

**PINELANDS COMPREHENSIVE MANAGEMENT PLAN
COMPLIANCE STATEMENT**

**SOUTH JERSEY GAS
PIPELINE RELIABILITY PROJECT**

May 21, 2015

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I. EXECUTIVE SUMMARY

South Jersey Gas Company (“SJG”) proposes to construct a 22-mile, 24-inch high pressure natural gas pipeline, approximately 10-miles of which would traverse the Pinelands Forest Area beneath the roadway or cleared shoulder of State Route 49 (the “Project”). The Project, which entirely is located within the “Pinelands,”¹ has two purposes. First, it is intended to provide natural gas service to BL England—the only electric generation plant located either in the Pinelands or in the southeastern coastal region of the State—thus eliminating coal firing and associated emissions at the plant. Second, it is intended to reinforce SJG’s existing infrastructure in the Pinelands, greatly reducing the potential for a loss of service to 28,500 Pinelands customers and 142,000 customers overall in Cape May and Atlantic Counties. A convergence of needs and opportunities has merged into a single project the ability to serve two long-standing and vital interests of the people of Cape May and Atlantic Counties: eliminating the combustion of coal at BLE, a critical electricity provider to the Pinelands region, and ensuring a more resilient natural gas distribution system in a coastal region vulnerable to flooding and damage by tropical storms and Nor’easters. In sum, the Project directly serves the needs of people living within the Pinelands, who like all of us, depend upon safe, reliable and clean electricity and natural gas service for powering and heating their homes and businesses.

Since the January 2014 tied vote on the Memorandum of Agreement (“MOA”) that would have approved the Project, SJG has re-evaluated the Project to respond to comments and issues raised during the MOA process and to account for important changes in the circumstances surrounding BLE’s operation. First, SJG undertook a comprehensive re-examination of Project alternatives, which concluded that every alternative requires construction in the Forest Area and that the proposed route has the least environmental impacts, by far, and therefore is the only practicable alternative to meet the Project needs. The New Jersey Department of Environmental Protection (“NJDEP”) recently concurred with this finding based upon its own review of all of the available information. Second, SJG has redesigned the Project to reduce impacts to the Forest Area by relocating the interconnect station to a parcel outside the Forest Area and by eliminating more than three miles of “open cut” pipe installation. These modifications will significantly reduce roadside disturbances in the Forest Area along Route 49. Third, SJG is publishing herewith its formerly confidential natural gas supply agreement with BLE’s owner, RC Cape May Holdings, LLC (“RCCM”), which requires SJG to use the entire capacity of the pipeline to provide an uninterrupted supply of natural gas to BLE on at least 350 days per year. The contract shows that the pipeline will be used to supply the plant at least 95 percent of the time. In fact, the pipeline will only be used to serve customers outside the Pinelands in the rare event of a system upset. Fourth, PJM Interconnection, LLC (“PJM”) has concluded that absent significant electric transmission system upgrades, the continued operation of BLE is vitally important to electric reliability in the Atlantic City Electric (“ACE”) service territory, which covers 39 out of the 55 Pinelands municipalities having a combined population of 638,000 people. In sum, the Project modifications coupled with this new information establishes that the proposed pipeline will be used to supply BLE, a business in the Pinelands, at least 95 percent of the time, will help maintain electric reliability for 638,000 people living in the Pinelands, and will have the least environmental impact of any of the eight alternatives.

The Forest Management Area use standards of the Pinelands Comprehensive Management Plan (“CMP”) permit the construction of public service infrastructure in the Forest Area—including a natural gas pipeline—if it is “intended to primarily serve the needs of the Pinelands” in accordance with N.J.A.C. 7:50-5.23(b)12. This standard does not require an applicant to show that the public service infrastructure is “necessary” to serve the needs of the Pinelands, nor that such infrastructure “solely” serves the Pinelands. Rather, the standard requires a showing that such infrastructure “primarily serves” the Pinelands; thus, public service infrastructure that primarily serves a Pinelands use while additionally benefiting areas outside the Pinelands still conforms to the CMP because its main purpose is to serve a use within the Pinelands. Here, the main usage of the pipeline is to provide natural gas service to a Pinelands customer, BLE. This conclusion is supported by the fact that SJG’s enforceable agreement to supply gas

¹ See N.J.A.C. 7:50-2.11, defining the term “Pinelands” to mean the Pinelands National Reserve and the Pinelands Area.

to BLE through the pipeline requires the entire capacity of the pipeline to be dedicated to the service of BLE at least 350 days/year, or 95 percent of the time, thereby enabling the plant to provide the necessary electricity and capacity to serve the electric reliability needs of 638,000 Pinelands residents while also slashing its air pollution emissions. In fact, the pipeline will only serve customers outside the Pinelands during an emergency circumstance. For these reasons, the Project conforms fully with Forest Management Area use standards and does not require a MOA or any other waiver of the CMP, although the underlying facts supporting the need for the Project also clearly would satisfy the standards for a compelling public need.

II. PRIOR PROCEEDINGS

On April 17, 2012, SJG attended a pre-application meeting with Pinelands Commission staff to discuss the Project. At the meeting, the Director of Regulatory Programs reviewed the minimum standards governing the distribution and intensity of development and land use in Forest Areas, including the requirements of N.J.A.C. 7:50-5.23(b)12, which permits public service infrastructure in the Forest Area if it is “intended to primarily serve the needs of the Pinelands.” The Director acknowledged that utility lines are an acceptable use in the Forest Area if they are primarily (at least 51%) intended to serve the Pinelands (this includes the Pinelands National Reserve). See *Letter from Ewing to Horner*, April 27, 2012. (attached hereto as **Exhibit 1**). The Director instructed SJG that to satisfy this requirement, it must be shown that at least 51% of the electric output from BLE would serve the Pinelands after the Oyster Creek nuclear plant retires in 2019. *Ibid*.

Shortly thereafter, SJG provided Staff with a detailed demonstration of compliance with N.J.A.C. 7:50-5.23(b)12. See *Letter from Fontaine to Horner*, June 18, 2012. (attached hereto as **Exhibit 2**). The letter stated that “the public service infrastructure needed for the repowering project is intended to serve the needs of a Pinelands facility” and further explained why the Project also would serve several additional economic and environmental needs of the Pinelands, including:

- economic needs of Pinelands residents and businesses, which will consume the majority of the electricity from BLE over its useful life;
- economic and community needs of a substantial Pinelands employer and its host municipality, which derives significant property tax and host fee revenue from the continued operation of BLE which pays for essential services to the community; and
- environmental needs of the Pinelands, which long has been impacted by air pollution associated with the BLE.

The letter attached a written report prepared by a well-qualified energy analyst, Power Grid Engineering & Markets (“PowerGEM”), which concluded that BLE would supply about 65 percent of its output to residents and businesses within the Pinelands after the closure of the 615 MW Oyster Creek nuclear plant in 2019. See PowerGEM, “Benefit to Pinelands Area of BL England Repowering,” (May 29, 2012) (attached hereto as **Exhibit 3**). PowerGEM later updated its report in October 2013 to reflect that 200 MW of peaking generation units in the coastal zone between Ocean and Cape May Counties would retire in 2015 which would increase the amount of BLE’s electricity consumed within the Pinelands to 86 percent after the retirement of the Oyster Creek nuclear power plant in 2019 (see discussion, Part IV.A.1., *infra*).

On July 23, 2012, in response to a request from Pinelands staff, SJG submitted an Application for Development to the Pinelands Commission, which included the required application fee of \$18,699. On July 26, 2012, SJG met with the Executive Director and Director of Regulatory Programs to discuss the application. The Executive Director advised that it had been decided based upon discussions with staff and Commissioners that the application was not fully compliant with N.J.A.C. 7:50-5.23(b)12 and therefore that the Project would have to be approved as a “public development” project under the Memorandum of Agreement (“MOA”) procedures under the CMP.

Reference was made to the Commission's long-held precedent of approving public utility projects through the MOA process, including a 2004 MOA with the New Jersey Board of Public Utilities ("BPU") authorizing ACE to construct a new 55-mile 230 kV electric transmission line from the Oyster Creek nuclear power plant to the Cardiff substation in Egg Harbor Township. See Memorandum of Agreement Between the New Jersey Pinelands Commission and the New Jersey Board of Public Utilities, (September 13, 2004) (attached hereto as **Exhibit 4**). The MOA was necessary to authorize ACE to construct a 17.5 mile segment of the new transmission line through the Pinelands Preservation Area and the Forest Area. In support of the 2004 MOA, the Commission cited "a critical need for additional electric transmission capacity in the eastern part of the Atlantic Region, especially in the southern New Jersey region... identified by both the PJM and Atlantic Electric...in the event that sufficient local generation is not available to meet the demands of local customers, sufficient bulk transmission capacity must be available to deliver energy from other parts of the PJM system to those customers during peak load conditions..." *Ibid.* at 1 & 4. The Commission approved² the ACE transmission line project as a "public service infrastructure," "public development" project³ through the MOA provisions of the CMP, in exchange for ACE paying \$13,000,000 to the "Pinelands Conservation Fund," a source of funds to pay for Commission programs, including the acquisition of land, environmental improvement measures, smart growth initiatives, and research, planning and conservation projects. *Ibid.*, Section II.C., p. 5-6. At the time of SJG's initial application for the pipeline Project, the Pinelands Conservation Fund was nearly depleted and the Commission was running out of funds to for its land acquisition program. See *Final Report: Land Acquisition Program of the Pinelands Conservation Fund*, (January 2014).

Following the July 26, 2012 meeting, by letter dated August 23, 2012, staff advised SJG that

In a Forest Management Area, the CMP permits public service infrastructure intended to primarily serve only the needs of the Pinelands. Based upon currently available information, it has not been demonstrated that the proposed gas main meets this requirement. Ongoing discussions are occurring between the applicant and our staff regarding the prospects for a Memorandum of Agreement (MOA) to permit the development of the gas main in a Pinelands Forest Area.

Letter from Ellis to Ewing, August 23, 2012. (attached hereto as **Exhibit 5**).

On June 28, 2013, the Commission's Policy & Implementation ("P&I") Subcommittee convened the first of ten (10) meetings over a 6 month period of either the full Commission or the Subcommittee at which public commentary was taken on the MOA.⁴ Throughout this process, at the request of Commission staff, SJG submitted supplemental information on various issues identified by Commissioners and members of the public.

² Interestingly, the Commission did not require ACE to relocate the transmission line to an available right-of-way on the eastern side of the Garden State Parkway, which was outside the State-protected Pinelands area. This alternative ROW would have impacted on more residential properties. See *In the Matter of Petition of Atlantic City Electric Company for the Right to Exercise the Power of Eminent Domain Pursuant to N.J.S.A. 48:3-17.6*, Docket No. A-6069-03T5 (App. Div..2006) (unpublished opinion).

³ While the CMP defines "public service infrastructure" as "sewer service, gas, electricity, water, telephone, cable television and other *public utilities developed linearly*, roads and streets and other similar services *provided or maintained by any public or private entity...*," it does not define "public development." See N.J.A.C. 7:50-2.11 Definitions (emphasis added). However, "public development" is a defined term under NJDEP's Coastal Permit Program rules and they include an "underground pipeline designed to transport petroleum, natural gas, or sanitary sewage, and a public facility..." and expressly state that "[p]ublic development" does not have to be publicly funded or operated." See N.J.A.C. 7:7-1.3 Definitions. The NJDEP Coastal Permit Program rules apply to pipelines, predate the CMP and are meant to be consistent with the CMP. See, Memorandum of Agreement Between the Department of Environmental Protection and the Pinelands Commission (1988).

⁴ These took place on July 26, 2013, August 28, 2013, September 13, 2013, September 24, 2013, October 11, 2013, October 23, 2013, November 22, 2013, December 4, 2013, December 13, 2013, and January 6, 2014. The Commission also convened a public hearing on December 9, 2013.

On January 4, 2014, the Executive Director made extensive written findings of fact in her *“Report on a Proposed Memorandum of Agreement Between the New Jersey Pinelands Commission and the New Jersey Board of Public Utilities Regarding Construction of a Proposed Approximately 15 Miles of a 22-Mile, 24-Inch Natural Gas Pipeline in the State Designated Pinelands Area,”* (January 3, 2014) (*“Findings of Fact”*) (attached hereto **Exhibit 6**).⁵ According to the *Findings of Fact*, Commission staff determined that while a pipeline to serve BLE would comply with N.J.A.C. 7:50-5.23(b)12, once the pipeline is interconnected to SJG’s existing distribution system, it no longer would primarily serve the needs of the Pinelands, because theoretically it could be used to serve more customers outside of the Pinelands than inside the Pinelands. The Executive Director explained her reasoning in multiple passages:

given that the proposed pipeline was intended to serve customers located both inside (BLE Plant) and outside (customers in the non-Pinelands portions of Cape May and Atlantic Counties) of the Pinelands, staff determined that the proposed pipeline development was not consistent with the Forest Area land use standards (Subchapter 5) of the Pinelands CMP.

Executive Director’s Findings of Fact, p. 2 (emphasis added).

given that the proposed pipeline is intended to serve customers located both inside and outside of the Pinelands, the project does not primarily serve only the needs of the Pinelands. As a result, the proposed pipeline is not fully consistent with the permitted use standards for a Forest Area.

Ibid, p. 3 (emphasis added).

Contrary to what many believe, public service infrastructure is permitted to be constructed in the Forest Area if such infrastructure is intended to primarily serve only the needs of the Pinelands generally, this includes both the state designated Pinelands Area and the Pinelands National Reserve. As noted above in the Findings of Fact, the BLE Plant is located within the Pinelands National Reserve. As a result, the construction of a pipeline in a Forest Area to serve the BLE Plant only, would have been consistent with Forest Area land use standards of the CMP. *It is because the proposed pipeline was also intended to serve customers within SJG’s service area in Cape May and Atlantic Counties, the majority of which do not reside within the Pinelands, that Commission staff made the determination that the proposed pipeline was not fully consistent with N.J.A.C. 7:50-5.23(b)12 and consideration of this MOA became necessary.*

Ibid, p. 12 (emphasis added).

[G]iven that the BLE Plant is located within the Pinelands PNR, not only is it appropriate for the Commission to consider the repowering of the BLE Plant, *but as discussed above, absent the need for the redundancy line, construction of a pipeline solely to repower the BLE Plant would have been consistent with the Forest Area land use standards at N.J.A.C. 7:50-5.23(b)12, given the pipeline would primarily only serve the needs of a Pinelands business. (See N.J.A.C. 7:50-2.11 that defines the term “Pinelands” to mean the Pinelands National Reserve and the Pinelands Area.)*

Ibid, p. 14 (emphasis added).

Although not strictly compliant with this standard, the project does comply in part. The proposed pipeline is intended to serve a business located within the Pinelands, the BLE Plant. *In addition, the pipeline will also provide redundant service to the approximately 142,000 SJG customers located east and south of the Union Road Station, 28,700 of which are located in the Pinelands*

⁵ SJG hereby incorporates by reference these Findings of Fact.

Area. It is evident that the proposed project will serve the needs of the Pinelands. That level of service, however, was not sufficient to constitute intent to primarily serve only the needs of the Pinelands.

Ibid, p.15 (emphasis added).

The CMP permits public service infrastructure in a Forest Area where it is intended to primarily serve only the needs of the Pinelands. The proposed project serves two purposes; the repowering of the BLE Plant from coal to natural gas and the provision of redundant natural gas supply to SJG customers in Atlantic and Cape May Counties. While the BLE Plant is located in the Pinelands, the majority of customers to benefit from the redundancy in gas supply are located outside the Pinelands. As such the project is not fully consistent with the land use standards of the Pinelands CMP.

Ibid, p. 41 (emphasis added).

On January 10, 2014, the full Commission voted on the MOA. Seven Commissioners voted to approve the MOA and seven voted against it. The Commission's by-laws require eight affirmative votes for any Commission action and therefore the MOA did not pass.

III. NEW INFORMATION & PROJECT MODIFICATIONS

Since the Commission's tied-vote on the MOA, several new developments have emerged that place the Project in a different light. First, SJG has redesigned the project to further minimize its environmental impact by relocating the interconnect station outside the Forest Area and by eliminating about three miles of open-cut trenching inside the Forest Area. Second, SJG is herewith publishing its confidential natural gas supply agreement with RCCM which makes clear that customers outside of the Pinelands will rarely be served by the pipeline. The contract requires that the proposed pipeline serve BLE at least 350 days per year, thus demonstrating that based upon the overwhelming amount of usage it is "intended to primarily serve" BLE. Moreover, the pipeline will serve outside the Pinelands on even rarer occasions when a system upset occurs. Third, both PJM and NJDEP have concluded that absent significant electric transmission system upgrades the continued operation of BLE is necessary to protect electric reliability inside the Pinelands. Fourth, a comprehensive re-evaluation of Project alternatives, confirmed by NJDEP, shows that the Route 49 route is the most viable alternative which will clearly have the least environmental impact of any of the seven alternative routes.

A. Reduction of Forest Area Impacts

Since the January 2014 vote on the MOA, SJG has redesigned the project to further minimize its environmental impacts to the Forest Area by relocating the interconnect station outside the Forest Area and by eliminating about three miles of open-cut trenching inside the Forest Area.

In the original application, the interconnect station would be located on a 10,000 square foot wooded parcel (Block 358, Lots 11-14) in Upper Township, Cape May County, within the Forest Area. The wooded parcel would be cleared and covered with 7,900 square feet of crushed stone on which the interconnect station would be located. The revision moves the interconnect station outside the Forest Area, approximately 900 feet north of the previous location. The new location is Block 350, Lot 12 in Upper Township, Cape May County within a Pinelands Village. The new location is adjacent to Mt. Pleasant –Tuckahoe Road and will be located on existing maintained lawn between the Upper Township public works facility and the old Municipal building. The new interconnect station layout provides a buffer adjacent to Mt. Pleasant –Tuckahoe Road. Construction of the station would only require the removal of one tree. A new stormwater management plan has been prepared for this site and is included in this revision.

In the original application, SJG intended to rely predominantly on the "open-cut" trench method of pipeline installation, which is the traditional and most popular method for pipeline installation. It consists of the excavation of a trench and the manual installation of each piece of pipe. A disadvantage of this method is that while it may be cheaper it requires excavation of soils, which must be carefully managed. SJG revised the project design to include 23 additional horizontal directional drills ("HDDs") in areas of shallow groundwater which will reduce surface area disturbance and potential adverse environmental impacts associated with roadside land disturbance in sensitive areas both within the State Pinelands Area and in the Coastal area. The 23 additional HDDs total 22,034 linear feet (4.17 miles). This will reduce roadside disturbance by 16,904 linear feet within the State Pinelands area along the same route.

The following is a summary of the reduction in open cut pipe installation in each of the Pinelands Planning Areas:

Open Cut Pipe Installation:

Forest Planning:	reduced by = 63%
Pinelands Village:	reduced by = 59%
Rural Development:	reduced by = 35 %

This modification is projected to reduce the area of disturbance along the project route by 11.6 acres and to eliminate the need to excavate about 18,782 cubic yards of soil, roughly the equivalent of 1,000 dump trucks worth of soil. The enclosed plans clearly show the location of the additional HDDs and the relocation of the interconnect station.

B. BLE Will Be Served By the Pipeline on At Least 350 Days Per Year

Since the January 2014 vote on the MOA, SJG has released its confidential 20-year contract to supply natural gas to BLE. See "Standard Gas Service Agreement-Firm Electric Service Agreement between South Jersey Gas and RC Cape May Holdings, LLC" ("FES Agreement") (attached hereto as **Exhibit 7**). The FES Agreement requires SJG to use the pipeline to supply natural gas to BLE on at least 350 days per year, which means that the pipeline will be used to supply gas to the facility at least 95 percent of the time. The FES Agreement was approved by the BPU on April 13, 2013 (BPU Docket No. GO13020052) (attached hereto as **Exhibit 8**).

Under the terms of the FES contract, SJG is required to use the pipeline to provide firm gas service to BLE on at least 350 days per year. Redundancy service to other customers is strictly limited to not more than 15 days per year, or during an emergency, such as an outage to the existing supply infrastructure to Cape May County. In fact, while the FES Agreement allows SJG a limited right to interrupt service to BLE, SJG's modeling indicates that the pipeline will not be needed to serve customers other than BLE for at least 10 years, and even then such service could not exceed 15 days/year, except during an emergency situation. Thus, only in the event of an emergency loss of service to the existing pipeline serving Cape May and Atlantic Counties would the proposed pipeline be used to serve customers other than BLE.

C. NJDEP and PJM Both Have Concluded That Absent Significant Transmission System Upgrades Continued Operation of BLE is Necessary for Electric Reliability

Since the January 2014 vote on the MOA, both NJDEP and PJM have concluded that absent significant electric transmission system upgrades, continued operation of BLE is necessary for electric reliability.

On July 11, 2014, NJDEP extended the operational life of the plant an additional two years because the facility is "is strategically vital for energy reliability in the southern New Jersey region, and DEP, in consultation with BPU, has determined that B.L. England should continue to operate beyond May 1, 2015, for a limited time period to assure that the region's power and reliability needs are not jeopardized." See NJDEP, *In the Matter of RC Cape May Holdings, LLC, Administrative Consent Order Amendment*, (July 11, 2014) ¶ 8 (attached hereto as **Exhibit 9**).

On July 22, 2014, PJM determined that deactivation of all of the generation at B.L. England without significant investments in transmission system upgrades “will have an adverse impact on the reliability of the transmission system...[resulting in] a number of thermal and voltage reliability criteria violations primarily on the 138 kV and 69 kV systems in Atlantic City Electric.” See PJM, 2014 Regional Transmission Expansion Plan, Transmission Plan Proposed for Approval to Proceed with Construction Related to the 2014 Baseline Regional Transmission Expansion Plan, Presented by PJM Staff to the Board Reliability Committee (July 22, 2014) (attached hereto as **Exhibit 10**). PJM identified a number of transmission system upgrades that would be necessary to address the potential thermal and voltage violations:

- Install new Dennis 230/69 kV transformer, environmental work –\$15.2 M
- Upgrade 138 kV and 69 kV breakers at Corson substation – \$0.8 M
- Reconductor 2.74 miles of Sherman - Lincoln 138 kV line and associated substation upgrades - \$4.22 M
- New Orchard - Cardiff 230 kV line (remove, rebuild and reconfigure existing 138 kV line) and associated substation upgrades - \$69.25 M
- New Upper Pittsgrove - Lewis 138 kV line and associated substation upgrades - \$7.23 M
- Relocate Monroe to Deepwater Tap 138 kV to Landis 138 kV and associated substation upgrade - \$0.57 M
- New Landis - Lewis 138 kV line and associated substation upgrades - \$31.03 M
- New Cardiff - Lewis #2 138 kV line and associated substation upgrades - \$11.26
- Install a 100 MVAR capacitor bank at B. L. England - \$4 M

ACE has advised that it intends to pursue some of these transmission upgrades whether or not BLE is repowered. However, as discussed more fully below, even in the event that BLE is repowered and ACE constructs its planned transmission upgrades, a repowered BLE will reduce a significant portion of PJM's mandated transmission system improvement cost and will provide significant reliability, economic, and environmental benefits to the Pinelands that transmission upgrades will not.

D. Re-evaluation of the Eight Alternatives Confirms that the Proposed Route Clearly Would Have the Least Environmental Impact

Since the January 2014 vote on the MOA, SJG has undertaken a comprehensive re-evaluation of Project alternatives to identify potential options for avoiding the Pinelands Forest Area while meeting the Project needs of repowering BLE and improving the resiliency of the existing natural gas distribution system to Cape May County.

As discussed in Section VI, below, the re-evaluation considered eight different alternatives ranging from the proposed route to a “no action” alternative. See Woodard & Curran (“W&C”), “*South Jersey Gas—BL England Gas Route Analysis Report*,” (June 18, 2012, *Addendum*, September 2014, *Addendum #2*, April 2015) (attached hereto as **Exhibit 11**). The re-evaluation shows that there is no viable pipeline route that avoids the Pinelands Forest Area and the proposed route clearly has the least environmental impact. A map depicting the alternatives considered in relation to the BLE facility and the Pinelands Area is attached as **Exhibit 12**. This conclusion is corroborated by the NJDEP which evaluated the alternatives and reached the same conclusion. See Letter from John Gray, NJDEP to Robert Fatzinger, SJG, dated May 14, 2015 (attached hereto as **Exhibit 13**).

At the request of SJG, as is authorized pursuant to *N.J.A.C. 7:7-3.1*, NJDEP held a pre-application meeting with the company to explore whether any of the other alternatives are practicable and would have less impact on environmental resources. NJDEP's input on the practicability of the alternatives was essential because several alternatives would require NJDEP to issue a permit under the Coastal Program Rules (i.e. Coastal Area Facilities Review Act, Waterfront Development Act, Freshwater Wetlands Protection Act). Securing such a permit would require SJG to demonstrate to NJDEP that no practicable alternative to serve the project need is available with less impact on the environmental resources. See *N.J.S.A. 13:9B-10(a)*; *N.J.A.C. 7:7A-7.4(b)*. Based upon NJDEP's

review of all of the available information, each of the alternatives to the selected route, including most significantly the alternatives impacting on the Great Egg Harbor Bay (“GEHB”), would have substantially more environmental impact and therefore would not be approved by NJDEP given the availability of the less-impacting selected alternative. Accordingly, based upon SJG’s re-evaluation and NJDEP’s review, the proposed route clearly remains the best option.

