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Via Email and U.S. Mail

Kevin A. Kispert
New York State Department of Environmental Conservation
Region One (SUNY @ Stony Brook)
50 Circle Road
Stony Brook, NY 11790-3409

Re: Comments on Port Jefferson Power Station SPDES Renewal and Modification
Draft SPDES Permit No. NY-0005932; DEC No. 1-4722-00107/00013

Dear Mr. Kispert:

On behalf of the Citizens Campaign for the Environment (CCE) and the Network for New Energy Choices (NNEC), we submit these comments on the draft renewed and modified State Pollutant Discharge Elimination System (SPDES) permit for the Port Jefferson Power Station, located on the southwestern shore of Port Jefferson Harbor in or near the Villages of Port Jefferson and Poquott in the Town of Brookhaven.

I. EXECUTIVE SUMMARY

The two operating units at Port Jefferson were built in 1958 and 1960 and rely on antiquated cooling water systems that withdraw up to 294 million gallons per day (MGD) from Port Jefferson Harbor. The large volume and high velocity of the plant's cooling water withdrawals needlessly destroy more than one billion fish and other aquatic organisms each year by sucking them into the plant's heat exchangers or trapping them on intake screens. Although Port Jefferson is a fairly small plant, with a generating capacity of 392 megawatts (MW), and has been operated in "cycling mode" with maximum operation during the summer when power demand is highest, its once-through cooling system kills a disproportionately high number of fish relative to the plant's capacity factor because late spring and summer are also the most biologically active seasons with large numbers of newly-spawned fish in Long Island Sound susceptible to being entrained. Specifically, although Port Jefferson has been running at an average of 48 percent capacity, it kills as many fish as if it operated at 91 percent of its full capacity.[1] Thus, from a fishery perspective, Port Jefferson has the same impact as if it ran virtually all the time.

[1] The plant's capacity factor is expected to decline to approximately 30 percent in coming years due to the addition of newer and more efficient sources of electricity on Long Island. The reduction in operations, however, would reduce fish kills only to the extent that the plant runs less during spawning season. If the operational reductions occur during the colder months, the plant may continue to destroy essentially the same number of fish even if it runs less than a third of the year.

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Port Jefferson's owner, National Grid, contends that it is considering a number of repowering alternatives for Port Jefferson, and that the remaining useful lives of the existing units may be limited. If, however, the Port Jefferson units continue to operate in any fashion, the plant should be required to install and operate a closed-cycle recirculating cooling system, which is standard equipment in new power plants and would reduce water usage and fish kills by 95 percent or more. The use of closed-cycle cooling is necessary to comply with section 316(b) of the federal Clean Water Act and 6 NYCRR § 704.5, both of which require the best technology available (BTA) to minimize the adverse environmental impacts of cooling water intake structures. Closed-cycle cooling is also required to comply with applicable New York State water quality standards, which provide that Port Jefferson Harbor must be suitable for fish propagation and survival as well as for fishing and shellfishing. By DEC's own admission, closed-cycle cooling is approximately one-and-a-half times as effective (95 percent as compared to 65 percent) in reducing entrainment than the flow reduction technologies, variable speed pumps combined with other measures, that DEC chose as BTA. Further, DEC has underestimated that difference through use of an improper "calculation baseline."[2] In fact, a once-through cooling system with variable speed pumps at Port Jefferson would kill nearly eight times as many fish (385 million per year) than would a closed-cycle cooling system (50 million per year).

Contrary to Department staff's conclusions and National Grid's contentions, the use of closed-cycle cooling at Port Jefferson is feasible, and the reasons given in the biological fact sheet and related documents for rejecting closed-cycle cooling are unsupportable. First, there is adequate space to locate the necessary mechanical-draft cooling cells either on parking lots or other occupied areas of the site (outside of the conservation easement) or within the footprint of the powerhouses for Units 1 and 2. Those small but highly inefficient and heavily polluting 60-year old units have not operated since 1992 and could be demolished since there is no demand for electricity from them. Second, the proximity to residential areas does not provide any local permitting difficulties based on aesthetics or any other concerns raised by National Grid because of their very low profile and the availability of ultra low noise fans (sometimes referred to as "super quiet" fans). As we further explain below, closed-cycle cooling is feasible, practical, affordable, and cost-effective, and will not itself cause any significant adverse impacts, environmentally or aesthetically. The draft permit's 65 percent entrainment reduction and 90 percent impingement reduction targets are therefore too low because closed-cycle cooling is an available technology that would achieve greater reductions.

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[2] DEC's use of a "full-flow" calculation baseline to calculate the impingement and entrainment reductions to be achieved is improper and misleading; for this reason, the variable speed pumps and other measures will not actually achieve a 65 percent reduction of the 1.02 billion organisms currently being entrained annually. If a calculation baseline is used at all, then it must reflect some accurate measure of the plant's actual water usage and actual fish kills.

Because the draft SPDES permit allows the Port Jefferson Power Station to continue destroying aquatic resources with antiquated technology, it should not be issued in its current form. Accordingly, to correct the draft permit's fatal flaws, DEC must determine that closed-cycle cooling represents the best technology available for minimizing adverse environmental impacts from the cooling water intake structures at Port Jefferson, and require the installation and use of that technology (or require flow reduction consistent with such technology) in the shortest possible time. Immediately commencing the design and construction planning of closed-cycle cooling at Port Jefferson would cause no undue hardship to National Grid, despite any uncertainty concerning repowering or eventual retirement, because the lead time for designing, constructing, and connecting both units to closed-cycle cooling is likely to be five years (National Grid estimates seven years), and thus the operational decision can be made well in advance of the actual retrofit.

As a closely related matter, the Port Jefferson plant should immediately install variable speed pumps (which have much shorter lead times) as an interim protective measure while the closed-cycle cooling retrofits are being designed, planned, and constructed. Apart from the need for closed-cycle cooling, there is no legal or practical justification for allowing the plant to continue killing fish at current levels while closed-cycle cooling is being designed, planned, and implemented.

