PETITION NO. 1218 – PSEG Power Connecticut LLC petition for a declaratory ruling that no Certificate of Environmental Compatibility and Public Need is required for the construction, maintenance, and operation of a new 485 megawatt (MW) dual fuel combined-cycle electric generating facility at the existing Bridgeport Harbor Station located at 1 Atlantic Street, Bridgeport, Connecticut.	}	Connecticut
	}	Siting
	}	Council
		July 21, 2016

Opinion

Introduction

On March 9, 2016, PSEG Power Connecticut LLC (PSEG or Petitioner) pursuant to Connecticut General Statutes (C.G.S.) §16-50k and §4-176(a), submitted a petition (Petition) to the Connecticut Siting Council (Council) for a declaratory ruling that no Certificate of Environmental Compatibility and Public Need (Certificate) is required for the construction, maintenance, and operation of a 485 megawatt (MW) dual fuel combined-cycle electric generating facility at the existing Bridgeport Harbor facility site at 1 Atlantic Street, Bridgeport, Connecticut. The purpose of the proposed project is to develop and operate an independent power production facility in the wholesale electric power market operated by ISO New England, Inc. (ISO-NE). The proposed project is eligible for approval by declaratory ruling pursuant to C.G.S. 16-50k(a) because it is an electric generating facility that does not use nuclear materials or coal as a fuel and would be located at a site where an electric generating facility operated prior to July 1, 2004.

Specifically, Bridgeport Harbor Unit #1 (BHU #1), a coal-fired electric generating facility, became operational in 1957. A second coal-fired generating unit, Bridgeport Harbor Unit #2 (BHU #2), was added to the plant in 1961 and later converted to burn oil exclusively. BHU #1 and BHU #2 are no longer in service. Additionally, Bridgeport Harbor Units #3 and #4 were installed in the 1960s and are currently active units. Bridgeport Harbor Unit #3 (BHU #3) is a coal-fired steam unit with summer output of approximately 384 MW. Bridgeport Harbor Unit #4 (BHU #4) is a peaking combustion turbine that burns jet fuel and has a summer output of approximately 17 MW. The proposed generating unit would be identified as Bridgeport Harbor Unit #5 (BHU #5). The primary fuel would be natural gas. The secondary or backup fuel would be ultra-low sulfur distillate (ULSD).

ISO-NE conducts annual forward capacity auctions (FCA) to solicit electric capacity resources to ensure adequate electric supply to meet its anticipated needs for New England three years in advance in order to allow time for such resources to be developed. The latest FCA, known as FCA #10, was conducted on February 8, 2016. PSEG was notified on February 10, 2016 that the proposed project had been selected to provide both energy and capacity beginning June 1, 2019 consistent with the purchasing needs of ISO-NE. PSEG's summer capacity supply obligation under FCA #10 is 484.3 MW or very close to the proposed 485 MW.

Municipal Consultation and Environmental Justice

C.G.S. § 22a-20a and the Department of Energy and Environmental Protection's (DEEP) Environmental Justice Guidelines require applicants seeking a permit from DEEP or the Council for a new or expanded facility defined as an "affecting facility" to file an Environmental Justice Public Participation Plan (EJPPP). The proposed facility would be an "affecting facility" under C.G.S. §22a-20a because it would be an "electric generating facility with a capacity of more than ten megawatts." DEEP approved PSEG's EJPPP on August 15, 2014.

PSEG began its community and municipal outreach approximately 18 months prior to the filing of the Petition or approximately September 2014. On October 27, 2014, PSEG held a Public Information Meeting on the project at the Bijou Theatre at 275 Fairfield Avenue, Bridgeport.

PSEG also provided formal notice of its Petition to all abutting property owners, federal, state and local officials and agencies identified in the Regulations of Connecticut State Agencies (RCSA) § 16-50j-40(a).

