Central Jersey Grid Upgrade (CJGU) Proposal

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Submitted by:
Public Service Electric & Gas Company

Submitted to:
PJM/New Jersey Board of Public Utilities (BPU)

In Response to:
The Request for Proposals issued by PJM and the BPU Supplemental Information Request in Support of Offshore Wind Transmission Projects to be developed under the 2021 State Agreement Approach

Proposing Entity Name	PSE&G
Company ID:	CJGU
Project Title	Central Jersey Grid Upgrade
PJM Proposal ID	2021-NJOSW-180

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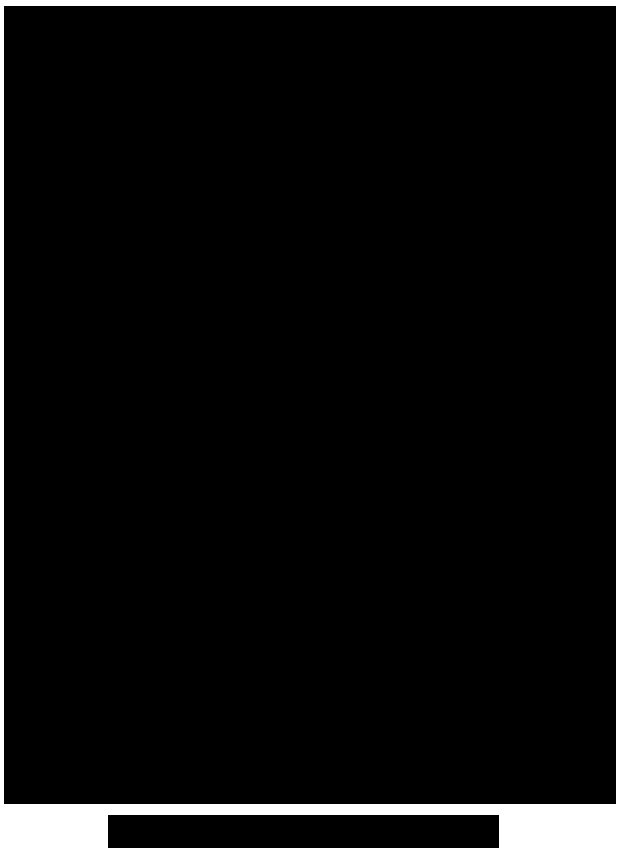
1. PROJECT SUMMARY/EXECUTIVE OVERVIEW

PSE&G proposes to construct, own, operate, and maintain the "Central Jersey Grid Upgrade Project" ("CJGU" or the "Project") located in New Jersey to resolve reliability violations outline in Section 1.1. The Project offers should be evaluated as a whole or any part thereof its following components:

- Reroute the Brunswick to Devil's Brook 230-kV T-2351 circuit into and out of new positions at the PSE&G Deans 230-kV Switching Station and the upgrade twelve (12) 230-kV to 80-kA breakers at Deans 230-kV Switching Station
- Relocate the existing 230-kV B-2254 circuit from Linden 230-kV to Linden 345-kV using a 345/230-kV Transformer
- Create paired circuit path from the existing 230-kV C-1017 between PSE&G's Clarksville Substation and JCP&L's Windsor Switch. Significant portion of this scope will be on infrastructure owned and operated by the incumbent utility and a shared execution is anticipated
- Install one (1) new breaker to expand PSE&G's Bergen 138-kV bus switching Station
- The proposed project cost is approximately $68.5 million base.
- The overall estimated project duration of the proposed solution(s) as a whole is four (4) years

1.1 NARRATIVE DESCRIPTION OF PROPOSED PROJECT(S)

Public Service Electric and Gas (PSE&G) presents the Central Jersey Grid Upgrade technical solution ("CJGU" or the "Project") to resolve potential reliability criteria violations on PJM facilities in response to the 2021 SAA Proposal Window.



This proposal will support integration of the NJ SAA Option 1a for the buildout of up to 7500MW of offshore renewable wind generation. PSE&G proposes to address multiple reliability violations resulting from the injections at identified default Points of Interconnection (POI) representing future offshore wind generation and the transmission facilities necessary to connect the future offshore wind to the PJM grid.

The Central Jersey Grid Upgrade (CJGU) technical solution will address the following identified generator deliverability criteria violations clusters for Summer, Winter and Light Load (PJM 2028 and 2035 results) in the PSE&G and PSE&G/JCP&L affected areas. The upgrades are intended to remove the overloaded facilities beyond the 7500 MW offshore wind (OSW) injection target. This will leave room for additional transfer of power from Central New Jersey into Northern New Jersey.

Cluster 1:	**Cluster 2:**	**Cluster 3:**
Deans to Brunswick 230-kV	Aldene to Springfield 230-kV Linden to TOSCO 230-kV TOSCO to VFT 230-kV	Windsor to Clarksville 230-kV

The scope of the CJGU Projects to address each of the violation clusters will be executed entirely within Transmission Substations and Transmission Right of Ways (ROW) owned or controlled by the incumbent utilities, without the need for Greenfield development.

The scope of the Deans to Brunswick Subproject addressing violation Cluster 1 will include:

- Construct two (2) additional breaker and a half bays
- Reroute the Brunswick to Devils Brook 230-Kv (T-2351) circuit into and out of new positions at the PSE&G Deans 230-kV Switching Station.

The scope of the Linden Subproject addressing violation Cluster 2 will include:

- Install a new 345/230-kV transformer at the PSE&G Linden 345-kV Switching Station [redacted]
- Install new 230-kV strain bus connecting Linden 230-kV yard to Linden 345-kV yard through the new transformer
- Relocate the TOSCO to Linden 230-kV (B-2254) circuit from the Linden 230-kV to the existing 345/230-kV transformer at Linden 345-kV

The scope of the Windsor to Clarksville Subproject addressing violation Cluster 3 will include:

- Reconfigure the Windsor to Clarksville 230-kV circuit to have two conductors per phase and make appropriate terminal upgrades at PSE&G's Clarksville and JCP&L's Windsor stations

Secondary NERC violations have been identified by PSE&G. They include short circuit violations at Deans 230-kV and the overload of the Bergen 138-kV series reactor on the R-1344 circuit.

Secondary Violation 1:	**Secondary Violation 2:**
Deans 230-kV Short Circuit	Bergen 138-kV Series Reactor

The scope of the Deans Subproject works to address the overdutied breakers at Deans 230-kV and will include work to:

- Increase the fault rating of the PSE&G Deans 230-kV Switching Station from 63-kA to 80-kA, via replacement of twelve (12) 230-kV 4000A circuit breakers, replacement of insulators, bus, grounding, controls, etc. to achieve desired rating.

The scope of the Bergen Subproject works to address the Bergen 138-kV series reactor overload and will include:

- Upgrading the Bergen 138-kV ring bus by installing one (1) 138-kV 80-kA breaker along with the foundation, piles, and relays to existing ring bus, installing breaker isolation switches on existing foundations, installing one (1) new monopole, foundation, overhead strain bus, installing one (1) new H-frame, foundations, and modifying and extending bus work

CJGU construction to be performed by PSE&G except for the following JCP&L responsibility:

- Windsor to Clarksville 230-kV outside plant upgrade
- Windsor 230-kV inside plant upgrade

Section 3 of this report provides additional technical information regarding the inside and outside plant scope of each project.

The overall estimated project duration for the proposed solution in 4 years.

PSE&G's latest FERC Order 1000 window pre-qualification recertification application document is on record, submitted August 2019 under PJM ID# 13-07.

1.2 ABOUT PSE&G

Headquartered in Newark, New Jersey, PSE&G is one of the largest combined electric and gas companies in the United States and is New Jersey's oldest and largest publicly owned utility, serving approximately 2.6 million customers, nearly three-quarters of the state's population. PSE&G is the largest subsidiary of Public Service Enterprise Group (PSEG). Since 2007, PSE&G has built over 400 miles of high-voltage transmission circuits (138-kV and above) to eliminate 200 NERC reliability violations identified by PJM. In addition, PSE&G owns and maintains 834 miles of transmission right-of-way with 1,579 miles of transmission lines over 100-kV and 484 miles of 500-kV transmission lines.

As an infrastructure company located in the most densely populated state in the United States, PSE&G has a record of consistently delivering complex linear transmission projects on time and on budget. PSE&G's experience building overhead, underground, and station facilities—often in environmentally sensitive areas uniquely equips PSE&G to execute the proposed CJGU project.

During the period 201 -2018, PSE&G invested $ 13.8 billion in new transmission projects. Some examples of the non-traditional construction methods we have recently deployed include:

- The utilization of alternative construction techniques (helicopter, wetland matting, etc.) to minimize the environmental impact of our projects and to optimize construction sequencing
- The siting, permitting, and construction of numerous projects—including GIS stations, in concentrated, urban areas across northern and central New Jersey
- The utilization of horizontal directional drilling (HDD) under the Newark Bay to accommodate two underground circuits in the Bergen-Linden Corridor Upgrade Project, the longest such crossing of a 345-kV
- The successful creation of a temporary routing of the Appalachian Trail to minimize the length of the trail through the ROW of the Susquehanna Roseland project; the initiative minimized the negative visual impacts of the project and ensured that hikers were separate from the habitats of key endangered species in the area.

1.2.1 PSE&G'S EXPERIENCE

Below is a list of representative projects that PSE&G has constructed, owns, and operates.

Project	Circuit Miles	Voltage (kV)	Cost	Scope	In-Service Dates
Metuchen-Trenton-Burlington 230kV Conversion Project	54	230	*Up to* $739M	Upgrade overhead transmission lines to 230kV; 12 station upgrades	2022 Target Completion
Bergen-Linden Corridor Upgrade Project	30	345	$1.2B	1 new station; 9 station upgrades, new overhead and underground lines	2019
Sewaren-Metuchen 230kV Conversion Project	14	230	$125M	Convert existing lines to 230kV; 4 station upgrades	August 2016
Northeast Grid Reliability Project	69	138/230	$975M	11 stations, upgrade overhead transmission line (50 miles) and underground transmission lines (19 miles)	July 2016
Mickleton-Gloucester-Camden	16	230	$435M	Two new 230kV overhead lines; three new 230kV underground lines, upgrade 5 stations	2015
Susquehanna-Roseland	45	500	$790M (PSE&G portion)	New 500kV overhead lines, construct new 500kV GIS station and expand an existing station	2014 (PSE&G portion); Energized 2015
Burlington-Camden Network Reinforcement Project	37	230	$399M	Reconfigure overhead transmission lines and upgrade	2014
Bayonne 3rd Source	5.5	230	$123M	New underground transmission line from Bayonne to Marion stations	2013

PSE&G's ability to manage projects effectively and deliver consistent, high-quality services lies in its standardized practices and procedures. PSE&G's extensive experience building transmission projects has led to a set of standardized practices and procedures to guide the execution of our work. Our standards can stand alone or be integrated with other Transmission Owner Interconnection Requirements as needed.