II.
ABOUT CCE AND NNEC

Citizens Campaign for the Environment (CCE) is an 80,000 member, not-for-profit, non-partisan advocacy organization, headquartered at 225-A Main Street, Farmingdale, NY 11735. CCE works to protect public health and the natural environment on behalf of its members in New York and Connecticut. The protection of waterways, especially estuaries and drinking water sources, are of the utmost importance to CCE. CCE has been working to protect water quality across New York State since its inception in 1985. CCE has been an active member of the Long Island Sound Study Citizens Advisory Committee for the last 20 years, and CCE staff serve as Chair of the South Shore Estuary Reserve Citizens Advisory Committee. CCE members include but are not limited to recreational and commercial fisherman, boaters, lobstermen, sailors and more. The operation of Port Jefferson Power Station directly damages the activities and enjoyment of CCE's members and their interest in the marine environment of Hempstead Harbor and Long Island Sound. For more information on CCE, see www.citizenscampaign.org.

The mission of the Network for New Energy Choices (NNEC) is to promote policies that ensure safe, clean, and environmentally responsible energy options. In pursuing that goal, NNEC collaborates with all levels of government, planning agencies, public interest organizations, government and industry associations, professional societies, labor groups, businesses, and the public. NNEC's focus is increasingly on the relationship between energy and water resource policy, planning and management. In particular, NNEC is examining the impacts

that conventional thermoelectric generation has on aquatic ecosystems. NNEC is also involved in the ongoing dialogue regarding Long Island's demand for energy and water. NNEC is located at 215 Lexington Avenue, Suite 1001, New York, NY 10016, and more information about its activities can be found at www.newenergychoices.org.

III.
BACKGROUND

A. National Grid's Five Fish-Killing Power Plants on Long Island

Long Island's coastal resources face an endless torrent of threats and its commercial and recreational fishing industries are struggling to survive. One significant contributor is the effect that National Grid's five power plants, including Port Jefferson, have on aquatic life. The five plants destroy billions upon billions of fish each year in the course of withdrawing water for their once-through condenser cooling systems. The fish that are killed are primarily in the form of eggs, larvae and young hatched fish. The next generations of aquatic life needed to replenish decimated fish stocks are continually destroyed by these power plant withdrawals, undermining species recovery and diminishing a significant source of food for other marine species. Combined, all five Long Island National Grid power plants can withdraw nearly two billion gallons of water each day for condenser cooling. On the north shore, the Port Jefferson, Glenwood and Northport plants can withdraw over 1.5 billion gallons of ocean water daily from Long Island sound and its embayments. On the south shore, the Far Rockaway and E.F. Barrett plants can take in 378 million gallons daily. All in all, approximately 10.6 billion fish – in the early stages of development – are killed each year by these five National Grid-owned power plants through entrainment, and nearly 400,000 additional fish are injured or killed through impingement.[3]

If National Grid intends to continue operating the Long Island plants in the twenty-first century, then DEC should require each of the five plants, including Port Jefferson, to replace their antiquated cooling systems with modern technology. In doing so, we urge DEC, in concert with stakeholders and other relevant state agencies, to adopt a comprehensive policy on the use of Long Island's coastal waters for power plant cooling. A forward-looking approach, one that considers the age of the plants and other factors such as energy efficiency and emissions of greenhouse gases and other pollutants, would be highly instructive, particularly in light of the potential that National Grid may choose to repower or retire one or more of the five plants.

As an example, a similar approach is being undertaken by the California State Water Resources Control Board in its draft "Statewide Water Quality Control Policy on the Use of

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[3] *See* "Power Plants Kill Fish - National Grid's Long Island Power Plants and their Adverse Effects on Fish," NNEC & CCE, July 2009 http://www.citizenscampaign.org/PDFs/fishKill_2009.pdf

Coastal and Estuarine Waters for Power Plant Cooling," which is attached hereto as Exhibit A ("California BTA Policy"). The policy establishes two BTA compliance tracks for all coastal and estuarine power plants in the state: Track 1 requires a reduction in intake flows commensurate with closed-cycle cooling (*i.e.*, a minimum 93 percent reduction) and an intake velocity of 0.5 feet per second. Track 2 (which is only available where compliance with Track 1 has been demonstrated to be infeasible) requires a comparable level of reduction of impingement and entrainment for all life stages of marine organisms. California BTA Policy at 3. Of particular note, the policy includes an "Implementation Schedule," which sets forth specific deadlines by which each of California's 19 coastal plants must be in full compliance with the applicable compliance track. *Id.* at 7. Furthermore, the policy makes a wholly disproportionate demonstration (*i.e.*, the opportunity to demonstrate that alternative requirements are justified on the basis that the costs of a technology are wholly disproportionate to its environmental benefits) unavailable to older, single-cycle steam plants (*i.e.*, those with a heat rate of 8500 British Thermal Units (BTUs) per Kilowatt-hour (KWh) or more). *Id.* at 9. While the California BTA Policy is far from perfect, and environmental groups have recently submitted comments aimed at improving it, the policy provides an example of how a state agency can adopt a comprehensive, forward-looking approach to the use of coastal waters for power plant cooling. We urge DEC evaluate the Glenwood, Port Jefferson, Northport, E.F. Barrett and Far Rockaway plants together rather than in isolation.