On February 25, 2016, PSEG entered into a Community Environmental Benefits Agreement (CEBA) with the City of Bridgeport, Connecticut Coalition for Environmental and Economic Justice, the University of Bridgeport (UB), the South End Neighborhood Revitalization Zone Committee, the West Side/West End Neighborhood Revitalization Zone Committee, and the Black Rock NRZ. In the CEBA, PSEG made several commitments, including, but not limited to, ending commercial operation of BHU #3 by July 1, 2021 subject to receipt of permits and approvals for BHU #5. As a result of the cooperative communications and negotiations that resulted in the CEBA, the City of Bridgeport and the community groups confirmed that they do not oppose the proposed project.

Proposed Site

The site is located on an approximately 58.8-acre parcel of land located on Bridgeport Harbor, just south of Bridgeport's transportation center and ferry terminal. The proposed project site is located within an industrial zone (i.e. a combination of the Industrial-Heavy Zone and Industrial-Light Zone). The BHU #3 plant lies to the north of the proposed new BHU #5 power plant site. Directly to the west of the site is the 60 Main Street property, currently undergoing demolition. This was the former Remington Shaver factory site, which is now a planned 12.2-acre waterfront development site within a mixed use waterfront zone that has been re-zoned for 1,200 residential units, 75,000 square feet of commercial space, and a 200-slip marina. The first phase of development is anticipated to include 222 apartments and 14,500 square feet of commercial space in two 4-story buildings. To the west, across from 60 Main Street is the University of Bridgeport campus. Farther to the northwest of the proposed site is the Bridgeport Energy power plant owned by Emera. To the east are wetlands and the open waters of Bridgeport Harbor. There are no residences located within a 1,000-foot radius from the center of the proposed power plant site. All properties located within a 1,000-foot radius from the center of the proposed power plant are zoned industrial or mixed use.

The closest residence to the proposed facility is located at 146 Main Street, approximately 900 feet from the western property boundary of the BHU #5 site. However, the Council notes that the distance to the actual power plant development area would be approximately 300 to 400 additional feet.

The proposed power plant site contains four existing aboveground No. 6 fuel oil tanks. On February 4, 2016, PSEG filed a Notice of Exempt Modification (EM) to remove these four oil tanks and perform limited site remediation in accordance with DEEP requirements. The EM also contained the proposal to remove three small underground storage tanks and install a new aboveground 217,000-gallon fuel oil storage tank for BHU #3. The EM was acknowledged by the Council on March 1, 2016.

Proposed Project

PSEG's proposed BHU #5 facility would utilize a General Electric 7HA.02 combustion turbine that can operate on either natural gas or ULSD as a fuel. The facility would also have a heat recovery steam generator (HRSG) and steam turbine that would use the waste heat of the combustion turbine to generate more electricity (known as combined cycle operation) and boost the efficiency. Using the waste heat to generate more electricity brings the thermal efficiency of the plant from 42 percent for simple cycle to about 59 percent for the proposed combined cycle configuration.

In addition to thermal efficiency benefits, PSEG is proposing an air-cooled condenser (ACC) for water efficiency benefits. The ACC is a sealed or closed system that does not rely on evaporative cooling. Thus, there would not be water loss via a plume of steam from the ACC. The ACC would also eliminate surface water withdrawals or discharges associated with condenser cooling.

The proposed power plant would have a 300-foot exhaust stack with a diameter of approximately 21 feet. The proposed turbine building, HRSG building, and ACC would have heights of approximately 97, 125 and 125 feet above proposed site design grade, respectively. The proposed power plant would also have a 2 MW (electric) diesel backup generator that would be fueled by ULSD. The Council will require that the plans for containment measures in the event of generator fuel, oil, or coolant leakage be provided in the Development and Management Plan (D&M Plan).

The proposed power plant would have a retaining wall around its footprint that would reach a height of approximately 20 feet amsl. Existing access to the PSEG property would be utilized for the power plant project and would not need to be upgraded/improved. Parking areas and access within the plant's footprint would be bituminous concrete. The majority of the open areas of the power plant footprint would be gravel. The existing power plant property is already surrounded by a security fence. PSEG would maintain that existing fence. No new fence is proposed.

