heated effluent, chlorine, and other pollutants or antifouling agents.

Section 7(a)(2) of the ESA states that each Federal agency shall, in consultation with the Secretary, insure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. Any discretionary federal action that may affect a listed species must undergo section 7 consultation. The relicensing of Indian Point by the NRC is a federal action that will require section 7 consultation. If it is determined through consultation between the NRC and NMFS that the action is likely to adversely affect any listed species (i.e., if any adverse effect to listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effects are not: discountable, insignificant, or beneficial) then a formal consultation, resulting in the issuance of a Biological Opinion and accompanying Incidental Take Statement would be required.

Any NEPA documentation prepared by NRC relating to the relicensing of this facility should contain an assessment of the facility's impact on shortnose and Atlantic sturgeon. Additionally, NMFS expects the NRC to initiate section 7 consultation with NMFS on the effects of the proposed action on listed species. In order to conduct a consultation, NMFS will need a complete project description and a complete assessment of the facility's impacts on listed species. NMFS expects that this assessment will include an estimate of the number of shortnose sturgeon likely to be impinged and/or entrained at the facility's intakes over the life of the proposed 20 year license. This information should be submitted to NMFS along with a request for concurrence with NRC's determination of effects and justification for that determination.

My staff looks forward to working cooperatively with the NRC during the relicensing process. Should you have any questions regarding shortnose sturgeon or the section 7 process in general, please contact Pat Scida, Endangered Species Coordinator (978-281-9208 or Pasquale.Scida@noaa.gov). For questions specific to Atlantic sturgeon, please contact Kim Damon-Randall, Proactive Conservation Program Coordinator (978-281-9300 x6535).

Sincerely,

Mary A. Colligan
Assistant Regional Administrator
for Protected Resources

Cc: Nash, NRC
Crocker, Damon-Randall - F/NER4
Rusanowsky, Colosi - F/NER3
Lindow, F

File Code: Sec 7 NRC Indian Point Relicensing
PCTS: F/NER/2006/07100

November 27, 2007

Ms. Jean Pietrusiak
New York State Department of the Environment
NYDEC-DFWMR
NY Natural Heritage Program – Information Services
625 Broadway, 5th Floor
Albany, NY 12233-4757

SUBJECT: REQUEST FOR LIST OF STATE PROTECTED SPECIES WITHIN THE AREA UNDER EVALUATION FOR THE INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3 LICENSE RENEWAL APPLICATION REVIEW

Dear Ms. Pietrusiak:

The U.S. Nuclear Regulatory Commission (NRC) is reviewing an application submitted by Entergy Nuclear Operations, Inc. (Entergy), for the renewal of the operating licenses for Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point). Indian Point is located in Buchanan, New York, approximately 24 miles north of the New York City boundary line. As part of the review of the license renewal application (LRA), the NRC is preparing a Supplemental Environmental Impact Statement (SEIS) under the provisions of Title 10 of the *Code of Federal Regulations* Part 51 (10 CFR Part 51), the NRC's regulation that implements the National Environmental Policy Act (NEPA) of 1969. The SEIS includes an analysis of pertinent environmental issues, including endangered or threatened species and impacts to fish and wildlife. This letter is being submitted under the provisions of the Endangered Species Act of 1973, as amended, and the Fish and Wildlife Coordination Act of 1934, as amended.

The proposed action is to renew the facility operating licenses for Indian Point for an additional 20 years beyond the expiration of the current operating licenses. The proposed action would include the use and continued maintenance of existing plant facilities and transmission lines. The Indian Point site covers approximately 239 acres. Indian Point is bordered on the north, south and east by partially wooded, privately owned land and on the west by the Hudson River. Enclosures 1 and 2 provide a general overview of the site location and site layout.

Indian Point is equipped with a once-through open-cycle cooling system that withdraws cooling water from, and discharges water back into, the Hudson River. The intake system includes seven bays for each unit located at the shore. Six 96-inch pipes discharge water beneath the river's surface within a 40-foot wide discharge canal.

The transmission lines in the scope of NRC's environmental review for license renewal are those that were originally constructed for the specific purpose of connecting the plant to the transmission system. The transmission line corridor to the Buchanan Substation (approximately 2100 feet southeast from the reactors, just across Broadway from the facility's main entrance) is located in the industrial portion of the site, except for where the lines cross Broadway. This transmission line corridor is being evaluated as part of the SEIS process.

The enclosed transmission line map shows the transmission system that is being evaluated in the SEIS. Two 345-kilovolt (kV) lines connect Indian Point to the Buchanan Substation. This

corridor also includes 138-kV transmission lines that supply offsite power from the substation into Indian Point.

To support the SEIS preparation process, the NRC requests information on state-listed, proposed, and candidate species and critical habitat that may be in the vicinity of Indian Point. In addition, please provide any information you consider appropriate under the provisions of the Fish and Wildlife Coordination Act.

If you have any questions concerning the NRC staff's review of this license renewal application, please contact Ms. Jill Caverly, Environmental Project Manager, at 301-415-6699 or by e-mail at jsc1@nrc.gov.

Sincerely,

/RA Bo Pham for/

Rani Franovich, Branch Chief
Projects Branch 2
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-247 and 50-286

Enclosures:
1. Site location map
2. Site layout map

cc w/encls: See next page

New York State Department of Environmental Conservation
Division of Fish, Wildlife & Marine Resources
New York Natural Heritage Program
625 Broadway, Albany, New York 12233-4757
Phone: (518) 402-8935 · **FAX:** (518) 402-8925
Website: www.dec.state.ny.us

Alexander B. Grannis
Commissioner

December 28, 2007

Rani Franovich
U. S. Nuclear Regulatory Commission
Projects Branch 2, Division License Renewal
Washington, DC 20555-0001

Dear Ms. Franovich:

In response to your recent request, we have reviewed the New York Natural Heritage Program databases with respect to an Environmental Assessment for the proposed License Renewal Application - Indian Point Nuclear Generating Units 2 and 3, area as indicated on the map you provided, located in Town of Buchanan.

Enclosed is a report of rare or state-listed animals and plants, significant natural communities, and other significant habitats, which our databases indicate occur, or may occur, on your site or in the immediate vicinity of your site. The information contained in this report is considered sensitive and should not be released to the public without permission from the New York Natural Heritage Program.

This project location is adjacent to a designated Significant Coastal Fish and Wildlife Habitat. This habitat is part of New York State's Coastal Management Program (CMP), which is administered by the NYS Department of State (DOS). Projects which may impact the habitat are reviewed by DOS for consistency with the CMP. For more information regarding this designated habitat and applicable consistency review requirements, please contact:

Jeff Zappieri or Vance Barr - (518) 474-6000
NYS Department of State
Division of Coastal Resources and Waterfront Revitalization
41 State Street, Albany, NY 12231

The presence of rare species may result in your project requiring additional permits, permit conditions, or review. For further guidance, and for information regarding other permits that may be required under state law for regulated areas or activities (e.g., regulated wetlands), please contact the appropriate NYS DEC Regional Office, Division of Environmental Permits, at the enclosed address.

For most sites, comprehensive field surveys have not been conducted; the enclosed report only includes records from our databases. We cannot provide a definitive statement on the presence or absence of all rare or state-listed species or significant natural communities. This information should NOT be substituted for on-site surveys that may be required for environmental impact assessment.