B. Port Jefferson Harbor in Long Island Sound

Long Island Sound is a unique estuary in that it has two connections to the sea and receives the flow of several major rivers that drain fresh water from states as far north as Massachusetts, New Hampshire and Vermont. The Sound provides feeding, breeding, nesting and nursery areas for a diversity of plant and animal life, and contributes an estimated $8 billion (adjusted to current dollars) per year to the regional economy from boating, commercial and sport fishing, swimming, and sight-seeing. More than eight million people live in the Long Island Sound watershed, which includes the north shore of Long Island and the entire coastline of Connecticut. In 1987, the Sound was designated as an Estuary of National Significance.[4]

Port Jefferson Harbor is located on the southern shore of the Sound and is classified as Class SA surface saline waters, which is the highest classification in the state of New York. The best uses of Class SA waters are shellfishing for market purposes, primary and secondary contact recreation, and fishing. Under New York State's water quality standards these waters are expected to be suitable for fish propagation and survival. *See* 6 NYCRR § 701.10. The fish and wildlife habitat in and around the harbor consists of open water, tidal flats, salt marshes and barrier beaches. Port Jefferson Harbor provides important habitat for several species of marine fish, such as scup, bluefish, Atlantic silversides, Atlantic menhaden, northern puffer, striped bass, blackfish and winter flounder. The harbor is also an important shellfish producing area,

[4] *See* http://www.epa.gov/ne/eco/lis/ ("What Makes Long Island Sound Special?").

with much of the area open seasonally or conditionally for recreational or commercial harvest of shellfish, including American oyster and hard clam. In addition to finfish and shellfish habitat, the harbor and parts of Long Island Sound may be important habitat for juvenile Atlantic Ridley turtles. The Long Island Sound Study designated Port Jefferson Harbor as one of Long Island Sound's "Stewardship Initiative Sites."

C. Port Jefferson Power Station

The Port Jefferson Power Station's two operating steam-electric power units, Units 3 and 4, were built in 1958 and 1960, respectively.[5] They are natural gas-fired units with oil as a secondary fuel source and a net generation of 392 megawatts (MW) of electricity.[6] Port Jefferson has recently been operated in "cycling mode" with maximum operation during the summer when power demand is highest and, according to National Grid's technology review, the plant's capacity factor (*i.e.*, the percentage of time it operates) will decrease from an average of 48 percent from 2000-2006 to an average of 26.8 percent in 2010 and 31.3 percent in 2011, with Unit 3 running significantly more than Unit 4.

The plant employs a once-through cooling system with two circulating water pumps per unit that can withdraw a plant-wide total of 294 million gallons per day (MGD) of water from Port Jefferson Harbor though a shoreline intake structure. The intake structure consists of four separate screenbays, each with a skimmer wall, trash rack and 3/8" traveling screen. Fish and debris washed from the traveling screens are returned to Port Jefferson Harbor through a 24" diameter return pipe. Once cooling water has been used to condense steam exhausted from its steam turbines, the plant discharges heated water back into the harbor via a submerged discharge opening, approximately 127 feet east of the intake structure.

D. Adverse Environmental Impacts of Port Jefferson's Intake Structures

As permitting documents make clear, the Port Jefferson plant's withdrawal of up to 294 million gallons per day from Hempstead Harbor kills more than one billion fish, eggs, and larvae annually by trapping them against intake screens ("impingement") or drawing them into the plants' cooling systems ("entrainment").[7] Cooling water intake structures can affect the full

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[5] DEC's biological fact sheet misstates these dates as 1948 and 1950, which are, in fact, the years that Units 1 and 2 were built.

[6] KeySpan's 2007 Design and Construction Technology Review states that the net generating capacity of each unit is 181 MW, which would total 362 MW for the plant. Likewise, DEC's biological fact sheet states that net generation for Port Jefferson is 362 MW. However, DEC has more recently informed us that the correct figure is 392 MW.

[7] As the U.S. EPA has explained, small, fragile aquatic organisms entrained through a plant's cooling system are subject to mechanical, thermal, and toxic stress including physical impacts in the pumps and condenser tubing, pressure changes caused by diversion of the cooling water into the plant or

spectrum of organisms in the aquatic ecosystem at all life stages (*e.g.*, eggs, larvae, juvenile, adult) from tiny photosynthetic organisms to fish, shrimp, crabs, birds, and marine mammals, including threatened and endangered species.[8] These impacts may result in appreciable losses of early life stages of fish and shellfish, serious reductions in forage species and recreational and commercial landings, and extensive losses over relatively short intervals of time. "Further, some studies estimating the impact of impingement and entrainment on populations of key commercial or recreational fish have predicted substantial declines in population size. This has lead to concerns that some populations may be altered beyond recovery."[9]

A January 2005 report of entrainment and impingement monitoring conducted at Port Jefferson Power Station from March 2003 to February 2004 determined that the plant entrains 34 distinct taxonomic groups of fish, including bay anchovy, Atlantic menhaden, gobies, tautog, cunner, fourbeard rockling, searobin, and winter flounder, which collectively comprise more than 92 percent of the entrainment sample. Using the DEC's "full-flow" calculation baseline, approximately 1.1 billion eggs and larvae would be entrained per year if the plant operated at maximum capacity all year long. Actual entrainment is more than 1.02 billion organisms annually. The monitoring study found that 44 species distinct species of fish were impinged, including Atlantic menhaden, striped killifish, butterfish, striped searobin, Atlantic silverside, and cunner (which collectively made up about 90 percent of the impingement sample). Under "full flow" conditions, 150,000 fish would be impinged each year, and under actual conditions annual impingement is approximately 76,500 fish. However, the monitoring study, which was conducted over only a single year, may have reflected an atypically short spawning season, and the plant owner is updating these estimates by conducting a subsequent entrainment and impingement monitoring study for 2008 and 2009.

National Grid incorrectly contends that it is more important to protect adult fish than early life stages of fish, and that the impacts of cooling water intake structures should be measured in "adult equivalents" (*i.e.*, how many eggs and larvae would survive to a size suitable for fishing) and compared to commercial landings of harvestable fish species. *See, e.g.*, BTA Proposal at 3, 8. However, the company's position enjoys no support in law or science. In fact, while protecting fishery yields may be desirable, it is not the central environmental concern at stake. Indeed, the regulatory goal of Clean Water Act section 316(b) is not limited to avoiding population- or community-level declines of particular species, but is primarily to minimize adverse impacts on *all life stages of aquatic organisms* and thereby protect the ecological integrity of the entire aquatic ecosystem. As the U.S. EPA has found, intake structures cause

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by the hydraulic effects of the condensers, thermal shock in the condenser and discharge tunnel, and chemical toxemia induced by antifouling agents such as chlorine. 65 Fed. Reg. 49,059, 49,072 (Aug. 10, 2000). Few, if any, entrained organisms survive the immediate and latent effects of entrainment.