As discussed in Section V, below, proper consideration of this objective new information demonstrates that the proposed pipeline is “intended to primarily serve the needs of the Pinelands” in accordance with N.J.A.C. 7:50-5.23(b)12 and therefore fully conforms to the CMP. No waiver or exemption from CMP is necessary for the Project to be approved by the Pinelands Commission. Nevertheless, the facts and circumstances also demonstrate clearly that multiple compelling public needs are served by the Project within the meaning of N.J.A.C. 7:50-4.64. The Project serves the vital needs of residents and businesses in Atlantic and Cape May County (many of whom live and work within the Pinelands) for safe and secure natural gas, electricity, and clean air. There is no debating that safe and secure electricity and natural gas are essential health and safety needs within the municipalities and counties served by the Project (N.J.A.C. §7:50-4.64(a)1), nor that the public health and safety demand that the Project be constructed (N.J.A.C. §7:50-4.64(a)1.i). The alternatives analysis clearly shows that these compelling needs cannot be served by any feasible alternative outside the Pinelands nor by any better alternative inside the Pinelands (N.J.A.C. §7:50-4.64(a)1.iv). The Project also will result in an overall improvement of the resources of the Pinelands Area, specifically the air resources of the Pinelands, which long has been adversely impacted by air pollution from BLE and other less-efficient electric generation plants located in Pennsylvania. (N.J.A.C. §§7:50-4.64(b) & -4.65(c)). In sum, the Project directly serves the compelling needs of the people in Cape May and Atlantic Counties and its proposed location results in the least impact on the environment. As described more fully in the remainder of this document, the impact of the pipeline NOT being constructed includes the following:

- **Reduced electric system reliability** – a major purpose of the pipeline is to provide natural gas service to BLE to enable the plant to repower with combined cycle technology and thereby to supply cleaner, safer, more efficient and more reliable electricity to residents and businesses in the Pinelands and surrounding areas of Cape May and Atlantic Counties. If the pipeline is not constructed to support the repowering of the plant, there will be multiple electric system reliability violations that will require significant electric system upgrades. These transmission upgrades alone cannot replace the reliability and economic benefits of BLE’s locally generated electricity. For example, during times of a natural disaster, like Hurricane Sandy, the reliability benefits of a local source of electricity are superior to more distant electricity sources, such as those in Pennsylvania. Additionally, local generating sources provide a valuable source of reactive power, which is critical to maintaining grid stability, especially during peak air conditioning days. The repowered BLE facility can be “black start” capable if PJM determines that this service is necessary. “Black start” is the ability of an electric generation plant to start-up without an electricity feed from the transmission system and to provide the power needed to restore the system after a black out event.
- **Increased air pollution** – the repowering of BLE will result in significant reductions in the levels of carbon dioxide (CO₂), nitrogen oxides (NO_x), sulphur dioxide (SO₂), mercury and fine particulates (PM_{2.5}). If the plant does not repower and is forced to shut-down, much of the replacement power will be purchased from nearby states, primarily Pennsylvania, where emission controls are less stringent. Much of the air pollution generated from Pennsylvania’s fossil steam generating units (coal- and natural gas-powered) directly impact air quality in New Jersey and specifically in the Pinelands. Prevailing west-east winds transport the fine particulates and sulfate air pollution from Pennsylvania’s power generation plants to the Pinelands, where they contribute to a number of human health problems.
- **Continued risk of natural gas interruption for customers in Cape May and Atlantic Counties** – the inability to construct the pipeline as proposed will significantly impact plans for “hardening” the SJG system and enhancing reliability of natural gas service for customers in Atlantic and Cape May counties. SJG’s existing infrastructure is dependent upon two segments of single natural gas transmission pipeline service

as the “backbone” of the entire system serving Cape May and Atlantic counties. If a service interruption were to occur along this backbone, as many as 28,700 Pinelands customers in the Pinelands and 142,000 overall could be without gas service for several months. An interruption of this magnitude would put public safety and health at risk, especially during the winter months when natural gas usage peaks due to the need to heat homes, businesses and other critical facilities such as hospitals, schools, elder care facilities, etc.

IV. PROJECT PURPOSE

The 870,000 people living within the Pinelands depend upon safe, reliable and clean electricity and natural gas service for powering and heating their homes and businesses. To that end the Project has two purposes. First, the pipeline is intended to provide natural gas service to BLE—the only electric generation plant located either in the Pinelands or in the southeastern coastal region of the State.⁶ Repowering BLE with natural gas will provide more efficient, more reliable, and cleaner energy to the Pinelands. It also will reduce the threat of electric service interruptions and air pollution emissions in the Pinelands. Second, the pipeline is intended to reinforce SJG’s existing infrastructure in the Pinelands, greatly reducing the potential for a loss of service to 28,500 Pinelands customers and 142,000 customers overall in Cape May and Atlantic Counties.

A convergence of needs and opportunities has merged into a single project the ability to serve two long-standing and vital interests of the people of Atlantic and Cape May Counties: eliminating the combustion of coal at BLE, a critical electricity provider to the Pinelands region, and ensuring a more resilient natural gas distribution system in the vulnerable coastal region. While the pipeline will primarily serve a Pinelands use, BLE, as reflected by the volume of natural gas to be delivered to the plant, the need to reinforce SJG’s existing infrastructure to provide greater reliability to its customers in Atlantic and Cape May Counties is an important additional need in its own right. Even without the opportunity to serve BLE, SJG would still proceed with a reinforcement project to provide greater reliability to its existing customers in Cape May and Atlantic Counties. Thus, the elimination of the electric generating plant does not eliminate the need to improve the reliability of the natural gas distribution system in Cape May and Atlantic Counties, in accordance with SJG’s obligations as a public utility.⁷

⁶ The BPU’s order approving the rates charged to BLE for the construction of the pipeline found that “Approval of this Stipulation and Agreement is a step in turning the B.L. England generating station to more productive use for the benefit of the State’s electric customers. Conversion of the Station’s two coal-oil-diesel generators to natural gas should result in fewer emissions, and more efficient generation which should make the Facility more competitive in the wholesale market.” BPU, *In the matter of the Joint Petition of South Jersey Gas Company and RC Cape May Holdings, LLC for Approval of a Standard Gas Service Agreement (FES) and a Standard Gas Service Agreement (FES) Addendum*, BPU Docket No. GO13020052, April 13, 2013, p. 4 (attached hereto as **Exhibit 8**).

⁷ In New Jersey, the BPU has the exclusive responsibility to ensure that residents of the State enjoy safe, adequate and proper public utility service, including safe and reliable natural gas for heating homes and businesses. N.J.S.A. 48:2-13. The BPU is the only agency of the State charged with this responsibility and vested with specific expertise to carry out this mission. The BPU fulfills this statutory responsibility by supervising and pervasively controlling the State’s various public utilities, which are granted franchise rights to provide these essential services to the public. In essence, the BPU implements its mandate to ensure safe and reliable service to the public only through its franchisees, the State’s public utilities. The BPU’s authority over public utilities is pervasive. Upon finding that a public utility has failed to provide safe, adequate and proper service to its customers, it may fire company employees and even direct that control of the company be entrusted to a custodial receiver. See *In I/M/O Allegations of Berkeley Water Company’s General Dereliction of Duty to Provide Safe, Adequate and Proper Service*, BPU Docket No. 7811-1515 and 797-637, OAL Docket No. 2587-79. The BPU has granted SJG a franchise to provide natural gas service within the southernmost seven counties in the State. The company provides essential gas services to approximately 360,000 homeowners and businesses customers and operates approximately 6200 miles of pipeline throughout its service territory. The privilege conferred to SJG to provide an essential service comes with an obligation to make sure that the service is safe and reliable and that all customers requesting service receive it subject to certain qualifications. All public utilities in the state, including SJG, are duty-bound to uphold the public interest and are subject to the BPU’s extensive jurisdiction, including its control over their property, equipment and facilities. N.J.S.A. 48:2-13. The BPU regulates and controls most of SJG’s operations including, but not

A. Repower BLE With Natural Gas

ACE constructed the BLE facility in 1962 and operated the plant until 2006 when it sold the plant to RC Cape May Holdings, LLC ("RCCM"). The BLE facility currently operates two primary combustion units and four secondary units that combust coal and oil to generate electricity. Unit 1 was a 129 megawatt ("MW") coal-fired unit retired in 2014. Unit 2 is a 156 MW coal-fired unit. Unit 3 is a 155 MW oil-fired peaking unit that burns No. 6 oil. Four 2 MW diesel generators serve PJM and can supply backup electricity to the existing facility if required.

The conversion of BLE from coal to natural gas has been a long-term priority of the State of New Jersey and various environmental groups. In 2006, NJDEP ordered ACE either to convert the plant from burning coal to natural gas or to close it. (attached hereto as **Exhibit 9**). In 2010, the Sierra Club urged that the BLE plant repower with natural gas:

Even though we do not have as many coal plants as other states, because of our location at the end of the air stream, we receive a lot of pollution from Ohio, Pennsylvania, and other Midwestern states. Added to the pollution from our coal plants here, coal pollution is having a devastating health impact. Part of the problem is that many of our coal fired power plants are located in areas where there are high concentrations of people, therefore having a big impact on human health. For instance, we have coal plants in Jersey City and Trenton. Those plants have bigger impact on public health because they are located in major cities. This report shows a direct correlation between the location of coal plants and the state of the public health around them. This report is validation that BL England and Deepwater should be closed or converted to natural gas.

NJ Sierra Club, "Report Shows 'Killer' Coal" (Sept. 9, 2010) (emphasis added). In 2012, RCCM made the decision to convert BLE to natural gas, a process known as "repowering." The announcement was widely applauded by the Sierra Club and other environmental groups. See Sierra Club, "Sierra Club Applauds Decision to Move BL England Off Coal on World Asthma Day" (May 1, 2012), http://action.sierraclub.org/site/MessageViewer.jsessionid=5B99EE0AE571FEB9A116F1883253AD5F.app234a?em_id=237501.0

The repowering project will convert BLE to the most efficient, modern power generation design—natural gas combined cycle ("NGCC") technology—while maximizing use of existing infrastructure and systems. RCCM will invest approximately \$400M to install a new 270 MW combustion turbine generator and associated heat recovery steam generator to be used with existing steam turbine Unit 2 to generate a total of about 425 MW in combined cycle operation. The existing oil fired boiler will be converted to natural gas and used with the steam turbine Unit 3 to generate another 155 MW in conventional (peaker) Rankine cycle for a total capacity of 580 MW. The repowering project will eliminate the burning and storage of coal at BLE. The repowered BLE facility can be "black start" capable if PJM determines that this service is necessary. "Black start" is the ability of an electric generation plant to start-up without an electricity feed from the transmission system and to provide the power needed to restore the system after a black out event.

1. Provide Safe and Reliable Electric Service to the Pinelands

A major purpose of the pipeline is to provide natural gas service to BLE to enable the plant to repower and thereby to supply cleaner, safer, more efficient, and more reliable electricity to residents and businesses in the Pinelands and surrounding areas of Atlantic and Cape May Counties.

limited to its service quality, customer service and billing practices, safety, construction specifications, accounting, financing and auditing.

Safe and reliable electricity is an essential health and safety need in every community within the Pinelands. The impacts to the electric grid from Hurricane Sandy illustrate this fundamental need. Of all the states impacted by Hurricane Sandy, New Jersey experienced the largest number of electric outages. New Jersey's four Electric Distribution Companies ("EDCs") reported 2,900,000 peak customer outages representing approximately 73% of all electric customers. The storm flooded 49 major substations, felled more than 100,000 trees and 9,000 poles, and damaged 3,000 distribution circuits, 100 transmission lines, and 4,000 transformers. NJBPU, Discussion Points, FY 2013-2014 Budget; Giuliano, BPU, Division of Reliability & Security, "Understanding Energy Emergency Preparedness and Storm Response" (June 17, 2014). Within the ACE service territory, which comprises most of the Pinelands region⁸, the storm damaged 23 transmission circuits and caused wide spread outages due to downed poles and downed conductors, including circuits serving the barrier Islands of Long Beach Island and Ocean City. Sixteen ACE substations experienced some degree of flooding during the last two major hurricanes (Irene and Sandy), with 13 substations within the Federal Emergency Management Agency's Advisory Based Flood Elevation (ABFE) 1% flood zone. See Pepco Holdings, "Challenges Impacting Critical Electrical Infrastructure in the Floodplain and Flood Prone Areas due to Storm Events and Sea-level Rise" (Sept. 19, 2013).

The *2014 New Jersey Hazard Mitigation Plan*⁹, the State's strategy to reduce risks from hazards and to prioritize project funding, plainly states that the loss of electrical service can have serious impacts on the health and welfare of residents, continuity of business, and the ability of public safety agencies to respond to emergencies:

Overall, the entire State is vulnerable to the power failure event. Loss of power can have serious impacts on the health and welfare of residents, continuity of business, and the ability of public safety agencies to respond to emergencies. Individuals with medical needs are vulnerable to power failures, because medical equipment such as oxygen concentrators requires electricity to operate. The elderly are also vulnerable to the effects of power failure, as power failure has the potential to expose them to extreme heat or extreme cold. According to the United States Census, there were 340,644 households or approximately 10% of homes in New Jersey that rely on electricity to heat their homes. Individuals living in these households will be exposed to significantly colder indoor temperatures during a power failure. The following counties have at least 10% or greater of their homes heated with electricity: *Cape May* (22.4%); Hudson (16.1%); Ocean (14.9%); *Atlantic* (14.7%); Burlington (14.2%); Sussex (14%); Mercer (12.3%); Salem (11.7%); Camden (11.3%); and Monmouth (10%)... During power failure events, water purification systems may not be functioning. Further, populations on private wells will not have access to potable water. Many power outage events are caused by storm events that can lead to flooding. Without electricity, residents would be unable to pump water from their basements potentially causing structural and content damage to their homes.

Power failure is particularly problematic for homes that are heated with electricity. Widespread power outages during the winter months can directly impact vulnerable populations such as the elderly and medically frail. According to the 2007 – 2011 American Community Survey, 340,617 homes across New Jersey are heated with electricity. This represents 10.7% of the total homes in the State.

⁸ ACE is the primary local electric distribution company in the Pinelands region, serving 39 out of the 55 Pinelands municipalities with a combined population of 638,000 people. Seventy-three percent of Pinelands residents receive their electricity from ACE, including the entire population of Cape May and Atlantic Counties.

⁹ The New Jersey Office of Emergency Management prepares the Hazard Mitigation Plan ("HMP") (available at http://www.ready.nj.gov/programs/mitigation_plan2014.html) which captures historic disaster experiences, and reflects the natural and human-caused hazards New Jersey faces, based on current science and research. All States are required to have a Federal Emergency Management Agency (FEMA)-approved hazard mitigation plan to be eligible for disaster recovery assistance and mitigation funding.

Aside from the importance of power to heat homes, power is vital to maintain out-of-hospital lifesaving systems for patients such as oxygen concentrators and ventilation machines. Across the State thousands of individuals rely on power to sustain their health. Without power, these individuals will require shelter at a medical-needs shelter or admission to a hospital. Although systems are in place to locate these individuals during disasters, such as New Jersey's Register Ready system, the number of individuals who require these services across the State is not definitively known.

New Jersey Hazard Mitigation Plan, pp. 5.22-15, 5.22-2 & 5.22-5. The BPU's Division of Reliability and Security has summarized the immediate impacts electricity outages have on public health and safety:

- Traffic Lights go out creating congestion and hazards
- Police departments scramble to address traffic issues
- Air and ground transportation is impacted
- Wireless telephones fail; FIOS backup fails after 6 to 8 hours
- Internet and voice over IP fails
- Manufacturing is interrupted
- HVAC systems fails
- Water and wastewater facilities fail or go to backup
- Hospitals go to backup but curtail certain functions; backup may fail
- Nursing homes and senior complexes may require evacuation
- Local commerce is impacted: ATM and financial transactions may shut down
- Gasoline stations cannot pump which can cause shortages
- Petroleum refineries may curtail certain processes
- 911 capabilities may be compromised
- Long duration outage equals economic impact

Giuliano, BPU, Division of Reliability & Security, "Energy Assurance: New Jersey Board of Public Utilities Energy Reliability and Security Mission" (2013).

New Jersey is vulnerable to electric transmission outages in large part because the state suffers from a critical shortage of in-state electric generation capacity. A lack of indigenous generation capacity means that a significant portion of the electricity consumed by New Jersey residents and businesses is imported into the State over transmission lines. It is the policy of the State of New Jersey to promote the construction of new electric generation capacity in the state, in lieu of new electric transmission lines to transport electricity from neighboring states, which the Legislature has determined increases prices and decreases reliability. See N.J.S.A. 48:3-98.2 (L. 2011, Ch. 9) (establishing a long-term capacity agreement pilot program to promote construction of qualified electric generation

facilities “to mitigate local electrical system reliability concerns caused by transmission system overloads or the lack of local generation being developed...”)

The State's Energy Master Plan (“EMP”)¹⁰ directs state agencies to support construction of new NGCC electric generation units to lower the high energy prices burdening New Jersey customers due to high capacity prices caused by inadequate native generation capacity. *EMP* at 75 & 83 (“New Jersey is opposed to a FERC-imposed paradigm that impedes in-state generation development while simultaneously imposing on our ratepayers an investment premium for transmission projects that import power from out-of-state generation sources far away from the State's loads”). The EMP also directs State Government to expand electricity generation sources with a particular goal of encouraging more combined-cycle natural gas plants to improve reliability and to lower costs, consistent with environmental and economic development objectives. *Ibid.* at 4. The EMP directs State Government to expand the State's natural gas pipeline network to serve gas utilities and power plants and notes that “South Jersey, in particular, lacks adequate natural gas infrastructure to support new, gas-fired generation as well as substitution for other fuels in the residential and commercial sectors.” *Ibid.* at 6. The *EMP* specifically notes that the retirement of the Oyster Creek nuclear plant in 2019 will pose a difficult challenge because “Oyster Creek's geographic location has prevented significant transmission bottlenecks and overloads in the State, and that unless replaced by new comparable base load generation, at least \$100 million in transmission upgrades will be required when Oyster Creek is retired, excluding new rights of way.” *Ibid.* at 79.

During the deliberations over the proposed MOA, SJG submitted detailed information to the Pinelands Commission identifying the energy security benefits to Pinelands residents associated with repowering the facility. Specifically, PowerGEM's analysis demonstrated that after the closure of the 615 MW Oyster Creek nuclear plant in 2019, 86 percent of the BLE's energy would be consumed by residents and businesses within the Pinelands, helping to avert multiple reliability violations:

The updated analysis demonstrates that BL England's presence as a power generating facility is even more critical now that there appear to be additional retirements prior to June 2015 of smaller, peaking CTs in the Pinelands region. Based upon PJM's own models, the retirement of BL England will negatively impact eight (8) transmission circuits in proximity to the Pinelands Area. As with other areas of New Jersey, overloaded circuits will be considered transmission violations by PJM and, therefore, require a solution to avoid the consequences of overloads, including the potential for blackouts. As stated above, a prior PJM study had indicated that the retirement of the Oyster Creek Nuclear facility would result in at least \$100 million in new transmission or transmission upgrades. The continued retirements of CTs would likely exacerbate this need for transmission upgrades. There were eight overloaded circuits in proximity to the Pinelands Area that were identified and are listed in Exhibit 1. These circuits are not overloaded if BL England is repowered.

¹⁰ The BPU prepares and oversees implementation of the EMP, a 10-year blueprint for how the State plans to produce, distribute, and conserve energy. The EMP statute requires that all actions, decisions, determinations and rulings of State Government with respect to energy—including such decisions by the Pinelands Commission—shall to the maximum extent practicable and feasible conform with the EMP. The BPU's jurisdiction with respect to the siting of any energy facility in the State by law is coextensive with that of any other State instrumentality, the provisions of any law to the contrary notwithstanding. To that end, no State instrumentality with the power to grant or deny any permit for the construction or location of any energy facility shall exercise its powers without obtaining the BPU's review and comment. The BPU is empowered and directed to intervene in any proceedings before, and appeals from, any State department, division, commission, authority, council, agency or board (i.e. “State instrumentalities”) charged with the regulation, supervision or control of any business, industry or utility engaged in the production, processing, distribution, transmission or storage of energy in any form when in the discretion of the BPU such intervention is necessary to insure the proper consideration of the EMP.

**Overloaded Circuits in Proximity to
Pinelands Area**

Union - Corson 138 kV
Corson - Middle Tap 138 kV
Cumberland - Union 138 kV
Lewis - Minotola 138 kV
Lewis - Dorothy 138 kV
Minotola - Landis 138 kV
Corson - Dennis 138 kV
Dorothy - Deepwater 138 kV

Power Grid Engineering & Markets, *"Benefit to Pinelands Area of BL England Repowering"* (May 29, 2012; Updated October 11, 2013), p. 3. (**Exhibit 3**).

During the Commission's consideration of the MOA, the BPU reinforced its finding that the Project would improve the reliability of electricity service:

One of the five overarching goals of the 2011 EMP [Energy Master Plan] is to "promote a diverse portfolio of new, clean, in-State [electricity] generation, to improve reliability and to lower costs, consistent with environmental and economic development objectives." To this end, the Administration has supported the construction of new NGCC plants and continues to work toward replacement of the capacity that will be lost following the retirement of the Oyster Creek nuclear plant (in 2019). As stated in the EMP, replacing Oyster Creek is a particular challenge because "Oyster Creek's geographic location has prevented significant transmission bottlenecks and overloads in the State, and [unless] replaced by new comparable base load generation, at least \$100 million in transmission upgrades will be required when Oyster Creek is retired, excluding new rights of way." The repowering of the B.L. England facility (from coal and oil to natural gas) will help to ensure an adequate supply of electricity in the Southern New Jersey region, and specifically in the Pinelands Area. Contrary to some common misperceptions, there is no "glut" of energy in New Jersey. In fact, New Jersey is located within the heart of the Mid-Atlantic Critical Congestion Area, one of only two such areas so designated by the U.S. Department of Energy ("DOE") due to severely inadequate transmission capacity that threatens the reliability of the electrical grid. In 2006 and again in 2009, the DOE determined that it is critically important to remedy existing congestion problems in New Jersey because the current and projected effects of the congestion are severe.

New Jersey is located at the extreme eastern edge of the PJM territory. Transmission constraints limit the ability to import electricity, causing most of the State to face electricity congestion and some of the highest electricity prices in the entire mid-Atlantic area. The solution has often involved the strategy of higher voltage reinforcement of the interstate transmission lines, which raises land use and other environmental concerns. The pending retirement of several old, inefficient power plants will also reduce local generation and further degrade reliability. The situation will be only worsened by the closure of the Oyster Creek nuclear plant in 2019. As discussed above, the closure of Oyster Creek, one of only two large electrical generation facilities in the eastern and southern portion of the State (the other being B.L. England), will require a replacement source of energy. Reliability in that region would be enhanced by new (or upgraded) local generation resources.

*Letter from Tricia Caliguire, Chief Counsel, BPU to Mark Lohbauer, Chairman, Pinelands Commission, (December 12, 2013) (attached hereto as **Exhibit 14**).*

The Executive Director relied upon this information in her report recommending that the Commission approve the MOA:

the need for the proposed pipeline project has bearing on the Commission's decision for a number [of] reasons. First, the continued need for the BLE Plant to provide an adequate supply of electricity for the Southern New Jersey region is significant given the potential impact to the Pinelands as a result of future transmission line upgrades and new transmission line rights of way that the EMP indicates will be necessary when Oyster Creek Nuclear Generation Facility retires in 2019. *Second, as discussed in the POWERGEM reports, some, if not most of the energy generated by the BLE Plant will be needed for the Pinelands Area.* Third, given that the BLE Plant is located within the Pinelands PNR, not only is it appropriate for the Commission to consider the repowering of the BLE Plant, but as discussed above, absent the need for the redundancy line, construction of a pipeline solely to repower the BLE Plant would have been consistent with the Forest Area land use standards at *N.J.A.C. 7:50-5.23(b)12*, given the pipeline would primarily only serve the needs of a Pinelands business. (See *N.J.A.C. 7:50-2.11* that defines the term "Pinelands" to mean the Pinelands National Reserve and the Pinelands Area.) *Finally, it is also appropriate for the Commission to consider the need for public service infrastructure to provide reliability to Cape May and Atlantic Counties, given that there are more than 25,000 Pinelands residents who are customers of SJG that will benefit from the proposed pipeline. The issue has never been that there will be no benefit to the Pinelands, but rather the proposed pipeline project is not intended to primarily serve only the needs of the Pinelands. N.J.A.C. 7:50-5.23(b)12.*

The BPU's concerns regarding energy needs include the fact that New Jersey is located at the extreme eastern edge of the PJM territory. Transmission constraints limit the ability to import electricity, causing most of the State to face electricity congestion and some of the highest electricity prices in the entire mid-Atlantic area. The solution has often involved the strategy of higher voltage reinforcement of the interstate transmission, lines, which raise land use and other environmental concerns. The pending retirement of several old, inefficient power plants will also reduce local generation and further degrade reliability. The situation, BPU notes, will only be worsened by the closure of the Oyster Creek Nuclear Generating Facility in 2019, one of only two large electrical generating facilities in the eastern and southern portions of the State (the other being BLE)". "These concerns have been validated by POWERGem, cited above. Specifically, POWERGem indicated that at least 200 MWs of peaking generation is scheduled to retire in May, 2015. Using the 2018 PJM RTEP model, POWERGem concluded that the need for energy and, more specifically, the continued operation of the BLE Plant would substantially increase. More importantly, *if the repowering of the BLE plant could not be completed, POWERGem concludes, based upon this same PJM 2018 RTEP model, that eight (8) transmission circuits in proximity to the Pinelands area would be impacted.* This impact is predicted to occur even with the construction of new generation in the state under the current Long-Term Capacity Payment Pilot Program. As has been recently seen in both the Pinelands and other areas of the State, PJM has required transmission upgrades to relieve congestion that results from overloaded circuits.