Additionally, because of the impact that our transmission projects may have on residents, PSE&G maintains a communication and outreach team to interface with local communities, siting boards, residents, and other key stakeholders in the communities affected by our operations. PSE&G also has a demonstrated commitment to preserving the safety and well-being of its employees and the employees of its contractors. This commitment is evidenced by our corporate vision, which is based on our desire to be a leader for providing safe, reliable, economic, and green energy.

PSE&G maintains a very sophisticated and highly skilled Projects & Construction organization, comprised of more than 1,000 employees, which includes a project management team; in-house engineering/design experts; a Project Management Office (PMO), robust Project Management Procedures; a contract management function; a QA/QC function, etc. This team also includes a Mobile Construction Workforce responsible for the construction of PSE&G's 69-kV network and a Transmission Construction and Maintenance team responsible for maintaining the company's network of high voltage circuits. In recent years, these teams have also participated in the construction of new high voltage circuits.

We also have extensive experience in land acquisition and negotiations associated with all types of utility projects including Transmission. PSE&G has an internal Corporate Properties staff responsible for the

oversight and management of the corporation's real estate assets, including the purchase and sale of property rights, leasing or licensing company-owned property to or from third parties, and handling day-to-day property maintenance issues that may arise.

PSE&G also has an in-house Environmental Projects and Services group dedicated to gaining approvals and ensuring environmental compliance for PSE&G's electric transmission and distribution projects. This group is also responsible for gaining appropriate approvals and land rights for conducting work on State and Federal lands, typically including new State land diversions and easement rights.

1.3 PROJECT OPTIONALITY, FLEXIBILITY AND MODULARITY

PSE&G proposes that the CJGU Projects can be constructed as separate, standalone projects addressing their own clusters or as a single unaltered scope to assure safe and reliable transmission system operations under the 2028 model conditions for offshore wind injections at the default POIs. However, PSE&G recommends that the upgrades proposed be executed concurrently.

Relocating the TOSCO to Linden 230-kV (B-2254) circuit from Linden 230-kV to Linden 345-kV addresses the high loading identified in the corridor between Linden, Tosco, VFT, Warianco, and Aldene as well as the underground 230-kV network between Aldene, Springfield Road, Stanley Terrace, West Orange and McCarter switching stations. Any NJBPU option 1b, 2, or 3 proposal that overloads circuits in these two corridors can be resolved by the relocation of the TOSCO to Linden 230-kV Circuit.

The Brunswick to Devils Brooks 230-kV (T-2351) loop-in at Deans 230-kV provides a second parallel path between Deans and Brunswick 230-kV. Any NJBPU option 1b, 2, or 3 proposal that overloads the Deans to Brunswick 230-kV circuit can be resolved by rerouting the T-2351 into Deans 230-kV. As a phase II approach to increase Deans' injection capacity even more, the reconductor or wreck and rebuild of the Deans to Brunswick (D-2204) circuit can build upon the T-2351 loop-in project.

The Windsor to Clarksville 230-kV upgrade provides a significant increase in the capacity of the circuit. Any NJBPU option 1b, 2, or 3 proposal that overloads the circuit can be resolved with the Windsor to Clarksville 230-kV upgrade.

PSE&G performed a comprehensive analysis of station headroom and network upgrades in order to identify optimal transmission upgrades and offers cost effective projects to ensure reliability and alignment with the State's public policy goals.

As over 50% of PSE&G load is located in the Northern New Jersey, the selection of the CJGU Project will increase the transfer capability from Central to Northern NJ, by eliminating the constrained facility between Deans and Brunswick. After the execution of the CJGU Project, the Deans 500-kV injection can be increased to 2700 MW before the Clarksville to Lawrence 230-kV circuit becomes overloaded during the loss of the Deans 500/230 Transformer #1 and Deans to Branchburg 500-kV line. If the Clarksville to Lawrence line were to be re-conducted, the CJGU project will accommodate a total of 3700 MW at Deans before the next limiting facility is constrained—allowing for a total increase of 1160 MW beyond the current 7500 MW plan. It is acknowledged that the CJGU execution schedule could be extended, or phased, to accommodate deferred offshore wind injection rates if modified by PJM.

In order for the Project to align with the planned schedule of offshore wind generation procurements, the Project's COD date is expected to align with the completion date for generation project selected by BPU in its Phase 3 OSW procurement. The project could be implemented earlier or later as desired by the BPU and PJM.

1.4 INTERDEPENDENCY OF OPTIONS

The reduced impedances of the Windsor to Clarksville 230-kV upgrade will encourage additional flow in the corridor between Windsor and Lawrence 230-kV. The implementation of the Deans to Brunswick Subproject—rerouting the T-2351 circuit into Deans—reduces the flow in the Windsor to Clarksville corridor potentially delaying the need for future upgrades between East Windsor and Lawrence 230-kV.

Deans 230-kV is currently at 96.7% of its 63-kA Breaker Duty in the base case. Short circuit issues at Deans can be triggered by any moderate Thevenin impedance reduction or increased fault current in the electric vicinity. Rerouting the T-2351 into Deans 230-kV requires upgrading Deans 230-kV breakers to 80-kA to meet criteria that no breaker become overdutied.

- If rerouting the T-2351 circuit into Deans 230-kV is selected by the NJBPU the Deans 230-kV station will exceed its 63-kA breaker duty limit. Once overdutied, the Deans Subproject—the upgrade of Deans 230-kV from 63-kA to 80-kA—will be required.
- If the rerouting of the T-2351 into Deans is not selected by the BPU, neither of the projects to move the B-2254 from Linden 230-kV to Linden 345-kV or upgrading the circuit between Windsor and Clarksville will require upgrading Deans 230-kV to 80-kA.
- If Deans is not built to 80-kA there will be a cost reduction the inside plant (IP) plant portion of the estimate.

The Bergen to East Rutherford 138-kV (R-1344) series reactor has a worst-case contingency loading exacerbated by the relocation of the B-2254 from Linden 230-kV to Linden 345-kV. The most cost-effective solution to fully address the NERC violation without relying on the Waldwick PARs requires the reconfiguration of the Bergen 138-kV ring bus.

- If the relocation of the B-2254 is selected by the BPU, the exacerbated loading on the reactor will become more difficult to regulate using the Waldwick PARs. Once exacerbated, the upgrade of Bergen 138-kV ring bus will be recommended.
- If the relocation of the B-2254 is not selected by the BPU, neither rerouting the T-2351 into Deans 230-kV or upgrading the circuit between Windsor and Clarksville will require reconfiguring the Bergen 138-kV ring bus.

The upgrade of the C-1017 between Windsor and Clarksville 230-kV has no interdependencies with any other project.

If the NJBPU chooses not to select a set of upgrades to address one particular cluster of overloads, the BPU should still consider the remaining upgrades to address the remaining clusters of overloads.

PSE&G states there are no known interdependencies of the CJGU project with any other proposals submitted by PSE&G.

1.5 OVERVIEW OF PROJECT BENEFITS

The CJGU project will support the objectives of the 2019 Energy Master Plan by enabling the buildout of up to 7500 MW of offshore wind generation by 2035. The CJGU package will solve several overload conditions identified by PJM which result from the injection of the renewable generation. The collection of CJGU solutions takes advantage of existing high-voltage transmission facilities and in doing so minimizes customer costs by optimizing use of incumbent owned assets.

1) **Reliability Analysis:** The proposed CJGU solution addresses all overloaded facilities pertaining to all clusters in Section 1.1 of this document. The PSE&G Project also resolves secondary violations identified by performing Generation Deliverability, N-1 and N-1-1 (thermal and voltage violation analysis), Load Deliverability and Long Term Deliverability tests using PSS®E and TARA. The PSE&G Project also resolves secondary violations identified by performing Short Circuit analysis using ASPEN®. All tests followed PJM Manual 14B procedures. PSE&G also performed additional analysis according to PSE&G's FERC 715 criteria. PSE&G has proposed solutions as part of the CJGU scope for all the violations that it has identified.

2) **Stability Analysis:** It is PSE&G's stance that without a full OSW dynamic model, the true quantitative impact of dynamic stability cannot be measured. It is known that the Brunswick to Devils Brook 230-kV (T-2351) reroute into Deans and the Windsor-Clarksville 230-kV (C-1017) upgrade will only improve system stability by reducing the Thevenin impedance in the surrounding system. The system stability could be negatively impacted by removing a 230-kV outlet from Linden 230-kV and relocating the B-2254 circuit to Linden 345-kV. Using the base case, the impact of relocating the B-2254 circuit to Linden 345-kV on the stability of the Linden generators was evaluated and no stability criteria violations were identified.

3) **Market Efficiency Economic Study:** PSE&G completed an extensive production cost analysis in PROMOD software utilizing the supplied PJM 2028 Market Efficiency base case. Offshore wind units were modeled at each of the PJM recommended proposed POIs using existing OSW models as a guide. The CJGU projects were then added to the model. The analysis was primarily focused on demonstrating a reduction in New Jersey's 2028 Gross Load payments by evaluating the CJGU project in conjunction with the 7500 MWs of NJBPU selected wind generation. Secondary benefits to New Jersey such as environmental benefits due to emissions reductions have also been captured. PJM wide energy market value has also been calculated, along with PJM production cost reductions due to the combination of this 7500MW of wind in addition to the CJGU project.

4) **Project Efficiencies and Avoided Costs:** PSE&G is proposing in good faith the least costly transmission upgrades to address each of the identified violations. PSE&G recommends the cost effect solution of relocating the Tosco to Linden 230-kV circuit, preventing the overload of the 3.5-mile underground 230-kV circuit between Aldene and Springfield Road. The proposed project also addresses the 6.4-mile underground cable overload between Aldene and Stanley Terrace without having to readjust the Essex PAR, potentially preventing any secondary reliability violations caused by the modified power flow patterns. This Project replaces the cost to address similar overloads estimated at $135M[1] providing a total savings of over $100M. The net impact on the transmission system will be reduced loading and increased margin between Linden to Aldene and Aldene to McCarter to West Orange thus helping to avoid significant future project cost to an extensive underground transmission system.[1]

5) **Environmental Due Diligence:** PSE&G is well-versed in navigating both agency and stakeholder concerns to produce solutions that accommodate avoidance of sensitive receptors or mitigation and best management practices. Our in-house staff includes public outreach professionals, wildlife biologists, and seasoned construction managers. We have found that a collaborative environment allows us to implement best management practices that will minimize environmental and construction impacts to the area.