[8] 69 Fed. Reg. 41,576, 41,586 (July 9, 2004).

[9] 66 Fed. Reg. 65,255, 65,264 (Dec. 18, 2001).

"multiple types of undesirable and unacceptable adverse environmental impacts," including entrainment and impingement; reductions of threatened, endangered or other protected species; damage to critical aquatic organisms, including important elements of the food chain; diminishment of a population's compensatory reserve; losses to populations including reductions of indigenous species populations, commercial fisheries stocks, and recreational fisheries; and stresses to overall communities and ecosystems as evidenced by reductions in diversity or other changes in system structure and function. 66 Fed Reg. 65,256, 65,292 (Dec. 18, 2001); 69 Fed Reg. 41,576, 41,586 (July 9, 2004). In particular, EPA has recognized that "the loss of large numbers of aquatic organisms" may affect not only "stocks of various species" and their compensatory reserve, but also "the overall health of ecosystems." 66 Fed. Reg. at 65,292.

Significantly, in a 2004 Federal Register publication, EPA approvingly cited DEC's analysis of such ecosystem effects in connection with the permitting of three Hudson River power plants. DEC found that entrainment not only reduces adult populations of the species whose eggs and larvae are entrained, but also depletes the species' ability to survive unfavorable environmental conditions, and, perhaps most significantly, diminishes the forage base, which disrupts the food chain, transferring energy from higher to lower trophic[10] levels and compromising the health of the entire aquatic community.[11] In particular, DEC explained, using a simplified example, that if an individual bay anchovy is killed via entrainment and disintegrated upon passage through an intake structure it is no longer available as food to striped bass and other top predators, and is instead consumed only by lower trophic level organisms, such as detritivores (organisms that feed on dead organic material), thus transferring energy from the top of the ecosystem to the bottom and affecting the integrity and proper functioning of the system. Likewise, the entrained bay anchovy would no longer be available to consume phytoplankton, which upsets the distribution of nutrients in the ecosystem. *Id.* In other words, the focus must not be solely, or even primarily, on measuring the plant's effect on adult fish population levels, but rather on minimizing the mortality of (and harm to) aquatic organisms of all species at all life stages, because such damage saps biological energy from the aquatic ecosystem and alters the integrity of the natural environment.

E. Port Jefferson's Current SPDES Permit

The plant's current SPDES permit, which became effective on June 1, 2004, was modified twice, on September 5, 2006 and June 10, 2008, and expired on June 1, 2009. Purportedly, the expired permit was administratively extended under the State Administrative

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[10] The term "trophic" refers to the feeding habits or food relationship of different organisms in a food chain.

[11] NYS DEC, 2003, Final Environmental Impact Statement: Concerning the Applications to Renew NY SPDES Permits for the Roseton 1 & 2, Bowline 1 & 2 and Indian Point 2 & 3 Steam Electric Generating Stations (cited by EPA at 69 Fed Reg. at 41,587-88).

Procedures Act (SAPA) until the current permit renewal process has been completed.[12] The current permit does not limit the intake of cooling water, but does have limits on thermal discharges, specifically a delta T of 30 degrees F, with a maximum discharge temperature of 110 degrees F.

As part of the current permit, the permittee was required to submit a Proposal for Information Collection Report (PICR) that included a description of the proposed and/or implemented technologies and/or operational measures to be evaluated in a Design and Construction Technology Review Plan (DCTRP), followed by a Proposed Suite of Technologies or Operational Measures (PSTOM or "BTA Proposal"). In August 2007, KeySpan submitted its Design and Construction Technology Review Plan for Port Jefferson Power Station.[13] National Grid provided additional information in January 2008, pursuant to a November 2007 request by DEC. DEC then approved the technology review in February 2008, and National Grid submitted its BTA Proposal in March 2008.

In its BTA Proposal, National Grid contends that "the only suite of technologies and operating measures consistent with BTA for the existing generating units at Port Jefferson (i.e., assuming no repowering at the Station) is:

- continuous screen operation in conjunction with Unit outages;
- seasonal use of an impingement barrier net; [and]
- variable speed pumps ..."

PSTOM at 10. That proposal was based, in large part, on National Grid's erroneous and wholly unsupportable claims that (1) that the loss of more than a billion aquatic organisms at Port Jefferson annually, particularly at early life stages, is "insignificant;" (2) that there is insufficient space for closed-cycle cooling; (3) that there are so-called "negative aesthetic, environmental and energy impacts" of closed-cycle cooling; (4) that closed-cycle cooling would cost $147 million; and (5) that the costs of closed-cycle cooling (and all of the other alternatives) are wholly disproportionate to their benefits. *Id.* at 3, 2, 2, 7, 6. Each of these contentions can be summarily dismissed erroneous, as discussed herein and as CCE and NNEC can further demonstrate.

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[12] To qualify for temporary administrative extension, a permittee must submit a "timely and sufficient" renewal application, *see* SAPA § 401(2), which in this case was due 180 days before the permit expired. We have not seen the permit renewal application, which may or may not have been timely and sufficient.

[13] *See* Design and Construction Technology Review for the Port Jefferson Power Station, Prepared for Keyspan Corporation by ASA Analysis & Communication, August 2007.

F. The Draft Renewed and Modified SPDES Permit

In July 2009, DEC issued the draft renewed and modified SPDES permit for Port Jefferson Power Station on which we are now commenting. In preparing and issuing that draft permit, the Department accepted National Grid's claim that there is insufficient space for closed-cycle cooling and, while it did not necessarily agree with National Grid's other contentions, DEC determined that, in combination, the following technologies represent BTA for minimizing the adverse environmental impacts from the cooling water intake structures at Port Jefferson:

1. Continuous operation of existing traveling screens;
2. Employ aggressive shutdown procedures;
3. Seasonal deployment of an Impingement Barrier Net;
4. Installation of variable speed pumps; and
5. Installation and operation of Fine-mesh traveling Screens with fish protection features.