Executive Director's Findings of Fact, pp. 13-14 and 34-35.

a. PJM's Finding That Absent Significant Transmission Upgrades Closure of BLE Will Cause Reliability Violations

Since the Executive Director's Findings in January 2014, PJM has confirmed that absent significant transmission system upgrades the continued operation of BLE is vital to maintaining the reliability of the electric grid in the ACE transmission zone which comprises most of the Pinelands region. ACE is the primary local electric distribution company in the Pinelands. The company provides electricity to 39 out of the 55 Pinelands municipalities with a total

population of 680,000 residents comprising 73 percent of the entire Pinelands population, including the entire population of Cape May and Atlantic Counties.

Generator retirements can reduce system reliability. *EMP* at 35. PJM's Transmission Expansion Advisory Committee ("TEAC") studied the impact closure of BLE would have on electric reliability in the ACE control area. In June 2014, the TEAC confirmed the PowerGEM findings and concluded that absent significant transmission system upgrades closure of BLE will result in voltage and thermal overload on multiple circuits within the ACE control area, in violation of North American Electric Reliability Corporation ("NERC")¹¹ Reliability Standards:

N-1-1 Violation: The DENNIS 230/138kV transformer is overloaded to 119.35% and DENNIS – CORSON 2 138kV line is overloaded to 114.37% for the loss of the New Freedom to Cardiff 230 kV line followed by the loss of Corson 3 – Union 138kV line. The MDLE TP – BLE 138kV line is overloaded to 102.81% for the loss of New Freedom – Cardiff 230 kV line followed by the loss of Oyster Creek – Cedar 230 kV line

N-1-1 Violation: The CORSON 2 - CORSON 1 138kV line is overloaded to 115.97% for the loss of the New Freedom to Cardiff 230 kV line followed by the loss of Corson 2 – MDLE TP kV 138kV line. The CORSON 2 - MDLE TP 138kV line is overloaded to 114.31% for the loss of New Freedom – Cardiff 230 kV line followed by the loss of Corson 1 – Corson 2 138kV line.

N-1-1 Violation: The SHRMAN#3 - LINCOLN 138kV line is overloaded to 103.22% for the loss of the Dennis – Corson 2 138kV (CONTINGENCY 'DENN-COR') followed by the loss of Union – Cumberland 138kV line.

Generator Deliverability Violation: Croydon – Burlington 230kV line is overloaded to 107.61%% for the loss of Neshameny 138kV bus.

PJM TEAC Report, June 5, 2014, pp. 23-30 (attached hereto as **Exhibit 15**).

In July 2014, to address these reliability violations, PJM mandated that ACE construct transmission upgrades within the Pinelands as part of the 2014 Regional Transmission Expansion Plan ("RTEP").¹² The 2014 RTEP requires the construction of multiple electrical transmission upgrades within the ACE zone to resolve multiple reliability violations resulting from the imminent closure of BLE. PJM's directive is mandatory:

PJM staff completed a series of "at-risk" scenario studies related to the B.L. England units in the Atlantic City Electric transmission zone. These studies evaluated the impact to the system of the complete shutdown of all generation at the site by June of 2015. There are currently three steam

¹¹ NERC is a not-for-profit international regulatory authority whose mission is to ensure the reliability of the bulk power system in North America. In 2007, the Federal Energy Regulatory Commission ("FERC ") granted NERC the legal authority to enforce the Reliability Standards with all U.S. users, owners, and operators of the bulk power system and made compliance with those standards mandatory and enforceable. NERC serves more than 334 million people and is overseen by the FERC. Its jurisdiction includes users, owners, and operators of the bulk power system. See <http://www.nerc.com/Pages/default.aspx>.

¹² The RTEP is prepared annually and identifies transmission system upgrades and enhancements necessary to meet the operational, economic and reliability requirements of PJM customers. The RTEP identifies transmission system enhancements needed to keep electricity flowing to more than 60 million people throughout 13 states and the District of Columbia. RTEP studies test the transmission system against mandatory NERC national standards and PJM regional standards. These studies look 15 years into the future to identify transmission overloads, voltage limitations and other reliability standards violations. PJM then develops transmission plans in collaboration with Transmission Owners to resolve violations that could otherwise lead to overloads and black-outs. This process culminates in one recommended plan – one RTEP - for the entire PJM footprint that is subsequently submitted to PJM's independent governing Board for consideration and approval.

units and four diesel units at the site. The B.L. England #1 unit is a 129 MW coal fired unit that retired in May of this year. In January of 2013 we were notified by the owners of the B.L. England diesels, which total 8 MW, of their intent to deactivate the units in the fall of 2015. The B.L. England #2 and #3 units are 155 MW oil fired steam units that had notified PJM back in 2004 of their intent to deactivate but withdrew that notice in 2007. In addition the #2 unit is under a consent order to shut down in 2017 due to environmental concerns. The owners of the B.L. England generators have entered an interconnection queue request (Y1-001) to build a new gas fired combustion turbine on site to replace the existing generation. The request is currently suspended. *Earlier in 2014, a permit for the construction of a new gas pipeline to the B.L. England facility was rejected.* PJM staff evaluated the impact of the deactivation of all of the generation at B.L. England. *Deactivation of all of the generation at B.L. England will have an adverse impact on the reliability of the transmission system.* Specifically PJM staff identified a number of thermal and voltage reliability criteria violations primarily on the 138 kV and 69 kV systems in Atlantic City Electric. The following transmission upgrades were identified to address the potential thermal and voltage violations:

- Install new Dennis 230/69 kV transformer, environmental work –\$15.2 M
- Upgrade 138 kV and 69 kV breakers at Corson substation – \$0.8 M
- Reconductor 2.74 miles of Sherman - Lincoln 138 kV line and associated substation upgrades -\$4.22 M
- New Orchard - Cardiff 230 kV line (remove, rebuild and reconfigure existing 138 kV line) and associated substation upgrades -\$69.25M
- New Upper Pittsgrove - Lewis 138 kV line and associated substation upgrades - \$7.23M
- Relocate Monroe to Deepwater Tap 138 kV to Landis 138 kV and associated substation upgrade -\$0.57M
- New Landis - Lewis 138 kV line and associated substation upgrades -\$31.03M
- New Cardiff - Lewis #2 138 kV line and associated substation upgrades - \$11.26M
- Install a 100 MVAR capacitor bank at B. L. England -\$4M

It should be noted that a number of these upgrades will use existing right-of-way and will address an aging infrastructure issue for a roughly 40 mile 138 kV double circuit tower line.

*See PJM, 2014 Regional Transmission Expansion Plan, Transmission Plan Proposed for Approval to Proceed with Construction Related to the 2014 Baseline Regional Transmission Expansion Plan, Presented by PJM Staff to the Board Reliability Committee (July 22, 2014) (attached hereto as **Exhibit 16**) (emphasis added).*

ACE has advised SJG that it still intends to pursue some of the transmission upgrades whether or not BLE is repowered to address “aging infrastructure” issues, as noted in the RTEP report. However, even in the event that BLE is repowered and ACE constructs its planned transmission upgrades, a repowered BLE still will reduce a significant portion of PJM's mandated transmission system improvement cost and will provide significant reliability, economic, and environmental benefits to the Pinelands that transmission upgrades, alone, simply cannot duplicate.

b. Grid Reliability Benefits to the Pinelands

Electric transmission upgrades by themselves cannot duplicate the reliability benefits of BLE's locally-generated electricity. The greater the distance electricity has to travel via transmission lines to get to southern New Jersey, the more vulnerable the area is to losing power due to damage to the electrical network. The greater the distance between generation and load, the greater the risk of a power outage because a problem anywhere along a transmission line can interrupt service. During times of a natural disaster, like Hurricane Sandy, the reliability benefits of a local source of electricity are superior to more distant electricity sources, such as those in Pennsylvania. *See NJDEP, In the Matter of RC Cape May Holdings, LLC, Administrative Consent Order Amendment, (July 11,*

2014) ¶ 8f. (**Exhibit 9**) (noting that in “New Jersey, from 2003 to 2012, the state had 22 major weather-related outages, including blackouts and emergency appeals to reduce electricity use <http://www.climatecentral.org/news/weather-related-blackouts-doubled-since-2003-report-17281> at 14.”)

Local electrical generation provides superior reliability because it reduces the distance power must travel to meet the needs of the load and is an essential source of reactive power, a critical service for maintaining voltage and grid stability especially during peak air conditioning days. Reactive power is produced by electric generators and is necessary to support the voltages that must be controlled for system reliability. FERC, Staff Report No. AD05-1-000, “Principles for Efficient and Reliable Reactive Power Supply and Consumption,” (Feb. 4, 2005) available at <http://www.ferc.gov/CalendarFiles/20050310144430-02-04-05-reactive-power.pdf>. A shortage of reactive power is a major contributing cause of blackouts, including the 2003 Northeast Blackout that resulted in at least 11 deaths and \$6 billion in damages:¹³

One of the characteristics of the August 14 blackout was an apparent “voltage collapse” that occurred on portions of the transmission system surrounding and within the northern Ohio and eastern Michigan load centers. Transmission system voltage is needed to transfer electric power from the generation stations to the load centers, and is somewhat similar in function to water main pressure. Reactive power is the component of total power that assists in maintaining proper voltages across the power system. Sufficient voltage is maintained by supplying the transmission system with reactive power from generating stations and static devices called capacitors. Lightly-loaded transmission lines also provide reactive power and help sustain system voltage. Conversely, customer loads such as motors and other electromagnetic devices consume reactive power, as do heavily loaded transmission lines. Therefore, as transmission lines become more heavily loaded, they consume more of the reactive power needed to maintain proper transmission voltage. Reactive power cannot travel long distances because it meets considerable resistance over the transmission lines. Therefore, reactive power sources need to be close to the point of reactive power demand — for example, near the load centers. When heavily loaded transmission lines disconnect, the lines that remain in service automatically pick up portions of flow from the disconnected line, which increases the reactive power consumed by these lines. When reactive supply is limited, the increased loading will cause a voltage drop along the line. If reactive supply is not provided at the end of the line, the voltage could fall precipitously. At that point, the transmission system can no longer transfer electric power from distant generation to energy users in load centers.

NERC, U.S./Canada Power Outage Task Force, “August 14, 2003 Outage Sequence of Events” (Sept 12, 2003) (emphasis added); see also, NERC, *U.S.-Canada Power System Outage Task Force Causes of the August 14th Blackout in the United States and Canada*, (November 2003) available at <http://www.nerc.com/docs/docs/blackout/814BlackoutReport.pdf>; Mozina, C., *Power System Instability—What Relay Engineers Need to Know Protective Relay Engineers, 2011 64th Annual Conference* https://www.eiseverywhere.com/file_uploads/e6bd0364490bfb675a-4f712b3d3431eb_moz2_pap.pdf.

It is well-documented that local generation provides the grid with the critical service of reactive power that helps to maintain the voltage stability of the grid:

‘Reactive power (vars) is required to maintain the voltage to deliver active power (watts) through transmission lines. Motor loads and other loads require reactive power to convert the flow of electrons into useful work. When there is not enough reactive power, the voltage sags down and it is not possible to push the power demanded by loads through the lines.’.. Reactive power does not

¹³ Minkel, JR, “The 2003 Northeast Blackout--Five Years Later,” *Scientific American* (Aug. 13, 2008).

travel very far [and therefore] it is usually necessary to produce it close to the location where it is needed. A supplier/source close to the location of the need is in a much better position to provide reactive power, versus one that is located far from the location of the need. Reactive power supplies are closely tied to the ability to deliver real or active power... Under regulated environment, most utilities owned/controlled G&T&D in its own control area [and] provided reactive power just as it had to provide sufficient generation and voltage. Restructuring has changed this and is causing problems dealing with reactive power, [including] merchant (non-utility) generation and related financial incentives [and the increasing need for] transmitting power over longer distances with multiple transactions.

U.S. Department of Energy, Oak Ridge National Laboratory, "Reactive Power and Importance to Bulk Power System" (2006).

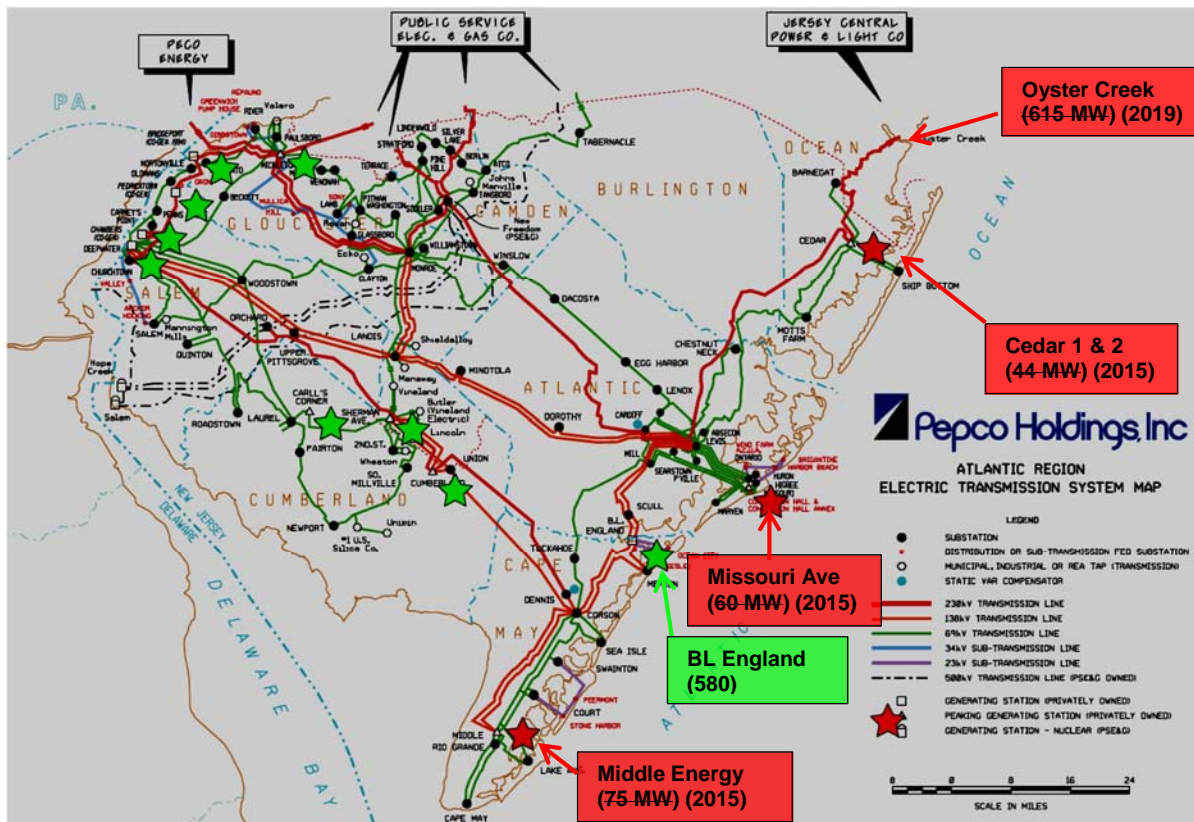
Not only is local generation a critical source of reactive power, also it typically provides "black start" capability, which helps to restore the grid after a blackout occurs. Restoration of the grid after a blackout often depends on the availability of local generation sources with "black start" capability—the ability of generation units to come on-line quickly after a blackout without the need for an electricity feed from the grid. See PJM, "Fundamentals of Transmission Operations System Restoration" (summarizing a lengthy catalogue of blackout events frequently involving transmission line problems and the necessity of having black start units available) <http://www.pjm.com/-/media/training/new-pjm-cert-exams/foto-lesson11-system-restoration.ashx>. The repowered BLE facility can be "black start" capable if PJM determines that this service is necessary and can provide a critical reliability function.

BLE's black start capability could be even more important in the coming years because 179 MW of black-start capable peaking generation units in the ACE zone are retiring this year due to new air pollution regulations.

Plant	MW	Retirement
Cedar 1	22	1/28/2015
Cedar 2	22	5/1/2015
Missouri Ave CT B	20	5/1/2015
Missouri Ave CT C	20	5/1/2015
Missouri Ave CT D	20	5/1/2015
Middle Energy Center 1	19	5/1/2015
Middle Energy Center 2	20	5/1/2015
Middle Energy Center 3	36	5/1/2015

Source: PJM "Generator Deactivation Summary Sheets."

All of these generation units are located along the coastal region of the ACE zone, between Stafford Township, Ocean County in the north (Cedar 1 & Cedar 2), Missouri Avenue, Atlantic City in the middle (Missouri Ave B, C, & D), and Rio Grande, Cape May County in the south (Middle Energy Center 1, 2 & 3). The Cedar, Missouri Ave, and Middle combustion turbines were owned by ACE until 2010, when the facilities were sold to Calpine. All three facilities were "black start" capable. As shown on the Pepco Holdings, Inc. Atlantic Region Electric Transmission System Map, below, with the retirement of these three coastal units (see red stars), BLE will be the only remaining electric generator within the coastal region between Long Beach Island and Cape May.



Source: ACE Petition to BPU for Approval of Churchtown to Orchard 230kV Line, Exhibit P-1.

During the deliberations on the MOA, the Commission heard public hearing testimony about BLE's critical role of supplying power during recent storm events. *In Re: Proposed MOA Between Pinelands Commission and Board of Public Utilities*, Hearing Tr. at 79-80. The critical role of locally generated electricity was acknowledged by the Executive Director. *Findings of Fact*, pp. 34-35. This finding was reinforced by NJDEP in July 2014, when it determined that BLE must continue to operate because it "is strategically vital for energy reliability in the southern New Jersey region, and DEP, in consultation with BPU, has determined that B.L. England should continue to operate beyond May 1, 2015, for a limited time period to assure that the region's power and reliability needs are not jeopardized." (Exhibit 9, ¶ 8). Specifically, NJDEP cited BLE's critical role in maintaining system reliability during the extreme cold in January 2014 caused by the polar vortex phenomenon. During this event, PJM dispatched BLE to operate both Units 2 and 3 at full capacity to ensure system reliability. Without the availability of BLE to operate during this period, a widespread voltage drop (a brown-out) leading to system failure (a blackout) easily could have occurred. *Ibid.* ¶ 8(e). Finally, PJM's most recent RTEP forecasts ACE's summer peak load will grow 1.1 percent annually over the next 10 years, increasing by about 11% from 2,703 MW in 2012 to 3,017 MW in 2022. *Ibid.* Book 2: 2012 RTEP Input Data, Assumptions and Scope Table 2.1: Transmission Owner Zonal Summer/Winter 2012 and 2022, p. 14.

c. Economic Benefits to the Pinelands

A repowered BLE will help temper electricity prices within the ACE transmission zone. The ACE transmission zone has limited electric generation capacity, as most of the electricity supplied by ACE comes from outside the South Jersey region, mainly Pennsylvania, resulting in greater congestion and line loss costs that are passed-along to customers.

Since its divestment of BLE in 2007 and the three peaking facilities (Cedar 1 & 2, Missouri Ave B, C & D, and Middle Energy 1 & 2) in 2010, ACE no longer owns electricity generation assets. The company obtains all of the electricity it needs to supply its customers from competitive suppliers. Like all electric distribution companies in New Jersey, ACE does not earn a profit on the cost of its default supply service to customers but does make a regulated rate of return on the aggregate value of its investment in property net of depreciation used to distribute electricity throughout its territory (mainly transmission lines and associated substations). The transmission facilities owned by ACE are interconnected with the transmission facilities of contiguous utilities and are part of an interstate power transmission grid over which electricity is transmitted throughout the region encompassing the mid-Atlantic portion of the United States and parts of the Midwest. In 2014, Exelon, one of the nation's largest energy companies with a diverse portfolio of electric generation facilities, received BPU approval to acquire ACE and its parent company, Pepco Holdings, Inc. Exelon owns the Oyster Creek Nuclear Power Plant, a 625 MW facility located in Lacey Township on the Forked River, which is connected to the ACE service territory by the 55-mile Oyster Creek-Cardiff 230 kV transmission line constructed pursuant to the 2004 MOA between the Commission and the BPU. In 2010, Exelon pledged in a consent order with NJDEP to close Oyster Creek in 2019, ten years before the end of its Nuclear Regulatory Commission (NRC) operating license, to avoid the cost of installing cooling towers. The retirement of Oyster Creek, and the electricity it supplies to the Pinelands via the 230 kV transmission line approved by the Pinelands in 2004, poses a threat to electric reliability and economy, as described in the EMP:

Generator retirements can reduce system reliability. When power plants retire, usually there is an increase in wholesale energy and capacity prices. Since 2003, approximately 1,150 MW of capacity have been retired in New Jersey, with an additional 654 MW of capacity expected to retire by 2013, according to the PJM 2010 Regional Transmission Expansion Plan Report. Oyster Creek is scheduled to retire in 2019.

EMP at 35.

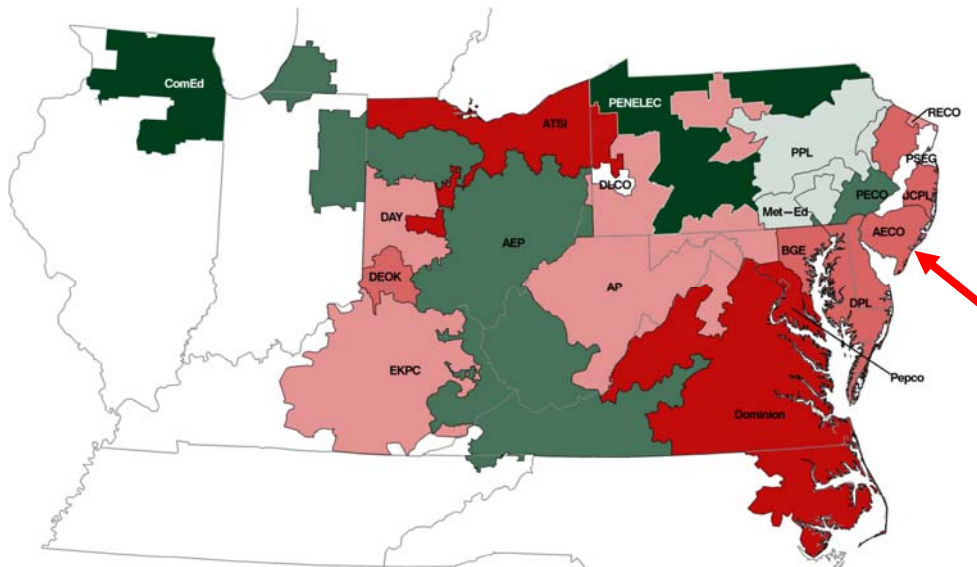
The locational marginal price ("LMP") of electricity within the ACE service territory is comprised of three cost components: (1) the cost of energy; (2) the cost of congestion on electric transmission lines; and (3) the cost of electricity losses during transport over transmission lines. Monitoring Analytics, LLC (Independent Market Monitor for PJM), *2014 State of the Market Report for PJM, Section 11 Congestion and Marginal Losses* (March 2015). "Losses" refer to energy lost to physical resistance in the transmission and distribution network as power is moved from generation to load. The greater the resistance of the system to flows of energy from generation to loads, the greater the losses of the system and the greater the proportion of energy needed to meet a given level of load. The longer the distance electricity must travel to serve load the more resistance it encounters and the greater the loss. *Ibid.*, Volume II, Detailed Analysis, p. 391. "Congestion" occurs when available, least-cost energy cannot be delivered to all load because transmission facilities are not adequate to deliver that energy and higher cost units in the constrained area must be dispatched to meet the load. The result is that the price of energy in the constrained area is higher than in the unconstrained area. *Ibid.*

According to the FERC, local generation in proximity to load centers in transmission-constrained areas (i.e. "load pockets") provides substantial economic benefits to consumers:

Not only is reactive power necessary to operate the transmission system reliably, but it can also substantially improve the efficiency with which real power is delivered to customers. Increasing reactive power production at certain locations (usually near a load center) can sometimes alleviate transmission constraints and allow cheaper real power to be delivered into a load pocket.

FERC, Staff Report No. AD05-1-000, "Principles for Efficient and Reliable Reactive Power Supply and Consumption," (Feb. 4, 2005); see also *EMP* at .

The LMP within the ACE zone is on the high-end of LMPs within the PJM control zone mainly because of loss and congestion charges. *Ibid*, Table 11-4 Zonal and PJM day-ahead, load-weighted average LMP components (Dollars per MWh): 2013 and 2014. In 2014, 10 percent of the cost of electricity in the ACE zone was related to electricity congestion and losses. *Ibid*. The ACE zone has a power flow imbalance. In 2014, ACE had a net load of 10,252.7 GWh and zonal generation of 3,296.0 GWh, yielding a deficit of 6,956.6 GWh of power. *Ibid*, Table 3-13 PJM real-time generation less real-time load by zone (GWh): 2013 and 2014. The generation deficit in the ACE zone is illustrated by the following map compiled by the PJM Market Monitor showing that the ACE control zone has a net deficit in generation capacity compared to the adjacent PECO and PSE&G zones, which have neutral or excess generation capacity. (Red shading reflects degree of generation deficit.) The PJM Market Monitor map indicates that a significant portion of the electricity ACE supplies to the 640,000 people in the Pinelands is generated outside the region.



Source: Monitoring Analytics, *2014 State of The Market Report for PJM*, Section 3 Energy Market, Figure 3-11 Map of PJM real-time generation less real-time load by zone.