   As described in more detail in Section 6, this Project proposes modification within previously disturbed and developed areas and Stations. This will minimize impacts to the environment and

[1] AE2-014 Feasibility Study Cost Estimate

sensitive receptors. The Team has unmatched experience and a proven record of responsibly working with the appropriate federal, state and local regulatory authorities to obtain required permits for this Project. The PSE&G Team is well poised to effectively work with the various regulatory agencies and stakeholders for a successful project implementation.

1.6 Overview of Major Risks and Strategies to Limit Risks

[redacted]

1.7 Overview of Project Costs, Cost Containment Provisions, and Cost Recovery Proposals

PSE&G is providing a good faith, educated cost estimate for this Project, subject to the unknown conditions and assumptions identified in this document. Based on PSE&G's current assessment of the risks associated with constructing this Project, Costs and cost containment are discussed in more detail in Section 9.

2. PROPOSAL BENEFITS

2.1. RELIABILITY BENEFITS

The proposed CJGU solution addresses all overloaded facilities pertaining to all clusters in Section 1.1 of this document. The PSE&G Project also resolves secondary violations identified by performing Generation Deliverability, N-1 and N-1-1 (thermal and voltage violation analysis), Load Deliverability and Long Term Deliverability tests using PSS®E and TARA. The PSE&G Project also resolves secondary violations identified by performing Short Circuit analysis using ASPEN®. All tests followed PJM Manual 14B procedures. PSE&G also performed additional analysis according to PSE&G's FERC 715 criteria. PSE&G has proposed solutions as part of the CJGU scope for all the violations that it has identified.

Any reliability concerns identified by PJM in the PSE&G footprint between Deans and Brunswick, the corridor between Linden, Tosco, VFT, Warianco and Aldene station as well as the underground 230-kV network between Aldene, Springfield Road, Stanley Terrace, West Orange, and McCarter stations can be resolved by the proposed CJGU solutions.

Any reliability concerns identified by PJM between JCP&L's Windsor 230-kV and PSE&G's Clarksville 230-kV stations can be resolved by the proposed CJGU solutions.

A full analysis of the CJGU projects on the PSEG, PSEG North, and EMAAC Locational Deliverability Area (LDA) zones was performed. PSE&G identified that the project does not significantly impact the Capacity Emergency Transfer Limits (CETL) of the PSEG, PSEG North, or EMAAC zones.

Deans 230-kV is currently at 96.7% of its 63-kA Breaker Duty in the base case. Addressing high breaker duty at Deans by upgrading Deans to 80-kA increases the short circuit head room for future projects in the vicinity.

While relocating the TOSCO to Linden 230-kV (B-2254) circuit from Linden 230-kV to Linden 345-kV addresses the Aldene to Springfield Road 230-kV underground cable overload, the project will also address the nearly overloaded Aldene to Stanley Terrace 230-kV underground cable. This causes a reduction of

approximately 27% loading on the Aldene to Stanley Terrace 230-kV cable thus delaying any future upgrade requirements. The reduction of loading in the constrained corridor between Aldene, McCarter and West Orange stations due to the B-2254 relocation project will also allow for [redacted] This will enable operators to better control flow between PSE&G Northern and Central zones.

The reduced impedances of the Windsor to Clarksville 230-kV upgrade will encourage additional flow in the corridor between Windsor and Lawrence 230-kV. The implementation of the Deans to Brunswick Subproject, rerouting the T-2351 (Brunswick to Devils Brook 230-kV) into Deans, reduces the flow in the Windsor to Clarksville corridor potentially delaying the need for future upgrades between East Windsor and Lawrence 230-kV.

CJGU was chosen for the following reliability benefits:

- Resolves the overload between Deans and Brunswick 230-kV
- Resolves the overload between Aldene and Springfield 230-kV
- Resolves the overload between Windsor and Clarksville230-kV
- This project can reduce any off-cost/curtailment of low cost generation thereby reducing any congestion on the aforementioned facilities.

Quantitative Benefits

Cluster ID	CJGU 2028 Primary Overloads	Upgrade	Highest Loading Pre-Upgrade	Highest Loading Post Upgrade
1	Deans to Brunswick 230kV	T-2351 Loop Into Deans 230kV	123%	68%
2	Aldene to Springfield Rd 230kV	Relocate B-2254 to Linden 345KV	104%	70%
3	Windsor to Clarksville 230kV (JCPL)	Upgrade Windor to Clarksville 230kV	108%	56%

Cluster ID	CJGU 2028 Secondary Violations	Upgrade	Highest Violation Pre-Upgrade	Highest Violation Post-Upgrade
1	Deans Short Circuit Violation	Upgrade Deans to 80kV	107%	85%
2	Bergen_R to Bergen_4 Series Reactor	Upgrade Bergen 138kV Ring Bus	106%	76%

2.2. PUBLIC POLICY BENEFITS

Using ABB Hitachi's Production Cost Modeling tool, PSE&G determined that rerouting the T-2351 circuit into Deans 230-kV eliminates the binding constraint on the Deans to Brunswick 230-kV circuit (Deans to Brunswick Subproject). Ratepayers will benefit in several ways. First by enabling the flow of these MWhs, customers will see overall lower marginal energy prices as this additional supply has beneficial impacts on NJ energy prices. Second, customers will benefit from lower overall OREC prices, as developers face lower curtailment risk, which should be reflected in the OREC price they require from customers to support their investment. Assuming an average OREC price of $80 in future solicitations, this expected higher output could yield more than $11 million annually.

Facilitation of OSW aligns with Federal and State climate change resiliency. At the federal level, transmission and substation planning is key to accomplish President Biden's target of achieving 30 GW of OSW by 2030 and New Jersey State's goal of achieving 7.5 GW of offshore wind by 2035. Investment in renewable energy will ensure the State's progress toward NJ's statewide greenhouse gas emissions reduction targets. PSEG announced in June 2021 its goal to have net-zero carbon emissions by 2030. PSEG will meet its net-zero ambitions by launching a three-pronged 2030 climate vision that extends across its business—a climate vision that is one of the most aggressive in the country by a large utility and power generator.

2.3. MARKET EFFICIENCY BENEFITS

PSE&G has completed extensive modeling efforts to evaluate the economic merits of the proposed CJGU Project. The economic study included PROMOD software simulations using the 2028 Market Efficiency base case. In order to establish a baseline against which Project benefits would be calculated, PSE&G ran the base case without any wind or projects included. After completing the base case runs, PSE&G modified the modeled 7648 MW of OSW consistent with other OSW models in the PJM base case. PSE&G then modeled the CJGU projects.

2.3.1 MARKET EFFICIENCY ECONOMIC STUDY

1) Potential Ratepayer Cost Savings

- The combination of 7500 MW and CJGU are expected to substantially reduce the price of electricity in New Jersey. See Section D for energy market benefits. The table below illustrates a reduction in the Locational Marginal Price (LMP) of electricity (in $/MWh) of the different load serving entities inside NJ.

NJ LMPs ($/MWH)			
LOAD SERVING ENTITY	BASECASE	OSW+CJGU PACKAGE	REDUCTION
AECO	$ 34.31	$ 32.09	**$ 2.22**
JCPL	$ 34.56	$ 32.64	**$ 1.92**
PSEG	$ 34.19	$ 32.56	**$ 1.63**
RECO	$ 34.42	$ 34.21	**$ 0.22**

- This combined reduction in LMPs leads to a **$144M** cost savings in gross load payments for New Jersey (observed in year 2028 alone).
- The combined reduction of load payments across all of PJM entities is reported to be **$522M** (observed in year 2028 alone).

2) Maximizing the Value of OSW

- Without transmission upgrades to address a binding constraint on the Deans-Brunswick 230-kV circuit, the offshore wind injection at Deans 500-kV must be curtailed and its true value cannot be realized. CJGU addresses this constraint and allows for **44,145 additional MWh** (an increase from 9,218,751 to 9,262,896 MWh) of offshore wind generation at Deans 500-kV to enter the onshore grid .

3) Environmental benefits

- The 7500MW of offshore wind generation and the Central Jersey project provide a large reduction of emissions in state of NJ.

Total Reduction (LBS)	SO2	476,463
	CO2	1,990,987,909
	NOX	262,324

4) **Energy Market Benefits**

- The energy market value of the 7500 MW of offshore wind generation and the central jersey project total **$902M** (year 2028).
- The 7500MW of offshore wind generation and the central jersey project reduce PJM wide production costs by **$636M** (year 2028).
- The Project has not modeled what incremental rights will be generated by this specific solution, but should such rights be created, the project will develop a pass-through mechanism to return these benefits directly to ratepayers.

5) **Transfer Capability:** As part of the Load Deliverability analysis, the CETL was recalculated with the CJGU project and no significant increase to the zonal CETL was identified.

3. CONSTRUCTABILITY INFORMATION

The Central Jersey Grid Upgrade (CJGU) technical solution will address the following generator deliverability criteria violations for Summer, Winter, and Light Load (PJM 2028 and 2035 results) in the PSE&G and PSE&G/JCP&L affected areas:

Cluster 1:	**Cluster 2:**	**Cluster 3:**
Deans to Brunswick 230-kV	Aldene to Springfield 230-kV Linden to TOSCO 230-kV TOSCO to VFT 230-kV	Windsor to Clarksville 230-kV