Our databases are continually growing as records are added and updated. If this proposed project is still under development one year from now, we recommend that you contact us again so that we may update this response with the most current information.

Sincerely,

Tara Seoane

Tara Seoane
Information Services
NY Natural Heritage Program

cc: Reg. 3, Fisheries Mgr.
Peter Nye, Endangered Species Unit, Albany
Shaun Keeler, Bureau of Fisheries, Albany
Chris Hogan, Environmental Permits, 4th floor, Albany

Enclosure (report containing a list of rare or State-listed plants and animals) withheld by NRC as sensitive information per New York Natural Heritage Program request.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
One Blackburn Drive
Gloucester, MA 01930-2298

FEB 28 2008

Ms. Rani Franovich
Branch Chief, Environmental Branch B
Division of License Renewal
Office of Nuclear Reactor Regulation
United States Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Re: Essential Fish Habitat Information Request for Docket Nos. 50-247 and 50-286; Indian Point Nuclear Generating Unit Nos. 2 and 3 License Renewal; at the Village of Buchanan, Town of Cortlandt, Westchester County, NY

Dear Ms. Franovich:

Reference is made to your information request regarding essential fish habitat (EFH) designated in the vicinity of the Indian Point Nuclear Generating Station (Indian Point). Your letter indicates that the Nuclear Regulatory Commission is in the process of preparing a supplemental environmental impact statement (SEIS) under the provisions of Title 10 of the Code of Federal Regulations Part 51 (10 CFR Part 51), the NRC's regulation that implements the National Environmental Policy Act (NEPA) of 1969. The SEIS is being prepared in conjunction with a request by Entergy Nuclear Operations, Inc. for the renewal of the operating licenses for the two operating units at Indian Point. This proposed renewal would extend the current operating licenses 20 years beyond their current expiration dates, and would cover the use and continued maintenance of Units Two and Three and appurtenant transmission lines that connect Indian Point to the nearby Buchanan Substation.

The facilities lie on the eastern shore of the Hudson River in Westchester County, approximately 24 miles north of the New York City limits. The industrial portions of the site occupy approximately 239 acres bounded to the north, east, and south by private property and by the Hudson River on the west. Entergy Nuclear Northeast owns all three units at the site. At this time, only Units Two and Three are operational, and Unit One is intact but has been decommissioned. The operating units feature Westinghouse pressurized water reactors that are cooled by water drawn from the Hudson River via a once-through, open-cycle cooling system. The intake system includes seven bays for each unit. Thermally-enriched water subsequently is returned back into the river through six, 96" pipes that empty into the plant's 40' wide discharge canal.

The Buchanan reach of the Hudson River is tidally-dominated and tends to exhibit mesohaline or oligohaline salinity ranges that vary seasonally. Salinity influences the distribution and function of aquatic communities, which comprise a wide variety of diadromous and resident fishes, a diverse forage species including a wide array of insects, crustaceans, and other invertebrates. While not intended to be an exhaustive list, it should be noted that the fish community includes American eel (*Anguilla rostrata*), striped bass (*Morone saxatilis*), white perch (*Morone americana*), blue crab (*Callinectes sapidus*), bay anchovy (*Anchoa mitchilli*), Atlantic silversides (*Menidia menidia*), bogchoker (*Trinectes maculates*), American shad (*Alosa sapidissima*), tomcod (*Microgadus tomcod*), blueback herring (*Alosa aestivalis*), and alewife (*Alosa*

pseudoharengus) which use the general project reach for a variety of habitat functions, notably spawning and nursery habitat, resting and seasonal concentration areas.

Atlantic sturgeon (*Acipenser oxyrinchus*), a candidate species for listing under the Endangered Species Act (ESA) as announced in the Federal Register on October 16, 2006 (71 FRN 61002), also occur in the Hudson River. The term "candidate species" refers to (a) species that are the subject of a petition to list as threatened or endangered; (b) species for which NMFS has determined that listing pursuant to section 4 (b)(3)(A) of the ESA may be warranted; and (c) those species are not the subject of a petition but for which NMFS has announced the initiation of a status review in the Federal Register. The notice of availability of the status review for the Atlantic sturgeon was published in the Federal Register on April 3, 2007 (72 FRN 15865). A copy of the report can be downloaded from the following website: www.nero.noaa.gov/prot_res/candidatespeciesprogram/esr.htm.

The Atlantic Sturgeon Status Review Team (SRT) has determined that the Hudson River and Delaware River Atlantic sturgeon stock constitute a distinct population segment (DPS) called the New York Bight DPS. The SRT has also concluded that the New York Bight DPS was likely (>50 % chance) to become endangered within the next 20 years. NMFS is currently considering the information in the status report to determine if action under the ESA is warranted. The SRT also identifies several different stressors that may impact the Atlantic sturgeon populations including dams for flood control and hydropower generation, water quality degradation, dredging, and blasting.

Federally endangered shortnose sturgeon (*Acipenser brevirostrum*) may be found in the Hudson River in the vicinity of Indian Point. Any federal action, such as the approval, funding, or implementation of a project by a federal agency that may affect a listed species must undergo consultation pursuant to Section 7 of the Endangered Species Act (ESA) of 1973, as amended. Once specific projects are identified and project plans are developed, the NRC should submit its determination of effects, along with justification for the determination and a request for concurrence, to the attention of the Endangered Species Coordinator, NMFS, Northeast Regional Office, Protected Resources Division, One Blackburn Drive, Gloucester, MA 01930.

In addition, EFH has been designated in the Hudson River mixing zone for a variety of federally managed fishery resources. These include certain life stages of the red hake (*Urophycis chuss*), winter flounder (*Pseudopleuronectes americanus*), windowpane (*Scoptholmus aquosus*), bluefish (*Pomatomus saltatrix*), Atlantic butter fish (*Peprilus triacanthus*), summer flounder (*Paralichthys dentatus*), Atlantic sea herring (*Clupea harengus*), and the black sea bass (*Centropristus striata*). Information regarding these designations may be found at our regional website (http://www.nero.noaa.gov/hcd/index.html#efh). This information is intended as a generic guide that lists the EFH species within an area and is not intended for use on its own. The actual EFH descriptions, the species habitat preferences, and life history parameters are provided in Guide to EFH Descriptions. The Councils' Fishery Management Plans (FMPs) also should be referred to for more extensive information regarding EFH

Section 305(b)(2) of the MSA requires all federal agencies to consult with NMFS on any action authorized, funded, or undertaken by that agency that may adversely affect EFH. Included in this consultation process is the preparation of an EFH assessment to provide necessary information on which to consult. Our EFH regulation at 50 CFR 600.905 mandates the preparation of EFH assessments and generally outlines each agency's obligations in this consultation procedure. The level of detail in the EFH assessment should be commensurate with the potential impacts of the

proposed project. It should also evaluate all of the direct, indirect, individual, and cumulative impacts on EFH.