A repowered BLE will help New Jersey to comply with USEPA's proposed Clean Power Rules to reduce CO₂ emissions from fossil fuel electric generators by 30 percent by 2030. See, U.S.EPA, Proposed Rule, "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units" 79 Fed. Reg. 34830 (June 18, 2014). EPA's proposed rule sets emissions rate targets for each state, expressed as pounds of CO₂ per megawatt-hour (lbs/MWh). Reductions in CO₂ emissions from existing fossil-fueled electric generating units will be achieved through a combination of greater renewable energy and energy efficiency but also, most significantly, by requiring grid operators to "re-dispatch" from higher-emitting steam electrical generation units (i.e. coal, oil, natural gas) to lower-emitting NGCC units. According to EPA, NGCC units are far more efficient than natural gas steam units, producing as much as 46 percent more electricity from a given quantity of natural gas than steam EGUs. *Ibid*. at 34857. The new EPA rule effectively will create a pricing signal based on the CO₂-intensity of the generation and will make higher-emitting units more expensive to operate, thus resulting in the dispatch of lower-emitting units, such as NGCC. A recent PJM analysis of how the Clean Power Rules will impact the dispatch of electric generation units within the PJM territory concluded that NGCC plants like the proposed BLE facility will have lower marginal cost because they emit less than half the CO₂ emissions of coal fired plants:

From a dispatch and modeling perspective, placing a price on CO₂ emissions represents CO₂ emissions as an input to producing energy in exactly the same way that generators face prices for fuel and face variable operations and maintenance expenses for each megawatt-hour of output. So, in the case of a mass-based target, higher-emitting resources face a larger increase in running

costs than lower-emitting resources. For example, coal units emit CO₂ at a rate of approximately 2,000 lbs/MWh (or 1 short ton/MWh) and new combined-cycle gas units emit CO₂ at a rate of approximately 700-800 lbs/MWh (or 0.35-0.40 tons/MWh). At a CO₂ price of \$20/ton, a coal unit's running cost will increase by about \$20/MWh. In contrast, a combined-cycle unit's running costs will increase by only \$7-\$8/MWh. As CO₂ prices increase, higher-emitting resources become more expensive to operate relative to lower-emitting resources and are dispatched less in order to meet the mass-based target. At the same time, lower-emitting resources will be dispatched more so that power demand can be met in all hours.

PJM Interconnection, "Economic Analysis of the EPA Clean Power Plan Proposal" (March 2, 2015) p. 24. If BLE is not repowered, make-up electricity must be sourced from other marginal generation units in the region, 53 percent of which is comprised of coal units that provided the marginal generation in the PJM zone.¹⁴ NJDEP has noted that the replacement electricity likely will come from out-of-state power plants that have excess capacity and emit much higher levels of air contaminants. See, Minutes of the New Jersey Clean Air Council (January 2014) available at http://www.state.nj.us/dep/cleanair/minutes/min_1401.pdf. The electricity from these units likely will be more expensive under the PJM economic dispatch model and likely will lead to higher energy costs for consumers in the ACE service territory. Higher energy costs, coupled with the already high congestion and line-loss costs within the ACE zone will contribute to an increase in the LMP and ultimately to the cost consumers pay for electricity.

2. Dramatic Air Pollution Reduction Benefits to the Pinelands

The reduction of adverse air quality impacts specifically associated with BLE long has been a priority of the Pinelands Commission. NJDEP's 1980 assessment of existing air quality in the Pinelands area, which was conducted on behalf of the Pinelands Commission to gain an understanding of Pinelands air quality issues and to aid in the preparation of the first CMP, specifically identified BLE as a major source of air pollution within the Pinelands:

The B.L. England Power Plant at Beesley's Point in Upper Township, Cape May County is located right on the Pinelands nation Reserve boundary. This large plant is responsible for most of the TSP [total suspended particulates] and SO₂ [sulfur dioxide] point source emissions in Cape May County. In Table 6.1 the B.L. England Plant is included among the point sources located in the Pinelands. If it were not included in the Pineland totals, point sources in the Pinelands would only be responsible for about 11% of the TSP emissions and less than one percent of the SO₂ emissions in southern New Jersey.

NJDEP, "Air Quality Assessment of the New Jersey Pinelands," (January 1980), p. 28. The Commission's 2011 solar energy amendments to the CMP further acknowledged the need to reduce carbon dioxide, sulfur dioxide, nitrogen oxides, mercury emissions, and particulate emissions from coal. See New Jersey Pinelands Commission, "Proposed Amendments to Pinelands Comprehensive Management Plan, Local communications facilities; Solar energy facilities; Accessory uses on deed restricted parcels" (April 18, 2011).

During the deliberations over the proposed MOA, NJDEP submitted detailed information to the Pinelands Commission identifying the air pollution reduction benefits to the Pinelands associated with repowering the facility with natural gas. By converting BLE to natural gas, the project will reduce dramatically the plant's air pollution impacts on the Pinelands. NJDEP testified¹⁵ that "the Department has determined that this project will result in significant improvements to the environment and human health of the Pinelands region." *Comments of John Gray*,

¹⁴ See Monitoring Analytics, *2014 State of The Market Report for PJM*, Vol. 2, p. 16.

¹⁵ NJDEP is the only State Agency invested with the statutory authority and technical expertise to analyze the air pollution control benefits associated with the repowering of BLE.

Acting Director for the Office of Permit Coordination and Environmental Review, NJDEP Tr. at 10. NJDEP's Assistant Director for Air Quality testified that:

Carbon dioxide emissions are expected to be reduced by at least 50 percent on a per megawatt basis. Actual emissions of sulfur dioxide are expected to be reduced by at least 99 percent, resulting in up to a 45 percent reduction in the maximum ambient SO₂ levels, sulfur dioxide. *This decrease will lower acid deposition in the Pinelands, since sulfur dioxide reacts in the atmosphere to form acidic sulfates.* Actual emissions of nitrogen oxides are also expected to be reduced by at least 75 percent, resulting in up to a ten percent reduction in the maximum ambient nitrogen dioxide levels, lowering acid deposition in the Pinelands. Additionally, since nitrogen dioxide also reacts in the atmosphere to form ozone, there will be a positive impact on ozone levels. *Lower ozone also -- is also important for public health, since all of New Jersey, including the Pinelands, exceeds Federal air quality standards for protection of health.* Actual emissions of particulates are expected to be reduced by at least 30 percent, resulting in up to a six percent reduction in maximum ambient fine particle levels. Fine particles have significant impacts on cardiovascular and pulmonary health, so reductions in fine particles improves public health. *Reductions in fine particles are expected to improve visibility in the Pinelands and other areas of New Jersey, including the nearby Brigantine National Wildlife Area. Finally, a 94 percent reduction in the allowable mercury emissions will benefit fish, and animals that eat the fish, including humans, lessening the bioaccumulation of mercury.*

Comments of Francis Steitz, Assistant Director for Air Quality Permitting, NJDEP Tr. at 20-22. NJDEP also prepared a written report describing the substantial air quality benefits of the Project. See NJDEP, "Pinelands Air Quality Benefit Analysis of BL England Repowering Project," Memorandum from Francis C. Steitz, Assistant Director, Division of Air Quality, to Nancy Wittenberg, Executive Director (September 16, 2013) (attached hereto as **Exhibit 16**). The report found that that "[t]he proposed Repowering Project will very significantly reduce both actual and allowable air pollutant emissions at the BL England Generating Station." *Ibid.* Table 1 in NJDEP's report showed significant improvement in allowable emission rates from before to after the repowering project. Hourly emission rate reductions included 99.3% for SO₂, 78.7% for NO_x, 96.7% for PM.

**Table 1. Summary of Allowable Emission Rates
Before and After the Repowering Project**

Hourly Emission Limits (lbs/hr)				
Pollutant	Allowable Emission Rate Before Project ^a	Allowable Emission Rate After Project ^b	Net Emission Reduction	Percent Reduction
SO ₂	1,633.9	10.8	- 1,623.1	99.3 %
NO _x	821.4	175.0	- 646.4	78.7 %
PM ₁₀	1,033.3	34.0	- 999.3	96.7 %
PM _{2.5}	1,033.3	34.0	-999.3	96.7 %
Annual Emission Limits (tons/yr)				
Pollutant	Allowable Emission Rate Before Project ^a	Allowable Emission Rate After Project ^b	Net Emission Reduction	Percent Reduction
SO ₂	5,887	15	- 5,87	99.7 %
NO _x	3,090	183	- 2,906	94.0 %
PM ₁₀	4,526	77	- 4,449	98.3 %
PM _{2.5}	4,526	77	-4,449	98.3 %
HAPs ^c	1,283	27	1,256	97.9 %

Mercury	0.068 (136 lbs/yr)	0.004 (8 lbs/yr)	- 0.064 (-128 lbs/yr)	94.1 %
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- a: Includes Unit 1 (coal) with ACO limits, Unit 2 (coal) with O limit, Unit 3 (residual oil) with RACT limits, and Unit 5 diesel generators.
- b: Includes Unit 3 (converted to natural gas), and the new Combined Cycle Combustion Turbine (natural gas).
- c: HAP: Hazardous Air Pollutants.

The NJDEP report estimated that annual tons per year of SO₂, NO_x, PM will be dramatically reduced from the existing plant, even conservatively assuming that the new NGCC plant will run at 100% annual capacity factor, which is unrealistic. These estimates are included in Tables 4 and 5 of NJDEP's report, which found that repowering will reduce annual SO₂ emissions by 97% or 550 tons per year (tpy), annual PM_{2.5} emissions by 42% or 50 tpy, and annual NO_x emissions by 78% or 322 tpy.

**Table 4. Emission Rates and Stack Parameters
For Modeling Short-Term Impacts of Actual Emissions Scenario**

Pollutant		Source	Emission Rate (lb/hr)	Stack height (ft)	Stack Temp. (K)	Stack Exit Velocity (m/s)	Stack Diameter (m)
SO ₂	Pre-Project	Boilers 1 and 2 (coal)	652.5	475	334.2	13.50	6.47
	Post-Project	CCCT (Gas)	6.8	180	350.7	17.96	6.71
PM _{2.5}	Pre-Project	Boilers 1 and 2 (coal)	409.6	475	334.2	13.50	6.47
	Post-Project	CCCT (Gas)	20.6	180	350.7	17.96	6.71
NO _x	Pre-Project	Boilers 1 and 2 (coal)	391.5	475	334.2	13.50	6.47
	Post-Project	CCCT (Gas)	22.6	180	350.7	17.96	6.71

Exhibit 16, Table 4.

**Table 5. Emission Rates and Stack Parameters
For Modeling Long-Term Impacts of Actual Emissions Scenario**

Pollutant		Source	Emission Rate (ton/yr)	Stack height (ft)	Stack Temp. (K)	Stack Exit Velocity (m/s)	Stack Diameter (m)
SO ₂	Pre-Project	Boilers 1 and 2 (coal)	565	475	334.2	13.50	6.47
	Post-Project	CCCT (Gas)	14	180	350.7	17.96	6.71
PM _{2.5}	Pre-Project	Boilers 1 and 2 (coal)	118	475	334.2	13.50	6.47
	Post-Project	CCCT (Gas)	69	180	350.7	17.96	6.71
NO _x	Pre-Project	Boilers 1 and 2 (coal)	414	475	334.2	13.50	6.47
	Post-Project	CCCT (Gas)	92	180	350.7	17.96	6.71

Exhibit 16, Table 5.

The NJDEP report did not address CO₂ emissions. However, CO₂ emissions on an annual basis from NGCC system at BLE would be dramatically less than such emissions from replacement power from the grid. It is important to know that existing sources on the PJM grid, which would need to generate replacement electricity if BLE is not repowered, would produce 73% more CO₂ emissions to generate the same amount of energy as the new combined cycle unit.

The dramatic reduction in emissions associated with a conversion of BLE to NGCC technology will produce a host of human health, environmental and economic benefits, which U.S.EPA has summarized in support of its proposed Clean Power Rules:

- **Reduced climate effects** (Global climate impacts from CO₂, climate impacts from ozone and black carbon (directly emitted PM)), other climate impacts (e.g., other GHGs such as methane, aerosols, other impacts);
- **Reduced incidence of premature mortality from exposure to PM_{2.5}** (Adult premature mortality based on cohort study estimates and expert elicitation estimates (age >25 or age >30), infant mortality (age <1));
- **Reduced incidence of morbidity from exposure to PM_{2.5}** (Non-fatal heart attacks (age >18), hospital admissions--respiratory (all ages), hospital admissions--cardiovascular (age >20), emergency room visits for asthma (all ages), acute bronchitis (age 8-12), lower respiratory symptoms (age 7-14), upper respiratory symptoms (asthmatics age 9-11), asthma exacerbation (asthmatics age 6-18), lost work days (age 18-65), minor restricted-activity days (age 18-65), chronic Bronchitis (age >26), emergency room visits for cardiovascular effects (all ages), strokes and cerebrovascular disease (age 50-79), other cardiovascular effects (e.g., other ages), other respiratory effects (e.g., pulmonary function, non-asthma ER visits, non-bronchitis chronic diseases, other ages and populations), reproductive and developmental effects (e.g., low birth weight, pre-term births, etc), cancer, mutagenicity, and genotoxicity effects).
- **Reduced incidence of mortality from exposure to ozone** (Premature mortality based on short-term study estimates (all ages), premature mortality based on long-term study estimates (age 30–99)).
- **Reduced incidence of morbidity from exposure to ozone** (Hospital admissions—respiratory causes (age > 65), hospital admissions—respiratory causes (age <2), emergency department visits for asthma (all ages), minor restricted-activity days (age 18–65), school absence days (age 5–17), decreased outdoor worker productivity (age 18–65), other respiratory effects (e.g., premature aging of lungs), cardiovascular and nervous system effects, reproductive and developmental effects).
- **Reduced incidence of morbidity from exposure to NO₂** (Asthma hospital admissions (all ages), chronic lung disease hospital admissions (age >65), respiratory emergency department visits (all ages), asthma exacerbation (asthmatics age 4–18), acute respiratory symptoms (age 7–14), premature mortality, other respiratory effects (e.g., airway hyper responsiveness and inflammation, lung function, other ages and populations)).
- **Reduced incidence of morbidity from exposure to SO₂** (Respiratory hospital admissions (age > 65), asthma emergency department visits (all ages), asthma exacerbation (asthmatics age 4–12), acute respiratory symptoms (age 7–14), premature mortality, other respiratory effects (e.g., airway hyper responsiveness and inflammation, lung function, other ages and populations)).
- **Reduced incidence of morbidity from exposure to methyl mercury** (Neurologic effects—IQ loss, other neurologic effects (e.g., developmental delays, memory, behavior), cardiovascular effects, genotoxic, immunologic, and other toxic effects).
- **Reduced incidence of morbidity from exposure to Hazardous Air Pollutants** (Effects associated with exposure to hydrogen chloride).

- **Reduced visibility impairment** (Visibility in Class 1 areas, visibility in residential areas).
- **Reduced effects on materials** (Household soiling, materials damage (e.g., corrosion, increased wear)).
- **Reduced PM deposition (metals and organics)** (Effects on Individual organisms and ecosystems).
- **Reduced vegetation and ecosystem effects from exposure to ozone** (Visible foliar injury on vegetation, reduced vegetation growth and reproduction, yield and quality of commercial forest products and crops, damage to urban ornamental plants, carbon sequestration in terrestrial ecosystems, recreational demand associated with forest aesthetics, other non-use effects, ecosystem functions (e.g., water cycling, biogeochemical cycles, net primary productivity, leaf-gas exchange, community composition)).
- **Reduced effects from acid deposition** (Recreational fishing, tree mortality and decline, commercial fishing and forestry effects, recreational demand in terrestrial and aquatic ecosystems, other non-use effects, ecosystem functions (e.g., biogeochemical cycles)).
- **Reduced effects from nutrient enrichment** (Species composition and biodiversity in terrestrial and estuarine ecosystems, coastal eutrophication, recreational demand in terrestrial and estuarine ecosystems, other non-use effects, ecosystem functions (e.g., biogeochemical cycles, fire regulation)).
- **Reduced vegetation effects from exposure to SO₂ and NO_x** (Injury to vegetation from SO₂ exposure, injury to vegetation from NO_x exposure).
- **Reduced ecosystem effects from exposure to methyl mercury** (Effects on fish, birds, and mammals (e.g., reproductive effects), commercial, subsistence and recreational fishing).

See U.S. EPA, "Regulatory Impact Analysis for the Proposed Carbon Pollution Guidelines for Existing Power Plants and Emission Standards for Modified and Reconstructed Power Plants," Table ES-5. Quantified and Unquantified Benefits (June 2014) available at <http://www2.epa.gov/sites/production/files/2014-06/documents/20140602ria-clean-power-plan.pdf>.

In sum, the combination of a high-efficiency combined cycle combustion turbine, state-of-the-art air emission controls, and clean-burning natural gas will place the repowered BLE among the cleanest power plants in New Jersey. Emission rates of NO_x and SO₂—the emissions associated with smog and acid rain—will be cut by 96% to 99% for each MW-hr of electricity generated compared either to the existing coal units *or to existing marginal generation units in the region that will have to run to replace BLE's output if the plant is not repowered*. Particulates will be cut by 96% for each MW-hr compared to the existing coal units and 85% compared to the grid replacement power. Carbon dioxide will be cut by 62% for each MW-hr compared to the existing coal plant and 42% compared to the grid replacement power.

a. Closure of BLE Will Worsen New Jersey's Air Quality

The notion that permanent closure of BLE somehow will improve New Jersey's air quality is flawed. Electricity to serve the Pinelands must be produced somewhere, as electricity demand in the ACE zone is increasing by 0.8% every year. See **Exhibit 14**, p. 5. BLE provided residents and businesses in Cape May and Atlantic Counties (many of whom live and work within the Pinelands) with 425 MW of total net summer electricity capacity, which must be replaced if the plant closes and is not repowered. According to NJDEP, the loss of electricity from the retirement of BLE largely will be made up by out-of-state power plants that emit higher levels of air pollutants that are transported into New Jersey by the prevailing winds:

Pinelands – The proposed pipeline for BL England along a road through the Pinelands was not approved by the Pinelands Commissioner with a 7 to 7 vote. NJDEP testified at the Commission's

hearing and explained the air quality benefits of the conversion of this power plant from coal and oil to gas, with a new very efficient combined cycle unit. *If this plant shuts down, the electricity lost would likely be provided from out of state power plants, with the much higher emissions of air contaminants transported into NJ on the prevailing winds from the west and southwest.*

New Jersey Clean Air Council, Minutes of January 2014 Meeting, Presentation by William O'Sullivan, NJDEP Division of Air Quality, (emphasis added) available at http://www.state.nj.us/dep/cleanair/minutes/min_1401.pdf.

New Jersey currently imports about one-quarter to one-third of the electricity it consumes. *EMP*, p. 26; U.S. Energy Information Agency, *New Jersey Profile Analysis*, Dec 2013. A significant portion of this imported electricity comes from Pennsylvania, the nation's largest net exporter of electricity. See, *Pennsylvania Department of Treasury, The McCord Report*, October 9, 2013; *U.S. Energy Information Administration State Profiles, Pennsylvania*. In 2011, Pennsylvania exported to adjacent states approximately 35% of its nearly 228 million megawatt hours of generation. In 2013, 40% of all electricity generated in Pennsylvania came from coal-fired generation, versus only 4% in New Jersey. *U.S. Energy Information Administration State Profiles, Pennsylvania & New Jersey*, <http://www.eia.gov/state/analysis.cfm?sid=PA> & <http://www.eia.gov/state/analysis.cfm?sid=NJ>. Much of the air pollution generated by Pennsylvania's marginal electric generation plants (i.e. coal-, natural gas-, and oil-steam plants) impacts on New Jersey and specifically on the Pinelands. It is well established that prevailing west-east winds transport fine particulates (PM_{2.5}), sulfate, NO_x, and mercury air pollution from Pennsylvania's power generation plants to the Pinelands, where they contribute to respiratory distress, cardiovascular disease, premature mortality, regional haze and acid deposition. See *State of New Jersey v. EME Homer City Generation, L.P., et al.*, Civil Action N. 2:11-cv-00019, (Fed. Dist. Ct., W.D. Pa) ¶¶ 4-6; see also Northeast States for Coordinated Air Use Management (NESCAUM), *The Nature of the Fine Particle and Regional Haze Air Quality Problems in the MANE-VU Region: A Conceptual Description, Second Update* (July 2012) available at <http://www.nescaum.org/documents/pm-haze-conceptual-descrip-update-20120731-final.pdf>; Sierra Club, "Report Shows 'Killer' Coal" (Sept. 9, 2010) (noting that "because of our location at the end of the air stream, we receive a lot of pollution from Ohio, Pennsylvania, and other Midwestern states. Added to the pollution from our coal plants here, coal pollution is having a devastating health impact.")

New Jersey repeatedly has pursued legal action against Pennsylvania coal plants to compel greater pollution controls and to reduce the interstate transport of coal-related pollutants into New Jersey. See, NJDEP, "Christie Administration Secures Settlement That Will Result In Permanent Cessation of Coal Use at Portland, PA Power Plant, Improving Air Quality in New Jersey" (May 15, 2013) available at http://www.nj.gov/dep/newsrel/2013/13_0054.htm. Despite these efforts, Pennsylvania still has the highest percentage of coal-based electric generation of any state in the northeast.

USEPA tracks the environmental attributes of virtually all of the electric power generated in the United States and links air emissions to electricity generated. The data is published in USEPA's Emissions & Generation Resource Integrated Database (eGRID), which widely is regarded as the preeminent source of data on the emissions rate for SO₂, NO_x and CO₂ from electric generation plants. The CO₂, SO₂, and NO_x emission rates for "non-baseload" electric generation plants (i.e. those marginal generation plants that would be displaced by a new NGCC plant such as a repowered BLE) in the eastern portion of the PJM zone, otherwise known as the "EMAAC region" (i.e. eastern Pennsylvania, New Jersey Maryland and Delaware) are dramatically higher than the emission rates from a repowered BLE. See USEPA, "eGRID 9th edition Version 1.0 (February 2014)" available at <http://www.epa.gov/cleanenergy-/documents/eGRID9th-edition-V1-0-year-2010-Summary-Tables.pdf>. A comparison of eGRID NO_x and SO₂ emission rates for electric generation units in Pennsylvania and New Jersey shows that Pennsylvania electricity has a NO_x intensity more than twice the NO_x intensity and four times the SO₂ intensity of New Jersey electricity. *Ibid.* p. 10. This means that the electricity imported into New Jersey from Pennsylvania is produced by more polluting electric generation units. The EPA's eGRID data clearly shows that the electricity from the grid that would be required to replace BLE would generate far greater levels of NO_x, SO₂, and CO₂

in comparison to a repowered BLE using NGCC technology. This is because 53 percent of the marginal generation in the PJM zone in 2014 were coal units.¹⁶

An “apples-to-apples” comparison of emission rates from: (1) BLE’s existing operating coal unit 2; (2) the marginal generation units that would be called upon to replace this unit if it is not repowered, and; (3) a repowered state-of-the-art NGCC BLE is provided below:

Comparison of lb/MW-hr (net) Emissions					
Pollutant	Existing BLE Coal Unit 2 ¹	Grid Emissions for PJM EMAAC ²	New BLE NGCC ³	New NGCC Improvement Over BLE Unit 2	New NGCC Improvement Over Grid
SO ₂	2.5806	3.8673	0.0163	99.4%	99.6%
NO _x	1.5484	1.3913	0.0542	96.5%	96.1%
PM _{10/2.5}	1.4032	0.5128/0.3370 ⁴	0.0494	96.5%	85.3%
CO ₂	2398	1562	900	62.5%	42.4%

Analysis provided by Trinity Consultants.

Note 1: Based on permit limits (PM_{10/2.5}), ACO Limits (NO_x, SO₂), and AP-42 emission factors (CO₂).

Note 2: Based on EPA eGRID 9th Edition Summary Tables published February 2014, the marginal emission rates (which NGCC would displace) for RFC East (EMAAC).

Note 3: Conservatively based upon BLE NGCC permit limits or related application (actual operations are required to be lower).

Note 4: Based on PJM marginal fuel analysis for April 1, 2014 through March 31, 2015, and PM_{2.5} emission rates from Argonne National Labs Greenhouse Gas and Criteria Air Pollutant Emission analysis (Sept 2013).

For all of these reasons, the suggestion that a permanent closure of BLE somehow will improve New Jersey’s air quality is incorrect. A closure of BLE will lead to greater imports of electricity generated from the eastern PJM region, mainly from Pennsylvania, which has excess capacity¹⁷ from its many older steam units (*i.e.* coal-, oil- or natural gas-fired). USEPA’s data shows that these units emit much higher levels of air pollution on a per unit basis¹⁸ than the state-of-the-art NGCC technology that will be used at BLE. The higher emissions of mercury, CO₂, SO₂, PM_{2.5} and NO_x, from these older fossil units will be transported to the Pinelands region by prevailing weather patterns, where they will impact the Pinelands environment and its people.

b. Repowering BLE with Natural Gas is Essential for Greater Renewable Energy Penetration

The electric generation capacity necessary to replace BLE cannot be supplied by wind or solar generation. The defining challenge to maintaining a reliable electricity grid is that electricity supply must always match electricity demand. Excess supply or excess demand can result in grid instability and ultimately a blackout. Substantial penetration of variable electricity sources (*i.e.* electric generators whose electric output fluctuates) like wind and solar power must be supported with adequate spinning reserves to meet electric demand when the wind and/or sun is not available. Therefore, even if renewable energy becomes a much greater percentage of New Jersey’s energy mix, quick-start natural gas-fired generation will remain an essential resource to balance load and to smooth-out the variability and intermittency associated with renewable technology. See, Ng, Ying, “Natural Gas Key to Renewable

¹⁶ See Monitoring Analytics, *2014 State of The Market Report for PJM*, Vol. 2, p. 16.