2009 Port Jefferson Biological Fact Sheet ("Bio Fact Sheet") at 4. In particular, DEC stated that "[a]lthough closed-cycle cooling would be the most protective technology," the Department does not believe it is available at Port Jefferson "due to a physical lack of available space at the site, the proximity to residential areas and an existing conservation easement." *Id.* at 4, 3.

IV.
DETAILED COMMENTS

A. Closed-Cycle Cooling is BTA for Port Jefferson Power Station.

1. Closed-Cycle Cooling is Far More Protective than Variable Speed Pumps.

The killing of more than a billion fish and other aquatic organisms each year by Port Jefferson Power Station is unacceptable. A closed-cycle cooling system is the best technology available to minimize that adverse environmental impact, and is therefore required under section 316(b) the federal Clean Water Act and 6 NYCRR § 704.5, because such systems require only five percent as much water as once-through cooling systems. Since aquatic mortality is directly related to the amount of water use, using a closed-cycle cooling system will cut aquatic mortality by approximately 95 percent. Given such huge reductions, closed-cycle cooling sets the standard for minimizing impacts as the U.S. EPA has made clear: "[c]losed-cycle cooling systems ... are the *most effective* means of protecting organisms from I&E [impingement and entrainment]."[14] Indeed, DEC admits that "[c]losed-cycle cooling would reduce the amount of water used by approximately 95%, which would provide the greatest benefit in entrainment reductions." Bio Fact Sheet at 3.

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[14] U.S. EPA Office of Science and Technology Engineering and Analysis Division, Economic and Benefits Analysis of Proposed Section 316(b) Phase II Existing Facilities Rule § A2-2.1(a), at p. A2-5, available at http://www.epa.gov/waterscience/316b/econbenefits/a2.pdf (emphasis added).

No other mechanisms short of plant outage during entrainment season can reduce the aquatic impacts to a level commensurate with closed-cycle cooling. Since the law requires the "location, design, construction, *and* capacity" of cooling water intake structures to reflect the best technology available for minimizing adverse environmental impact, 33 U.S.C. §1326(b) (emphasis added), DEC must limit Port Jefferson's withdrawal capacity to closed-cycle cooling even if it requires other technologies or operational measures to further reduce mortality. Given these substantial reductions, it is impossible to meet the Best Technology Available standard without recirculating the water via closed-cycle cooling. Other technologies such as variable speed pumps ("VSPs") may *reduce* impacts, but they do not *minimize* them. Simply put, BTA for Port Jefferson Power Station is, at a minimum, closed-cycle cooling because it is the best technology for minimizing the adverse environmental impact of the plant's intake structures and is available for installation and use at Units 3 and 4.

In contrast, DEC estimates that variable speed pumps combined with other measures (such as fine mesh screens) would provide an approximately 65 percent reduction in entrainement. But that figure overstates the actual reduction due to DEC's improper use of a hypothetical "full-flow" baseline for calculation. (See below.) This misleading accounting mechanism masks the full extent of the differences in effectiveness between the technologies. Whatever benefit VSPs and other measures might provide, they do not even begin to approach the protection offered by closed-cycle cooling, and thus they are not the Best Technology Available. Furthermore, VSPs have an environmental cost that closed-cycle cooling does not – they increase thermal discharges, while closed-cycle cooling reduces thermal discharges.[15] Lastly, to the extent DEC has assumed that fine mesh screens would measurably reduce entrainment, such results have not been demonstrated, and even if screens with a mesh size small enough to prevent entrainment of fish eggs could be effectively deployed in the marine environment (which is doubtful), any eggs protected from entrainment would likely be destroyed by impingement instead. Thus, the technologies DEC chose as BTA are not the best available for minimizing the adverse environmental impacts of Port Jefferson's cooling water intake structures and do not satisfy sections 316(b) and 704.5.

2. Closed-Cycle Cooling is Required to Meet Water Quality Standards.

In addition to meeting the technology-based BTA standard, closed-cycle cooling is also required to meet New York State water quality standards ("WQSs"). EPA's Environmental Appeals Board ("EAB") has recognized that "in certain cases, even if the technology standard

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[15] Variable speed pumps allow a power plant to throttle back its intake pumps, thereby using less water to cool and condense the steam exhausted from the steam turbine and reducing intake flows (but not by nearly as much as closed-cycle cooling). Although the total amount of heat discharged does not change, the use of variable speed pumps increases the temperature of the water discharged because less water is used to absorb the same amount of heat from the steam.

does not require closed-cycle cooling, a state's WQSs may."[16] EPA has explained this requirement as follows:

> The NPDES permit's requirements pertaining to CWISs [cooling water intake structures] under CWA § 316(b) must also be consistent with applicable State legal requirements, including water quality standards. Determining exactly how to apply water quality standards to CWIS requirements in any given case will depend on the exact nature of the water quality standards and the particular circumstances of the case at hand. The most obvious consideration, however, is whether the CWIS requirements will provide for the protection of the designated uses of the water bodies of concern.[17]

Under New York State's water quality standards, Port Jefferson Harbor must be suitable for "fish propagation and survival," and the designated uses include fishing and shellfishing. *See* 6 NYCRR § 701.10. Given the needless destruction by Port Jefferson's intake structures of more than one billion fish and other organisms in 34 distinct taxonomic groups – particularly, bay anchovy, Atlantic menhaden, gobies, tautog, cunner, fourbeard rockling, searobin, and winter flounder – closed-cycle cooling is also necessary to protect the designated uses of the harbor.

3. Closed-Cycle Cooling is Feasible at Port Jefferson Because there is Ample Space to Locate the Cooling Cells.

Although DEC rejected closed-cycle cooling "due to the lack of space on facility property" (Bio Fact Sheet at 4), there is, in fact, adequate space to locate plume-abated mechanical draft cooling cells for both units at Port Jefferson Power Station. Review of the site plan and aerial photographs of the site by our engineering consultant, Bill Powers, P.E., of Powers Engineering, establishes that the cooling cells could be located in one of several locations.