The proposed power plant project also includes rehabilitation of the existing approximately 50-year old fuel dock terminal facility, which was damaged during Storm Sandy on October 29, 2012. This dock rehabilitation would be intended to allow for future ULSD deliveries by barge. The existing oil dock was designed for oil tankers much larger than necessary to support the new facility, so the proposed rehabilitation of the existing dock would involve demolishing and removing portions of the existing timber walkways, rehabilitating existing platforms, piers, and mooring dolphins, constructing new walkways and upgrading and replacing existing fender units and mooring hardware. The Council will require that the final details of the fuel dock rehabilitation plans associated with this project be provided in the D&M Plan.

Water Usage

The proposed power plant would have a worst-case water consumption rate of 239 gallons per minute (GPM) when operated at full load on natural gas. The proposed power plant would have a worst-case water consumption rate of 818 GPM when operated at full load on ULSD. Water consumption is higher under ULSD due to emissions controls. Aquarion Water Company (AWC), the local water utility, would supply the facility's water requirements. PSEG has consulted with AWC and confirmed availability of sufficient water to supply the plant.

The demineralized system wastewater discharge rate would range from 10 GPM to 25 GPM under natural gas operation and 160 to 200 GPM when operating on ULSD. Sanitary wastewater would be about 2 GPM. Wastewater would be discharged to the Bridgeport Water Pollution Control Authority facility. The Council will require that a copy of any applicable wastewater discharge permit through the City of Bridgeport and/or DEEP be submitted prior to construction.

Natural Gas

The Southern Connecticut Natural Gas Company (SCG) operates an existing high pressure natural gas lateral pipeline connection adjacent to the proposed site. The lateral pipeline terminates at the Emera Bridgeport Energy power plant at 10 Atlantic Street. This existing pipeline is capable of delivering natural gas for the proposed project via a new take-off connection using a high-pressure natural gas service lateral line. PSEG is negotiating appropriate natural gas service agreements with SCG. The proposed power plant would require

on-site compression to raise the pressure of the natural gas. The Council will require that the final design and location of the gas compressor building would be included in the D&M Plan.

ULSD

The Council notes that the project would have 5,500,000 gallons of ULSD on site via an aboveground storage tank. This is approximately a 10-day supply, which is double the 5-day supply suggested by DEEP. The Council believes that the extra ULSD storage is prudent in the event of a prolonged natural gas supply curtailment. The Council will require that PSEG submit its final plans for containment in the event of an ULSD leak in the D&M Plan.

Air Quality

The proposed power plant will have state-of-the-art air quality emissions control technology, including Dry Low oxides of nitrogen (NO_x) burners, water injection, and selective catalytic reduction (SCR) to further reduce NOx emissions and an oxidation catalyst to reduce carbon monoxide (CO) and volatile organic compound (VOC) emissions. The proposed project would employ an exhaust stack design to reduce potential ground-level air quality impacts to comply with all applicable state and National Ambient Air Quality Standards (NAAQS).

PSEG would obtain its Air Permits from DEEP. PSEG filed its Prevention of Significant Deterioration (PSD) Pre-Construction Permit Application on November 13, 2014, which is currently being revised. In October 2016, PSEG will file an application to renew the Bridgeport Harbor Station Title V permit, including applications for a Clean Air Interstate Rule Permit and renewal of the Bridgeport Harbor Station Acid Rain Permit. The Council will require that PSEG submit a copy of its final DEEP air permit(s) to the Council prior to construction.

The proposed project would align with the goals of the Connecticut Global Warming Solutions Act (by reducing carbon dioxide emission at the site compared to the baseline specified in the Act (both 1990 and 2001 baselines) through the increased fuel efficiency of the technology used, the selection of natural gas as the primary fuel and the retirement of BHU #3.