¹⁷ See Monitoring Analytics, *2014 State of The Market Report for PJM*, Section 3 Energy Market, Figure 3-11 Map of PJM real-time generation less real-time load by zone (referenced on p. 22 *supra*).

¹⁸ According to EPA, NGCC units can produce as much as 46 percent more electricity from a given quantity of natural gas than steam EGUs. See, U.S.EPA, Proposed Rule, “Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units” 79 Fed. Reg. at 34857.

Energy Future”, *Power Engineering* (July 1, 2012); NJDEP, *Environmental Trends*, “Energy Use and Renewable Energy Sources,” (May 2013) <http://www.nj.gov/dep/dsr/trends/pdfs/energy.pdf>.

Replacing BLE’s 425 MW of electricity with solar panels would require construction on 13,000 acres of land within the Pinelands and/or CAFRA area for a solar installation capable of supplying the equivalent level of electricity. Even then, a back-up supply of quick-start electricity would be necessary because even the most efficient solar panels operate at their full rated capacity about 17% of the time. Similarly, offshore wind energy systems operate at their full rated capacity between 20% to 50% of the time. The successful development of offshore wind power in New Jersey will require additional back-up power from readily dispatchable generation sources. *EMP* at 4. NGCC technology—such as that proposed for repowering the BL England plant—is the best available generation technology capable of providing rapid power to balance load. Countless studies by grid operators, energy consultants, and various federal and state agencies conclude that significant penetration of wind power is not feasible without adequate, readily dispatchable reserve power to balance electricity supply when the wind is not blowing. See Trembath, A., Luke, M., Schellenberger, M. & Nordhaus, T., The Breakthrough Institute, *Coal Killer: How Natural Gas Fuels the Clean Energy Revolution* (2013) pp. 28-29 at http://thebreakthrough.org/images/main_image/Breakthrough_Institute_-_Coal_Killer.pdf; ISO New England, *New England Wind Integration Study*, Dec. 2010, p. 21, at http://www.uwig.org/newis_es.pdf; National Renewable Energy Laboratory, *Operating Reserves and Wind Power Integration: An International Comparison*, Oct. 2010, <http://www.nrel.gov/docs/fy11osti/49019.pdf>; Rigos, D., Shapiro B., Levitan, R., *Leaning on Line Pack Green energy mandates might overburden gas pipelines*, Public Utilities Fortnightly, Jan 2011 at http://www.levitan.com/wp-content/uploads/2012/10/PUFLinePack1_11_11.pdf; North American Electric Reliability Corporation (NERC), “2013 Special Reliability Assessment: Accommodating an Increased Dependence on Natural Gas for Electric Power Phase II: A Vulnerability and Scenario Assessment for the North American Bulk Power System” (May 2013). p. 82 (“The strong growth in wind power and the lack of cost-effective electric storage solutions indicates that power systems will rely heavily on more flexible resources, such as gas turbines, to compensate for wind power variability.”)

The consistent finding that natural gas generation is a necessary catalyst for New Jersey wind power development was confirmed by Princeton University modeling of large scale wind development off the Mid-Atlantic coast. The modeling finds that the difficulty in forecasting “precipitous drops in wind in the hour-ahead time frame [will] require additional spinning reserves, namely, the ability to ramp up (or down) a significant amount of (fast) generation within a relatively short period of time (say, 10 min).” Simao, H. & Powell W., *SMART-ISO: Modeling Uncertainty in the Electricity Markets*, Princeton University Laboratory for Energy Systems Analysis, Presentation to Federal Energy Regulatory Commission, Staff Technical Conference, June 2013, at www.ferc.gov/EventCalendar/Files/20130625081929-T1A_Simao.pdf. The synergy between natural gas powered electricity and renewable electricity recently is explained by the progressive think-tank, Breakthrough Institute, in its report *Coal Killer: How Natural Gas Fuels the Clean Energy Revolution*, which explains that:

Gas-fired power provides cheap, low-carbon, and flexible backup support for intermittent wind and solar. Grid operators depend on reliable power production from power plant operators to match grid supply and demand and ensure consistent price signals. As intermittent renewables — particularly wind — continue to occupy a greater share of the nation’s electricity output, power system operators will need to increasingly rely on capacities of backup and firming power. Natural gas-fired power plants offer the best currently available solution.

Natural gas power — and particularly power from natural gas combined cycle (NGCC) plants — provides a readily substitutable alternative to baseload and older load-following coal plants. Flexible gas plants provide support for electric power grids that are increasingly occupied by intermittent wind and solar. A study from researchers at Carnegie Mellon University suggests that for every 4 MW of wind capacity, 3 MW of NGCC capacity will be needed to operate the grid reliably. The expansion of gas-fired power plants could accelerate the integration of intermittent power into existing grid systems. New natural gas plants have ramping rates of approximately 8

percent per minute and can reduce their output to 80 percent capacity with minimal heat rate penalty. New NGCC plants that are specifically designed to offer flexibility to a renewables-heavy grid system can ramp to 150 MW in 10 minutes and to full load in 30 minutes. General Electric's new fleet of gas-fired power plants is designed to optimize integration with variable power sources and can ramp as fast as 100 MW per minute. Modeling efforts at the National Renewable Energy Laboratory (NREL) find that "large quantities of variable renewable energy and flexible gas generation work synergistically to maintain system reliability requirements."

Trembath, et al., *Coal Killer: How Natural Gas Fuels the Clean Energy Revolution* available at http://thebreakthrough.org/images/main_image/Breakthrough_Institute_Coal_Killer.pdf. Therefore, contrary to popular statements that offshore wind power can replace BLE, in fact, repowering BLE will be an essential catalyst to the successful deployment of offshore wind energy in New Jersey.

For these reasons, renewable energy sources, such as wind and solar, simply are not capable of supplying sufficient replacement electricity without support from a NGCC generation source. A closure of BLE most certainly will lead to greater imports of out-of-state electricity which is generated by older fossil units (i.e. coal- or natural gas-fired) that PJM data shows emit higher levels of air pollution that is carried to the Pinelands by prevailing winds. In contrast, a repowered BLE will be the most efficient and lowest-emitting source of electricity, will provide black start capability to make the grid more resilient to outages, and will serve as an essential catalyst for the development of New Jersey's abundant off-shore wind energy resources.

B. Improve Resiliency of Gas Supply to the Pinelands and Atlantic & Cape May Counties

An important purpose of the Project is to improve the resiliency of the natural gas distribution system in the Pinelands and the entire southernmost portion of SJG's service territory, from the Cape May Gate Station south, which currently is served by only a single-feed supply. There are 25,400 Atlantic County customers and 3,300 Cape May County customers residing within the Pinelands who will directly benefit from strengthening the resiliency of the existing natural gas distribution infrastructure through the construction of the pipeline. *See South Jersey Gas, BL England & Reliability Pipeline Project, Presentation to Pinelands P&I Committee*, pp. 7-9 (September 27, 2013) (attached hereto as **Exhibit 17**). However, like any natural gas distribution system, SJG's system is an interconnected network of transmission and distribution pipelines extending across the Pinelands and into the coastal areas beyond the Pinelands. Thus, any project to improve the resiliency of the distribution system serving people living and working in the Pinelands unavoidably improves the whole interconnected system, including portions of the system outside the Pinelands.

SJG's existing infrastructure serving all of Cape May County and portions of Atlantic County is dependent upon two segments of single natural gas transmission pipeline that serves as the "backbone" of the entire supply system to Cape May and Atlantic Counties: the Vineland to Mays Landing Segment and the Route 50 Segment. Both segments are located within the Pinelands and both are vulnerable to service interruptions. The Vineland to Mays Landing Segment consists of a 20" diameter pipeline operating at 435 PSIG as it travels east from Vineland to Mays Landing, cross country, through easements along private property within the Pinelands. The Route 50 Segment consists of a 20" diameter pipeline that operates at 435 PSIG, which reduces to 16" at 250 PSIG as it travels south along the Route 50 right-of-way from Mays Landing to Tuckahoe. Several portions of the Route 50 segment are within the storm surge zone of a major hurricane. If a service interruption were to occur anywhere along this "backbone," whether due to a natural disaster or an accident, as many as 28,700 residents and businesses located within the Pinelands and 142,000 customers overall would be without natural gas service. Depending on the severity of the interruption, these customers could be without natural gas for heating or cooking for several months. An interruption of this magnitude would place public health and safety at risk, especially during the winter months when natural gas usage peaks due to the need to heat homes, businesses, and other critical facilities such as hospitals,

schools, elder care facilities, etc. Due to this vulnerability in SJG's Atlantic and Cape May system, it is vitally important that any route considered for this project address this reliability need.

To understand why the Project is necessary to address a major vulnerability in SJG's existing distribution system, it is essential to understand how the Company's distribution system is configured. Attached as **Exhibit 18** is a map depicting the Company's existing transmission and distribution system in relation to the Pinelands.

1. 70-Mile Cross-State Transport Through the Pinelands Forest Area

All of the natural gas serving the coastal region of the SJG service territory originates 70 miles away at two interstate pipelines that parallel Interstate 295 in the vicinity of Paulsboro (Transco Pipeline) and Swedesboro (Columbia Pipeline). After the transition to natural gas in the 1950s, SJG's gas transmission pipelines were built to bring gas supplies from the interstate natural gas pipelines to the growing customer base in the east and south, including Atlantic City to the east and Cape May to the south. Cape May and Atlantic Counties are located in the furthest eastern and southeastern portions of SJG's service territory. With the Atlantic Ocean to the east and south and the Delaware Bay to the southwest, service to the critical coastal areas of Cape May and Atlantic Counties requires SJG to transport the natural gas from the interstate pipelines, clear across the state, and through the Pinelands Forest Area and/or Preservation Area, which forms a continuous band from extreme southern Cape May County all the way north to Ocean County. Accordingly, the only way to transport natural gas to Cape May and Atlantic Counties is to traverse the Southern Forest Area, which is located in the heart of SJG's service territory. The Company has 188 miles of gas mains and 32 miles of high pressure pipelines within the Forest Area and nearly 1,400 miles of gas mains and 133 miles of high pressure pipelines within the Pinelands. Much of this infrastructure located in the Forest Area was installed decades before the creation of the Pinelands Commission. The Company's first pipeline into Atlantic County was the 12" 250 PSIG Woodbury Line constructed in 1951 between Woodbury and Pleasantville. In 1962, the Company constructed the 10" 250 PSIG "Lawnside Line" between Lawnside and Pleasantville. Finally, in 1987, the Company constructed the 20" 435 PSIG Vineland-Mays Landing line between Vineland and Mays Landing. Based on pipe flow capacities, the 20" Vineland-Mays Landing pipeline supplies approximately 70% of the west-east flow, while the existing 12" Woodbury Line and 10" Lawnside Line supply the remaining 18% and 12%, respectively. All three cross-country pipelines traverse the Forest Area.

Due to the location of this pipeline infrastructure, virtually any reliability improvement project to reduce the vulnerability of the existing single supply line into Cape May and Atlantic Counties necessarily will require construction within the Pinelands Forest Area as this is where the Company's pipeline infrastructure exists. Only by extending this existing infrastructure can BLE receive natural gas service and the residents and businesses in Cape May County be protected against a failure of the single pipeline serving this remote area of the State.

2. Two Single-Feed Vulnerabilities In the Supply to Atlantic & Cape May Counties

The Company's supply of natural gas to all of Cape May County and 70 percent of Atlantic County and depends on two "single-feed" pipeline segments that currently lack any redundancy and are both located within the Pinelands Forest Area. In the event either pipeline segment suffers damage due to a storm, accident, or sabotage there is no secondary route for transporting natural gas to all of Cape May County and most of Atlantic County, leaving 28,700 customers in the Pinelands and 142,000 customers overall without fuel for heating or cooking. This area is the only portion of SJG's service territory of this magnitude lacking secondary feed capability. The Company has long-planned to address this reliability deficiency but only recently has it had the ability to do so.

The first single-feed pipeline segment is the 20" diameter Vineland to Mays Landing Segment, which runs west-east between Vineland and just south of Mays Landing at Rt. 50. The pipeline increases in diameter to 24" as it continues east past Rt. 50 another 4 miles to SJG's McKee City LNG facility off of Ocean Heights Avenue. The Vineland-Mays Landing Segment, which was constructed in 1986, carries 100 percent of the gas serving Cape May County and 70

percent of the gas serving Atlantic County. The second pipeline, which interconnects with and is fed by the Vineland-Mays Landing Segment at Rt. 50, is a 20-mile pipeline segment that runs north-south beneath Rt. 50 (the "Route 50 Segment"). This pipeline runs from Estell Manor beneath Rt. 50 in a 20" diameter pipe reducing to 16" just north of Corbin City. The Route 50 Segment was constructed in various segments between 1977 and 2005, and includes a critical crossing of the Tuckahoe River separating Atlantic & Cape May Counties, installed in 1997. The Route 50 Segment carries 100 percent of the gas serving Cape May County.

Should a system upset condition occur anywhere along the 10-mile portion of the Vineland-Mays Landing Segment between Union Road and NJ Route 50, approximately 142,000 residential and commercial customers in both Cape May and Atlantic Counties would be without natural gas service. Should a system upset condition occur anywhere along the 10-mile portion of the Route 50 Segment from Mays Landing to Tuckahoe, 61,000 customers of Cape May County would be without natural gas service. *Ibid*, p. 10. Both the Vineland-Mays Landing segment and the Route 50 segment are vulnerable to a "single-contingency failure." This means that a single disruptive event along either of these segments, such as damage from a significant storm, sabotage, or a construction accident, would cause a large number of customers to lose gas service. Both segments are vulnerable to disruption. The Vineland-Mays Landing segment is not located beneath a roadway but a 2-mile portion of the segment shares a right-of-way with the same electric transmission lines that PJM has ordered to be expanded. The Route 50 segment is even more vulnerable to a single-contingency failure because it is beneath an active roadway on which there is periodic construction, including at the bridge crossing the Tuckahoe River. This segment also is directly within the storm surge zone of major storms.

Until 2010, SJG lacked the ability to address this risk of a single contingency failure of either the Vineland-Mays Landing Segment or the Route 50 Segment. In 2010, SJG completed construction of a 15 mile, 24" diameter pipeline loop from Malaga south to the Union Road Station at the Vineland-Mays Landing Segment, which created an alternate feed down to the Vineland-Mays Landing Segment (the "Malaga-Union Road Pipeline"). This new Malaga-Union Road Pipeline fixed the single-feed deficiency between Vineland and Union Road. The pipeline is interconnected with the Vineland-Mays Landing Segment at Union Road and then joins with the existing 20" pipeline beneath Union Road. The Malaga-Union Road Pipeline provided SJG with a secondary option to feed gas to the Vineland-Mays Landing Segment in the event that any portion of this pipeline west of Union Road is damaged. This improvement also provided SJG with an opportunity to create a secondary option to feed into both Atlantic and Cape May Counties in the event of a catastrophic failure east of Union Road on the Vineland-Mays Landing Segment or South on the Route 50 Segment, by extending service from its the existing 20" pipeline beneath Union Road (which currently ends at Rt. 49) across to the Route 50 Segment south of Corbin City.

3. Why Redundant/Looping Infrastructure Is Necessary

The proposed 13-mile extension connecting the Malaga-Union Road Pipeline to the Route 50 Segment, which would be constructed entirely beneath Rt. 49 and secondary roads, would solve the single-feed deficiency in both the Vineland-Mays Landing Segment and the Route 50 Segment. With the construction of the Project, customers in Cape May and Atlantic Counties could receive gas service in the event that either the Vineland-Mays Landing Segment or the Route 50 Segment north of Tuckahoe is damaged and taken out-of-service. The Project creates an essential alternative pathway, or "loop," to transport gas around the two vulnerable segments.

If a construction accident, sabotage, or a natural disaster were to disrupt the gas flow from the main backbone that serves Cape May County and a portion of Atlantic County, such as occurred in Ocean and Burlington Counties in the wake of Hurricane Sandy, the consequences to the public health and emergency services that rely on natural gas would be devastating. Tens of thousands of people in Cape May and Atlantic Counties would be impacted by a service disruption on either the Vineland to Mays Landing Segment or the Route 50 Segment. Restoring service to all of Cape May County could take 3 months or longer. Facilities such as hospitals, nursing homes, schools, emergency shelters providing essential services to thousands of people would be left without natural gas service possibly for months. Restoring natural gas service is a lengthy, tedious process that must be performed by trained,

qualified personnel. The first step is to shut off each individual gas meter. Distribution lines and lines from the meters to homes or businesses must then be purged of air and re-pressurized with gas. Once this is done, workers visit each home and business, inspect gas appliances for safety, open meter valves, relight pilot lights, and confirm that the appliances are operating safely. This can only be done when the customer is present, and if workers find that any appliances are not operating properly, service cannot be restored until repairs have been made. See Federal Energy Regulatory Commission & North American Electric Reliability Corp, *Report on Outages and Curtailments During the Southwest Cold Weather Event of February 1-5, 2011: Causes and Recommendations*, p. 125 (Aug. 2011). A disaster at any time of the year would adversely impact public health and safety since so many essential services rely on gas service. A disaster in the winter that cuts-off gas flow to customers in Atlantic and Cape May Counties would have a devastating impact public safety since many customers rely on gas to heat their homes, businesses and public service buildings.

The need for a redundant supply line to Cape May and Atlantic Counties is not some abstract concept. Hurricane Sandy demonstrated that a storm-related natural gas outage is not a remote possibility. In the case of Hurricane Sandy, thirty-two thousand customers of New Jersey Natural Gas lost natural gas service for two months due to extreme flooding and erosion of natural gas mains buried two feet below the ground:

Superstorm Sandy was the largest and most severe storm in NJNG's history, affecting hundreds of thousands of NJNG'S customers and causing widespread destruction in communities across the Company's service territory, especially in the waterfront areas. Many miles of NJNG's gas distribution mains were exposed to excessive damage from the storm surge, resulting in equipment and communication failures at metering and regulating facilities. Extensive water damage from the storm surge occurred in most of waterfront communities in NJNG's service territory. The unprecedented nature of Superstorm Sandy required that the Company curtail natural gas service to approximately 30,000 customers in the heavily-damaged areas of Long Beach Island, and from Bay Head to Seaside Park (the "Seaside Peninsula"). When portions of the infrastructure were torn away from premises, damaging and cracking mains, services, house regulators and meters, natural gas was discharged into the atmosphere. However, following these extreme events, NJNG was able to safely restore service over an eight-week period to almost 30,000 customers capable of receiving natural gas service.

In Re Petition of New Jersey Natural Gas Company for Approval of the NJ Rise Program and Associated Rate Recovery Mechanism, BPU Docket No. GR13090828; see also Star-Ledger, *Underground but not unscathed, N.J. natural gas utilities seek upgrades after Sandy* (October 27, 2013). Severe storm events like Sandy have the potential to cause coastal floodwaters to rise which poses a substantial risk of water penetrating the natural gas system in low-lying areas and causing erosion of the ground around buried utilities, leading to a loss of gas service. Since 1993, the federal Pipeline and Hazardous Materials Safety Administration ("HMSA"), which regulates pipeline safety, has issued five Advisory Bulletins warning that severe flooding events can adversely affect the safe operation of pipelines. According to HMSA data, 50% of the property damage resulting from natural gas distribution system failures is caused by heavy rains and flooding.

Despite the widespread damage Hurricane Sandy inflicted upon coastal areas of the State, far more destructive storms are expected in the coming decades, according both to the historical record and to the latest climate projections. Swiss Re, *The big one: The East Coast's USD 100 billion hurricane* (Sept 2014) available at <http://big.assets.huffingtonpost.-com/SwissReHurricanePaper.pdf>.

Also, accelerating sea level rise heightens concern about the vulnerability of pipeline infrastructure. The latest scientific findings from the United States' *Third National Climate Assessment* conclude that energy infrastructure in the northeast coastal region "will be increasingly compromised by climate-related hazards, including sea level rise, coastal flooding, and intense precipitation events." See Horton, R., G. Yohe, W. Easterling, R. Kates, M. Ruth, E. Sussman, A. Whelchel, D. Wolfe, and F. Lipschultz, 2014: *Ch. 16: Northeast. Climate Change Impacts in the United*

States: *The Third National Climate Assessment*, available at <http://nca2014.globalchange.gov/report-regions/northeast>. "Extreme storm surge events at high tides are expected to increase, raising the risk of inundating energy facilities such as power plants, refineries, pipelines, and transmission and distribution networks." <http://nca2014.globalchange.gov/report/sectors/-energy>. According to *The Third National Climate Assessment*, a sea level rise of two feet, without any changes in storms, would more than triple the frequency of dangerous coastal flooding throughout most of the Northeast. *Ibid.* Chapter 4 of the report specifically assesses risk to the energy sector and concludes that there is a "high likelihood" of physical impacts to pipelines due to coastal erosion and sea level rise. See Dell, J., S. Tierney, G. Franco, R. G. Newell, R. Richels, J. Weyant, and T. J. Wilbanks, 2014: *Ch. 4: Energy Supply and Use. Climate Change Impacts in the United States: The Third National Climate Assessment*, Table 4.3, available at <http://nca2014.globalchange.gov/report/sectors/energy>.

The risk of storm surge along the New Jersey coast is heightened because sea levels are rising faster than in many other regions due to land subsidence. Rutgers scientists recently predicted based upon current data that within 15 years, sea levels along the New Jersey coastline will rise by 7 to 16 inches, with a best estimate of 10 inches. See Broccoli A., Kaplan M., Loikith P., Robinson D., *State of the Climate: New Jersey*, (2013) available at <http://climate-change.rutgers.edu/resources/state-of-the-climate-new-jersey-2013>. Sea levels are rising 4 mm/year in Atlantic City. By 2050, sea level is expected to be 13 to 28 inches higher with a best estimate of 18 inches. Even at the low-end of these projections, coastal flooding will be substantial, *ibid.*, and will increase the already real threat to natural gas infrastructure.

Atlantic and Cape May Counties are particularly vulnerable because a significant portion of their land mass is low-lying and within the zone of storm surge impact. According to the *New Jersey Hurricane Evacuation Study*, prepared for the U.S. Army Corps of Engineers five years before Hurricane Sandy, Cape May County is particularly at risk. U.S. Army Corps of Engineers, *New Jersey Hurricane Evacuation Study*, (June 2007), p. 1-1 (emphasis added). One case study of the vulnerability of Cape May County concluded that climate change and associated sea-level rise places critical facilities at particularly heightened risk. Wu SY, Yarnal B., Fisher A., *Vulnerability of coastal communities to sea-level rise: a case study of Cape May County, New Jersey, USA*, 22 *Clim Res.* 255, 268 (Nov. 4, 2002) http://www.ccpo.odu.edu/~atkinson/ODUResearch/ProfPapers/wu_et_al%202002_New_Jersey1.pdf.

In sum, there is a vital need to improve the resiliency of the Company's supply infrastructure to Cape May and Atlantic Counties. Storm and flooding events do pose a tangible threat to SJG's backbone distribution system to Cape May County, which lies within the flood zone of a major hurricane. Several portions of the Route 50 segment are within the storm surge zone, including the portion crossing beneath the Tuckahoe River between Corbin City and Tuckahoe. According to New Jersey's *Action Plan* to recover from the extensive devastation caused by Hurricane Sandy, the construction of redundant, "looped" natural gas supplies to vulnerable coastal areas is essential to strengthen the ability of natural gas supply infrastructure to survive future storm events. New Jersey Department of Community Affairs, *Community Development Block Grant Disaster Recovery Action Plan*, Approved by HUD, April 29, 2013, pp. 2-25 & 2-26 (emphasis added). The lesson from Hurricane Sandy and from the HMSA data is that pipelines can be damaged by both man-made and natural disasters. There is a vital need to harden the natural gas distribution infrastructure serving the Pinelands and coastal areas of Cape May and Atlantic Counties, which depend on a single pipeline that is vulnerable. Construction of a redundant pipeline into Cape May County will vastly reduce the risk to the people living in Cape May County and is the course of action recommended by New Jersey's *Disaster Recovery Action Plan*.

V. THE PROJECT FULLY CONFORMS WITH N.J.A.C. 7:50-5.23(B)12

Pinelands staff concluded that, while the proposed pipeline is a conforming use within the Forest Area¹⁹ because BLE is located within the Pinelands, the proposed interconnection of the pipeline to the existing distribution system

¹⁹ Contrary to the public statements by some opponents, the construction of the pipeline is not an unprecedented "scar on the Pinelands." Not only does the current CMP permit the construction of a natural gas pipeline in Forest Areas, even the first CMP

servicing Atlantic and Cape May Counties means that the Project is not “intended to primarily serve [only] the needs of the Pinelands” and therefore is not a permitted use. **Exhibit 6**, pp. 12, 15, & 41. Specifically, staff concluded:

- “Given that the proposed pipeline is intended to serve customers located both inside and outside of the Pinelands, the project does not primarily serve only the needs of the Pinelands. As a result, the proposed pipeline is not fully consistent with the permitted use standards for a Forest Area.” *Ibid.* at 3.
- “It is because the proposed pipeline was also intended to serve customers within SJG’s service area in Cape May and Atlantic Counties, the majority of which do not reside within the Pinelands, that Commission staff made the determination that the proposed pipeline was not fully consistent with N.J.A.C. 7:50-5.23(b)12 and consideration of this MOA became necessary.” *Ibid.* at 12.
- “The CMP permits public service infrastructure in a Forest Area where it is intended to primarily serve only the needs of the Pinelands. The proposed project serves two purposes; the repowering of the BLE Plant from coal to natural gas and the provision of redundant natural gas supply to SJG customers in Atlantic and Cape May Counties. While the BLE Plant is located in the Pinelands, the majority of customers to benefit from the redundancy in gas supply are located outside the Pinelands. As such the project is not fully consistent with the land use standards of the Pinelands CMP.” *Ibid.* at 41.