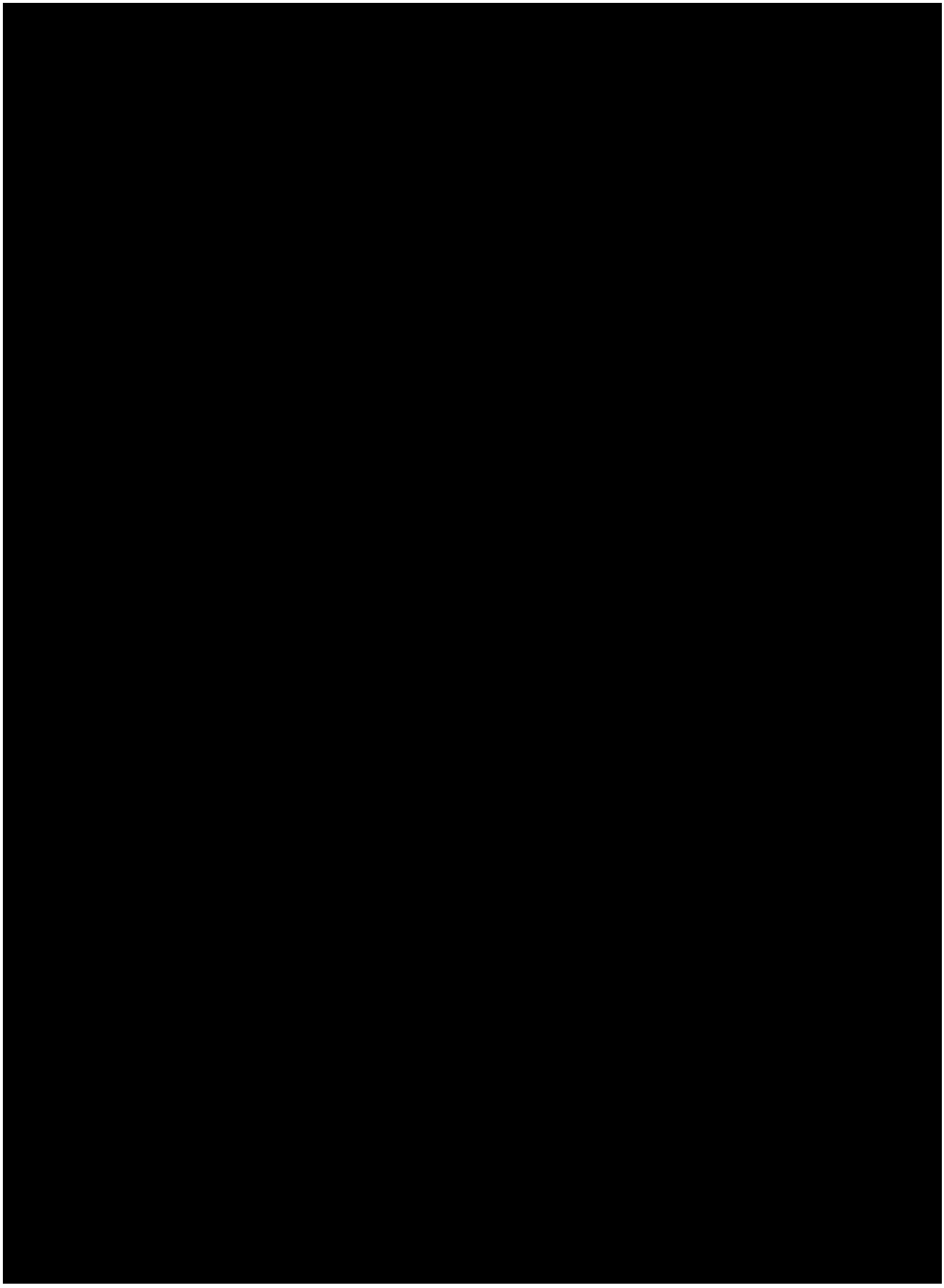
Additionally, secondary NERC violations have been identified by PSE&G. They include short circuit violations at Deans 230-kV and the overload of the Bergen 138-kV series reactor on the R-1344 circuit.

Secondary Violation 1:	**Secondary Violation 2:**
Deans 230-kV Short Circuit	Bergen 138-kV Series Reactor

3.1 OUTSIDE PLANT PROJECT SCOPE

3.1.1 DEANS TO BRUNSWICK SUBPROJECT (CLUSTER 1)

[redacted]



3.1.2 REROUTING 230-KV B-2254 INTO LINDEN STATION (CLUSTER 2)

To address the violations on Aldene to Springfield 230-kV cable, the outside plant scope will reroute the B-2254 from Linden 230-kV to Linden 345-kV.

[redacted]

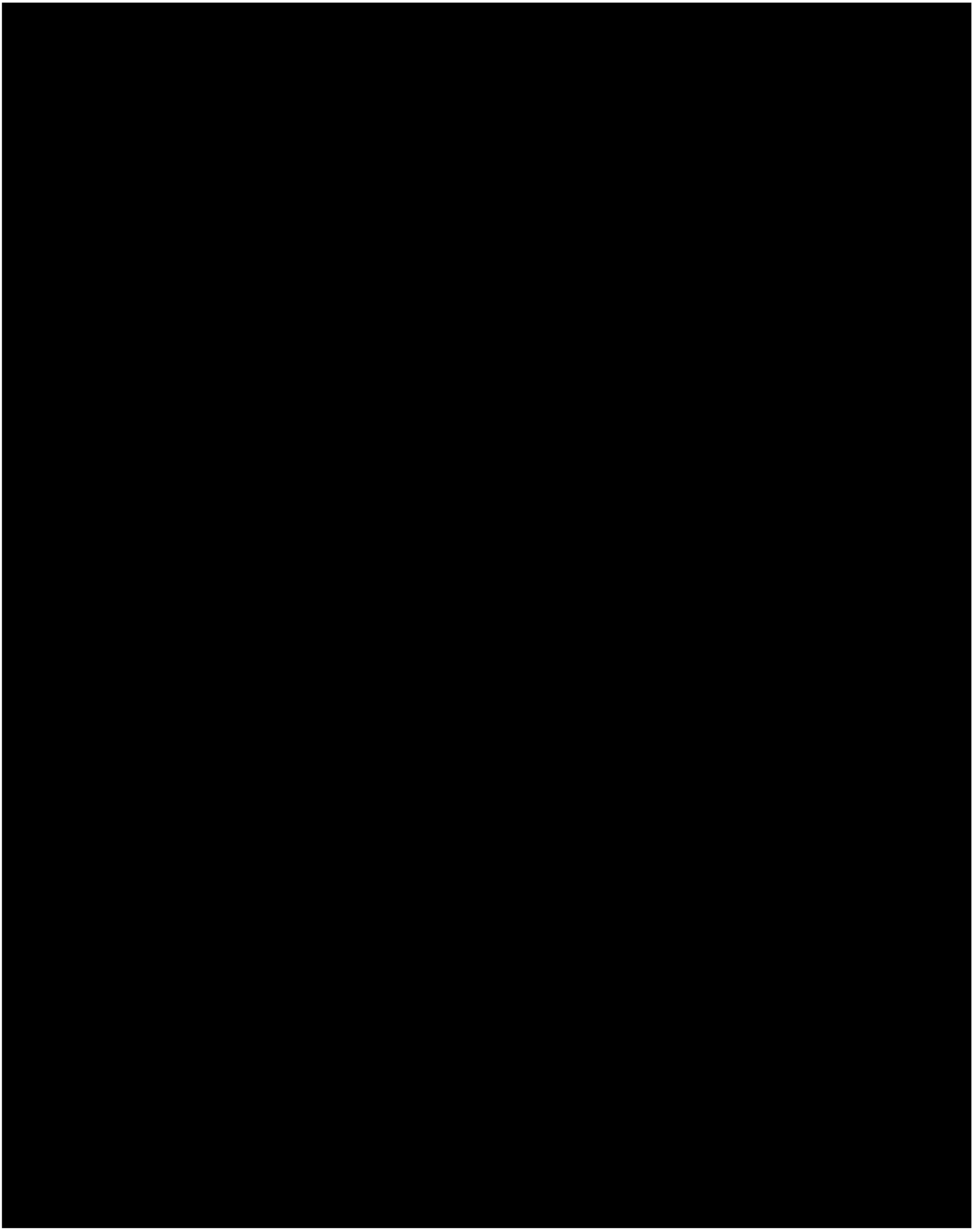
[redacted]

3.1.3 WINDSOR TO CLARKSVILLE 230-KV (CLUSTER 3)

The C-1017 (Windsor to Clarksville 230-kV) currently has a Summer Normal Rating (SNR) and Summer Emergency Rating (SER) of 678/813 MVA respectively. Offshore wind interconnection will lead the C-1017 to exceed its existing ratings.

The scope of this project is to create a paired circuit path between Windsor-Clarksville 230kV using the existing C-1017 in order to achieve a minimum SNR of 1300 MVA and minimum SER of 1600 MVA. Where idle circuits are not available, new towers will be constructed to accommodate a second conductor for the circuit.

[redacted]



3.2 Inside Plant Project Scope

3.2.1 Rerouting 230-kV B-2254 into Linden Station (Cluster 2)

This project resolves overloads on the G-2285 (Aldene to Springfield) and includes work to:

- Install a new 345/230-kV transformer between Linden 345-kV and Linden 230-kV.
- Relocate the 230-kV B-2254 (Tosco to Linden) circuit from Linden 230-kV to Linden 345-kV via the existing 345/230-kV transformer.

3.2.3 Windsor to Clarksville 230-kV (Cluster 3)

The IP scope of the project includes plans to:

- Pair the phases of the existing 230-kV C-1017 circuit and the idle 2nd conductor to the same line positions at Windsor and Clarksville 230-kV (the work at Clarksville will be performed by PSE&G).
- Upgrade all terminal equipment at Windsor, and Clarksville as necessary

3.2.4 SECONDARY VIOLATION 1 (DEANS 230-KV SHORT CIRCUIT)

This project upgrades Deans 230-kV to 80-kA and reroutes the T-2351 (Brunswick to Devils Brook 230-kV) into Deans 230-kV. This project resolves an overload on the D-2204 (Deans to Brunswick) circuit. The scope includes work to:

- Increase the fault rating of the PSE&G Deans 230-kV Switching Station from 63-kA to 80-kA, via replacement of twelve (12) 230-kV 4000A Circuit breakers, replacement of insulators, bus, grounding, controls, etc. to achieve desired rating and construct an additional breaker and a half bay
- Construct two (2) additional breaker and a half bays at Deans 230-kV
- Reroute the T-2351 circuit into and out of new positions at the PSE&G Deans 230-kV Switching Station.

3.2.5 SECONDARY VIOLATION 2 (BERGEN 138-KV SERIES REACTOR)

The IP Scope of the Project includes:

[redacted]

As New Jersey's largest electric and gas utility, PSE&G is uniquely qualified to operate and maintain the proposed Project. PSE&G has extensive experience in constructing, operating, and maintaining major transmission facilities in accordance with Good Utility Practice. This experience has enabled PSE&G to develop a comprehensive set of policies and procedures that govern preventative and predictive maintenance of transmission lines and substations. Our staff of experienced professionals and highly skilled craft workers are located throughout our New Jersey service territory and can efficiently mobilize in response to routine or emergent conditions. This flexibility is supported through our negotiated contracts with our labor workforce.

4.1 OVERVIEW

PSE&G follows standard operations and maintenance procedures and practices that satisfy regulatory and industry standards. The purpose of these procedures and practices is to implement the necessary activities that ensure the safe, reliable, and cost-effective operation of the bulk electric system. PSE&G utilizes standard time- and condition-based practices, along with constant focus on safety, customer service, and cost control, to optimize the utilization and minimize the downtime of equipment that is critical to the

delivery of electric power. PSE&G monitors equipment condition and applies resources to improve the condition and extend the useful life of its electric equipment, thereby maximizing the value of its investment in these facilities. Our preventative maintenance process is founded on Reliability Centered Maintenance, where the maintenance intervals to the manufacturer's recommendations are incorporated to optimize cost, improve safety, and to perform effective maintenance tasks to safeguard the reliable operation of the electrical equipment. PSE&G was recognized by PA Consulting as the recipient of the 2020 Outstanding Customer Engagement Award. PSE&G was also named as the recipient of the ReliabilityOne® Award for Outstanding Reliability Performance in the Mid-Atlantic Metropolitan Service Area for the 19th year in a row.