The required contents of an EFH assessment include: 1) a description of the action; 2) an analysis of the potential adverse effects of the action on EFH and the managed species; 3) the NRC's conclusions regarding the effects of the action on EFH; 4) proposed mitigation, if applicable. Other information that should be contained in the EFH assessment, if appropriate, includes: 1) the results of on-site inspections to evaluate the habitat and site-specific effects; 2) the views of recognized experts on the habitat or the species that may be affected; 3) a review of pertinent literature and related information; and 5) an analysis of alternatives to the action that could avoid or minimize the adverse effects on EFH.

In order to allow us to evaluate fully the project's impacts on EFH and federally managed species, additional information on the impacts of continued plant operation, especially with regard to the once-through cooling water intake from the river and water release back to the river. This information will allow us to develop EFH conservation recommendations to further minimize impacts on EFH and federally managed species. Depending upon the expected impacts and the construction schedule, additional best management practices or seasonal work restrictions may be appropriate EFH conservation recommendations

Thank you for your inquiry regarding habitat uses by resources of concern in the Indian Point area. We appreciate the opportunity to provide you with this preliminary coordination information. Should you wish to discuss these comments further, please contact Diane Rusanowsky at (203) 882-6504.

Sincerely,

Peter D. Colosi, Jr.
Assistant Regional Administrator
for Habitat Conservation

dr: 08_indian_point_spl.doc

cc: F/NER4 – Milford
F/NER3 – Protected Resources
USACE – NAN
USFWS – Cortland

Biological Assessment

Indian Point Nuclear Generating Plant Unit Nos. 2 and 3
License Renewal

December 2008
Docket Nos. 50-247 and 50-286

U.S. Nuclear Regulatory Commission
Rockville, Maryland

Appendix E

Biological Assessment of the Potential Effects on Federally Listed Endangered or Threatened Species from the Proposed Renewal of Indian Point Nuclear Generating Plant, Unit Nos. 2 and 3

1.1 Introduction and Purpose

The U.S. Nuclear Regulatory Commission (NRC) prepared this biological assessment (BA) to support the draft supplemental environmental impact statement (SEIS) for the renewal of the operating licenses for Indian Point Nuclear Generating Unit Nos. 2 and 3 (IP2 and IP3), located on the shore of the Hudson River in the Village of Buchanan, in upper Westchester County, NY. The current 40-year licenses expire in 2013 (IP2) and 2015 (IP3). The proposed license renewal for which this BA has been prepared would extend the operating licenses to 2033 and 2035 for IP2 and IP3, respectively.

The NRC is required to prepare the draft SEIS as part of its review of a license renewal application. The draft SEIS supplements NUREG-1437, Volumes 1 and 2, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants (GEIS)," (NRC 1996, 1999)[c] for the license renewal of commercial nuclear power plants. The draft SEIS covers specific issues, such as the potential impact on endangered and threatened species, that are of concern at IP2 and IP3 and that could not be addressed on a generic basis in the GEIS.

Pursuant to Section 7 of the Endangered Species Act of 1973 (ESA), as amended, the NRC staff requested, in a letter dated August 16, 2007 (NRC 2007), that the National Marine Fisheries Service (NMFS) provide information on federally listed endangered or threatened species, as well as on proposed or candidate species, and on any designated critical habitats that may occur in the vicinity of IP2 and IP3. In its response, dated October 4, 2007 (NMFS 2007), NMFS expressed concern that the continued operation of IP2 and IP3 could have an impact on the shortnose sturgeon (*Acipenser brevirostrum*), an endangered species that occurs in the Hudson River. NMFS also noted that a related species that also occurs in the Hudson River, the Atlantic sturgeon (*Acipenser oxyrinchus*), is a candidate species for which NMFS has initiated a status review to determine if it should be listed as threatened or endangered.

Under Section 7, the NRC is responsible for providing information on the potential impact that the continued operation of IP2 and IP3 could have on the federally listed species, the shortnose sturgeon. In addition, the NRC has prepared information regarding the potential impact on important species, including the Atlantic sturgeon; this information can be found in Chapters 2 and 4 of the draft SEIS.

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a 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.

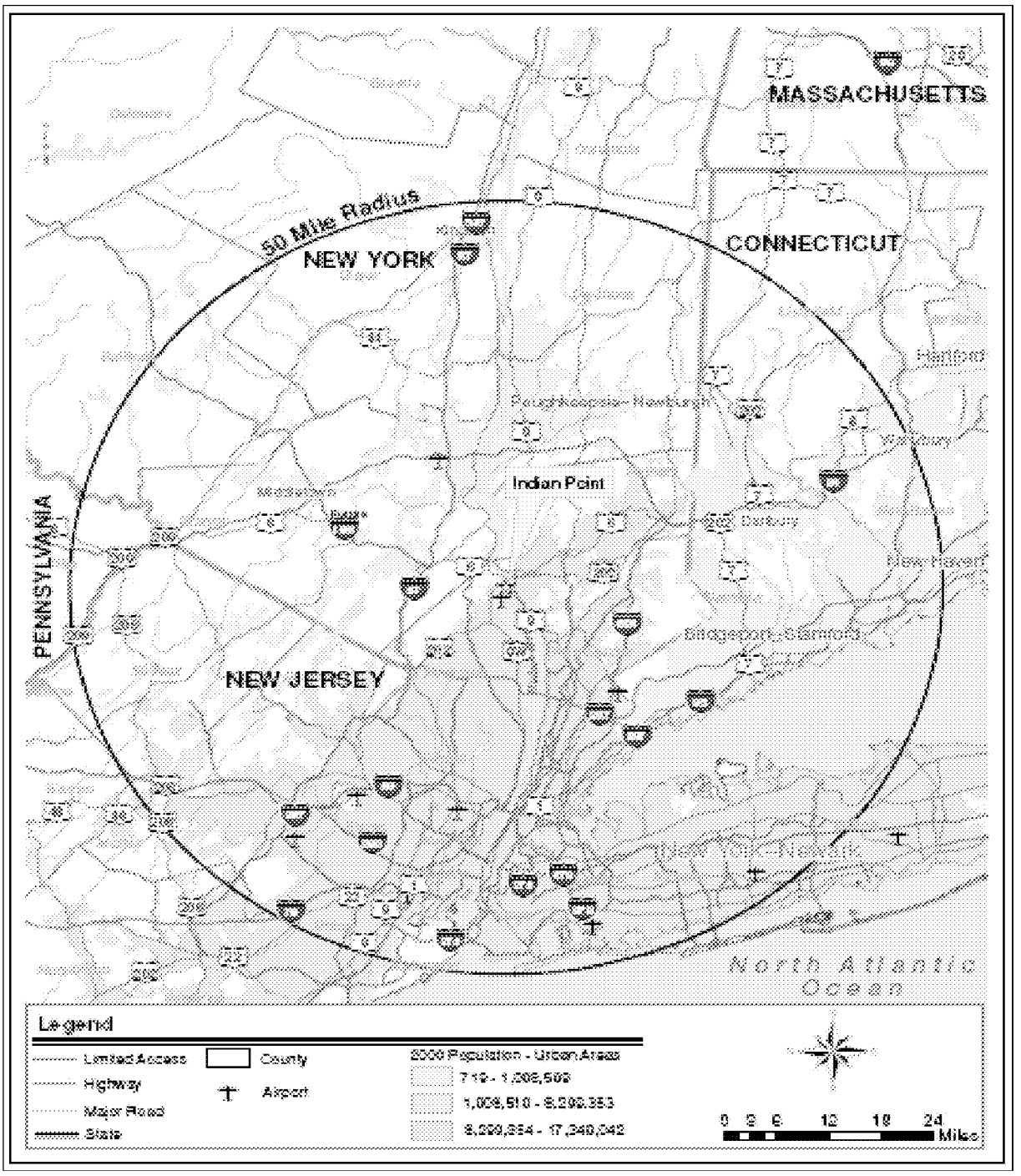
2.0 Proposed Action

The current proposed action considered in the SEIS is the renewal of the operating licenses for IP2 and IP3 for an additional 20-year term beyond the period of the existing licenses. The applicant has indicated that it may replace reactor vessel heads and control rod drive mechanisms during the period of extended operation. (For a description of these activities and potential environmental effects, see Chapter 3 of the draft SEIS.) If the NRC grants the operating license renewals, the applicant can operate and maintain the nuclear units, the cooling systems, and the transmission lines and corridors as they are now until 2033 and 2035.