It is evident from these findings that Pinelands staff decided the purpose of the pipeline solely based on the number of customers *theoretically* that could be served by the pipeline, without regard for how the pipeline *actually* will be used in light of the objective circumstances, which indicate that virtually all of the gas transported through the pipeline will be consumed within the Pinelands.

A. The Meaning of “Intended to Primarily Serve [Only] the Needs of the Pinelands”

Assessing the conformity of the proposed pipeline with N.J.A.C. 7:50-5.23(b)12 requires analysis of the language of N.J.A.C. 7:50-5.23(b)12 to determine its meaning. The provision states in pertinent part:

a municipality may, at its option, permit the following uses in a Forest Area:

recognized that natural gas pipelines in all Pinelands Management Areas (including the Forest Area) was needed. In 1978, during the deliberations over the formation of the Commission, NJDEP recommended that “gas lines should be the only utility line permitted along existing roads and rights-of-way in the preservation area. These lines are no threat to water quality, and they can be allowed to revegetate.” *DEP Recommendations for Final Pinelands Review Committee Report* (December 26, 1978). Thereafter, the Commission’s very first CMP authorized natural gas pipelines in all management areas of the Pinelands:

A specific statement of Department of Energy siting policy with regard to the Pinelands is contained in the DEP’s Coastal Management Program. These policies were jointly drafted pursuant to a 1978 memorandum of understanding, and are contained in the Coastal Management Program (August, 1980) and the New Jersey Energy Master Plan...*Natural gas pipelines are discouraged [only] in the critical area [i.e. Preservation Area] unless the developer can show that the activity will meet the non-degradation water quality standards and cause no long-term adverse environmental impacts.*

Pinelands Commission, *New Jersey Pinelands Comprehensive Management Plan* (Adopted November 21, 1980) p. 279. The referenced August 1980 *Coastal Zone Management Program* document required that new natural gas pipelines in the Pinelands be channeled to “pipeline corridors... located in or adjacent to existing already developed or disturbed road, railroad, pipeline, electrical transmission or other rights-of-way, to the maximum extent practicable.” *New Jersey Coastal Management Program and Environmental Impact Statement* (August 1990) p. 189. The regulations acknowledged that “New Jersey recognizes that pipelines, rather than other modes of surface transportation such as tankers and barges, are the preferred and more environmentally sound method of bringing crude oil and natural gas ashore from offshore wells.” *Ibid.* at 130.

(12) *Public service infrastructure intended to primarily serve only the needs of the Pinelands.* Centralized waste water treatment and collection facilities shall be permitted to service the Forest Area only in accordance with N.J.A.C. 7:50-6.84(a)2. Communications cables not primarily intended to serve the needs of the Forest Area may be permitted provided that they are installed within existing developed rights of way and are installed underground or are attached to road bridges, where available, for the purpose of crossing water bodies or wetlands.

N.J.A.C. 7:50-5.23(b)12. It is interesting to note for comparison purposes that the companion provision governing public service infrastructure in the Preservation Area contains a more rigorous standard requiring that such infrastructure is *necessary* to serve *only* the Preservation Area:

a municipality may, at its option, permit the following uses in the Preservation Area District:

(4) *Public service infrastructure which is necessary to serve only the needs of the Preservation Area District uses.* Centralized waste water treatment and collection facilities shall be permitted to service the Preservation Area District only in accordance with N.J.A.C. 7:50-6.84(a)2. Communications cables not primarily intended to serve the needs of the Preservation Area District may be permitted provided that they are installed within existing developed rights of way and are installed underground or are attached to road bridges, where available, for the purpose of crossing water bodies or wetlands.

N.J.A.C. 7:50-5.22(b)4.

1. Presence of the Word “Only” in the Text of N.J.A.C. 7:50-5.23(b)12 Is a Mistake and Has No Bearing on Interpretation

As a threshold matter, the presence of the word “only” in the provision governing public service infrastructure in the Forest Area is a drafting mistake and has no bearing on its meaning. The term “only” was inadvertently inserted into the official version of the New Jersey Administrative Code in 1994 as a result of printer error during a proposed revision to this provision. See 26 N.J.R. 183 (January 3, 1994). It appears that the printer mistakenly borrowed the word “only” from the nearly identical provision governing public service infrastructure in the Preservation Area. The error is confirmed easily by a review of the prior versions of N.J.A.C. 7:50-5.23(b)12, which has been amended several times over the years.

The original version of the provision contained in the 1980 CMP permitted “[p]ublic service infrastructure *which is necessary to serve the needs of the Pinelands.*” See CMP 5-303.A.8 (1980). The provision was significantly amended in 1987 to lessen what was perceived to be overly restrictive language by replacing “[p]ublic service infrastructure *which is necessary to serve the needs of the Pinelands...*” with “[p]ublic service infrastructure *intended to primarily serve the needs of the Pinelands.*” See Proposed Amendments to the Pinelands Comprehensive Management Plan, 18 N.J.R. 2260 (Nov. 17, 1986) and Final Rule 19 N.J.R. 2013-2014 (Nov. 2, 1987) (emphasis added).

Following the 1987 amendment, the Commission proposed no changes in the wording of N.J.A.C. 7:50-5.23(b)12 until 1994. The Commission’s proposed rule, published in the New Jersey Register January 3, 1994, offered a very minor change to the language of the provision by replacing the term “[Sewer]” with the term “**Centralized waste water.**” See 26 N.J.R. 183 (bold text in original). However, also present *in what was represented to be the existing language of the provision* was the word “only,” even though the official version of N.J.A.C. 7:50-5.23(b)12 did not contain the word “only,” as the provision had not been changed since the 1987 amendments. It appears that the term “only” was inadvertently transposed from the provisions governing public service infrastructure in the Preservation Area and in the Special Agricultural Production Area, which is permitted if “necessary to serve *only* the needs of [those Areas].” See N.J.A.C. 7:50-5.22(b)4 & 7:50-5.25(b)3.

Confirming that insertion of “only” was an error is that the word was not set-off in bold text, as is required for a proposed wording change. Nor was there any explanation either in the proposed rule or in the final rule stating that the Commission intended to narrow N.J.A.C. 7:50-5.23(b)12 by adding the term “only,” as would be required if the Commission intended to alter the substantive meaning of the provision. Had the Commission intended to change the meaning of the provision, it chose ambiguous language directly conflicting with the antecedent modifier “primarily.” If the regulation requires a project to be intended to serve *only* the needs of the Pinelands, then why insert the word “primarily,” thus signaling a clear intent to allow a project also to serve other needs unrelated to the Pinelands. Finally, we note that the version of the regulation furnished by the Commission to the public via the Commission’s webpage, “updated: 09/02/2014,” does not contain the word “only.”

Accordingly, based upon both the drafting history of N.J.A.C. 7:50-5.23(b)12 and a logical reading of the text, the word “only” is a mistake and has no bearing on the meaning of the provision. To require public service infrastructure to serve *only* the needs of the Pinelands ignores the plain meaning of the text and its regulatory history. Public service infrastructure is a permitted use in the Forest Area even if it meets additional needs unrelated to the Pinelands provided the objective information shows that the project primarily serves a Pinelands use.

2. Public Service Infrastructure Conforms With N.J.A.C. 7:50-5.23(b)12 If Objective Information Shows That Its Main Purpose Is to Serve the Needs of an Existing Use in the Pinelands National Reserve, Even If Its Additional Purpose Is to Serve a Need Outside the Pinelands

Having dispensed with the term “only,” we now address the remaining words of the provision. While the CMP does not define the meaning of the phrase “intended to primarily serve the needs of the Pinelands,” it does define the “Pinelands” to include both the state-designated Pinelands Area and the federally-designated Pinelands National Reserve. N.J.A.C. 7:50-2.11 (Definitions). Thus, as the Executive Director correctly acknowledged throughout her *Findings of Fact*, public service infrastructure that primarily serves a use within the Pinelands, including the National Reserve, conforms with N.J.A.C. 7:50-5.23(b)12. (**Exhibit 6**, pp. 2, 3, 12, 14, 15 & 41).

According to its ordinary meaning, the word “primarily” is an adverb used “to indicate *the main purpose* of something, reason for something, etc. . . for the most part.” Merriam-Webster, Inc. (2014) (emphasis added). The word “intended” is an adjective meaning “in your mind as a purpose or goal. . . expected to be such in the future.” *Ibid*. The word “to serve” is a verb meaning “to furnish or supply with something needed or desired.” *Ibid*. The word “need” is a noun meaning “a condition requiring supply or relief.” *Ibid*.

Applying the plain meaning of the words used in N.J.A.C. 7:50-5.23(b)12, public service infrastructure is a conforming use in the Forest Area if its main purpose is to supply something needed by the Pinelands, even though it has an additional purpose unrelated to a Pinelands need. This meaning is clear based not just upon a plain reading of the text but also upon the drafting history of the provision. As previously discussed, the Commission amended the provision in 1987 to eliminate the more restrictive requirement that public service infrastructure be “*necessary* to serve the needs of the Pinelands.” See CMP 5-303.A.8 (1980); N.J.R. 2013-2014 (Nov. 2, 1987). The Commission made this change by replacing “necessary to serve” with “intended to primarily serve,” thus making it clear that the siting of public service infrastructure in the Forest Area does not have to be “necessary” to serve the Pinelands. Rather, such infrastructure merely has to be “intended to primarily serve the needs of the Pinelands,” thus signaling a clear intent to allow such infrastructure also to serve another need(s).²⁰

²⁰ This change made particular sense in the case of new natural gas pipeline infrastructure in the Pinelands which typically is interconnected to the existing distribution system for reliability purposes. Because such an improvement is interconnected to the entire system, the benefits of the improvement are distributed across the entire network, including to areas outside the Pinelands. Thus, a resiliency improvement to the pipeline system in the Pinelands, as here, will have the effect of improving the

Based upon this change, it is clear that public service infrastructure in the Forest Area does not have to be “necessary” to serve the needs of the Pinelands; nor does it have to serve “only” the Pinelands. Rather, such infrastructure merely has to be “intended to primarily serve” the needs of the Pinelands. Public service infrastructure that provides an additional benefit outside the Pinelands conforms to the CMP provided that its main purpose is to provide service to the Pinelands.

It is uncontroverted that providing utility services to an existing use within the Pinelands is a “need,” as the Executive Director correctly acknowledged in her *Findings of Fact*. (*Ibid.* pp. 2, 3, 12, 15, & 41); see also 2004 Pinelands Commission-BPU MOA, **Exhibit 4** (acknowledging “a critical need for additional electric transmission capacity in the eastern part of the Atlantic Region, especially in the southern New Jersey region”). The people living within the Pinelands and countless others working in the Pinelands require basic public utility services to sustain their daily lives, including reliable electric and natural gas services. The Pinelands Protection Act and the CMP both make clear that the various “needs” or conditions requiring supply or relief within the Pinelands include the basic economic needs of the people living and working in the Pinelands. See N.J.S.A. §13:18A-8d(3) (CMP must recognize existing economic activities within the area); N.J.S.A. §13:18A-5b. (Commission membership must include residents representing economic activities); 13:18A-56. (legislative declaration that economic development may be compatible with the environmentally sensitive and rural character of the region); and N.J.A.C. §7:50-1.3. Indeed, the Commission periodically monitors the health of the economy of the Pinelands to fulfill the goals of the Act and CMP. See, N.J. Pinelands Commission, *2010 Annual Report of the Pinelands Long-Term Economic Monitoring Program*.

B. The Proposed Pipeline Is a Conforming Use Under N.J.A.C. 7:50-5.23(b)12

A determination of whether the Project conforms with N.J.A.C. 7:50-5.23(b)12 must be based upon objective information bearing upon whether the main purpose of the Project is to supply utility service to an existing use in the Pinelands. While the provision refers to “intent,” we presume the Commission means this in the objective sense and not in a subjective sense.

The purpose of a natural gas pipeline is to deliver natural gas to customers. When those customers are located both inside and outside the Pinelands, determining who are the main customers to be served can be determined objectively based upon the (1) time of use (i.e. how often will the customer be served by the pipeline), (2) capacity of use (i.e. how much gas will the customer receive by the pipeline), or (3) level of service (i.e. what is the nature of the service being provided to the customer by the pipeline). A proportional allocation of the time, capacity, or level of service the pipeline provides to customers inside the Pinelands and outside the Pinelands provides a rational and objective basis for deciding whether the Project “is intended to primarily serve the needs of the Pinelands.” This approach also comports with how the Commission measures expansions of non-conforming public utility infrastructure under the CMP.²¹

resiliency of the entire interconnected network, including portions serving residents and businesses inside and outside the Pinelands.

²¹ In deciding whether it is permissible to expand a pre-existing, non-conforming use pre-dating the CMP, such as public service infrastructure (e.g., a natural gas pipeline, electric transmission line, etc.), the CMP requires the applicant to show that: (1) the use was not abandoned or terminated subsequent to January 14, 1981; (2) the expansion or alteration of the use is in accordance with all of the minimum standards of N.J.A.C. 7:50-6; and (3) the area of expansion does not exceed 50 percent of the floor area, the area of the use or the capacity of the use, whichever is applicable, on January 14, 1981 or which was approved pursuant to this Plan. See N.J.A.C. 7:50-5.2(b)3. Thus, for example, a project to increase the voltage of a pre-existing electric transmission line would be subject to Commission review if it would increase the capacity of the use (i.e. the voltage of the transmission line) by more than 50%. Similarly, a project to increase the size of a pre-existing natural gas pipeline would be subject to Commission review if it would increase the capacity of the use (i.e. the volume of the pipeline) by more than 50%.

Applying these objective metrics to the proposed pipeline, it is clear that the primary user of the pipeline is BLE, a Pinelands business.

1. SJG Will Use the Pipeline to Supply Gas to the Pinelands At Least 350 Days Per Year

The intent of the Project is reflected by the amount of time the pipeline will be used to supply a Pinelands use, as reflected in the 2013 "Firm Electric Service (FES)" Agreement between SJG and RCCM. (See **Exhibit 7**). The agreement obligates SJG to use the pipeline to supply BLE on at least 350 days per year. "Due to system constraints, the Seller may instruct Buyer to limit all or a portion of Buyer's Winter Daily Contract Demand during a given day for a maximum of fifteen (15) days during and Service Year..." *Ibid.* Para. 18. This level-of-service, which nearly is continuous, reflects the reality that the gas flowing through the pipeline will be used by BLE to generate electricity, which is subject to PJM Capacity Performance standards that require BLE to have the capability to provide energy when needed during both summer and winter peak-load conditions and extreme weather events. While the FES Agreement allows SJG a limited right to interrupt service to BLE up to 15 days per year in the Winter Season, SJG's modeling shows that the pipeline will not be needed to provide service to any other customer even during the 15 coldest days of the year for at least the next 10 years. Thus, the **only** time the pipeline would be used to serve a customer outside the Pinelands is in the event of a force majeure event, such as an accident, natural disaster, or sabotage of the existing Vineland-Mays Landing or Route 50 single-feed segments.

Finally, it is important to note that the FES Agreement obligates SJG to supply BLE for at least the next 20 years. "The sale and purchase of gas hereunder shall continue until the twentieth anniversary of said commencement date, and subject to Seller's possession of an adequate supply of gas, shall continue thereafter from year to year unless and until terminated upon written notice given by either party ..." *Ibid.*, Article 1 Term of Agreement. Thus, the fundamental use of the pipeline to provide gas service to BLE will not change from year-to-year.

2. SJG Will Use 100% of the Capacity of the Pipeline to Supply the Pinelands

The intent of the Project also is reflected by the amount of the pipeline's capacity dedicated to a Pinelands use. The FES Agreement obligates SJG to deliver 125,000 thousand cubic feet ("MCF") per day of natural gas to BLE. "Seller hereby agrees to sell and deliver to Buyer and Buyer agrees to pay for in accordance with provisions of the tariff: (1) a Winter Daily Contract Demand of 125,000 MCF per day; (2) a Summer Daily Contract Demand of 125,000 MCF per day." *Ibid.*, Article IV Service Volumes. The amount of 125,000 MCF represents the entire capacity of the pipeline, which means that none of the pipeline's capacity is reserved for any other customers (except during the 15 days of interruptible service or during an emergency). In fact, *the volume of gas reserved for BLE and to be transported through the pipeline to serve BLE represents the annual gas load of more than 210,000 residential customers, which is more than all of SJG's customers in Cape May and Atlantic Counties combined.* See **Exhibit 8**, BPU Order, Docket No. GO13010052, Stipulation, Para. 18. Thus, it is beyond question that the volume and capacity of gas to be delivered by the pipeline to a customer in the Pinelands far exceeds the volume and capacity that would be delivered to customers outside the Pinelands.

3. The Pipeline's Level of Service Reflects an Intent to Primarily Serve the Pinelands

The intent of the Project also is reflected in the different level of services it will provide to different uses. While the "redundancy service" provided by the pipeline is vitally important to the overall reliability of the gas distribution system in Cape May County, this service is qualitatively and quantitatively different from the "dedicated service" to BLE. The pipeline's redundancy service will be called upon rarely, if at all. Redundancy service will be used only during an emergency, such as an outage to the existing supply infrastructure to Cape May County. Its value to SJG and its customers is significant but difficult to quantify. The economic impacts of a catastrophic failure of the Cape May trunk

line would be significant and the pipeline will greatly reduce this risk. However, actual use of the pipeline to deliver natural gas to Cape May County will be a rare, if ever, occurrence. The terms of the FES Agreement makes this absolutely clear. Thus, while the damage resulting from a catastrophic failure of the Cape May trunk line would be large, and therefore a redundant feeder is essential to prevent this damage, the probability of a catastrophic failure of the Cape May feeder line is small. For example, while the risk of an automobile accident is small, a prudent driver buys a car equipped with airbags, just in case their protection is needed during an accident. Similarly, while the pipeline's "redundancy service" is vitally important to the overall reliability of SJG's gas distribution system in Cape May County, and the redundancy will serve more customers outside the Pinelands than inside the Pinelands, the pipeline's "dedicated service" to BLE is qualitatively and quantitatively different from the type of service provided to all other customers.

4. The Benefits of the Electricity Generated By Virtue of the Project Will Serve the Pinelands

Given that the primary use to be served by the pipeline is located in the Pinelands it is not necessary for purposes of demonstrating compliance with CMP Section 5.23(b)12 to show that the benefits of the pipeline also primarily inure to the Pinelands. Nevertheless, based upon the information provided above, it is clear that the pipeline does primarily benefit the public welfare, economy, and environmental resources of the Pinelands, which is further support for the conclusion that the Project fully complies with the CMP. It is worth noting that the product and services ultimately produced by the Project—safe, reliable, and clean electricity—will:

- Primarily be consumed by residents and businesses in the Pinelands (see pp. 10-15, *supra*);
- Prevent the need for some of the transmission upgrades in the Pinelands (see pp. 15-17, *supra*);
- Provide significant reliability benefits to residents and businesses in the Pinelands (see pp. 17-23, *supra*); and
- Provide significant air quality benefits to the residents and environment in the Pinelands (see pp. 23-29, *supra*).

For these reasons, whether the pipeline's degree of "service to the Pinelands" is measured based upon its relative time, capacity, level of service, or public welfare benefits the objective evidence readily demonstrates that the proposed pipeline will primarily serve the needs of the Pinelands and fully conforms with *N.J.A.C. 7:50-5.23(b)12*. Having established that a pipeline to serve the BLE is consistent with the CMP because both the pipeline and the plant that it serves are located entirely within the Pinelands, merely because the Project has the additional benefit of reinforcing reliability to more customers outside the Pinelands than inside the Pinelands does not render the pipeline non-conforming. *The pipeline fully conforms because the Pinelands will consume very nearly 100 percent of all the natural gas transported through the pipeline and 86 percent of all the electricity generated by that natural gas.* These facts are uncontroverted, dispositive, and more than a sufficient basis to conclude that the pipeline is "intended to primarily serve the needs of the Pinelands."

VI. ALTERNATIVES ANALYSIS

Following the MOA proceedings, SJG undertook a detailed re-evaluation of Project alternatives to identify potential options for meeting the Project needs of repowering BLE and improving the resiliency of the existing natural gas distribution system to Cape May County. The re-evaluation considered eight different alternatives ranging from the proposed route to a "no action" alternative. Based upon the re-evaluation, the proposed route clearly remains the best option from the standpoint of adverse environmental impact. *The re-evaluation demonstrated that there is no pipeline route that avoids the Pinelands Forest Area simply because the two pipelines off of which an extension to BLE could be constructed are located in the Forest Area.* See Woodard & Curran ("W&C"), "South Jersey Gas—BL

England Gas Route Analysis Report," (June 18, 2012, *Addendum*, September 2014, *Addendum #2*, April 2015) (**Exhibit 11**). A map depicting the alternatives considered in relation to the BLE facility and the Pinelands Area is attached as **Exhibit 12**.

A. All of the Alternatives Impact the Pinelands Forest Area

All of the alternatives would traverse significant portions of the Pinelands Forest Area. Alternative "A" traverses 10.17 miles of Pinelands Forest Area, Alternative "B" 7.2 miles, Alternative "C" 14.5 miles, Alternative "D" 12.6 miles, Alternative "E" 7.3 miles, Alternative "F" 13.0 miles, and Alternative "G" 7.2 miles.

It has been suggested that the Pinelands Forest Area could be avoided by extending the Vineland-Mays Landing Segment to the south and then approaching BLE from the northern side of the Great Egg Harbor Bay ("GEHB") via an HDD across the water body (Alternatives "B" and "G"). However, these two alternatives would require replacement of the existing 20" Vineland-Mays Landing Segment within the Pinelands Forest Area with a larger 30" pipeline *and still would not provide a redundant supply route to serve Atlantic and Cape May Counties.*²² Replacement of the existing 20" pipeline with a new 30" pipeline also would not provide complete reliability for two reasons. First, a new 30" pipeline would not fix the single-feed configuration of the 20-mile Route 50 Segment. Approximately 60,000 Cape May County customers still would be vulnerable to a single contingency failure of the Route 50 Segment along the segment north of Tuckahoe which includes a particularly vulnerable crossing beneath the Tuckahoe River. *Ibid.* Second, a new 30" pipeline still would be vulnerable to the same exposures as the existing 20" pipeline it would replace. An event capable of taking-out service along the existing 20" pipeline between Union Road and Rt. 50 would have the potential to take-out service to a new 30" pipeline, thus exposing 142,000 customers east of Rt. 50 and south into Cape May County to a loss of service.

Full redundancy can be achieved only through what is known as a "loop," an alternative, geographically separate pathway to transport natural gas to an area. A fundamental concept in utility infrastructure reliability planning is the looping of infrastructure so that if one pathway is lost due to an accident, natural disaster, or sabotage the other pathway is available to provide service. See New Jersey Department of Community Affairs, *Community Development Block Grant Disaster Recovery Action Plan*, Approved by HUD, April 29, 2013, pp. 2-25 & 2-26; FEMA, *Collocation Impacts on the Vulnerability of Lifelines During Earthquakes with Applications to the Cajon Pass, California*, FEMA-221 (Oct. 1991); National Infrastructure Advisory Council, *A Framework for Establishing Critical Infrastructure Resilience Goals Final Report and Recommendations*" (Oct. 2010).

The construction of a new 30" pipeline, in addition to failing to achieve the need for full reliability, also would have significant environmental impacts. SJG would have to excavate about 7 miles of Pinelands Forest Area within Weymouth and Hamilton Townships, none of which is within existing roadways. The environmental impacts to the Pinelands Forest associated with installation of a new 30" pipeline between Union Road and Rt. 50 would be substantial. While the existing cleared ROW was originally 30 feet wide, since construction in 1986, the cleared

²² SJG modeled the system impact extending the Vineland-Mays Landing Segment to serve BLE. The modeling indicates that the existing 10-mile segment of the 20" diameter Vineland-Mays Landing Segment, between Union Road and Rt. 50, lacks sufficient capacity to serve BLE *and* supply existing customers on cold days. SJG did not complete this system impact modeling during the MOA deliberations because the alternative of crossing the Great Egg Harbor Bay was rejected early in the process due to technical risks and significant environmental impacts. SJG's gas flow modeling indicates that an extension of the Vineland-Mays Landing Segment to serve BLE would require SJG to shut-off supply to BLE on 30 days out of the year under present day conditions, and 70 days per year by the 2023-2024 heating system, an outcome that is not viable due to the critical electricity supply provided by the plant. Also, RCCM has advised SJG that interruption of natural gas service to the plant up to 30 days per year would render the repowering project financially infeasible. The modeling indicates that the deficiency in the capacity of the line could be addressed by constructing a new 30" diameter pipeline to replace the 20" diameter segment within the existing 30' ROW. Under this scenario, the existing 20" diameter segment would be retired. A new 30" would have significantly more capacity and would operate at a higher pressure allowing SJG to take the 20" line, which currently is running at its maximum capacity and pressure, out of service.

ROW has narrowed in many places to no more than a few feet. It is also unpaved and runs through a variety of freshwater wetlands, wetland buffers and threatened and endangered species habitat, in contrast to the paved or mowed road shoulders of the preferred alternative. NJDEP's database indicates there are approximately 8.5 acres of mapped wetlands within the 30 foot wide ROW. It is very unlikely, however, that the mapping identifies all of the existing wetlands within the ROW. While HDD technology could avoid some wetland, buffer and stream impacts, the route geometry and the extent of wetlands suggests that some impacts would be unavoidable. SJG conservatively has estimated that approximately 2.5 acres of wetlands would be impacted if a new 30" pipeline had to be constructed between Union Road and Rt. 50. Also, the ROW would have to be cleared by an additional 30 feet to accommodate construction, which would require the removal of a minimum of 36 acres of trees along the 10 mile route.