4.1.1 PREVIOUS EXPERIENCE

PSE&G owns and maintains 834 miles of transmission ROW with 1,579 miles of transmission lines over 100-kV and 484 miles of 500-kV transmission lines. PSE&G also owns, operates, and maintains 81 substations and switching stations in its transmission network, which includes eight (8) 500-kV stations and four (4) 345-kV stations.

PSE&G's internal Transmission Construction and Maintenance organization is responsible for the planning and execution of all required Corrective Maintenance (CM) and Preventative Maintenance (PM) on PSE&G overhead and underground transmission facilities greater than 100-kV. The specific work performed by this organization includes:

- Overhead maintenance
- Underground maintenance
- Live line work
- Inspections (visual, infrared, foundation, ROW)

The group is responsible for:

- Inventorying existing transmission assets and assessing maintenance needs
  - Maintaining a database of all transmission assets
  - Ensuring that all transmission assets are scheduled for periodic maintenance according to the correct schedule
  - Assessing the condition of existing assets
  - Identifying the CM and PM requirements for current maintenance period
- Prioritizing the CM and PM maintenance work for the current period
- Identifying and securing required resources (e.g., labor, materials, funding)
- Developing a detailed work plan and assigning resources required to accomplish all CM and PM
- Scheduling the CM and PM work to be performed and coordinate with labor, equipment, material, vendor, outages, and support services availability
- Preparing labor work orders, material, outside services, purchase orders, and arranging outages, if required
- Performing and completing all scheduled CM and PM work in accordance with the work plan and established standard practices and procedures

PSE&G's internal Substation Maintenance Organization is responsible for the planning and execution of all required Corrective Maintenance CM and PM on PSE&G substation/switching station transmission facilities in coordination with PSE&G's Asset Management & Centralized Services Organization. Detailed manuals on transmission standards and practices for design, construction, operation, and maintenance are managed by our Asset Management Organization. Qualified internal resources supported by a robust

Materials Management & Logistics Organization support our routine PM schedules as well as our emergency response to affect a timely restoration of equipment related interruptions.

Vegetation maintenance is performed to reduce the occurrence of tree-related interruptions on overhead transmission and distribution facilities. Clearance guidelines are established based on voltage, type of construction, a tree's location relative to the wires, and its rate of growth (species).

The Vegetation Management team manages distribution and transmission utility line clearance programs, and grounds maintenance efforts that ensure safe, reliable electric service to our customers, while meeting regulatory and governmental requirements and commitments. Utility line clearance efforts include tree trimming, tree removals, mowing, and herbicide applications and are managed utilizing a project management approach to ensure that quality, cost, scope, and schedule goals/commitments are achieved within budget.

5. REAL ESTATE PLAN

The Project's route in support of the onshore transmission system will be located in portions of New Jersey. The Project Team will work with impacted stakeholders, municipalities, and local authorities to obtain the necessary property rights to construct and maintain its facilities as detailed in Section 6 of this report.

While the routes and sites associated with this Project have been designed to fall within existing footprints of PSE&G lands and/or ROW, PSE&G has expertise acquiring site control in the event the acquisition of additional property is necessary.

PSE&G will coordinate all outreach, real estate-related requests, and efforts to identify environmental and non-environmental conditions affecting the properties along the proposed Project route. Working collaboratively with our internal Outreach Team, PSE&G will coordinate stakeholder engagement and public outreach with land acquisition planning. This level of collaboration will help to ensure proactive and cohesive stakeholder communications in order to better serve landowners and impacted individuals and entities.

PSE&G contemplates the need for access roads and areas, as part of any lands to be acquired. As part of its facilities construction, PSE&G also contemplates the need for temporary staging areas and laydown sites to help facilitate construction. PSE&G has extensive experience coordinating complex construction projects and will work to leverage that experience to execute this Project efficiently from a cost, impact, and timing perspective.

5.1 ROUTING AND SITE CRITERIA

The Project Team evaluated the sites from an engineering and technical perspective while prioritizing environmental constraints and stakeholder impacts—while simultaneously reviewing preliminary environmental and topographical data. For each route, and to the extent possible, the Project Team has designed the routing to fall primarily within public ROW and/or unencumbered public lands.

5.1.2 ROUTING AND SITE CRITERIA FOR CENTRAL JERSEY GRID UPGRADES

1) **T-2351 Deans Reroute/IP Deans 80-kA** requires aerial easement and additional ROW.

2) **IP/OP Linden B-2254** may require an easement on PSE&G Fossils property.

3) **Windsor to Clarksville OP** is assumed not to require any easements, as the footprint will all be within existing ROW.

4) **Bergen 138-kV Series Reactor** is assumed not to require additional plan acquisition; construction will take place within PSE&G station footprint.

In addition to the initial criteria above, the Project Team analyzed the routes and inside plant work based on engineering and technical requirements as detailed in the Section 3 and Appendices A.1-A.3. of the Project Team's Bid, as well as, reviews of environmental constraints and stakeholder impacts in the Section 6 of the Project Team's Bid. Detailed engineering of the final design and site control may require:

- Alignment of the overhead routes based on further engineering/design studies
- Consultation with the federal, State, and local agencies and authorities with jurisdiction over the sites, which will be initiated in connection with the permitting of the Project.

5.1.2 PROPOSED SITING AND GRID UPGRADES

The proposed siting and grid upgrades have been designed to fall primarily within existing routes and facilities. The technical and engineering analyses used to design each respective aspect of the Project are detailed in Section 3 and Appendices A.1-A.3of the Project Team's Bid.

5.2 RIGHT-OF-WAY AND PROPERTY ACQUISITION EXPERIENCE

The Project Team has significant experience building underground and overhead transmissions in New Jersey and has built, and currently operates, hundreds of miles of underground and overhead transmissions throughout the State. The Project's new infrastructure will be primarily on private property, public ROW and/or on public, unencumbered lands.

PSE&G has hundreds of miles of rights-of-way, some of which are owned in fee and others in the form of easements. In addition, PSE&G, as an electric public utility regulated by the NJBPU, has the right to build in public rights-of-way within the State of New Jersey and also has the right of condemnation under applicable New Jersey law.

PSE&G has years of experience in undertaking the various processes necessary to secure certificates of public necessity and in acquiring the necessary right-of-way needed to site facilities, including , including the legal ability/authority under NJSA Title 48 to exercise eminent domain authority if necessary, and actual experience in doing so.

PSE&G also has extensive experience in land acquisition and negotiations associated with all types of utility projects, including transmission. PSE&G has an internal Corporate Real Estate group responsible for the oversight and management of the corporation's real estate assets, including the purchase and sale of property rights, leasing or licensing company-owned property to or from third parties, and handling day-to-day property maintenance issues that may arise. PSE&G has acquired, installed, and/or upgraded numerous substations and other large facilities necessary for the reliable transmission and distribution of electric service. As such, PSE&G has the expertise to acquire the necessary parcels and manage the myriad issues and complexities associated with the Project.

In addition, PSE&G has broad in-house expertise to handle acquisition of property for large transmission projects. PSE&G has extensive experience working with federal, State, local authorities, and private entities to properly plan and develop community-focused solutions with minimal impact to private properties of surrounding areas. PSE&G also hires the services of outside vendors including several Member of

Appraisal Institute-("MAI") designated appraisers who routinely prepare market analyses for additional rights that PSE&G may need to acquire. PSE&G also engages the services of experienced land acquisition and engineering firms to make contact with current property owners from whom PSE&G needs additional easement rights and to begin negotiations for those additional rights using the appraisals as the basis of compensation.

Finally, PSE&G has in-house Environmental Projects and Licensing & Permitting groups dedicated to obtaining any requisite approvals and dealing with environmental issues for electric transmission and distribution projects. These groups are also responsible for gaining appropriate approvals and land rights for conducting work on State and federal lands, typically including new State land diversions and easement rights. The Project Team will work with impacted stakeholders, municipalities, and local authorities to obtain the necessary property rights to construct and maintain its facilities as detailed in Section 6.

6. ENVIRONMENTAL IMPACTS AND PERMITTING

6.1 ENVIRONMENTAL PROTECTION PLAN

PSE&G conducted an assessment of anticipated permits associated with the improvements necessary at the Bergen Switching Station, Linden Switching Station, and Deans Switching Station and have supported the evaluation and development scenarios throughout the project development process. The permitting and environmental assessments have included a review of federal, regional, state, county, and local regulatory requirements that could potentially impact each of the individual Project scenarios. These assessments are based on an analysis of the proposed Project plan reviewed with available GIS data, a detailed understanding of applicable regulations, and significant professional experience with projects of similar scope and prior projects within these stations.

PSE&G is confident that it can deliver the required permits and approvals on schedule. PSE&G has unmatched experience and a proven record of responsibly working with the appropriate federal, state, county, and local regulatory authorities to obtain required permits for this Project. PSE&G is well poised to effectively work with the various regulatory agencies and stakeholders to successfully execute the Project. PSE&G has vast New Jersey-based permitting experience with firsthand relationships across the federal and state government. A detailed Project environmental protection plan, a Project permitting matrix highlighting major permits and approvals, and a permitting narrative for obtaining these permits and approvals with anticipated timeframes are provided below.

6.1.1 RESOURCE STUDIES

1) **Physical Resources:** The improvements proposed at the three stations were designed to minimize impacts to physical resources, in large part by locating equipment on previously disturbed areas within the station yards. This approach results in only minimal impacts to wetlands at the Linden Switching Station, and possibly the Deans Switching Station, for the installation of transmission structures to carry the new conductors into/out of the stations.

   The emissions from construction activities will be minimal and will not require NJDEP air permits.

2) **Biological and Cultural Resources:** The proposed Project is not likely to have significant biological or cultural impacts. It is unlikely that this Project will impact avian and bat species. There is no anticipated tree removal for the installation of the proposed transmission poles, so bat habitat and designated timing restrictions are unlikely to be applicable. No terrestrial wildlife concerns are anticipated by the construction or operation of the Project. PSE&G will consult with NJDEP, New

Jersey State Historic Preservation Office (NJSHPO) and USACE to minimize any impacts during the Project permitting process.

3) **Socioeconomic Resources:** Every construction project generally has positives and negatives when it comes to socioeconomic resources impacts. From a visual perspective, the three stations are not located in heavily populated neighborhoods and have structures of similar height and function as the proposed equipment and towers. The infrastructure for this Project has been located in areas that are necessary to interconnect into the transmission grid and do not reduce air quality in the local communities where they are located.