The permanent shutdown of the coal-fired BHU #3 and the addition of the proposed BHU #5 will result in emissions reductions for NO_x, sulfur dioxide (SO_2), particulate matter ten micrometers or less (PM_{10}), CO, and VOCs on both a tons per year basis and also on a pounds per MW-hour basis. For the purposes of such comparison, PSEG has made appropriate adjustments to the capacity factor of BHU #3 (to convert to 80 percent) in order to ensure an "apples to apples" comparison with the proposed BHU #5. With respect to the pounds per MW-hour analysis, PSEG based this analysis on projected average ULSD operation time and typical natural gas operation parameters. The Council finds these assumptions to be reasonable and believes that BHU #5 will have a net environmental benefit in terms of reduced air emissions over BHU #3.

Aqueous ammonia would be used to reduce NO_x emissions. The proposed facility would have an aqueous ammonia storage tank with an approximate capacity of 20,000 gallons of 19 percent ammonia solution. The tank would be located within a containment area as required by applicable codes. To ensure employee safety, employees would be informed of any hazards associated with ammonia storage and handling. The Council will require that PSEG's final ammonia safety measures be provided in the D&M Plan.

Hydrogen would be used to cool the generators. PSEG would include proper design and training measures relative to the use and storage of hydrogen. The Council will require PSEG's final safety measures relative to hydrogen be provided in the D&M Plan.

PSEG would not use natural gas to clean the gas pipelines. An inert gas would be used. In addition, PSEG would comply with the recommendations and conditions relative to Council Docket No. NT-2010. The Council will require that PSEG submit its final plans to comply with Docket No. NT-2010 including but not limited to its emergency response plan.

Electrical Interconnection

The proposed facility would have two on-site step-up transformers (one for the combustion turbine generator and one for the heat recovery steam turbine generator) to boost the voltage to 345-kV before leaving the plant. The transformers would have a dielectric fluid that would not contain polychlorinated biphenyls (PCBs). Notwithstanding, the Council will require that PSEG submit its final plans for containment in the event of a dielectric fluid leak.

A single-circuit underground 345-kV generator lead line (about 800 feet long) will run along the northern side of Henry Street connect the proposed power plant to UI's Singer Substation. The worst-case magnetic field level, under peak load conditions and directly over the centerline of the line, would be 132 milligauss (mG). However, the Council notes that this far below the International Commission on Non-ionizing Radiation Protection acceptable exposure level of 2,000 mG for the general public as recognized in the Council's "Electric and Magnetic Field Best Management Practices for the Construction of Electric Transmission Lines in Connecticut." In addition, it would not impact the existing magnetic field levels at the nearest residential structure.

UI will have to make some equipment installations/upgrades inside Singer Substation to accommodate PSEG's interconnection. UI is willing to submit an Energy Exempt Modification or Petition for Declaratory Ruling on or about the time that PSEG files its D&M Plan. The Council will evaluate UI's equipment installations/upgrades at Singer Substation when UI files such materials.

Wildlife

No negative impacts to State-listed species are expected to occur as a result of the proposed project. The roseate tern, a federally-listed Endangered species of seabird, has the potential to occur in the project area. However, the Bridgeport Harbor power plant site is not nesting habitat for roseate terns. The construction and operation of the proposed power plant facility is not expected to adversely impact the breeding or foraging for roseate terns because essentially all project elements are landward of the high tide line. Work in the vicinity of the water such as the oil dock rehabilitation is not expected to disrupt the feeding behavior of the roseate tern.

U.S. Fish and Wildlife Services (USFWS) Migratory Birds, including birds of Conservation Concern, have the potential to occur at the proposed power plant site. However, the site lacks significant forage or habitat within its footprint. In addition, the Council notes that the nearest Important Bird Area as identified by the National Audubon Society is Stratford Great Meadows area, approximately 1.3 miles away from the proposed BHU #5 site.

Osprey are present in the vicinity of the site, with intermittent nesting on or near waterfront structures, including the oil dock. Prior to commencement of construction, PSEG would consult with DEEP to avoid or minimize impacts to any nesting ospreys near the site and on the oil dock, including the potential for taking mitigating actions.

No wildlife species in the adjacent wetland are expected to be impacted by the proposed project.