The Rt. 49 alternative, in contrast, would address both the need to reinforce service to all 142,000 customers in Atlantic and Cape May Counties and the need to supply BLE. It also would have minimal environmental impact. The Rt. 49 alternative solves the reliability problem with the single-feed characteristic of both the 10-mile segment of the Vineland-Mays Landing Segment between Union Rd and Rt. 50 and the 10-mile segment of the Route 50 Segment between Mays Landing and Tuckahoe. In the event of a loss of the Vineland-Mays Landing Segment between Union Road and Rt. 50, natural gas could be fed along the proposed Rt. 49 Pipeline to feed both Atlantic County to the north, by "reverse-feeding" or "back-feeding" gas north via the Route 50 Segment, and Cape May County to the south, by feeding gas along the normal flow south via the Route 50 Segment. The Rt. 49 alternative also would have no wetlands or wetland buffer impacts and no threatened and endangered species impacts because the entire route through the Forest Area would be installed beneath existing pavement or the cleared shoulder of the road. For these reasons, only the Rt. 49 alternative extending the Malaga-Union Road Pipeline is a viable alternative to provide redundancy to 142,000 customers, serve BLE, and to minimize environmental impacts.

B. Crossing the GEHB With the Pipeline is Not Feasible

Early in the planning phase for the Project, SJG evaluated the technical feasibility of drilling the pipeline beneath the GEHB estuary using HDD technology. Laying the pipeline on the bottom of the GEHB estuary was not considered feasible because this is prohibited by federal Department of Transportation regulations, which require natural gas pipelines in navigable waters to be buried beneath at least 48 inches of cover, presumably due to the risk of damage from anchoring boats (49 CFR §192.327(e)). While SJG did not conduct a geotechnical investigation of soils beneath GEHB at that time, the Company concluded that further evaluation was fruitless due to the other fatal flaws. The alternative would have resulted in major impacts to wetlands and to other environmental resources located within this Wild & Scenic River estuary, including threatened and endangered species. Also, at the time of the evaluation in 2011, an HDD of nearly 7,000 feet was considered to be outside the technical limits of the technology and thus was found to present a significant risk of failure which in turn could result in even greater impacts to the GEHB. See Black & Veatch Report, p. 19. Finally, Alternative B would have had major impacts upon the residents along the narrow ROW on Schoolhouse Lane and at Jeffers Landing, who would have to be relocated for at least 6 months. For these reasons, SJG did not undertake a detailed analysis of the technical feasibility of constructing the pipeline beneath GEHB using HDD technology.

As part of the re-evaluation of alternatives, SJG examined again the feasibility of drilling the pipeline beneath the GEHB, even though this alternative does not meet the Project need for improving the resiliency of the natural gas distribution network to Cape May County. The recent re-evaluation concluded, once again, that the existing technology is not capable of safely constructing the pipeline beneath the GEHB, and that the adverse environmental consequences of drilling beneath the GEHB would be far greater than the selected route, making these alternatives impermissible under NJDEP's Coastal Permit Program Rules at *N.J.A.C. 7:7E*.

1. An HDD Beneath GEHB Poses an Unreasonable Risk and Is Not Practicable

Three years have passed since SJG first examined whether an HDD beneath the GEHB estuary is feasible. Since then, the limits of HDD technology have advanced as several HDDs in excess of 10,000 feet have been constructed. In light of this new information, SJG engaged an engineering expert specializing in trenchless drilling technology, Dr. David Bennett, PE²³, to evaluate thoroughly whether an HDD beneath the GEHB is feasible.

Based upon his knowledge and experience, Dr. Bennett concluded that an attempt to install the pipeline beneath the GEHB would pose several significant risks that could not be mitigated and that none of the alternatives involving an HDD beneath the GEHB are technically feasible. Specifically, Dr. Bennett evaluated 104 soil boring logs developed during three separate geotechnical investigations in the vicinity of the proposed HDD GEHB crossing. Based upon his review of the boring logs, Dr. Bennett concluded that there are extensive depths of highly unfavorable, low blow count, very soft to soft organic silt and clay, which would pose “extremely unfavorable, and likely insurmountable” challenges, including a high degree of risk of inadvertent returns of drilling fluid mud to the benthic zone of the GEHB. See Bennett, D., “*Technical feasibility and risk evaluation for HDD bore proposed by Pinelands Preservation Alliance (PPA) and alternative HDD alignments beneath Greater Egg Harbor Bay (GEHB)*” (August 18, 2014) (attached hereto as **Exhibit 19**). Dr. Bennett also evaluated the risks associated with the HDDs along the preferred route and concluded based upon the soil borings and site conditions that these HDDs were well within the technical limits of the technology and posed much less risk than the GEHB alternatives.

2. The Garden State Parkway Is Not Suitable for the Pipeline

During the deliberations over the MOA, the Pinelands Commission staff evaluated the possibility of avoiding the wetlands and community impacts posed by the Jeffers Landing location (Alternative B) by using the ROW beneath the Garden State Parkway (“GSPY”) as an alternative route to get the pipeline to the north side of the GEHB estuary and then by suspending the pipeline either from the GSPY bridge or from a new dedicated pipeline bridge that would be constructed over the Bay. This option, referred to as Alternative “G,” was found not to be feasible because suspension of the pipeline over the water was determined to pose safety risks and result in very substantial environmental impacts on the GEHB estuary due to the need to construct a new bridge. One group also offered that the pipeline could be constructed beneath 2.6 miles of the GSPY ROW and that, in lieu of suspending the pipeline over the water, it could be constructed beneath the GEHB via an HDD at the northern side of the GSPY bridge.

SJG evaluated this alternative and concluded that it is not feasible for several reasons. First, as discussed above, drilling beneath the GEHB is not technically feasible due to the geotechnical conditions. Second, state law prohibits construction of natural gas pipelines along the ROW of limited access highways in New Jersey, including the GSPY. See *N.J.A.C. §16:25-1.7(b)(2)* (Authority of utilities to use and occupy limited access highways) (directing that “public utility facility shall not be used for transmitting gases or liquids under pressure.”) Third, the New Jersey Turnpike Authority, which owns and operates the GSPY, has informed SJG that it will not grant permission to construct the Project beneath the GSPY because it has a firm policy prohibiting parallel infrastructure that impedes its ability to maintain, modify or expand the Parkway, consistent with the prohibition contained in *N.J.A.C. §16:25-1.7(b)(2)*. A copy of the NJTPA’s letter is attached. See *Letter from Robert Fischer, PE, Chief Engineer, New Jersey Turnpike Authority to Steven Ewing, Woodard & Curran* (July 14, 2014) (attached hereto as **Exhibit 20**).

²³ Dr. Bennett is the president of Bennett Trenchless Engineers, a specialty engineering consulting firm focusing entirely on trenchless pipeline design and construction. Dr. Bennett served 28 years with the U.S. Army Corps of Engineers (“USACE”), where he directed the Waterways Experiment Station Soil and Rock Testing Laboratory. Dr. Bennett was responsible for the development and publication of the USACE’s trenchless construction guidelines and has authored more than 50 technical papers on trenchless technology, tunneling and geotechnical engineering. He is the co-author of “HDD Good Practices Guidelines”, published by the North American Society for Trenchless Technology, in which he serves as a Good Practice instructor.

For these reasons, construction of the pipeline beneath the GSPY is not a feasible alternative.

3. Coastal Permit Program Rules Prohibit an HDD Beneath GEHB Because There Are Feasible Alternatives

Drilling the pipeline beneath the GEHB would require the NJDEP to issue Coastal Permits pursuant to the Waterfront Development Act, Freshwater Wetlands Protection Act, and implementing regulations and require the US Army Corps of Engineers to issue a permit pursuant to Section 10 of the Rivers and Harbors Act of 1899. To secure these permits, SJG would have to demonstrate that there is no practicable alternative having less impact on the environmental resources. Of course, this showing would be impossible in light of the proposed route beneath Route 49.

The Waterfront Development Act and Freshwater Wetlands Protection Act implementing regulations contain a strong presumption disfavoring permits for construction projects in regions with sensitive environmental characteristics when other alternatives are available. See generally, *Crema v. New Jersey Dep't of Environmental Protection*, 182 N.J. Super. 445, 453 (App. Div. 1982). The Coastal Zone Management Rules, *N.J.A.C. 7:7E-1.1*, et seq., specifically protect designated Wild and Scenic River corridors, such as the Great Egg Harbor River and Bay. Linear development in Wild and Scenic River Corridors is prohibited if it would "have a direct and adverse effect on any 'outstandingly remarkable resource value' for which the river was designated..." *N.J.A.C. 7:7E-3.46(b)*. Furthermore, any linear development "shall be located within the right of way of an existing linear development route or outside of the wild and scenic river corridor where feasible." *N.J.A.C. 7:7E-3.46(e)*. The Freshwater Wetland Protection Act rules provide that, for non-water-dependent activities in a wetland or special aquatic site, such as the construction of a natural gas pipeline, there is a rebuttable presumption that a practicable alternative exists. *N.J.S.A. 13:9B-10(a)*; *N.J.A.C. 7:7A-7.4(b)*. To rebut the presumption that practicable alternatives exist, SJG would have to show, among other things, that the basic project purpose cannot reasonably be accomplished by using other sites in the region that would avoid or reduce adverse impacts on the aquatic ecosystem; that the basic project purpose cannot reasonably be accomplished by a reduction in the size, scope, configuration, or density of the proposed project; and that the basic project purpose cannot reasonably be accomplished by an alternative design that would avoid or reduce adverse impacts. *N.J.A.C. 7:7A-7.4(c)*, *N.J.S.A. 13.9B-10(a)*. If another possible location for a project exists that is less environmentally harmful and serves the project purpose, the presumption disfavoring Waterfront Development permits for construction in regions with sensitive environmental characteristics requires denial of a permit. See *Tanurb v. New Jersey Dept. of Environmental Protection*, 363 N.J. Super. 492, 501 (App. Div. 2003) ("the Legislature apparently intended to create a difficult hurdle for permit applicants to meet, essentially requiring them to rule out all other reasonable alternatives before a freshwater wetlands permit would be granted.")

During the initial phase of the project, SJG consulted with NJDEP concerning the feasibility of crossing of the GEHB. NJDEP advised that it would not approve any alternative involving adverse impacts to the GEHB because other viable alternatives are available in less environmentally sensitive areas outside the CAFRA area, namely the proposed alternative beneath Route 49. See *Executive Director's Findings of Fact*, pp. 31-32. For these reasons, the option of drilling beneath the GEHB estuary was rejected.

More recently, SJG requested a pre-application review by the NJDEP pursuant to *N.J.A.C. 7:7-3.1* to explore the other alternatives, which would require approval under NJDEP's Coastal Permit Program Rules, *N.J.A.C. 7:7-1.1*, et seq. The pre-application review process is designed to flesh-out apparent strengths and weaknesses of the proposed development, as well as the procedures and policies that would apply to the particular development. NJDEP's pre-application review of the alternatives concluded that Route A remained the option with the least environmental impact based upon wetlands impacts, potential adverse impacts to threatened and endangered species habitat, and minimization of stream and open water crossings. See Letter from John Gray, NJDEP to Robert Fatzinger, South Jersey Gas, May 14, 2015 (**Exhibit 13**).

As discussed above, drilling a pipeline beneath the GEHB poses inherent, unmanageable risks due to poor geotechnical conditions that substantially increase the risk of drilling failure and inadvertent returns of drilling fluid along the bottom of the GEHB. The risk of significant adverse environmental impacts associated with the GEHB alternatives is extremely high and in any case the alternatives do not serve the Project need because they do not provide for full redundancy. In contrast, Alternative A entirely serves the Project need of serving BLE and of providing full redundancy, and has minimal environmental impacts. For these reasons, because there is another possible location for the Project that is less environmentally harmful and serves the project purpose, the presumption disfavoring Waterfront Development and Freshwater Wetland permits that would pose greater impacts would require denial of the permit. Based upon Dr. Bennett's expert opinion that drilling beneath the GEHB poses unacceptable risks, the significant and far greater adverse environmental consequences associated with the GEHB alternative routes, and the inability to satisfy the "no feasible alternative" criterion for issuance of a Waterfront Development permit, none of these alternatives are viable.

C. Re-Evaluation of Alternative Routes

With these fundamental conditions in mind, we now discuss the eight alternatives that were evaluated for this Project.

During the Commission's deliberations over the MOA, SJG and Pinelands Commission staff evaluated seven alternative routes plus a "no action" alternative. The Executive Director made extensive findings of fact which concluded that the selected route, Alternative A, was superior to every other route. *See Executive Director's Findings of Fact*, pp. 30-35.

Since the completion of the June, 2012 report and the advancement of the project design and details, the project team has been able to better quantify significant issues associated with each alternative. The re-evaluation provides a more detailed assessment of the impacts associated with each alternative. Analyzing alternative routes begins by establishing the purpose and goals of the project, and progresses through the primary elements of each route to determine if there are significant issues or "fatal flaws" associated with a particular route that eliminate a route from further consideration. Some of the most obvious fatal flaws are significant environmental impacts; failure to meet project goals; significant time delays impacting Project needs; significant construction risks; unreasonable safety impacts; and unavailability of a right-of-way.

SJG evaluated each of the eight alternatives based upon its effectiveness in meeting the established public needs to: (1) provide natural gas service to BLE; (2) provide redundancy to 142,000 customers in Atlantic and Cape May Counties who are vulnerable to a single-contingency failure of service; and (3) minimize environmental impacts. Based on engineering and constructability constraints and in accordance with required state and federal mandates that require avoidance and minimization of natural resource impacts, each alternative was evaluated for its potential impacts to state and federally protected waters and wetlands, threatened and endangered species, engineering constraints, protected lands, and natural heritage sites. Each alternative was evaluated consistently using the following assumptions:

- All stream and wetland crossings would be crossed using jack and bore (J&B) or horizontal directional drill (HDD) methods, resulting in no impacts to subject resources where ever possible;
- Required pipeline ROW in areas that are not cleared would be 30 feet wide;
- HDD crossings would require a cleared pipe staging area at one end of drill 30 feet wide and the length of the HDD;
- HDD crossings would require a pad at the other end 30 feet wide by 200 feet long. Clearing would not be required along any ROW with enough area to install the pipeline.

Based upon this alternatives analysis, it is clear that all of the alternative routes would originate in and would occupy the Pinelands Forest Area. All routes either would originate in the Pinelands Forest Area (Routes A, C, D, E, F) and/or would require an upgrade to an existing pipeline within the Pinelands Forest Area (Routes B, E, F & G). No alternative is outside the Pinelands Forest Area due to the location of SJG's existing supply infrastructure in relation to BLE.

Summary of Pipeline Alternatives

Route	A	B	C	D	E	F	G	No Action
Satisfy Project Need	Yes	No	Yes	Yes	No	No	No	No
Length Miles	22	21	29	37	29	34	34	Unknown
Pinelands Forest Miles/Unpaved Miles	10/0	7/7	10/10	9/0	7/7	13/7	7/7	Unknown
Wetlands Impacted Acres	0	8	2	0	3	3	3	Unknown
Endangered Species Impacted	No	Yes	Yes	No	Yes	Yes	Yes	Unknown
Streams Crossed	16	8	12	27	20	18	18	Unknown

1. Alternative "A"

The selected route is 21.7 miles long and would approach BLE from the west. The pipeline would be installed beneath the pavement or cleared shoulder of SR 49 through approximately 10 miles of Pinelands Forest Area. The pipeline would be interconnected to SJG's existing 20" gas main at Route 664 (Mount Pleasant-Tuckahoe Road) at the Upper Township Municipal complex which is located outside the Forest Area in a Pinelands Growth Area. The remaining 11 miles would be beneath Route 50 southward to Route 631 (Tuckahoe Road) toward BLE and then along the right of way of ACE electric transmission lines at Hudson Avenue and connecting to BLE. Roughly 45 percent of Route A would be outside the Pinelands Area.

Field delineation confirmed the presence of extensive wetlands adjacent to the route with 16 stream crossings. However, the conditions along this route allowed the project design to avoid all wetland areas so this route does not encroach on any wetland areas. Wetland buffer impacts also are limited and are primarily temporary impacts associated with work on grass road shoulders. Construction will utilize HDD and J&B methods to avoid adverse impacts to wetlands, streams and rivers. Numerous T&E species were identified along the route; however, the NJDEP and Pinelands Commission have imposed specific requirements for field investigations to address plant and animal species of concern. The results of the T&E studies prepared by Trident Environmental Consultants ("Trident") were submitted to the Pinelands Commission, the NJDEP and the US Army Corps of Engineers ("USACE") so that their wildlife biologists could evaluate the conclusions of the investigations in conjunction with the project design plans. The wildlife biologist's at all three regulatory agencies agreed with Trident's conclusions that the project would not have a significant adverse impact on T&E species. Richard Grubb & Associates (Grubb) coordinated with the New Jersey Historic Preservation Office, the Pinelands Commission and the USACE archeologists prior to conducting field investigations for cultural and historic resources along the route and at material storage and staging areas. The archeologists at all three regulatory agencies agreed with Grubb's conclusions that the project would not have a significant adverse impact in historic or cultural resources. The wetlands were delineated in the field along

the route and reviewed in the field by the Pinelands Commission and the NJDEP. Both agencies concluded that Route A does not encroach on any wetlands.

The route 49 portion of the Route would travel across and well beneath the Manumuskin River, a Natural Heritage site and a Wild & Scenic River. The route also would travel across and well beneath tributaries to the Egg Harbor River, a designated Wild & Scenic River. However, construction of the pipeline would be entirely within the existing road ROW many feet below these water bodies, and no above ground structures would be located near the designated areas. The National Park Service has completed its review of the design and confirmed there will be no significant adverse impact on these water bodies.

The preliminary evaluation concluded that the Project could be designed to avoid significant adverse impacts while still achieving the goals of the Project. The final designs are complete, and were submitted to and approved by the NJDEP under CAFRA, the Freshwater Wetlands Protection Act, and the Flood Hazard Area Protection Act. The NJDEP concluded that the Project complies with all applicable regulations and issued permits for the Project. The design also was submitted to the USACE for compliance with Section 404 of the Clean Water Act, Section 10 of the Rivers and Harbors Act of 1899 and Section 106 of the National Historic Preservation Act of 1966. The USACE concluded that the Project complies with all applicable regulations, and issued permits for the Project. The NJDOT reviewed the design plans and maintenance and protection of traffic plans and issued approvals for the Project.

Finally, the Executive Director made detailed factual findings concluding that Alternative A will not result in any adverse impacts to Pinelands resources. :

The proposed pipeline project is primarily being constructed within existing paved roadway, paved shoulder and previously disturbed shoulder. As a result, and as confirmed by Commission staff, there are no adverse impacts to the resources of the Pinelands associated with the proposed natural gas pipeline. The proposed project is fully consistent with the development standards, Subchapter [6] 5, of the Pinelands CMP. The only regulation to which the project is not fully compliant is the Forest Area Land Use standards at *N.J.A.C. 7:50-5.23(b)12*.

Executive Director's Findings of Fact, pp. 15 & 21-22.

2. Alternative "B"

This route would approach BLE from the north by extending SJG's existing 24" Vineland-Mays Landing Segment starting at Ocean Heights Ave and Harbor Ave in Egg Harbor Township. The pipeline would be installed beneath Ocean Heights Ave., then south beneath English Creek Ave. to School House Lane to Somers Point-Mays Landing Road to Jeffers Landing Road. At Jeffers Landing, the pipeline would be installed through an HDD beneath the GEHB a distance of about 7,000 feet. At BLE, the pipeline could then be continued southward along the same route as the "dedicated line" under Alternative A, the chosen alternative, with an interconnection to the Route 50 Segment at the same location.

This alternative was rejected for multiple reasons. This alternative would require the filling of approximately 5 acres of sensitive wetlands along GEHB. More than a dozen permanent residents at Jeffers Landing also would have to be relocated for at least 6-months. The 7,000 foot HDD beneath the GEHB presents several unacceptable risks as outlined in the attached technical evaluation by Dr. David Bennett and would pose unacceptable risks to this sensitive ecosystem in the event of a drilling fluid return to the surface or other difficulty completing the drill. This alternative also would require SJG to upgrade the existing 10-mile segment of the Vineland-Mays Landing Segment, about 7 miles of which is located in Pinelands Forest Area. This upgrade would require filling of an additional 2.5 acres of wetlands and the clearing of approximately 36 acres of forest to widen the existing pipeline ROW. Route "B", with the upgrade to the Vineland-Mays Landing Segment and the reliability segment from BL England facility to Tuckahoe, would provide limited reliability to SJG's customers. The alternative would provide redundancy to the Route 50

Segment and thus would improve security for SJG's 60,000 Cape May County customers if a service interruption were to occur on the Route 50 Segment. However, the alternative adds no redundancy to the Vineland-Mays Landing Segment and therefore provides no security to SJG's 142,000 customers located within Atlantic County and Cape May County if a service interruption were to occur on this vulnerable segment. Finally, NJDEP would not approve the route due to significant impacts on CAFRA-protected resources and the availability of other less destructive alternatives outside the CAFRA area. For these reasons, Route B was not considered a feasible or better alternative.

3. Alternative "C"

This route would approach BLE from the west and south by extending SJG's existing 20" pipeline which terminates near Union Road and Rt. 49. Route "C" begins in Maurice River Township, Cumberland County and ends at the BLE. Two variations of Route "C" were evaluated as part of W&C's addendum to ensure better reliability. The original route begins at the same location as Route "A", but deviates off of NJ Route 49 onto Port Elizabeth Road south to an abandoned Conrail railroad ROW; then southeast to the intersection of Route 9; then north on Route 9 for approximately 8.9 miles to the intersection of Clay Avenue; then west on Clay Avenue for approximately 0.3 miles to BLE. Route "C" crosses through 10.5 miles of Pinelands Forest Area. Route "C" in the original Route Analysis is approximately 29 miles long and provides limited redundancy to SJG customers. This route is similar to Route B in that it only adds redundancy to the Route 50 Segment due to the limited capacity of SJG's existing 16" diameter 250 psig pipeline that is located on Mount Pleasant Tuckahoe Road.

An alternate segment for Route "C" that would provide full redundancy, similar to Route "A", would also be approximately 29 miles long. This route would start at the same location as Route "A", but deviates off of NJ Route 49 onto Port Elizabeth Road south to an abandoned Conrail Railroad ROW. The route then proceeds along the Conrail ROW cross country through the town of Woodbine to the intersection with Dennisville-Petersburg Road. The route then travels northeast along Dennisville-Petersburg Road to Mount Pleasant- Tuckahoe Road. Then it travels north into the town of Tuckahoe to the intersection with Marshal Avenue (Mt. Pleasant-Tuckahoe Road Segment). The route then follows the Tuckahoe Road Segment to the BL England Power Plant. This route would eliminate the bottleneck in the SJG system of the 16" diameter pipeline on Mount Pleasant Tuckahoe road that prevents the original Route "C" from providing full reliability. The alternate for Route "C" would then be approximately 29 miles in length, cross through 14.5 miles of Pinelands Forest Area, provide service to the BL England Facility and provide full redundancy to SJG's customers.

Both variations of Alternative "C" were rejected for multiple reasons. Both variations would require extensive clearing of Pinelands Forest, including the clear-cutting of a 30' ROW along 5.9 miles of a reforested railroad corridor. About 21 acres of forest would be clear-cut and approximately 1.7 acres of wetlands would be permanently disturbed along with significant impact to numerous threatened and endangered species, including Pine Snake habitat. This route would be approximately 7 miles longer than Route "A". The unavoidable necessity of clearing significant portions of Pinelands Forest Area, and of impacting wetlands and threatened and endangered species were considered fatal flaws and therefore this route was not considered a feasible or better alternative.

4. Alternative "D"

This route would approach BLE from the south by extending SJG's existing 20" pipeline which terminates near Union Road and Rt. 49. Route "D" begins in Maurice River Township, Cumberland County and ends at the BLE. To ensure better reliability on this Route an alternative segment was evaluated as part of W&C's addendum. The original route begins in Maurice River Township, Cumberland County at the intersection of Route 49 and Union Road and continuing east on Route 49 for approximately 0.5 miles to the intersection of Route 49 and County Route 646 (Port Elizabeth-Cumberland Road); then south on Route 646 for approximately 4.8 miles to the intersection of Route 47; then south on Route 47 for approximately 14.9 miles to the intersection of County Route 610 (Petersburg Road); then northeast on Route 610 for approximately 3.4 miles to the intersection of County Route 550 (Woodbine-Oceanview

Road); then southeast on Route 550 for approximately 3.9 miles to the intersection of State Route 9; then north on Route 9 for approximately 8.9 miles to the intersection of Clay Avenue; then west on Clay Avenue for approximately 0.3 miles to the BL England Power Plant in Upper Township, Cape May County. This route primarily follows existing cleared road and utility right-of-ways minimizing potential impacts and limiting clearing required to install the gas pipeline. Route "D" crosses through 8.6 miles of Pinelands Forest Area. Route "D" would be approximately 36.8 miles in length, provide service to the BLE but only provide limited reliability to SJG's customers.