3.0 Site Description

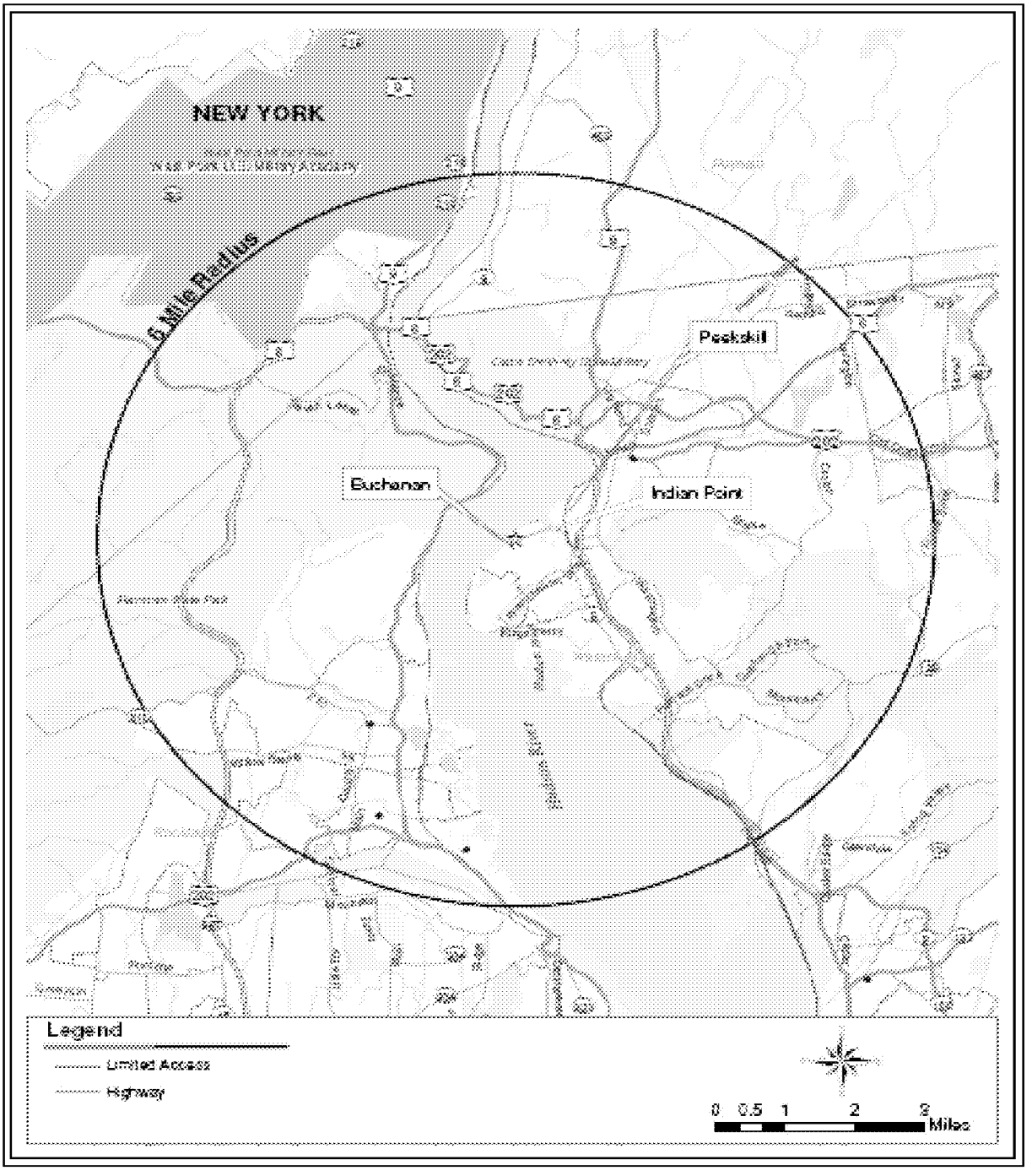
IP2 and IP3 are located on a 239-acre (97-hectare) site on the eastern bank of the Hudson River in the Village of Buchanan, Westchester County, NY, about 24 miles (mi) (39 kilometers [km]) north of New York City, NY (Figures 1 and 2). Privately owned land bounds the north, south, and east sides of the property (Figure 3). The area is generally described as an eastern deciduous forest, dominated by oak (*Quercus*), maple (*Acer*), and beech (*Fagus*) species. The lower Hudson River is a tidal estuary, flowing 152 miles (244 km) from the Federal Dam at Troy, NY, to the Battery in New York City. IP2 and IP3 are located at River Mile (RM) 43 (RKM 69), where the average depth is 40 feet (ft) (12 meters [m]), and the average width of the river is 4500 ft (1370 m). The Hudson River is tidal all the way to the Federal Dam, and the salinity zone in the vicinity of the facility is described as oligohaline (low salinity, ranging from 0.5 to 5 parts per thousand (ppt)), with the salinity changing with the level of freshwater flow. Water temperature ranges from a winter minimum of 34 degrees F (1 degree Celsius (C)) to a summer maximum of 77 degrees F (25 degrees C) (Entergy 2007a).

The mid-Hudson River provides the cooling water for four other power plants: Roseton Generating Station, Danskammer Point Generating Station, Bowline Point Generating Station, and Lovett Generating Station; all four stations are fossil-fueled steam electric stations, located on the western shore of the river, and all use once-through cooling. Roseton consists of two units and is located at RM 66 (RKM 106), 23 mi (37 km) north of IP2 and IP3. Just 0.5 mi (0.9 km) north of Roseton is Danskammer, with four units. Bowline lies about 5 mi (8 km) south of IP2 and IP3 and consists of two units (Entergy 2007a; CHGEC 1999). Lovett, almost directly across the river from IP2 and IP3, is no longer operating.