Although we reserve our offer of proof and the submission of more detailed technical information for the issues conference and subsequent proceedings, we provide a preliminary discussion here. The type of cooling technology that we believe should be installed at Port Jefferson is the standard in-line, plume-abated, mechanical-draft, evaporative cooling cell, that has been available from several manufacturers for many years and used at many power plants in the state and beyond. To give a sense of what in-line cooling cells look like when installed at a power plant in New York, attached hereto as Exhibit B is a depiction of similar plume-abated

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[16] In *In re Dominion Energy Brayton Point, L.L.C. Brayton Point Station,* NPDES 03-12, 12 E.A.D. 490, 496 (Remand Order) (EAB Feb. 1, 2006).

[17] U.S. EPA - New England, Clean Water Act NPDES Permitting Determinations for Thermal Discharge and Cooling Water Intake from Brayton Point Station in Somerset, MA (July 22, 2002) at 7-27.

cells at the Bethlehem Energy Center (BEC) on the Hudson River just south of Albany.[18] (The array of cooling cells is the low gray rectangular object in the back of the site, away from the river.)

Mr. Powers has estimated that five cooling cells would be needed for each Port Jefferson unit, and that each cell would occupy a nearly square area measuring 54 feet by 48 feet. On the overlay attached hereto as Exhibit C, Mr. Powers illustrates three very good locations, each of which is sufficiently large to accommodate five cooling cells. One site is in an existing parking lot next to an oil storage tank. A second site along the water is also presently a parking lot. The third site to the south along the fenceline is presently wooded with a relatively gently sloping terrain. (Significantly, all of these locations are outside of the Stephen D. Matthews preserve, *i.e.*, the conservation easement referred in the Bio Fact Sheet that apparently stretches in an L-shape from Route 25A to the waterfront on the northwestern side of the station.) Only one of these three locations is needed for each unit, and two of the three locations would serve both units. Alternatively, the powerhouses for Units 1 and 2 could be demolished and the space they now occupy could be used for cooling cells because there is no longer any demand for electricity from those small, highly inefficient, and heavily polluting 60-year old units that have not operated since 1992.

Accordingly, there is no basis on which to conclude that closed-cycle cooling is infeasible at Port Jefferson due to the alleged lack of space.

4. Closed-Cycle Cooling is Practical, Affordable, and Cost-effective, and Will Not Cause any Significant Adverse Impacts.

Although DEC based its rejection of closed-cycle cooling on an alleged lack of space, we wish to dispel here several other concerns that National Grid had raised or that opponents or skeptics of the technology sometimes raise.

Closed-Cycle Cooling is Cost-Effective. Our engineering consultant, Bill Powers estimates that the "all-in" cost of building and installing closed-cycle cooling at Port Jefferson would be in the range of $27-30 million for plume-abated cooling cells at both units (plus any cost to demolish existing buildings on site, if necessary), which is far less than the $60 million construction cost figure given by National Grid in its technology review. National Grid also added another $50 million in costs to its estimate to represent "replacement power" costs during a six-month period that it believes the plant would have to be shut down for retrofitting. However, a much shorter outage, a few weeks at most, is all that is necessary and this can be done in the winter when the plant is not being used (see below). At less than $85 per kilowatt (kW), that capitol cost is readily affordable, *i.e.*, the costs can be reasonably borne by the

[18] DEC is, of course, familiar with the closed-cycle cooling retrofit at the BEC plant, as the Department permitted that project in 2002.

company. It is also cost-effective in that it is a small price to pay if National Grid chooses to keep Port Jefferson available as a load-following plant.

Closed-Cycle Cooling Will Not Noticeably Increase Electricity Rates. The low cost of closed-cycle cooling can likely be absorbed by National Grid without any increase in the cost of electricity to homeowners. Even if the costs are passed on, the resulting increase on electricity bills would likely be only pennies per month. A study by the U.S. EPA of a power plant in Massachusetts that is being required to retrofit to closed-cycle cooling found that the cost to upgrade that plant (which is larger and will be more expensive than Port Jefferson to retrofit) would result in an increase to ratepayers of only 6 to 18 cents per month – less than the cost of the postage stamp needed to mail the electric bill!

Closed-Cycle Cooling Cells Are Visually Unobtrusive. The plume-abated cooling cells would be only 50 to 60 feet tall, which makes them much smaller than the main power plant buildings on site. For that reason, they would be hardly noticed. The rendering of the Bethlehem Energy Center in Exhibit B shows just how small and unobtrusive cooling cells are at a power plant site. Further, because of the availability of plume-abated cooling cells, there would be no visible steam plumes from those cells.

Closed-Cycle Cooling Is Quiet. The use of ultra low noise fans, which are available from several manufacturers, would allow Port Jefferson's cooling cells to operate extremely quietly. Attached as Exhibit D are a low noise cooling cell fan brochure from SPX/Marley, as well as case study conducted by Howden Cooling Fans (one the largest cooling tower fan manufacturers in the world) entitled "Retrofit of a Large Cooling Tower in Combination with a Significant Noise Reduction." Both SPX and Howden have available an ultra low noise fan option – Howden's product is referred to as a "super quiet SX-fan[19] – and Howden's case study verified that the total noise emanating from the tested cooling towers measured only 39.2 dB(A) at a nearby housing area.[20] A sound level of 40 dB(A) is equivalent to a "quiet rural area," according to a University of Wisconsin sound chart.[21]

No Groundwater or Municipal Water Use Would Be Necessary. Although the water for closed-cycle recirculating cooling cells can come from a variety of sources, including treated effluent, municipal drinking water supplies, or groundwater, the simplest solution for Port

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[19] More information on Howden's fans can be found at: http://www.howden.com/en/Products/CoolingFans/DSeries/default.htm (D-series fans); and http://www.howden.com/en/Products/CoolingFans/ESeries/default.htm (E-series fans).

[20] *See* also http://www.evapco.com/evapco_videos.asp?vID=lss1 and http://www.districtenergy.org/08CoolingConference/Proceedings/4A2_HOETICKXGood_Cooling_Tower_Practises.pdf (video and presentation from EVAPCO on the performance of the super low noise fan).