Flood Elevation

PSEG has designed its plant to an elevation of approximately 16.5 feet above mean sea level (based on the current sea level), which is above the current 100-year and 500-year flood elevations. (In addition, the plant's proposed retaining wall would have an elevation of at least 20 feet amsl.) This proposed plant elevation is conservative relative to the federal Quadrennial Energy Review projected sea level rise of roughly 2.7 feet by 2060 (or close to the 40-year projected service life of the plant from the proposed activation in 2019). Approximately 160,000 cubic yards of clean (i.e. non-contaminated) fill would be brought to the site to develop the proposed power plant project.

According to DEEP Comments, the Connecticut Department of Housing has received a Natural Disaster Resilience award from the U.S. Department of Housing and Urban Development towards the development of flooding resiliency measures in the project neighborhood of Bridgeport. This includes elevating University Avenue to create an access/egress route that would connect to Park Avenue and provide safe access during significant coastal flooding events. This also includes constructing a flood protection berm from the rail viaduct at Ferry Access Road southward to tie into the high ground of the PSEG plant site and the berm to be constructed as part of the 60 Main Street development. The Council notes that PSEG should consider how this might impact their flood mitigation plans and take into account such impacts, if any, in the D&M Plan.

Visibility

While the proposed plant would be visible, it is not expected to be visually out of character or out of proportion with the existing Bridgeport Harbor units or other energy infrastructure in the area. The tallest structure at the existing Bridgeport Harbor site is a 498-foot red/orange and white stack on BHU #3. The proposed BHU#5 would have a significantly shorter 300-foot gray stack, which is the minimum required height to ensure that particulate matter 2.5 micrometers or less ($PM_{2.5}$) impacts remain less than the Significant Impact Level. The Council notes that the proposed stack would have a smaller visibility area on land than the existing stack. Specifically, within a 2-mile radius, the visibility area would decrease from 1,188 acres to 983 acres. This is a decrease of about 17 percent. In addition, the Council believes that the plain gray color will have less visual impact than the alternating red/orange and white configuration. PSEG is able to avoid the alternating color configuration and still comply with FAA aviation safety requirements by utilizing lighting. White lighting would be used during the day and red lighting would be utilized at night. The Council will require that the final FAA lighting plan for the stack be included in the D&M Plan.

PSEG has not yet completed its lighting plan for the power plant footprint. However, its lighting design is not expected to significantly impact the surrounding community. The Council will require that the final lighting plan for the power plant footprint and details about how the design would minimize impacts on off-site properties be included in the D&M Plan.

The proposed rehabilitation of the oil supply dock would have about 40 percent fewer walkways, be similar to the existing dock, and would result in some improvements in appearance. The dock repairs would not adversely impact existing views.

Other Environmental

The proposed project is expected to meet DEEP noise regulations at surrounding noise receptors. Noise associated with construction is exempt per DEEP noise regulations.

Approximately 39 trees with a diameter of at least six inches would be removed to construct the facility. These trees are located in the developed portion of the site, which is not currently forested. DEEP has confirmed that at least three of the existing trees are already dead.

The closest wetland is located approximately 28 feet to the east of the limits of construction. However, PSEG would utilize appropriate soil and sedimentation control measures to prevent loose sediment form entering the wetland area. The Council believes that this is prudent and will require a final Erosion and Sedimentation Control Plan (E&S Control Plan) consistent with the *2002 Connecticut Guidelines for Erosion and Sedimentation Control* and protective of nearby wetlands be submitted as part of the D&M Plan.

The Council will also require that the PSEG consider possible stormwater impacts to wetlands in its final stormwater design and avoid or minimize direct stormwater discharges into wetlands. The Council will require a final stormwater design plan consistent with the *2004 Connecticut Stormwater Quality Manual* and protective of nearby wetlands be included in the D&M Plan.

The Council will also require that PSEG provide, in the D&M Plan, the status of remediation of the fuel oil storage tank area and remaining remediation work and indicate which areas of contamination would be rendered inaccessible by constructing on top of such soils. Specifically, the D&M Plan should also include a demarcation layer marking the location of any areas of contaminated soil.