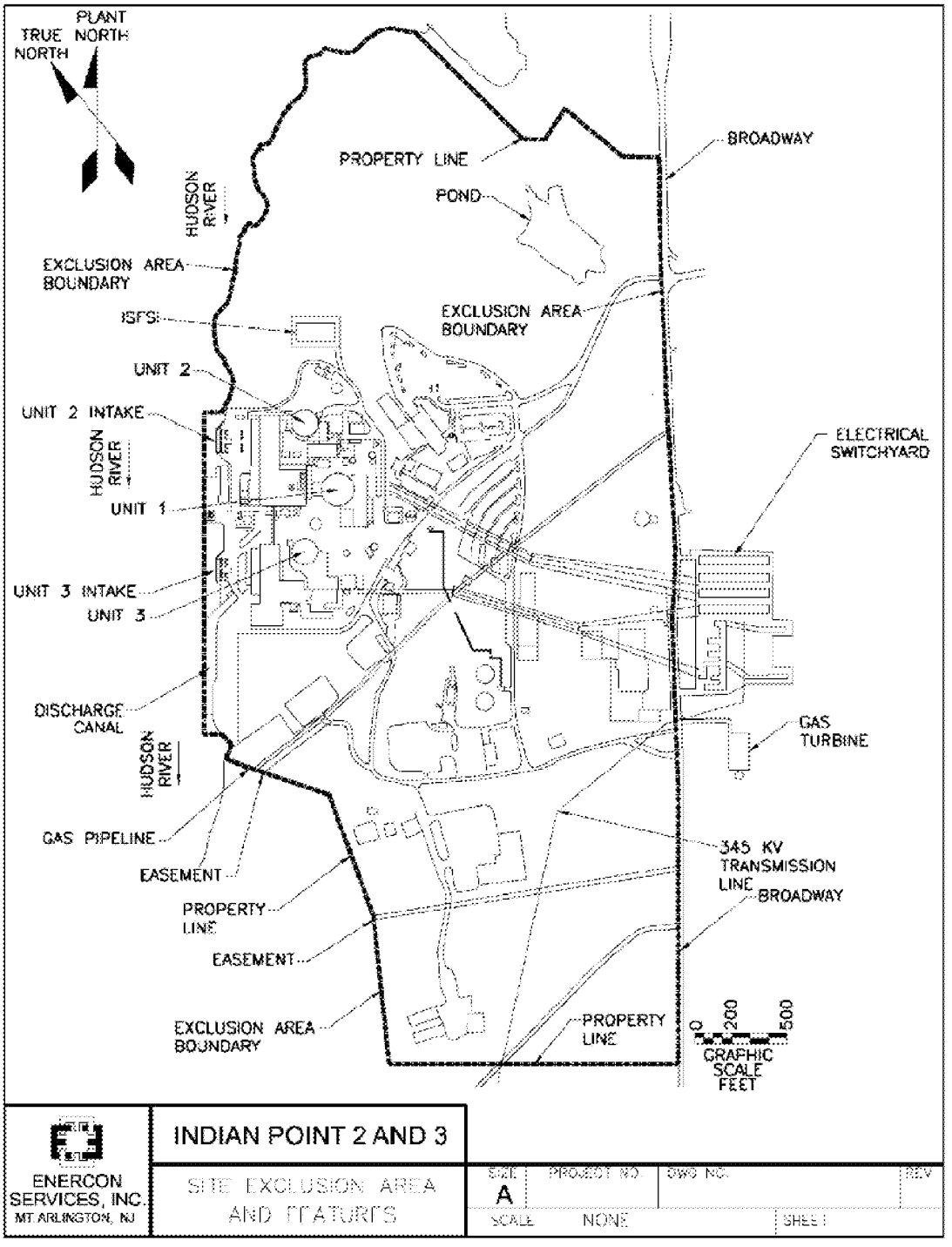
1 Source: Entergy 2007a

2 **Figure 1. Location of IP2 and IP3, 50-mile (80-km) radius**



Source: Entergy 2007a

Figure 2. Location of IP2 and IP3, 6-mile (10-km) radius

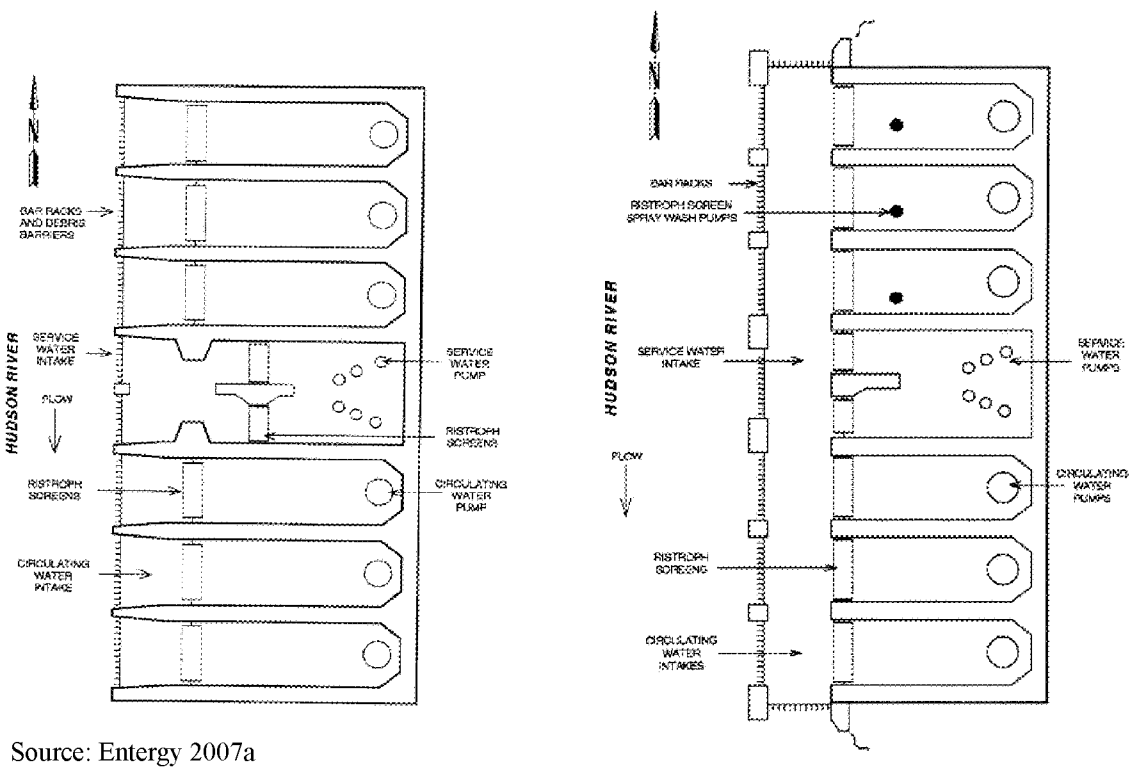


1 Source: Entergy 2007a

2 **Figure 3. IP2 and IP3 property boundaries and environs**

3.1.1 Description of Plants and Cooling Systems

IP2 and IP3 are pressurized-water reactors with turbine generators that produce a net output of 6432 megawatts-thermal and approximately 2158 megawatts-electrical. Both IP2 and IP3 use water from the Hudson River for their once-through condensers and auxiliary cooling systems. Each unit has seven intake bays (Figure 4), into which the river water flows, passing under the floating debris skimmer wall and through Ristroph traveling screens (Figure 5). IP2 has six dual-speed circulating water pumps that can each pump 140,000 gallons per minute (gpm) (8.83 cubic meters per second [m^3/s]) at full speed and 84,000 gpm (5.30 m^3/s) at reduced speed; at full speed, the approach velocity is approximately 1 foot per second (fps) (0.30 meters per second [m/s]) and at reduced speed, the approach velocity is 0.6 fps (0.2 m/s). IP3 also has six dual-speed circulating water pumps. The full speed flow rate of each of these pumps is 140,000 gpm (8.83 m^3/s), with a 1 fps (0.30 m/s) approach velocity; the reduced speed is 64,000 gpm (4.04 m^3/s), with a 0.6 fps (0.2 m/s) approach velocity (Entergy 2007a).