   There will be temporary air quality impacts during the construction of the Project, but the overall benefit of interconnecting renewable energy into the electric grid reduces the need for fossil fuel generation facilities in the state, benefitting all communities in the State. This reduction in fossil fuel generation inherently benefits air quality and ambient conditions and is a major step to reducing the impacts of fossil fuel generation in overburdened communities.

   PSE&G's vision is to be increasingly recognized as "a leader for People providing Safe, Reliable, Economic and Green Energy." People come first—and so does their health and safety. The Commitment to Health and Safety statement unites PSE&G employees, unions and company leaders in achieving an accident-free environment where no one gets hurt.

   Union-management Health & Safety Councils are the backbone of the PSE&G Health and Safety System. Today, employee-led councils at the local, business and company levels dedicate their time, effort, and expertise to achiev4 a culture built on:

   - **Trust:** Respect and trust each other's opinions and decisions and follow through on all health and safety concerns
   - **Care:** Approach each day with the determination to care for ourselves, co-workers, contractors, and the communities we serve
   - **Knowledge:** Have the knowledge and skills to be healthy and safe
   - **Communication:** Communicate in a clear, open and honest manner

   PSE&G is fully committed to protecting the health and safety of our employees, contractors and the local communities. Operational excellence—with safety first—is the key to long-term success. PSE&G will construct the Project based on a combined Environment, Health, and Safety Program that will reference relevant health and safety policies and practices for daily implementation. Each day begins with a tailboard and every person on the job has the right to stop the job to ensure that safety practices are consistent.

   Applicable land use and zoning considerations are discussed in the Permit Plan of this document. Land use and zoning is consistently reviewed with the PSE&G Team throughout project planning. This ensures the Project is in conformance with the applicable local, county, and regional planning requirements to the greatest extent possible and any deviations will be subject to the applicable rules and governing body approval process. In a given year, PSE&G completes approximately 60 site plan hearings in New Jersey and prepares and receives thousands of construction permits and road opening permits. Since COVID-19 restrictions were implemented in 2020, PSE&G has worked with municipalities to continue to successfully be heard by the local boards. PSE&G understands the concerns of municipal stakeholders and stays available and attentive during all phases of a project. PSE&G knows that business success is heavily dependent on the opinions of its customer base and governmental stakeholders.

[redacted]

6.2 ENVIRONMENTAL BENEFITS NARRATIVE

- How does the project reduce environmental impacts to fisheries, habitat, and sensitive resources in comparison to radial lines? N/A
- What is the reduction in impacts (approximate area) compared to radial lines, temporary and permanent? N/A
- A description of whether and how the project infrastructure, including offshore platforms, could provide direct ocean and ecological observations throughout the water column: N/A
- Fisheries Protection Plan: N/A.
- Environmental and Fisheries Stakeholders Discussion: N/A

6.3 PERMITTING PLAN

6.3.1 FEDERAL PERMIT OVERVIEW

Based upon PSE&G's experience in developing large infrastructure projects, we understand how to successfully navigate the National Environmental Policy Act Review (NEPA) review process, and other environmental statutes and regulations, through the assessment of a project's purpose and need and providing the lead action agency with sufficient information to allow for a robust analysis of the Project's environmental, social, economic, and cultural impacts of both the proposed Project and its alternatives.

Through its over 100 years of power and utility services in NJ, NY, CT, MD and other states, PSE&G has a long history with federal regulatory agencies, successfully developing and operating large-scale power generating assets including renewable resources such as nuclear, solar, and now offshore wind and large-scale utility delivery companies serving over 4.4 million people. PSE&G has successfully navigated through large scale permitting such as NEPA to small-scale USACE Permitting.

1) **USACE:** Under the USACE's Delegation of Authority, the State of New Jersey promulgated a program under the Freshwater Wetlands Protection Act (FWPA), N.J.S.A. 13:9B, which established a program for the review of activities in freshwater wetlands as well as wetland transition areas (buffers). To implement the FWPA, the NJDEP promulgated the FWPA Rules (N.J.A.C. 7:7A). This is discussed in more detail in the state permitting section below (6.3.2).

   The USACE retains jurisdiction over tidally influenced waters, including wetlands as well as waters/wetlands, within 1,000 feet of tidally influenced waters. These areas are known as non-delegable waters wherein both Federal (USACE: Section 404 of the Clean Water Act and potentially Section 10 of the Rivers and Harbors Act) and State (NJDEP: Coastal Zone Management Rules at N.J.A.C. 7:7) requirements apply. Note that the USACE's jurisdiction includes only wetlands and waters—they do not regulate transition (buffer) areas.

   It is not anticipated that the improvements proposed at the Bergen Switching Station will impact any waters/wetlands under the USACE jurisdiction. The Deans Switching Station is not located in a tidally influenced area and not subject to USACE jurisdiction. Depending on the magnitude of impacts for the improvements at the Linden Switching Station, the USACE has two permit options available for the installation of electrical transmission lines: Individual Permits and Nationwide Permit (NWP) #57 - Electric Utility Line and Telecommunication Activities.

2) **Federal Aviation Administration (FAA):** All onshore structures that exceed 200 feet above ground level are considered obstructions and, therefore, the FAA is obligated to study them to determine their effect on the navigable airspace. To initiate the FAA review process, PSE&G will file FAA Form 7460–1, Notice of Proposed Construction or Alteration for the onshore HVDC converter station infrastructure. Based upon the design, no lighting and/or aviation obstruction concerns are anticipated. PSE&G regularly files for the highest anticipated assets on a site to ensure safety and compliance with the FAA.

3) **Other:**

- U.S. Environmental Protection Agency (EPA): N/A
- Federal Coastal Zone Consistency Determination: N/A
- United States Coast Guard (USCG): N/A
- National Marine Fisheries Service (NMFS) & U.S. Fish and Wildlife Service (USFWS): N/A
- Bureau of Ocean Energy Management (BOEM): N/A
- National Environmental Policy Act Review (NEPA): N/A
- Federal Historic Resource Review—National Historic Preservation Act (NHPA) Section 106 Consultation: N/A
- Endangered Species Act (ESA) Section 7 Consultation and Incidental Take Authorization: N/A
- National Marine Fisheries Service (NMFS): N/A

6.3.2 NJ STATE PERMIT PROGRAM OVERVIEW:

PSE&G carefully plans restoration of project sites to return the work areas to a better ecological condition than their original state. From building safe wildlife crossings near construction sites in environmentally sensitive areas, to using temporary matting for work areas in wetlands, having certified wildlife monitors onsite to protect wildlife from harm during work activities, planning work around sensitive breeding or nesting seasons, or using special helicopters instead of trucks to transport crews and equipment in wetlands and parklands, PSE&G has proven history of consistently taken great care to be stewards of the environment while carrying out the essential work of upgrading and maintaining the electric system. As an integral part in this Project's success, PSE&G looks to continue to coordinate closely with the NJDEP throughout planning and construction.

1) **New Jersey Coastal Zone Management Rules (N.J.A.C. 7:7):** The Coastal Zone Management Rules concerns the use and development of coastal resources within New Jersey's coastal zone and sets forth the application procedures and standards for the review of coastal permit applications under Coastal Area Facility Review Act (CAFRA), the Wetlands Act of 1970, and Waterfront Development Law as well as the standards for reviewing federal consistency determinations under the Federal Coastal Zone Management Act and Water Quality Certificates under Section 401 of the Federal Clean Water Act.

   Application for impact to coastal zone areas/coastal zone resources can be applied for via a Permit-by-Rule, General Permit-by-Certification, General Permit, or Individual Permit. The first three are reserved for relatively specific and minor impacts. Individual Permits are required for larger impacts and for impacts not specifically authorized by a Permit-by-Rule, General Permit-by-Certification, and/or a General Permit. If a prospective applicant determines that an activity does not impact a coastal area/resource and has the need to have that verified by the NJDEP, an application for a Coastal Applicability Determination can be prepared and submitted to the NJDEP.

   It is anticipated that the improvements proposed at the Bergen Switching Station and Linden Switching would require Individual NJDEP Waterfront Development Permits. The Deans Switching Station is not located in the Coastal Management Zone.

2) **Floodplains/Flood Hazard Areas:** The Flood Hazard Area (FHA) Control Act Rules (N.J.A.C. 7:13) implement the New Jersey Flood Hazard Area Control Act, N.J.S.A. 58:16A-50 et. seq. and regulate work within floodways, flood hazard areas, flood fringes, and riparian zones.

Regulation within the floodway and FHA is generally more concerned with fill and the displacement of flood storage volumes while regulation within the riparian zone is generally more concerned with natural resource issues (i.e. vegetation impact/rare species impact).

Floodways, FHAs, and riparian zones are generally associated with surface water resources that drain more than 50 acres; however, there are a number of nuances where a water may have no floodway/FHA but still have an associated riparian buffer.

The width of a riparian zone measured along the top-of-bank of a regulated water can extend 50, 150, or 300 feet perpendicularly away from the top-of-bank, based on the surface water resource classification (non-trout, trout-maintenance, trout-production), the absence/presence of rare species, or the classification of a water as Category One (requires the 300-foot-wide riparian zone).

It is not anticipated that the improvements proposed at the Deans Switching Station will impact any flood hazard areas or riparian zones. However, because the Bergen and Linden Switching Stations are located within tidally influenced areas, and/or located within previously existing disturbed areas, impacts to regulated waters, including FHA's and riparian zones under the Flood Hazard Area Control Act Rules (FHACAR's—N.J.A.C. 7:13) should be covered by the following Permits-by-Rules:

- 7:13-7.9 Permit-by-Rule 9: General construction activities in a tidal flood hazard area

The Permit-by-Rule 9 would be applicable to any Project-related work at-grade as long as the work is located at least 25 feet from the top of bank of any regulated water. Activities covered under an FHA Permit-by-Rule do not require formal application to the NJDEP.

3) **Federal and State Rare Species Review:** The potential effects on species listed as threatened or endangered are regulated at the Federal level by the USFWS and NFMS, as discussed above. At the state level, effects on state-listed species is regulated by the NJDEP Endangered and Non-game Species Program (ENSP) as well as by the Division of Land Resource Protection.