An alternate for Route "D" that would provide full reliability, similar to Route "A", would also be approximately 36.8 miles long. This route would begin in Maurice River Township, Cumberland County at the intersection of Route 49 and Union Road and continuing east on Route 49 for approximately 0.5 miles to the intersection of Route 49 and County Route 646 (Port Elizabeth-Cumberland Road); then south on Route 646 for approximately 4.8 miles to the intersection of Route 47; then south on Route 47 for approximately 14.9 miles to the intersection of County Route 610 (Petersburg Road); The route then travels northeast along County Route 610 (Petersburg Road) for approximately 5.0 miles to Mount Pleasant Tuckahoe Road. Then it travels north 3.3 miles into the town of Tuckahoe to the intersection with Marshal Avenue. Then the route travels 0.2 miles east on Marshall Avenue to NJ Route 50 (Mt. Pleasant-Tuckahoe Road Segment). Then 1.5 miles south on NJ Route 50 to Tuckahoe Road; then east on Tuckahoe Road for 4.2 miles to the intersection with Oceanwoods Avenue. The route then proceeds 0.4 miles north on Oceanwoods Avenue to the intersection with the Atlantic Electric ROW, then proceeds 2.1 miles east cross country on the Atlantic Electric ROW and the BLE property to the power station (Tuckahoe Road Segment). This route would eliminate the bottleneck in the SJG system of the 16" diameter pipeline on Mount Pleasant Tuckahoe Road that prevents the original Route "D" from providing full redundancy. The alternate for Route "D" would then be approximately 36.8 miles in length, cross through 12.6 miles of Pinelands Forest Area, provide service to the BL England Facility and provide full redundancy to SJG's customers.

These variations of Alternative "D" were rejected for multiple reasons. This alternative would cross 27 known streams and many large wetland systems. It also would travel through 8.6 or 12.6 miles of Pinelands Forest Area and extensive portions of the marsh system of the Delaware Bay. The NJDEP Landscape mapping identified 12 areas of potential vernal habitat along this route. While no design has been completed for this alternative, the much higher incidence of stream crossings and low-lying areas increases the probability of wetlands impacts. Based upon the potential for significant impacts to wetlands, including extensive portions of the Delaware Bay marsh system, and the fact that the route would occupy substantially the same or greater portions of the Forest Area, Route D was not considered a feasible or better alternative.

5. Alternative "E"

This route would approach BLE from the west and north via SR 50 and would travel through two separate portions of the Pinelands Forest Area. This route would install a new pipeline adjacent to the existing Route 50 Segment, beginning in Estell Manor, Atlantic County and ending at BLE. The original route begins at SJG's Esterville Station located on Route 50 in Estell Manor, Atlantic County, following Route 50 south for approximately 8.5 miles to the intersection of Tuckahoe Road; then east on Tuckahoe Road for 4.2 miles to the intersection with Oceanwoods Avenue; then 0.4 miles north on Oceanwoods Avenue to the intersection with the Atlantic Electric ROW; then 2.1 miles east cross country on the Atlantic Electric ROW and the BLE property to the power station.

Route "E" would require SJG to upgrade the Vineland-Mays Landing Segment from a 20" diameter pipeline to a 30" diameter pipeline to meet the volume and capacity demands of SJG's Atlantic County and Cape May County customers and the BL England Facility. This upgrade would operate at a Maximum Allowable Operating Pressure (MAOP) of 700 psig and would begin in the City of Vineland, Cumberland County, just east of Union Road and just north of the intersection of Asher Road and Union Road at the existing South Jersey Gas, Union Road Station facility and follow the existing gas line easement right-of-way east, cross country, for approximately 10.2 miles to the intersection of Route 50.

Route "E" also crosses through 7 miles of Pinelands Forest Area in connection with the upgrade to the Vineland to Mays Landing Segment and 7.3 miles of Pinelands Forest Area in connection with the Route 50 portion. Route "E" would be approximately 25.4 miles in length, and would provide limited redundancy to SJG's customers.

This alternative was rejected for multiple reasons. Route "E" would require SJG to upgrade the 10-mile Vineland-Mays Landing Segment which would require filling of an additional 2.5 acres of wetlands and the clearing of approximately 36 acres of forest to widen the existing pipeline ROW. There are also multiple waterway crossings throughout this area, and HDDs may not be feasible in some of these locations as the route has multiple curves and bends along the alignment. There also would be no access for laying out the pipe or staging the pipe for the HDD installation without performing additional clearing of trees and potential wetlands. Route E would be approximately 6 miles longer than Route "A" resulting in more overall disturbance. The route also has numerous areas of exposed sandy soils that may provide habitat for northern pine snake. Open ROWs often host populations of Pinelands threatened and endangered plants. Finally, the alternative would not provide full redundancy. The co-location of the new 24" pipeline with the existing Route 50 Segment creates vulnerability because a parallel configuration along Route 50 is less reliable. A single event has the potential to take-out both pipelines. The co-location of critical "lifeline" infrastructure (i.e. those systems and facilities that deliver vital services and products to a community, including natural gas pipelines) increases system vulnerability because natural events like large storms, or man-made disasters like excavation accidents, can take-out co-located infrastructure. See FEMA, "Collocation Impacts on the Vulnerability of Lifelines During Earthquakes with Applications to the Cajon Pass, California," FEMA-221 (Oct. 1991); National Infrastructure Advisory Council, "A Framework for Establishing Critical Infrastructure Resilience Goals Final Report and Recommendations" (Oct. 2010). An event that would be capable of taking-out service along the 20" pipeline located on Route 50 would have the potential also to take-out service to a new 24" pipeline, thus exposing the 60,000 customers in Cape May County to a loss of service. Full redundancy only can be achieved through what is known as a "loop," an alternative pathway to transport natural gas to an area.

Because Alternative "E" would impact the Pinelands Forest Area, would impact wetlands and threatened and endangered species, and would not provide full redundancy, it was not considered a feasible or better alternative.

6. Alternative "F"

This route is similar to Alternative E but with an additional new feeder line that would originate in Gloucester County. Route "F" begins in Franklin Township, Gloucester County and ends at BLE in Upper Township, Cape May County. Beginning in Franklin Township, Gloucester County, at the South Jersey Gas Forest Grove Station, approximately 1900 feet west of the intersection of County Route 555 and Weymouth Road, adjacent to Weymouth Road and following the existing gas line easement right-of-way southeast, cross-country for approximately 15.5 miles to the intersection of Route 50; then south on Route 50 for approximately 13.5 miles to the intersection of Tuckahoe Road; then (Tuckahoe Road Segment) east on Tuckahoe Road for 4.2 miles to the intersection with Oceanwoods Avenue. The route then proceeds 0.4 miles north on Oceanwoods Avenue to the intersection with the Atlantic Electric ROW, then proceeds 2.1 miles east on the Atlantic Electric ROW and the BLE property to the power station. Route "F" would be approximately 35.7 miles in length, provide service to BLE and provide limited reliability to SJG's customers because it would not provide full redundancy. The co-location of the new 24" pipeline with the existing Route 50 Segment creates vulnerability because a parallel configuration along Route 50 is less reliable. A single event has the potential to take-out both pipelines. The co-location of critical "lifeline" infrastructure (i.e. those systems and facilities that deliver vital services and products to a community, including natural gas pipelines) increases system vulnerability because natural events like large storms, or man-made disasters like excavation accidents, can take-out co-located infrastructure. *Ibid.* An event that would be capable of taking-out service along the 20" pipeline located on Route 50 would have the potential also to take-out service to a new 24" pipeline, thus exposing the 60,000 customers in Cape May County to a loss of service. Full redundancy only can be achieved through what is known as a "loop," an alternative pathway to transport natural gas to an area.

This alternative was rejected for multiple reasons. This route would cross 18 known streams on the entire route and 6 streams on the cross-country segment of the route. It would also traverse significant portions of Pinelands Forest Area. The 15+ mile cross-country segment includes approximately 7.7 acres of mapped wetlands within the 30 foot wide ROW. The project design would utilize HDDs where possible to avoid wetland, buffer and stream impacts but it is anticipated that the route geometry and extent of wetlands would result in approximately 3 acres of wetland impacts and additional wetland buffer impacts. According to the NJDEP Landscape project mapping, the 15-mile segment includes habitat for Barred Owl, Eastern Tiger Salamander, Pine Barrens Tree Frog, Bald Eagle, Osprey, Black Skimmer, Cattle Egret, Least Tern, Black-crowned night-heron. Since there are anticipated impacts on 3 acres of wetlands on this segment of the route and significant clearing required during construction it was assumed there would be impacts to some of the species habitat identified. The cross-country segment of Route "F" traverses through an existing SJG Easement, the new gas main expansion line would require at least a 30 ft. wide clearing in order to install the gas main in this location. The existing easement traverses through heavily wooded/forested areas with a dirt access road approximately 6 to 10 feet wide; thus requiring additional clearing of up to 25 ft. for construction of the new pipeline for the majority of the route. This would require the removal of about 45 acres of trees. For the majority of the route, there is limited access for construction vehicles/equipment to enter construction areas due to the location of the proposed route.

Because Alternative "F" would not provide full redundancy, would require the clearing of significant portions of Pinelands Forest Area, and would impact wetlands and threatened and endangered species, it was not considered a feasible or better alternative.

7. Alternative "G"

This route would approach BLE from the north by extending SJG's existing 24" Vineland-Mays Landing Segment which terminates at Ocean Heights Ave and Harbor Ave in Egg Harbor Township. Route "G" begins in Hamilton Township, Atlantic County and ends at the BL England power plant in Upper Township, Cape May County. Beginning in Hamilton Township Atlantic County on Route 559 / Ocean Heights Ave at the intersection with Harbor Avenue; then southeast approximately 6.1 miles to the intersection of the Garden State Parkway right-of-way (GSPY ROW); then south on the GSPY ROW for approximately 2.6 miles to a point just north of the Somers Point Toll Plaza on the GSPY ROW; then directional drill approximately 8,700 feet under the Great Egg Harbor Bay to a point on Route 9 just north of the intersection of Clay Avenue; then south on Route 9 for approximately 0.1 miles to the intersection of Clay Avenue; then west on Clay Avenue for approximately 0.3 miles to BLE. This route has been presented by Pinelands Preservation Alliance as a viable alternative route.

Route "G" would require the upgrade of the Vineland-Mays Landing Segment from a 20" diameter pipeline to a 30" diameter pipeline to meet the volume and capacity demands of SJG's Atlantic County and Cape May County customers and the BL England Facility. This upgrade would operate at a Maximum Allowable Operating Pressure (MAOP) of 700 psig and begin in the City of Vineland, Cumberland County, just east of Union Road and just north of the intersection of Asher Road and Union Road at the existing South Jersey Gas, Union Road Station facility and following the existing gas line easement right-of-way east, cross-country for approximately 10.2 miles to the intersection of Route 50. This upgrade crosses through 7.2 miles of Pinelands Forest Area that is not within the ROW of existing roads.

Route "G" with the upgrade of the Vineland to Mays Landing Segment is 20.7 miles in length but only satisfies one aspect of the project, the need to provide natural gas to BLE. In order to provide some redundancy to SJG's customers in Atlantic County and Cape May County, there are two alternatives. The first alternative would require an additional 8.4 miles of 24" diameter pipe installed from the BLE to Tuckahoe (Tuckahoe Road Segment) where it would tie into SJG's existing transmission facilities. This route would begin at BLE and travel south through the BLE property to the Atlantic Electric ROW, then travel through the Atlantic Electric ROW southwest to the intersection of Oceanwoods Ave. The alignment then would proceed south along Oceanwoods Ave. to Tuckahoe Road. Then the route would travel west along Tuckahoe Road to NJ Route 50 where it would proceed north to the intersection with

Marshall Ave. The route then would travel west along Marshall Ave to Mount Pleasant Tuckahoe Road. From there, the route would travel north along Mount Pleasant Road to a SJG Interconnect Station and tie into SJG's existing transmission facilities.

The second alternative would require approximately 12.8 miles of additional pipe starting at the intersection of Clay Avenue and Route 9 and traveling South along Route 9 for approximately 8.9 miles to the intersection of Route 550; than northwest on Route 550 approximately 3.9 miles to the intersection with an existing South Jersey Gas pipeline which would provide the redundancy element of the project.

With the upgrade to the Vineland to Mays Landing Segment and either reliability segment from BLE to SJG's existing transmission facilities, Route "G" would provide limited reliability to SJG's customers by adding redundancy to the Route 50 Segment. This pipeline would provide security for SJG's 60,000 Cape May County customers if a service interruption were to occur on the Route 50 Segment. However, Route "G" adds no redundancy to the Vineland-Mays Landing Segment because it would still be a "single-feed" configuration and therefore provides no security to SJG's 142,000 customers located within Atlantic County and Cape May County if a service interruption were to occur along this segment.

Route "G" would be at least 29.1 miles in length, and could be as much as 33.5 miles in length depending on the alternative chosen. It would provide service to the BL England Facility but only provide limited reliability to SJG's customers.

Route "G" was rejected for multiple reasons. The upgrade of the existing 10-mile Vineland-Mays Landing Segment would require filling of an additional 2.5 acres of wetlands and the clearing of approximately 36 acres of forest to widen the existing pipeline ROW. It would also impact 7.2 miles of Pinelands Forest Area. There are also multiple waterway crossings throughout this area, and HDDs may not be feasible in some of these locations as the route has multiple curves and bends along the alignment. This route would cross 18 known streams on the entire route and 6 streams on the cross-country segment of the route. There also would be no access for laying out the pipe or staging the pipe for the HDD installation without performing additional clearing of trees and potential wetlands. Route "G" would be approximately 13 miles longer than Route "A" resulting in more overall disturbance. The route also has numerous areas of exposed sandy soils that may provide habitat for northern pine snake. Open ROWs often host populations of Pinelands threatened and endangered plants. Finally, Route "G", with the upgrade to the Vineland to Mays Landing Segment and the Tuckahoe Road Segment, would provide only limited reliability to SJG's customers by adding redundancy to the Route 50 Segment but not solving the vulnerability of the Vineland and Mays Landing Pipeline and therefore provides no security to SJG's 142,000 customers located within Atlantic County and Cape May County if a service interruption were to occur on the Vineland to Mays Landing Segment.

In addition, Route "G" was surveyed to determine the number and location of "High Consequence Areas"(HCA) along the route for comparison to the preferred Route "A." See *South Jersey Gas Company, "Proposed Pipeline Routes HCA Analysis,"* (July 28, 2014) (attached hereto as **Exhibit 21**). HCA's are specific locations where an inadvertent release could have the most significant adverse consequences. The U.S. Department of Transportation's Pipeline & Hazardous Materials Safety Administration's Fact Sheet: "*High Consequence Areas (HCA)*" states "HCA's for natural gas transmission pipelines focus solely on populated areas. Populated areas include both High population areas (called 'urbanized areas' by the U.S. Census Bureau) and other populated areas (areas referred to by the Census Bureau as a 'designated place')." These areas require additional focus, efforts and analysis to ensure the integrity of the pipeline. The survey was conducted in accordance with CFR 49 Part 192.03 and SJG's Transmission Integrity Management Plan, using the potential impact circle method. All three segments of Route "G" were evaluated. The 10.9 mile segment from McKee City to BLE was found to have 10 identified sites totaling 4.5 miles of HCA. The 8.4 mile Tuckahoe Road segment contained six identified sites containing 2.1 miles of HCA. The 10.5 mile Vineland-Mays Landing segment had one site identified containing 0.7 miles of HCA. Route "G" therefore contains 17 identified sites for a total of 7.3 miles of High Consequence Area. In contrast, Route "A" contained only 7 identified sites with a total of 2.9 miles of HCA.

Apart from these flaws, Route G's reliance upon the GSPY ROW is fatal. State law prohibits construction of natural gas pipelines beneath limited access highways such as the GSPY and the New Jersey Turnpike Authority has informed SJG that it would not approve the installation of the pipeline beneath the GSPY. Also, the expert report prepared by Dr. Bennett makes clear that the technical risks posed by an 8,500 foot HDD in conjunction with the difficult geotechnical conditions, renders this alternative infeasible. Finally, NJDEP would not approve the route due to significant impacts on CAFRA-protected resources and the availability of other alternatives outside the CAFRA area. For these reasons, Route "G" was not considered a feasible or better alternative.

8. "No Action" Alternative

The alternative of no action obviously will not satisfy the compelling public needs of the Project, which are to provide a supply of natural gas to support the repowering of the BL England electric generating station, as well as to enhance the reliability of gas service for customers in Cape May and Atlantic counties. The impact of the pipeline not being constructed includes the following.

Reduced electric system reliability – A major purpose of the pipeline is to provide natural gas service to BLE to enable the plant to continue operating and thereby to supply cleaner, safer, and more reliable electricity to residents and businesses in the Pinelands and surrounding areas of Cape May and Atlantic Counties. If the pipeline were not constructed to support the repowering of the plant, there would be multiple electric system reliability violations that would require significant electric system upgrades. The PJM Transmission Expansion Advisory Committee report dated April 10, 2014 and PJM's 2014 Regional Transmission Expansion Plan dated July 22, 2014 (Attachment 4) specifically identified improvements that would be required in the existing electric transmission system, should the BL England power plant not be repowered, as part of their "At Risk Generation Analysis" section of the report. The upgrades identified include:

1. Rebuild and reconfigure existing 138 kV line to establish a new Orchard – Cardiff 230 kV line (Cost Estimate: \$57M)
2. New Upper Pittsgrove – Lewis 138 kV line (Cost Estimate: \$28M)
3. New Cardiff – Lewis #2 138 kV line (Cost Estimate: \$3.5M)
4. Orchard substation work to accommodate new Orchard – Cardiff 230 kV line (Cost Estimate: \$3.6M)
5. Upper Pittsgrove substation work (Cost Estimate: \$0.05M)
6. Landis substation work to convert Landis to a ring bus and connect 3 lines to it (Cost Estimate: \$13.4M)
7. Dorothy Substation work – replace two switches with breakers (Cost Estimate: \$4M)
8. Cardiff substation work to accommodate new Orchard – Cardiff 230 kV line and new Cardiff – Lewis 138 kV line (Cost Estimate: \$16.4M)
9. Lewis substation work (Cost Estimate: \$0.1M)
10. Environmental (Cost Estimate: \$2M)

These transmission upgrades alone cannot replace the reliability and economic benefits of BLE's locally generated electricity. For example, during times of a natural disaster, like Hurricane Sandy, the reliability benefits of a local source of electricity are far superior to more distant electricity sources, such as those in Pennsylvania. Additionally, local generating sources provide a valuable source of reactive power, which is critical to maintaining grid stability, especially during peak air conditioning days. Moreover, in the event of a blackout, restoration of the grid often depends on the availability of local generation sources with "black start" capability – the ability of generating units to come on-line quickly after a blackout without the need for an electricity feed from a larger unit. BLE will have this black start capability.

ACE has advised that it intends to pursue some of these transmission upgrades whether or not BLE is repowered. However, in the event that BLE is repowered and ACE constructs their planned transmission upgrades, a repowered BLE will still result in the reduction of a significant portion of PJM's mandated transmission system improvement cost and will provide significant reliability, economic, and environmental benefits to the Pinelands that transmission upgrades will not.

Increased air pollution – the repowering of BLE will result in significant reductions in the levels of carbon dioxide (CO₂), nitrogen oxides (NO_x), sulphur dioxide (SO₂), mercury and fine particulates (PM_{2.5}). If the plant does not repower and is forced to shut-down, much of the replacement power will be purchased from nearby states, primarily Pennsylvania. Much of the air pollution generated from Pennsylvania's fossil steam (coal- and natural gas-powered) marginal generating units directly impact air quality in New Jersey and specifically in the Pinelands. Prevailing west-east winds transport the fine particulates and sulfate air pollution from Pennsylvania's power generation plants to the Pinelands, where they contribute to a number of human health problems.

Continued risk of natural gas interruption for customers in Cape May and Atlantic Counties – the inability to construct the pipeline as proposed will significantly impact plans for “hardening” the SJG system and enhancing reliability of natural gas service for customers in Atlantic and Cape May counties. SJG's existing infrastructure is dependent upon two segments of single natural gas transmission pipeline service as the “backbone” of the entire system serving Cape May and Atlantic counties. If a service interruption were to occur along this backbone, as many as 28,700 Pinelands customers in the Pinelands and 142,000 overall could be without gas service for several months. An interruption of this magnitude would put public safety and health at risk, especially during the winter months when natural gas usage peaks due to the need to heat homes, businesses and other critical facilities such as hospitals, schools, elder care facilities, etc.

For the reasons stated above, the No Action alternative clearly produces significant risks to the well-being of residents who live in the Pinelands, and as a result should be eliminated from consideration.

In summary:

Route “A” meets the goals of the project, would not have significant environmental or community impacts but does cross through Pinelands Forest Area.

Route “B” would not meet the goals of the project because it would only provide limited redundancy. There would be significant wetland and threatened & endangered species impacts, and significant legal, engineering and environmental risks associated with the HDD under GEHB. It would also impact the Pinelands Forest Area because of the need to upgrade the 10-mile Vineland-Mays Landing Segment.

Route “C” meets the goals of the project but would have significant impacts on the Pinelands Forest Area, wetlands and threatened & endangered species. Large sections of the railroad ROW have overgrown so it is not considered an improved right-of-way or an acceptable route for the gas pipeline.

Route “D” meets the goals of the project but would have greater community, traffic, and environmental impacts than Route “A”. This route also crosses through approximately 8-12 miles of the Pinelands Forest Area and is 15 miles longer than Route “A”.

Route “E” would not meet the goals of the project because it would only provide limited redundancy, would cross through approximately 7 miles of the Pinelands Forest Area and would have significant wetland and threatened & endangered species impacts.

Route "F" would not meet the goals of the project because it would provide only limited redundancy, would have significant wetland and threatened & endangered species impacts, and would traverse two portions of the Pinelands Forest Area.

Route "G" would not meet the goals of the project because it would only provide limited redundancy. There would be significant wetland and threatened & endangered species impacts, and significant legal, engineering and environmental risks associated with the HDD under GEHB.

VII. CONCLUSION

Based upon the entirety of the facts and circumstances set forth above, the Project is the only practicable, least-impacting alternative to serve the vital need of Pinelands residents and businesses for safe, reliable, and clean electricity and natural gas services. Because the main usage of the pipeline is to provide natural gas service to BLE—as reflected by the fact that the pipeline will be used to supply BLE at least 95 percent of the time and thereby to enable a drastic reduction in air pollution within the Pinelands while serving the electric reliability needs of 638,000 Pinelands residents—the Project conforms fully with Forest Management Area use standards and does not require a MOA or any other waiver of the CMP although the facts also clearly would sustain a showing of a compelling public need.

LIST OF EXHIBITS

1. Letter from Ewing to Horner, April 27, 2012.
2. Letter from Fontaine to Horner, June 18, 2012
3. Power Grid Engineering & Markets, Benefit to Pinelands Area of BL England Repowering (May 29, 2012; Updated October 11, 2013).
4. Memorandum of Agreement Between Pinelands Commission and Board of Public Utilities, September 13, 2004 Regarding ACE Oyster Creek-Cardiff 230 kV Transmission Line.
5. Letter from Ellis to Ewing, August 23, 2012.
6. NJ Pinelands Commission, Report on a Proposed Memorandum of Agreement Between the New Jersey Pinelands Commission and the New Jersey Board of Public Utilities Regarding Construction of a Proposed Approximately 15 Miles of a 22-Mile, 24-Inch Natural Gas Pipeline in the State Designated Pinelands Area, January 3, 2014.
7. Standard Gas Service Agreement-Firm Electric Service Agreement between South Jersey Gas and RC Cape May Holdings, LLC" ("FES Agreement")
8. BPU, Order In the Matter of the Joint Petition of South Jersey Gas Company and RC Cape May Holdings, For Approval of a Standard Gas Service Agreement (FES) and a Standard Gas Service Agreement (FES) Addendum, Docket No. G013010052, April 29, 2013.
9. NJDEP, In the Matter of RC Cape May Holdings, LLC, Administrative Consent Order Amendment (July 11, 2014).
10. PJM, 2014 Regional Transmission Expansion Plan, Transmission Plan Proposed for Approval to Proceed with Construction Related to the 2014 Baseline Regional Transmission Expansion Plan, Presented by PJM Staff to the Board Reliability Committee, July 22, 2014.
11. Woodard & Curran, Addendum II to Alternatives Analysis South Jersey Gas—BL England Gas Route Analysis Report (April 2015).
12. Woodard & Currant, Map of Alternatives.
13. Letter from John Gray, NJDEP to Robert Fatzinger, SJG, May 14, 2015.
14. BPU, Letter from Tricia Caliguire, Chief Counsel, BPU to Mark Lohbauer, Chairman, Pinelands Commission, (December 12, 2013).
15. PJM, Transmission Expansion Advisory Committee Report, June 5, 2014.
16. NJDEP, "Pinelands Air Quality Benefit Analysis of BL England Repowering Project," Memorandum from Francis C. Steitz, Assistant Director, Division of Air Quality, to Nancy Wittenberg, Executive Director (September 16, 2013).

17. South Jersey Gas, BL England & Reliability Pipeline Project, Presentation to Pinelands P&I Committee, (September 27, 2013) pp. 7-9.
18. Map of South Jersey Gas Existing Transmission and Distribution System in the Pinelands.
19. Bennett, D., Technical feasibility and risk evaluation for HDD bore proposed by Pinelands Preservation Alliance (PPA) and alternative HDD alignments beneath Greater Egg Harbor Bay (GEHB) (August 18, 2014).
20. Letter from Robert Fischer, PE, Chief Engineer, New Jersey Turnpike Authority to Steven Ewing, Woodard & Curran, July 14, 2014.
21. South Jersey Gas Company, Proposed Pipeline Routes HCA Analysis, July 28, 2014.