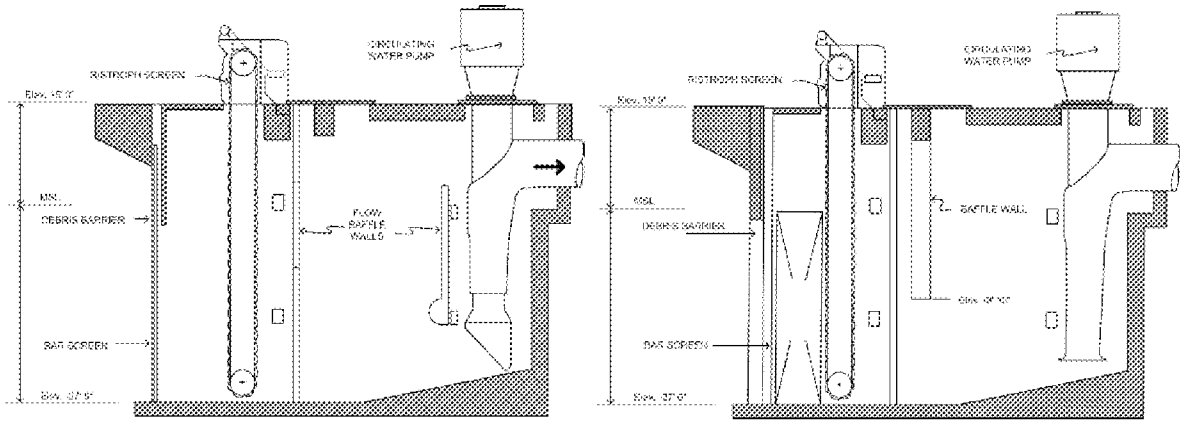


Source: Entergy 2007a

Figure 4. IP2 intake structure (left) and IP3 intake structure (right)

The traveling screens employed by IP2 and IP3 are modified vertical Ristroph-type traveling screens installed in 1990 and 1991 at IP3 and IP2, respectively. The screens were designed in concert with the Hudson River Fishermen's Association, with screen basket lip troughs to retain water and minimize vortex stress (CHGEC 1999). Studies indicated that, assuming the screens continued to operate as they had during laboratory and field testing, the screens were "the screening device most likely to impose the least mortalities in the rescue of entrapped fish by

mechanical means" (Fletcher 1990). The same study concluded that refinements to the screens would be unlikely to greatly reduce fish kills.



Source: Entergy 2007a

Figure 5. IP2 intake system (left) and IP3 intake system (right)

There are two spray-wash systems—the high-pressure spray wash removes debris from the front of the traveling screen mechanism; the low-pressure spray washes fish from the rear of the mechanism into a fish sluice system to return them to the river. A 0.25 x 0.5-inch (in.) (0.635 x 1.27-centimeter [cm]) clear opening slot mesh on the screen basket panels was included to minimize abrasion as the fish were washed into the collection sluice. The sluice system is a 12-in.-diameter (30.5-cm–diameter) pipe that discharges fish into the river at a depth of 35 ft (10.7 m), 200 ft (61 m) from shore (CHGEC 1999).

4.0 Status Review of Shortnose Sturgeon

4.1 Life History

The shortnose sturgeon (*Acipenser brevirostrum*, family Acipenseridae) is amphidromous, with a range extending from the St. Johns River, FL, to the St. John River, Canada. Unlike anadromous species, shortnose sturgeons spend the majority of their lives in freshwater and move into salt water periodically without relation to spawning (Collette and Klein-MacPhee, 2002). From colonial times, shortnose sturgeons have rarely been the target of commercial fisheries but have frequently been taken as incidental bycatch in Atlantic sturgeon and shad gillnet fisheries (NEFSC 2006; Dadswell et al. 1984). The shortnose sturgeon was listed on March 11, 1967, as endangered under the ESA. In 1998, NMFS completed a recovery plan for the shortnose sturgeon (NMFS 1998).

Shortnose sturgeons can grow up to 143 cm (56 in.) in total length and can weigh up to 23 kilograms (kg) (51 pounds [lb]). Females are known to live up to 67 years, while males typically do not live beyond 30 years. As young adults, the sex ratio is 1:1; however, among fish larger than 90 cm (35 in.), measured from nose to the fork of the tail, the ratio of females to males increases to 4:1. Throughout the range of the shortnose sturgeon, males and females mature at 45 to 55 cm (18 to 22 in.) fork length, but the age at which this length is achieved varies by geography. At the southern extent of the sturgeon's range, in Florida, males reach maturity at age 2, and females reach maturity at 6 years or younger; in Canada, males can reach maturity as late as 11 years, and females, 13 years. In 1 to 2 years after reaching maturity, males begin to spawn at 2-year intervals, while females may not spawn for the first time until 5 years after maturing and, thereafter, spawn at 3- to 5-year intervals (Dadswell et al. 1984).

Shortnose sturgeons migrate into freshwater to spawn during late winter or early summer. Eggs sink and adhere to the hard surfaces on the river bottom, hatching after 4 to 6 days. Larvae consume their yolk sac and begin feeding in 8 to 12 days, as they migrate downstream away from the spawning site, remaining close to the river bottom (Kynard 1997; Collette and Klein-MacPhee 2002). The juveniles, which feed on benthic insects and crustaceans, do not migrate to the estuaries until the following winter, where they remain for 3 to 5 years. As adults, they migrate to the near-shore marine environment, where their diet consists of mollusks and large crustaceans (Dadswell 1984).

4.2 Status of Shortnose Sturgeon in Hudson River

Shortnose sturgeons inhabit the lower Hudson; the Federal Dam creates a physical barrier preventing the species from swimming farther north. They are found dispersed throughout the river-estuary from late spring to early fall and then congregate to winter near Sturgeon Point (RM 86). Spawning occurs in the spring, just downstream of the Federal Dam at Troy, between RM 118 and 148 (between Coxsackie and Troy) (Bain et al. 2007; NMFS 2000). According to the NMFS environmental assessment (2000) for a permit for the incidental take of shortnose sturgeons at the nearby power plants, Roseton and Danskammer, larvae are typically found upstream of the intakes of all five power plants along the mid-Hudson.

The Hudson River population of the shortnose sturgeon was estimated to be approximately 13,000 adults in 1979–1980. Based on population studies done in the mid-1990s, the population has apparently increased 400 percent since then, up to almost 57,000 adult fish. Additional data suggest that the total population of the shortnose sturgeon in the Hudson River is approximately 61,000, including juveniles and nonspawning adults (Bain et al. 2007). The population growth has been ascribed to several strong year-classes, as well as 2 decades of sustained annual recruitment (Woodland and Secor 2007). Bain et al. (2007) maintains that the annual trawl surveys conducted by the electric utilities (CHGEC 1999) show an increase in abundance between the mid-1980s and mid-1990s, supporting the finding that the Hudson River population has increased. Staff assessed the population trend for yearling and older shortnose sturgeons in the fall juvenile survey data provided by the applicant and found an overall increase in the catch-per-unit-effort from 1975 to 2005.