Information on the presence of Federally threatened or endangered species listed under the Endangered Species Act (ESA), critical habitat, and other trust resources under the jurisdiction of the U.S. Fish and Wildlife Service (USFWS) was obtained by querying the USFWS Information for Planning and Consultation (IPaC) database. The area within 500 feet of each Switching Station was included in the query. Threatened species and or endangered species identified in the vicinity of the stations include the following:

Identified:

Rare Species	Habitat Type	Listing Status
Monarch Buttefly (*Danaus plexippus*)	Wherever found	Candidate
Northern Long-Eared Bat (*Myotis septentrionalis*)	Wherever found	Threatened

At the state level, investigation regarding the presence of rare species within any given project area/project corridor starts with obtaining Natural Heritage Program/Landscape Project data. No trees are proposed to be removed at any of the stations as the proposed work is infill development in existing stations and the new transmission towers do not affect any trees. At the three stations,

the following were identified:

Rare Species: Bergen Switching Station	Habitat Type	Status
Bald Eagle (*Haliaeetus leucocephalus*)	Foraging & Nesting	Endangered
Cattle Egret (*Bubulcus ibis*)	Foraging	Threatened
Yellow-Crowned Night-heron (*Nyctanassa violacea*)	Foraging	Threatened

Rare Species: Linden Switching Station	Habitat Type	Status
Bald Eagle (*Haliaeetus leucocephalus*)	Foraging & Nesting	Endangered
Black-Crowned Night Heron (*Nycticorax nycticorax*)	Foraging	Threatened
Cattle Egret (*Bubulcus ibis*)	Foraging	Threatened
Yellow-Crowned Night heron (*Nyctanassa violacea*)	Foraging	Threatened

Rare Species: Deans Switching Station	Habitat Type	Status
Silver-bordered Fritillary (*Boloria selene myrina*)	Breeding/Courtship	Threatened

Note that the process of dealing with rare species is generally made part of the application for any one or combination of the permits outlined above. In addition, it is not common for either the USFWS or the NJDEP to require an actual on-site rare species survey for terrestrial species. Rather, protection of present/potentially present/suitable habitat is handled as part of permit conditions of approval, generally in the form of a construction timing restriction and/or the employment of environmental monitors during construction.

PSE&G employs environmental monitors for its transmission projects when and where avoidance is not possible. PSE&G works with the resource agencies and consultants to prepare an environmental plan that is acceptable and feasible to implement. At the completion of each project, PSE&G's goal is to leave the area and habitat in a better state than it was prior to work being performed.

4) **New Jersey Historic Preservation Office:** NJSHPO is responsible for implementation of Section 106 of the National Historic Preservation Act. NJSHPO does not provide a permit. However, its findings are considered as part of NJDEP's natural resource permitting process.

The Project is not anticipated to require any preconstruction detailed studies as the work is within previously developed areas. NJSHPO will review the project along with the NJDEP applications and issue its recommendation along with the issuance of the permits. Given the disturbed and developed nature of the areas. no studies or monitoring is anticipated to be required.

5) **Green Acres Program:** No parcels encumbered by Green Acres will be affected by the work proposed within the Bergen, Linden, and Deans Switching Stations, nor for the transmission structures to bring the overhead conductors into the stations.

6.3.3 SITE SPECIFIC INFORMATION AND REQUIRED PERMITS: BERGEN SWITCHING STATION

Summary of Bergen Switching Station

- Location: Block 4014, Lots 4 and 5
  Hendricks Causeway,
  Borough of Ridgefield, Bergen County, New Jersey

Area: 78.24 acres

1) **Bergen Switching NJDEP Permitting Summary:** The new electrical equipment will be installed within the existing station yard, in an area that has been previously disturbed for the installation of existing equipment that will be removed as part of this project. This part of the station is located outside any regulated wetlands/buffer areas attributed to the Bellman's Creek located to the south and west of the station yard. However, due to its location in a flood hazard area, a NJDEP Waterfront Development Individual Permit will be required. The Flood Hazard Area impacts will be addressed under a Permit-by-Rule.

2) **Bergen Switching Station FAA Permitting Summary:** All structures that exceed 200 feet above ground level are considered obstructions and, therefore, the FAA is obligated to study them to determine their effect on the navigable airspace. To initiate the FAA review process, PSE&G will file FAA Form 7460–1, Notice of Proposed Construction or Alteration for the proposed transmission towers. Based upon the design, no lighting and/or aviation obstruction concerns are anticipated. PSE&G regularly files for the highest anticipated assets on a site to ensure safety and compliance with the FAA.

3) **Bergen Switching Station New Jersey Sports and Exposition Authority (NJSEA) Permitting Summary:** The Bergen Switching Station is located within the Meadowlands District, which is regulated by the NJSEA. The Station is located in the (Environmental Conservation Zone (EC), the Light Industrial B Zone (LI-B), and the Public Utility Zone (PU) where public utilities, including electrical substations, are a permitted use. PSE&G will submit an application the NJSEA's Land Use Management Division for Site Plan Review and Zoning Certificate. Ron Seelogy is the Principal Planner for the NJSEA Land Use Management Division.

4) **Bergen Switching Station Regional Permitting Summary:** The Bergen Switching Station is within the jurisdiction of the Bergen County Soil Conservation District. An application to the district will be required since the area of land disturbance will exceed the 5,000-square-foot threshold. Angelo Caruso is the District Manager.

5) **Bergen Switching Station Bergen County Permitting Summary:** The Bergen Switching Station is located on Hendricks Causeway, which is under the jurisdiction of Bergen County. Although the additional equipment inside the station and the proposed transmission towers will not impact any facilities owned and operated by Bergen County, an application for Applicability Review and Determination will be submitted to the County Planning and Economic Development, Planning Department. Alan Camlet is the Assistant Planner for the Bergen County Planning Department.

6) **Bergen Switching Station New Jersey Department of Community Affairs (NJDCA) and Municipal Construction Permitting Summary**: The NJDCA recently adopted new regulations, effective December 7, 2020, that transfer the plan review authority for electrical substations from the NJDCA to the local enforcing agency. Due to this change, the NJDCA is no longer reviewing plans for electrical substations and converter stations, which now requires PSE&G to submit plans directly to the municipality for technical review and approval. Construction permits will be acquired from the NJSEA and Ridgefield Construction Department for the foundations and structural steel required for the proposed electrical equipment inside the station. Process equipment and transmission structures (overhead and below ground transmission) are exempt from review pursuant to the Uniform Construction Code (UCC). Gregory Yfantis is the Ridgefield Borough Construction Official.

6.3.4 SITE SPECIFIC INFORMATION AND REQUIRED PERMITS: LINDEN SWITCHING STATION

Summary of Linden Switching Station

Block 586, Lot 16.01
Off Tremley Point Road
City of Linden, Union County, New Jersey

Area: 10.79 acres (345-kV Station) and 3.88 acres (230-kV Station)
Existing Use: Electrical Switching and Substation

Section 31-20.16 of the City of Linden's Zoning Ordinance addresses Public Utilities and states that public utilities may be located in any zone as a conditional use where such uses are not specifically permitted by the ordinance. Public utilities are not specifically listed as a permitted use in the LI-A Light Industrial District. PSE&G will submit an application for site plan approval to the City's Planning/Zoning Board for the proposed electrical equipment, transformer and transmission towers.

1) **Linden Switching Station FAA Permitting Summary:** All structures that exceed 200 feet above ground level are considered obstructions and, therefore, the FAA is obligated to study them to determine their effect on the navigable airspace. Due to the station's proximity to the Linden Airport, PSE&G will file FAA Form 7460–1, Notice of Proposed Construction or Alteration for the proposed transmission towers to initiate the FAA review process. Based upon the design, no lighting and/or aviation obstruction concerns are anticipated. PSE&G regularly files for the highest anticipated assets on a site to ensure safety and compliance with the FAA.

2) **Linden Switching Station NJDEP Permitting Summary:** The new electrical equipment and transformer will be installed within the existing 345-kV and 230-kV station yards, in area that have been previously disturbed. The stations are located outside any regulated freshwater wetlands/buffer areas attributed to the Piles Creek located to the south and the Arthur Kill to the east. However, a new transmission pole will be installed within a mapped wetland area, which will require a general permit from the NJDEP. Where such work is required to be located within a wetland and/or a transition/buffer area, the following approvals may be applicable to the Project:

- FWW General Permit No. 21: Above Ground Utility Lines
- Special Activity Transition Area Waiver: Redevelopment

Use of the above, either individually or together, would appear to cover impacts to wetlands and their associated transition areas.

3) **Linden Switching Station Regional Permitting Summary:** The Linden Switching Station lies within the jurisdiction of the Somerset-Union Soil Conservation District. An application to the district will be required since the area of land disturbance will exceed the 5,000-square-foot threshold. Matthew D'Alessandro is the District Manager.
4) **Linden Switching Station County Permitting Summary:** The Linden Switching Station is located off Tremley Point Road, which is a City-owned road. Although the additional equipment inside the station—the new 230-kV transformer and new transmission structures—will not impact any facilities owned and operated by Union County, an application for Site Plan Review Exemption will be submitted to the County Planning Board.

6.3.5 SITE SPECIFIC INFORMATION AND REQUIRED PERMITS: DEANS SWITCHING STATION

Summary of Deans Switching Station

Block 24, Lot 14.19
126-32 Davidson Mill Road
South Brunswick, Middlesex County

Area: 94.34 acres
Existing Use: Electrical Switching Station.

The Deans Switching Station is located in the Rural Residential zone district (RR). According to the Township's ordinance, public utilities are a conditional permitted use in all districts within South Brunswick, subject to six requirements listed under Section 62-2151 related to noise, sanitary sewer service, buffering, equipment enclosure/security, street access, and compatibility with surrounding neighborhood. These six elements do not apply to the overhead conductor routes. The current route proposed through South Brunswick to the PSE&G's Deans Switching Station is located within public ROWs, with the exception of where the conductors enters the switching station. Site plan approval from the Township's Planning/Zoning Board will be required for the improvements inside the station and the transmission structures.

1) **Deans Switching Station NJDEP Permitting Summary:** The new electrical equipment will be installed within the existing station yard, in an area that has been previously disturbed. The station is surrounded by regulated freshwater wetlands/buffers. The new transmission pole to bring the conductors into/out of the station may be installed within a mapped wetland area, which would require a general permit from the NJDEP. If the structure is required to be located within a wetland and/or a transition/buffer area, the following approvals may be applicable to the Project:

    - FWW General Permit No. 21: Above Ground Utility Lines
    - Special Activity Transition Area Waiver: Redevelopment

    Use of the above, either individually or together, would appear to cover impacts to wetlands and their associated transition areas.

2) **Deans Switching Station Regional Permitting Summary**: The Deans Switching Station is within the jurisdiction of the Freehold Soil Conservation District. An application to the District will be required since the area of land disturbance will exceed the 5,000-square-foot threshold. Ines Zimmerman is the District Manager.

3) **Deans Switching Station Middlesex County Permitting Summary**: The Deans Switching Station is located off Davidson Mill Road, which is a Township-owned road. Although the proposed towers and equipment inside the station will not impact any facilities owned and operated by Middlesex County, an application for Site Plan Review Exemption will be submitted to the County Planning Board.