The project is not expected to impact water quality. Specifically, site development would occur outside of wetland areas, and wetlands would be protected via the E&S Control Plan and the stormwater design plans. Furthermore, the site is not located within a DEEP-designated Aquifer Protection Area. The proposed plant would not discharge to groundwater nor adversely impact groundwater.

Accordingly, PSEG (through its consultant) performed a plume analysis according to the Federal Aviation Administration (FAA) recommendations and the Connecticut Airport Authority's request. FAA's standard ceiling for pilots is 2,000 feet in congested areas such as Bridgeport. The Council has reviewed the plume analysis print-outs and notes that, at an altitude of 2,000 feet, the worst-case risk of severe turbulence is on the order of a 10^{-5} probability for the light sport aircraft. This is equivalent to a 1 in 100,000 event. This worst-case risk at the typical ceiling height is approximately the same for natural gas operation of BHU #5, ULSD operation of BHU #5, and the existing coal-fired operation of BHU #3, all under full load conditions. Thus, the proposed project is not expected to increase the risk under this scenario as compared to the existing power plant.

Finally, the Council notes that, on September 24, 2015, FAA issued a memorandum referencing a change to the Aeronautical Information Manual (AIM) made on July 24, 2014. The change updated terminology and provide more detail regarding the associated hazards of exhaust plumes. In addition, in order to retain a current license, all aircraft pilots are required to complete a Biennial Flight Review. This two-year refresher training includes both classroom and flight time and is intended to ensure that all pilots remain aware of regulatory and other information in the AIM. Therefore, all pilots who hold current licenses are expected to be aware of the potential risks of flying in the vicinity of exhaust plumes by the end of July 2016.

Finally, the Council notes that, with the retirement of the approximately 384 MW BHU #3 and the addition of the proposed approximately 485 MW BHU #5, the net summer power output increase after July 1, 2021 would be close to 100 MW. While BHU#5 is a larger plant than BHU #3 in terms of generating capacity, because the proposed project was selected in the ISO-NE FCA #10, it will be needed by ISO-NE for New England electric reliability.

Decommissioning

PSEG anticipates commencing site construction for the proposed power plant on or about March 2017 with start-up testing and commissioning in August 2018 and achieving commercial operation by June 2019. PSEG is required to achieve commercial operation by June 1, 2019 because of its obligation to ISO-NE under FCA #10 results.

The Council notes that PSEG has an obligation to ISO-NE to deliver capacity and energy from BHU #3 through 2020. However, given that PSEG has committed to ending commercial operation of BHU #3 by July 1, 2021 (subject to securing all required permitting), PSEG has agreed to work with the City of Bridgeport on a joint planning study to explore how the development and/or reuse of the remainder of the site, including any schedule for partial or complete deconstruction of BHU #3 can reinforce City and community objectives for the South End section of the City. The deconstruction plans for BHU #3 are not part of the Council's instant Petition, nor did the Council certificate the facility, but nevertheless, the Council is pleased with PSEG's cooperation with the City of Bridgeport, surrounding neighbors and the community to address the aesthetics and other impacts associated with a nearly 48-year old coal-fired power plant to be removed from service.

The Council will require that a Decommissioning Plan for BHU #5 be filed as part of the D&M Plan. The Decommissioning Plan is a contingency plan in the event that BHU #5 is permanently taken out of service. For example, if the plant is permanently shut down and not repowered with a new generator configuration (i.e. ceases use as an electric generating facility), the Decommissioning Plan on file with the Council would contain plans to remove plant infrastructure and restore the site.

Conclusion

Based on the record in this proceeding, the Council finds that there would be no significant adverse environmental effect associated with the construction of 485 MW combined-cycle natural gas and ULSD-fueled facility in Bridgeport to be located at the site of the existing Bridgeport Harbor facility that has been operated prior to July 1, 2004. The project would have no adverse environmental effect on air or water quality: it would meet all applicable DEEP Ambient Air Quality Standards and Water Quality Standards. Accordingly, the Council will issue a Declaratory Ruling that no Certificate of Environmental Compatibility and Public Need is required for this project.