4.3 Impact Assessment of Indian Point on the Shortnose Sturgeon Population

4.3.1 Entrainment

The southern extent of the shortnose sturgeon spawning area in the Hudson River is approximately RM 118 (RKM 190), about 75 RM (121 RKM) upstream of the intake of IP2 and IP3 (NMFS 2000). The eggs of shortnose sturgeons are demersal, sinking and adhering to the bottom of the river, and, upon hatching, the larvae in both yolk-sac and post-yolk-sac stages remain on the bottom of the river, primarily upstream of RM 110 (RKM 177) (NMFS 2000). Shortnose sturgeon larvae grow rapidly, and, after a few weeks, they are too large to be entrained by the cooling intake (Dadswell 1979). Because the egg and larval life stages of the shortnose sturgeon (the life stages susceptible to entrainment) are not found near the intake for IP2 and IP3, the probability of their entrainment at IP2 and IP3 is low.

IP2 and IP3 monitored entrainment from 1972 through 1987. Entrainment monitoring became more intensive at Indian Point from 1981 through 1987, and sampling was conducted for nearly 24 hours per day, 4 to 7 days per week, during the spawning season in the spring (NMFS 2000). Entrainment monitoring reports list no shortnose sturgeon eggs or larvae at IP2 and IP3. NMFS (2000) lists only eight sturgeon larvae collected at any of the mid-Hudson power plants (all eight were collected at Danskammer, and four of the eight may have been Atlantic sturgeons). Entrainment sampling data supplied by the applicant (Entergy 2007b) include large numbers of larvae for which the species could not be determined, and, therefore, one cannot conclude that there was no entrainment of shortnose sturgeons at IP2 and IP3. Entergy Nuclear Operations, Inc. (Entergy) currently conducts no monitoring program to record entrainment at IP2 and IP3, and any entrainable life stages of the shortnose sturgeon taken in recent years would go unrecorded.

Based on the life history of the shortnose sturgeon, the location of spawning grounds within the Hudson River, and the patterns of movement for eggs and larvae, the number of shortnose sturgeons in early life stages entrained at IP2 and IP3 is probably low or zero. The available data from past entrainment monitoring do not indicate that entrainment was occurring. Therefore, the staff concludes that the continued operation of Indian Point for an additional 20 years is not likely to adversely affect the population of shortnose sturgeons in the Hudson River through entrainment.

4.3.2 Impingement

IP2 and IP3 monitored impingement daily until 1981, reduced collections to a randomly selected schedule of 110 days per year until 1991, and then ceased monitoring in 1991 with the installation of the modified Ristroph traveling screens. As described in Section 2.1, these screens were designed in a collaborative effort with the Hudson River Fishermen's Association to minimize the mortality of impinged fish.

In 2000, NMFS prepared an environmental assessment (EA) for the incidental take of shortnose sturgeons at Roseton and Danskammer (NMFS 2000). The EA included the estimated total number (Table 1) of shortnose sturgeons impinged at Roseton, Danskammer, Bowline Point,

Lovett, and IP2 and IP3, with adjustments to include the periods when sampling was not conducted.

Table 1. Estimated Total and Average Shortnose Sturgeon Impinged by Mid-Hudson River Power Plants, Adjusted for Periods Without Sampling

	1972–1998		1989–1998	
Power Plant	**Total**	**Average No. Impinged/Year**	**Total**	**Average No. Impinged/Year**
Bowline Point	23	0.9	0	0
Lovett	0	0	0	0
IP2	37	1.4	8	0.8
IP3	26	1.0	8	0.8
Roseton	49	1.8	15	1.5
Danskammer Point	140	5.2	44	4.4
Total	275	10.2	75	7.5

Source: Adapted from NMFS 2000.

Impingement data provided by Entergy (2007b), which are available through the NRC's online Agencywide Documents Access and Management System (ADAMS), include the raw number of shortnose sturgeons collected at IP2 and IP3 during impingement monitoring (Table 2). Some blank entries in historical results do not differentiate between "no samples analyzed" and "samples analyzed but no individuals found." Since it is unknown if there were any impinged shortnose sturgeons for those time periods, counts must be considered minimal. The NRC staff notes, however, that data submitted by Entergy indicate that a larger number of shortnose sturgeons were impinged at IP2 and IP3 in the 7 years with reported data (1974–1979, 1984, and 1987 for IP2; 1977–1980, 1984, 1987, and 1988 for IP3) than NMFS data indicate were impinged by all mid-Hudson power plants from 1972 through 1998. The NRC staff finds that the numbers provided by NMFS (2000) in its EA for IP2 and IP3 cannot be accurate. In this case, the applicant-supplied data indicate a greater effect than the NMFS-supplied data.

An increase in the population of shortnose sturgeons in the Hudson River would most likely result in an increase in impinged shortnose sturgeons at IP2 and IP3. If the population data presented by Bain et al. (2007) and Woodland and Secor (2007) are accurate, then a four-fold increase in population between the mid-1980s and mid-1990s could result in a similar increase in impingement rates. However, this population increase would also mean that the impact of taking an individual shortnose sturgeon would decrease. Without current impingement data, the NRC staff cannot determine how changes in the shortnose sturgeon population have affected impingement rates.

When considering the effects of impingement, it is important to consider the affected species' impingement mortality rate. For IP2 and IP3, however, there are few data regarding the survival of the shortnose sturgeon after impingement. In 1979, NMFS issued a biological opinion (BO) relating to the take of shortnose sturgeons at Indian Point (Dadswell 1979). At the time, there was only 1 year in which records describing the status of impinged shortnose sturgeons were kept. In that year, 60 percent of collected impinged shortnose sturgeons were dead when

collected. The BO assumes both that all dead sturgeons died as a result of the impingement and that no impingement-related mortality occurred after the impinged sturgeons were released.

Table 2. Numbers of Shortnose Sturgeons Collected During Impingement Monitoring at Indian Point Units 2 and 3

Year	Unit 2	Unit 3
1975	3	-
1976	2	-
1977	11	2
1978	5	5
1979	4	3
1980	-	2
1981	-	-
1982	-	-
1983	-	-
1984	176	154
1985	-	-
1986	-	-
1987	116	55
1988	-	186
1989	-	-
1990	-	-
Total	317	407

Source: Enclosure 3 to NL-07-156

The BO estimated that, in a worst-case scenario, 35 shortnose sturgeons would be impinged at IP2 and IP3 per year, and that 60 percent (21 individuals) would die on the impingement screens. At the time, the population of adult shortnose sturgeons in the Hudson River was estimated to be 6,000, and this level of mortality would result in a 0.3 to 0.4 percent death rate caused by impingement at IP2 and IP3 (Dadswell 1979).