[21] *See* http://trace.wisc.edu/docs/2004-About-dB/

Jefferson would be to re-use the same intake structure that the plant currently uses, and to continue to withdraw water from Port Jefferson Harbor, but in far lower volumes – less than five percent of the current withdrawal volume of 294 MGD, likely between 7 and 10 MGD. Changing the source water, if feasible, would completely eliminate entrainment and impingement (*i.e.*, it would eliminate the last five percent of the impact), but would not be necessary to achieve the overwhelming majority of the benefits of closed-cycle cooling.

The Retrofit Will Not Require Long Outages. Little or no unscheduled downtime is necessary for plants to retrofit to closed-cycle cooling. The entire cooling cell and piping construction process can take place while the plant continues to operate using once-through cooling. A short shutdown is only required to allow final tie-in of the cooling tower piping to the existing surface condensers at each unit. And this hook-up of the new cooling system can be carried out with little or no downtime beyond the typical annual maintenance outage period of two to four weeks and/or in non-summer months when power demand is low.

Closed-Cycle Cooling Should Not Increase Air Emissions. The switch from once-through cooling to closed-cycle cooling will cause a very minor loss in electricity production efficiency, approximately 1 to 2 percent. Output would thus be reduced by about 3.5 to 7 MW as a result of the conversion to cooling cells.[22] If this 3.5 to 7 MW is generated by a natural gas-fired combined-cycle plant, the annual NOx and PM10 emissions from this output would be a relatively modest 0.35 to 0.7 tons per year (12 to 24 lbs/day) and 0.175 to 0.35 tons per year (7 to 14 lbs/day), respectively, assuming a 30 percent plant usage rate. Better yet, there would be no increase in air emissions if the power is replaced by renewable geothermal, solar, or wind resources, as it should be. Like many states, New York is developing renewable energy sources to replace fossil fuel sources and, in California, the state energy commission recently denied an application for a 100 MW natural gas fired peaking power plant in part because rooftop solar photovoltaic cells could potentially achieve the same objective for comparable cost, *i.e.*, they are equally cost-effective.[23]

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[22] For example, the measured annual efficiency penalty at the 346 MW Jeffries Station in South Carolina – which converted its cooling system to a full recirculating, mechanical-draft system after many years of operation utilizing a once-through system – is 0.16%. The cooling tower pump and fan energy demand for steam plants is estimated by EPA at 0.73%. Thus, the total energy penalty (the sum of those two numbers) would be approximately 0.9%. *See, e.g.*, U.S. EPA, Office of Water, Technical Development Document for the Proposed Section 316(b) Phase II Existing Facilities Rule, April 2002, Chapter 5, Sections 5.6.1 to 5.6.3, pp. 5-34 to 5-36. In fact, there is a similar loss in efficiency when power plants stacks are fitted with wet scrubbers and other equipment to reduce NOx and SO_2.

[23] *See* NATURAL GAS & ELECTRICITY, August 2009, 8-13, Bill Powers, "CEC Cancels Gas-Fed Peaker, Suggesting Rooftop Photovoltaic Equally Cost-Effective."

B. VSPs Should Be Required Immediately as an Interim Measure.

Furthermore, the Port Jefferson plant should immediately begin installing the variable speed pumps as an interim protective measure while the closed-cycle cooling retrofits are being designed, planned, and constructed. There is no legal or practical justification for considering VSP and closed-cycle cooling as alternative technologies. Rather, VSPs should be installed and operated immediately while the retrofit of closed-cycle cooling is being planned, designed, and implemented, which would take, perhaps, five years (National Grid estimates seven years). Attached hereto as Exhibit E is the September 25, 2009, comment letter that CCE and NNEC submitted to DEC with respect to the draft SPDES permit for Glenwood Generating Station, also owned by National Grid. That letter, which we hereby incorporate by reference, explains that DEC may well be prohibited by federal law from including a compliance schedule for BTA in SPDES permits, and that even if such schedule were allowed, state and federal law would require compliance as soon as possible. *See* Glenwood comments at 14-16. For many of the same reasons explained in our Glenwood comments, DEC must require the maximum level of BTA in the earliest possible timeframe.

C. DEC Should Use an Actual-Flow, not a Full-Flow, Baseline.

Further, DEC's "full-flow" calculation baseline to calculate impingement and entrainment reductions is improper and misleading and should not be used. No power plant, not even a baseload nuclear plant, actually operates at "full flow" or 100 percent pumping capacity of the system. Using hypothetical full flow conditions to determine impingement and entrainment reduction levels thus represents an enormous departure from reality that would allow the plants to receive credit for reductions in environmental impacts which have not occurred and have no basis in fact. For this reason, the variable speed pumps will not actually achieve a 65 percent reduction of the one billion organisms currently being entrained annually, while closed-cycle cooling would achieve a 95 percent reduction in those actual fish kills.

To illustrate the point, using a full-flow baseline, DEC estimated that Port Jefferson would entrain 1.1 billion organisms per year if it operated 100 percent of the time. DEC then used that baseline to calculate that VSPs combined with planned outages, aggressive pump shut down procedures, and other measures would reduce entrainment by 65 percent, *i.e.*, to approximately 385 million organisms per year.[24] But, in fact, the station is actually entraining 1.02 billion organisms per year under its actual operating conditions. In contrast, closed-cycle cooling would actually reduce entrainment by 95 percent or more from the current 1.02 billion entrainment figure, reducing entrainment to approximately 50 million organisms per year. Put another way, the plant will kill *nearly eight times as many* organisms with the technologies DEC

[24] We dispute that the measures DEC selected as BTA are capable of reducing entrainment to 385 million organisms per year. Nonetheless, this illustration shows that even if DEC's estimates of their effectiveness was correct, closed-cycle cooling would still be nearly eight times more effective in reducing fish kills.

selected as BTA than it would with closed-cycle cooling. DEC's full-flow baseline wholly distorts reality and should not be used.

If a calculation baseline is used at all,[25] then it must reflect some reasonable measure of the plant's actual water usage and actual fish kills.