Because all monitoring of impingement ceased after the Ristroph screens were installed in 1991, no updated mortality rate estimates for impinged shortnose sturgeons exist at IP2 and IP3. The NRC staff does not know the current level of impingement or the level of mortality. Although the laboratory and field tests (Fletcher 1990) performed on the modified Ristroph screens were not conducted using the shortnose sturgeon, the tests did show that injury and death were reduced for most species when compared to the first version of screens that were proposed (and rejected, based on their "unexceptional performance") (Fletcher 1990). If the NRC staff assumes that the modified Ristroph screens performed as well as the Fletcher's 1990 results indicated, then mortality and injury from impingement would be lower than reported by the NMFS in its BO (Dadswell 1979), and the impact to the species would be less. Without current monitoring, however, the NRC staff cannot confirm this.

Based on the limited amount of data from the years before the installation of modified Ristroph screens at IP2 and IP3, and the lack of data from the years following screen installation, including any potential changes in rates of mortality caused by impingement, the NRC staff

concludes that the continued operation of IP2 and IP3 for an additional 20 years could adversely affect the population of shortnose sturgeons in the Hudson River through impingement but cannot assess the extent to which the installation of modified Ristroph screens might reduce the impact.

4.3.3 Thermal Impacts

The discharge of heated water into the Hudson River can cause lethal or sublethal effects on resident fish, influence food web characteristics and structure, and create barriers to migratory fish moving from marine to freshwater environments.

State Pollution Discharge Elimination System (SPDES) permit NY-0004472 regulates thermal discharges associated with the operation of IP2 and IP3. This permit imposes effluent limitations, monitoring requirements, and other conditions to ensure that all discharges are in compliance with Article 17 of the Environmental Conservation Law of New York State, Part 704 of the Official Compilation of the Rules and Regulations of the State of New York, and the Clean Water Act. Specific conditions of the SPDES permit related to thermal discharges from IP2 and IP3 are specified in NYSDEC (2003) and include the following:

- The maximum discharge temperature is not to exceed 110 degrees F (43 degrees C).
- The daily average discharge temperature between April 15 and June 30 is not to exceed 93.2 degrees F (34 degrees C) for an average of more than 10 days per year during the term of the permit, beginning in 1981, provided that it not exceed 93.2 degrees F (34 degrees C) on more than 15 days during that period in any year.

The final environmental impact statement (FEIS) associated with the SPDES permit for IP2 and IP3 (NYSDEC 2003) concludes that "Thermal modeling indicates that the thermal discharge from Indian Point causes water temperatures to rise more than allowed." The thermal modeling referred to in the FEIS appears to represent a worst-case scenario. Available modeling indicates the potential for the discharges from IP2 and IP3 to violate the conditions of the IP2 and IP3 SPDES permit, which could result in a negative impact on the shortnose sturgeon. IP2 and IP3 have not performed any triaxial thermal studies to completely assess the size and nature of the thermal plume created by the discharge from IP2 and IP3 and the possible impact on the sturgeon.

According to the NMFS Final Recovery Plan for the Shortnose Sturgeon (NMFS 1998), "During summer months, especially in southern rivers, shortnose sturgeons must cope with the physiological stress of water temperatures that often exceed 82 degrees F (28 degrees C)." Although the area closest to the discharge from IP2 and IP3 can exceed these temperatures, the summer maximum temperature of the Hudson River in the area of IP2 and IP3 is 77 degrees F (25 degrees C) (Entergy 2007a). The combined discharge from both Indian Point units is about 1.75 million gpm (110 m^3/s), including the service water (Entergy 2007a). Table 3 presents the net downstream flows caused by freshwater inflow. From these data, it can be seen that 20 percent of the time, the discharge from IP2 and IP3 would be, at most, 15 percent of the net flow; however, 98 percent of the time, the discharge would be, at most, 97 percent of the net flow. This means that, at given times, the discharge from IP2 and IP3 would not necessarily be well mixed into the Hudson River.

Table 3. Cumulative Frequency Distribution of Net Downstream Flows of Hudson River

Million gallons per minute (gpm)	Cumulative percentile
11.7	20
6.8	40
4.71	60
3.1	80
1.8	98

Adapted from Entergy 2007a

The NRC staff cannot determine—based on available information—whether a shortnose sturgeon in the Hudson River would experience any prolonged physiological stress from the thermal plume caused by the discharge from IP2 and IP3. Shortnose sturgeons could be forced to seek refuge from elevated water temperatures as they are forced to do in southern rivers, and this could limit their available habitat. If studies reveal that the plume is buoyant, shortnose sturgeons could pass underneath the plume on their passage past the facility, but there are no data to indicate that this is the case.

As noted earlier, the NYSDEC thermal modeling of the Hudson River suggests that the discharge from IP2 and IP3 could exceed the limits specified in the SPDES permit, but without a triaxial thermal study, the exact size and nature of the thermal plume is unknown. Information about the species, based on the NMFS recovery plan, suggests to the NRC staff that increased temperatures can have a significant effect on the shortnose sturgeon. Therefore, the NRC staff concludes that the continued operation of IP2 and IP3 for an additional 20 years could adversely affect the population of shortnose sturgeons in the Hudson River through thermal discharge, but the staff is unable to determine the extent to which the population would be affected.

5.0 Conclusion

Renewal of the operating licenses of IP2 and IP3 to include another 20 years of operation could adversely affect the population of shortnose sturgeon in the Hudson River through impingement and thermal impacts. At this time, the NRC staff cannot quantify the extent to which the population could be affected.

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Appendix F

GEIS Environmental Issues Not Applicable to Indian Point Nuclear Generating Station Unit Nos. 2 and 3

Appendix F

GEIS Environmental Issues Not Applicable to Indian Point Nuclear Generating Unit Nos. 2 and 3

Table F-1 lists those environmental issues identified in NUREG-1437, Volumes 1 and 2, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (hereafter referred to as the GEIS), issued 1996 and 1999,[4] and in Table B-1 of Appendix B to Subpart A of Title 10, Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," of the *Code of Federal Regulations* (10 CFR Part 51), that are not applicable to Indian Point Nuclear Generating Unit Nos. 2 and 3 (IP2 and IP3) because of plant or site characteristics.

Table F-1. GEIS Environmental Issues Not Applicable to IP2 and IP3

ISSUE—10 CFR Part 51, Subpart A, Appendix B, Table B-1	Category	GEIS Sections	Comment
SURFACE WATER QUALITY, HYDROLOGY, AND USE (FOR ALL PLANTS)			
Altered thermal stratification of lakes	1	4.2.1.2.3, 4.4.2.2	IP2 and IP3 do not discharge into a lake.
Water use conflicts (plants with cooling pond or cooling towers using makeup water from a small river with low flow)	1	4.3.2.1, 4.4.2.1	IP2 and IP3 have a once-through cooling system.
Water use conflicts (plants with cooling towers and cooling ponds using make-up water from a small river with low flow)	2	4.3.2.1 4.4.2.1	This issue is related to heat-dissipation systems that are not installed at IP2 and IP3.
AQUATIC ECOLOGY (FOR ALL PLANTS)			
AQUATIC ECOLOGY (FOR PLANTS WITH COOLING TOWER-BASED HEAT DISSIPATION SYSTEMS)			
Entrainment of fish and shellfish in early life stages	1	4.2.2.1.2, 4.4.3	This issue is related to heat-dissipation systems that are not installed at IP2 and IP3.

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