V.
REQUEST FOR PUBLIC HEARING

Under Article 70 (Uniform Procedures) of the New York State Environmental Conservation Law (ECL), after evaluating public comments on a permit application, DEC must "determine whether or not to conduct a public hearing on the application." ECL §§ 70-0119(1). Such determination shall be based on whether the comments raise substantive and significant issues relating to any findings or determinations the department is required to make [pursuant to the ECL], including the reasonable likelihood that a permit ... can be granted only with major modifications to the project because the project as proposed may not meet statutory or regulatory criteria or standards." ECL §§ 70-0119(1). In particular, "where any comments received from members of the public or otherwise raise substantive and significant issues ... and resolution of any such issue may result in ... the imposition of significant conditions..., the department *shall* hold a public hearing." *Id.* (emphasis added); *see also* 6 NYCRR § 621.8(b) (same).

Public hearings on SPDES permits must be held according to the provisions of Part 624, which provide that the first portion of the hearing process is a "legislative hearing" during which unsworn statements are received from the public and the parties. *See* 6 NYCRR §§ 624.2(t), 624.4(a). Following the legislative hearing, but prior to an adjudicatory hearing, the administrative law judge (ALJ) must schedule an issues conference in order to, *inter alia*: (1) narrow or resolve disputed issues of fact without resort to taking testimony; (2) determine whether disputed issues of fact that are not resolved meet the standards for adjudicable issues; and (3) determine whether legal issues exist whose resolution is not dependent on facts that are in substantial dispute and, if so, to hear argument on the merits of those issues.[26] 6 NYCRR § 624.4(b)(2).

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[25] Neither a calculation baseline, nor a target reduction percentage, is necessary or even desirable in determining BTA because minimizing adverse environmental impacts requires reducing those impacts *as much as possible,* not reducing them by some arbitrary percentage below a fictional, or even actual, baseline measure. Further, BTA can be articulated with reference to specific technologies rather than percentage reductions.

[26] Where substantive and significant legal issues are not dependent on substantially disputed facts, adjudication is unnecessary and the ALJ may direct DEC staff to revise the draft permit to comport with the law. *See, e.g.*, IN THE MATTER OF MODIFICATION OF STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM (SPDES) PERMITS PURSUANT TO ENVIRONMENTAL CONSERVATION LAW ARTICLE 17 AND 6 NYCRR PARTS 621, 624 AND 750 FOR FOURTEEN PUBLICLY OWNED SEWAGE TREATMENT PLANTS

A proposed issue is adjudicable if it is both substantive and significant. 6 NYCRR § 624(c)(1)(iii). The regulations further provide that, "an issue is substantive if there is sufficient doubt about the applicant's ability to meet statutory or regulatory criteria applicable to the project, such that a reasonable person would require further inquiry." *Id.*, § 624(c)(2). "An issue is significant if it has the potential to result in ... a major modification to the proposed project or the imposition of significant permit conditions in addition to those proposed in the draft permit." *Id.*, § 624(c)(3).

The issues raised in this comment letter meet the criteria for substantive and significant issues requiring an adjudicatory hearing, in addition to a legislative hearing, to be held. In particular, and among other things, CCE and NNEC contend herein that closed-cycle cooling reduces water withdrawals and mortality by 95 percent or more, is the best technology available to minimize the adverse environmental impact of the Port Jefferson plant's cooling water intake structures, and is feasible for installation and use at Port Jefferson. The issue is significant because it would require DEC to alter the terms of the Port Jefferson draft SPDES permit to require closed-cycle cooling as BTA. The issue is substantive because the certain and superior protectiveness of closed-cycle cooling would prompt a reasonable person to inquire further as to whether any other technology, and in particular, the technologies required or suggested by the draft permit are sufficient to comply with the federal Clean Water Act and state law requirements. Further, we cast sufficient doubt on DEC's finding of infeasibility such that a reasonable person would require further inquiry into National Grid's ability to comply with the BTA standard without closed-cycle cooling. Since we can demonstrate that the proposed permit does not meet statutory or regulatory criteria or standards, our comments raise a reasonable likelihood that the permit can be granted only with major modifications or the imposition of significant additional permit conditions.

For those reasons, we maintain that we are entitled to legislative and adjudicatory public hearings on the Port Jefferson draft SPDES permit.

OPERATED BY THE CITY OF NEW YORK'S DEPARTMENT OF ENVIRONMENTAL PROTECTION, Ruling on Proposed Adjudicable Nitrogen Issues and Party Status (March 16, 2007) at 22 (identifying a "legal and policy matter" as substantive and significant with no factual issues in dispute and directing DEC staff to revise draft SPDES permits).

VI.
CONCLUSION

Based on the foregoing, CCE and NNEC request that DEC:

(a) Make a determination that the Best Technology Available for minimizing the adverse environmental impacts of Port Jefferson Power Station's cooling water intake structures includes, at a minimum, a closed-cycle recirculating cooling system (or any other technology or operational measures capable of reducing intake flows to a level commensurate with such a system);

(b) In light of that determination, and consistent with the effectiveness of closed-cycle cooling, require the Port Jefferson Power Station to achieve a minimum of 95 percent reductions in both impingement mortality and entrainment;

(c) In calculating reductions in impingement mortality and entrainment, utilize and require Port Jefferson Power Station to use a baseline that reflects real-world conditions, *i.e.*, actual water usage and actual fish kills, rather than hypothetical and unrealistic "full-flow" conditions;

(d) Require Port Jefferson Power Station to immediately commence the design and construction planning process for the installation and operation of closed-cycle cooling in the shortest possible time; and

(e) Require Port Jefferson Power Station to immediately install and operate variable speed pumps (VSPs) as an interim flow reduction measure until the closed-cycle cooling system is fully operational;

Very truly yours,

Reed Super

cc (by email):
Congressman Gary Ackerman
Congressman Steve Israel
Congressman Timothy Bishop
Senator John J. Flanagan
Senator Antoine M. Thompson
Senator Kenneth LaValle
Senator Carl Marcellino
Assemblyman Steven Englebright

Assemblyman Charles Lavine
Assemblyman Marc Alessi
Assemblyman Robert Sweeney
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Chuck Nieder, DEC Steam Electric Unit Leader, Albany
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