4) **Deans Switching Station New NJDCA and Municipal Construction Permitting Summary:** NJDCA recently adopted new regulations, effective December 7, 2020, that transfer the plan review authority for electrical substations from the NJDCA to the local enforcing agency. Due to this change, the NJDCA is no longer reviewing plans for electrical substations and converter stations, which now requires PSE&G to submit plans directly to the municipality for technical review and approval. Construction permits will be acquired from South Brunswick's Construction Department for building permits for the foundations and structural steel required for the proposed electrical equipment inside the station. Process equipment and transmission structures (overhead and below ground transmission) are exempt from review pursuant to the Uniform Construction Code (UCC).

6.4 NJDEP CHECKLIST

Please see Appendix A.7 for the NJDEP Checklist.

6.5 NJDEP PRESUBMISSION MEETING

The Project Team met with multiple departments within the NJDEP, led by the office of Permitting & Project Navigation, to review the potential Project solutions in response to the BPU/PJM Bid.

6.6 – ADDRESSING IDENTIFIED IMPACTS AND INNOVATIVE MEASURES

The Project as proposed, includes upgrades to existing PSE&G Stations and infrastructure and the majority of it is within previously disturbed and developed areas. Therefore, impacts of the project are minimal. Additional details on the impacts and permitting are provided in the below sections.

6.7 OVERBURDENED COMMUNITIES/ENVIRONMENTAL JUSTICE

On September 18, 2020, the NJ Senate and Assembly passed an Act declaring that all New Jersey residents, regardless of income, race, ethnicity, color, or national origin, have a right to live, work, and recreate in a clean and healthy environment. The Act further finds that historically, New Jersey's low-income communities and communities of color have been subject to a disproportionately high number of environmental and public health stressors, including pollution from numerous industrial, commercial, and governmental facilities located in those communities. The proposed Project promotes the injection of clean renewable wind energy into the region's electrical grid, thus being consistent with the intent of these statewide legislative goals.

Since the release of PSEG's 2020 Climate Report, we have developed an Environmental Justice Commitment in support of the communities we serve across the state. We believe such a commitment should convey the importance of centering around Environmental Justice considerations across our

organization so that all our customers, especially those in disadvantaged communities, can benefit from the coming changes of a decarbonized future. Our commitment to Environmental Justice is embedded in everything we do, from infrastructure, planning, and investment, to the way we design customer-facing programs such as energy efficiency, to the day-to-day operation of our business.

As a national sustainability leader, our commitment to Environmental Justice is guided by the following principles:

1) **Engagement**: PSE&G engages in active listening which further promotes a two-way dialogue with the communities and stakeholders we impact.

2) **Understanding:** Through ongoing and project-specific engagement, PSE&G builds a better understanding of the needs of our communities, including the needs of communities and customers of color, and those that face disproportionate burdens from the impacts of climate change and yet are least able to afford the transition to a clean energy future.

3) **Win-Win Solutions and Shared Value:** With this deeper understanding, PSE&G strives to develop win-win solutions that not only address the needs of overburdened communities and customers, but also achieve environmental goals to preserve our planet and allow PSE&G to continue providing safe, reliable, economic, and greener energy and infrastructure.

4) **Long-Term Sustainability:** PSE&G has served New Jersey customers and communities for more than 100 years. Putting environmental justice considerations at the forefront is part of PSE&G's broader commitment to Diversity, Equity and Inclusion (DEI) in all aspects of our business. As we work to build a business that will survive well into the next century, we recognize that our own long-term sustainability demands that we include customers and communities in decisions that affect them; that we work to bring all our customers along with us in the journey toward a clean energy future; and that we harness the power of diversity to forge the best path forward.

6.8 SHAPE FILES

General Arrangements and Shape Files have been provided as part of this proposal. Please see Appendix A.2 for General Arrangements and Appendix A.9 for Shapefiles. There is limited scope on existing utility infrastructure.

7. COMMUNITY ENGAGEMENT

7.1 COMMUNITY OUTREACH PLAN

PSE&G has a longstanding history of managing, maintaining, and upgrading the electrical transmission grid within the state of New Jersey and the communities it serves. PSE&G has been managing the electrical grid in the Garden State for more than 100 years, has an understanding of the landscape, and has developed valuable relationships with public stakeholders. Successfully managing and maintaining the grid is an essential part of not only the infrastructure, but also for further growth development. Since the Northeast blackout in 2003, PSE&G has established and implemented various initiatives to upgrade the transmission grid to sufficiently handle the evolving demand for electricity and strengthen the system's resiliency and reliability. Continuing to provide safe and reliable energy is not simply a job, but a fundamental responsibility of PSE&G. A critical component of PSE&G's approach revolves around its community engagement and outreach. PSE&G values the diverse communities it serves and understands the importance of corporate citizenship. PSE&G would be unable to achieve the level of success it has without community engagement or responsible communication.

PSE&G Public Affairs' key focus is to responsibly communicate with any and all stakeholders to ensure PSE&G has developed a comprehensive communication process for all transmission projects to adequately keep stakeholders engaged at all levels, including public officials, municipal officials, environmental organizations, business customers, residents, etc. This process ensures constant and detailed communication efforts throughout all phases of a project, including pre-, mid-, and post-construction activities. This outreach process is a critical part of PSE&G's ability to successfully manage the transmission grid to achieve exceptional electric reliability. Throughout its history of effective communications with stakeholders, PSE&G has been able to gain a thorough understanding of the various concerns typically raised by either directly impacted or peripheral parties, such as disruptions during construction, concerns around Electromagnetic Fields (EMF), property value, traffic impacts and other potential matters. However, more importantly, PSE&G has been able to identify solutions for each potential concern and has strong insight on how to mitigate public apprehension and construction impacts.

PSE&G has developed a specific outreach plan (detailed below) tailored towards this Project that will be implemented to foster success.

7.2 PROJECT OUTREACH & COMMUNICATIONS PLAN

The purpose of this plan is to develop and align strategies to support the overall Project Bid submission for the SAA RFP

7.2.2 OBJECTIVES/DESIRED OUTCOMES

- In order to align with Governor Murphy's NJ Clean Energy Goals, PSE&G will develop a project and work in conjunction with local, state, and regional stakeholders to meet the goals of New Jersey's Energy Master Plan.
- Provide clear, consistent, and timely information to municipalities, local stakeholders, property owners, environmental groups, fisheries organizations, and all other potential stakeholders while being responsive to their input
- Generate a positive image for the project and its agents so that PSE&G is perceived as a credible source of information and a cooperative community partner
- Continue to strengthen PSE&G's image as a leader in electric reliability and foster an environment that supports economic development in New Jersey by creating clean energy jobs
- Strategically provide outreach to key stakeholders post-bid submission in order to support the project's objectives and gain public input

7.2.3 ROLES AND RESPONSIBILITIES

Overall, the Bid Outreach Team consisting of Federal/State Governmental Affairs and Environmental Policy/Permitting is responsible for:

- Facilitating all communications internally and externally between the project team and key stakeholders
- Coordinating with various internal groups such as Permitting, Environmental, Real Estate, Engineering, Project Management, and other cross-functional teams to ensure strategic and tactical alignment with the planning and execution of the project, ultimately engaging stakeholders with a well-coordinated plan
- Working closely with Project Management to implement a communication strategy developed using publicly available messaging and information. As more project-specific details become

available and are approved by the Project Team, PSE&G's Public Affairs Team will communicate those specifics with its various stakeholders.

- Developing specific communication methods with the public, municipalities, and other stakeholders directly impacted by the project
- Managing any potential public affairs or outreach issues arising from day-to-day activities
- Integrating the policies developed in anticipation of issues/concerns likely to be raised during the construction period into the outreach and communications
- Participate in weekly meetings to report updates on outreach activities
- Leverage and cultivate relationships with applicable officials to foster success of the bid/project

7.2.4 PRELIMINARY OUTREACH PLAN

PSE&G's strategy outreach plan uses multiple and concurrent communication methods to reach and inform and address diverse audiences and knowledge levels. A variety of communication tactics will be used, tailored to each stakeholder audience and its particular communication style and preference.

Messages and actions will be customized for each stakeholder group. Communications will be designed to provide adequate information to stakeholders. All timings of these communications will be aligned with the project's schedule post-bid submission.

1) **Identify Key Stakeholders**

   - Identify stakeholders—town, legislative, community and environmental groups, local advocates, etc.
   - As the development of the project advances, PSE&G Public Affairs will actively identify key local stakeholders, both in and out of PSE&G's service territory. These stakeholders will consist of local and state officials, community organizations, advocates, businesses, environmental groups, commercial/recreational fisheries, local workforce, etc. that could potentially impact the project, whether positively or negatively. PSE&G will identify each key stakeholder and develop a communication plan that is specifically tailored for them. Stakeholders and the timing of their engagement will be tracked in a Stakeholder Registry.
   - **Stakeholder Registry**: PSE&G has identified the following stakeholders who will be essential when coordinating project details and mitigating public concerns:

     - North Brunswick Township, New Jersey
     - Middlesex County, New Jersey
     - City of Linden, New Jersey
     - Union County, New Jersey
     - Richfield Borough, New Jersey
     - Bergen County, New Jersey
     - Trenton City, New Jersey
     - Hightstown Borough, New Jersey
     - Mercer County, New Jersey
     - State of New Jersey Public Government Officials (Governor, Senate, Etc.)
     - New Jersey Department of Environmental Protection (NJDEP)

2) **Outreach Within PSE&G Service Territory:** Outreach will be primarily aimed at informing municipal officials of PSE&G's plans to support the NJ Energy Master Plan, also keeping them

up to date on the current status of the project. Initial communications with municipalities will begin with those that are geographically within PSE&G's service territory and are municipalities PSE&G actively works with to maintain positive relationships. Early conversations will be held at a high level with municipalities with proximity to the project's scope of work. Additionally early conversations will provide a proactive approach to properly engage municipalities, answer their questions, and gain an understanding of potential concerns of conflict. As more information regarding the potential project is released, PSE&G will continue to communicate and coordinate with the appropriate municipalities. These conversations will be conducted via phone call, Zoom meetings or in-person, if applicable.

3) **Outreach Outside of PSE&G Service Territory**

- Once a variety of potential transmission routes are defined, PSE&G will conduct a high-level evaluation of each route. Route Profiles will be developed for each potential route which analyzes the route, by identifying municipalities and their local officials, stakeholders, and community/environmental groups, as well as providing a detailed analysis of the community. Specifics of each route analysis can be located within the routing appendixes. Please see Appendix A.3.
- As routes are being defined, PSE&G will take a similar approach to how it engaged potentially impacted municipalities that are currently within its service territory. When the details are available, PSE&G will engage the municipalities' local/county officials. High-level conversations will occur to properly engage these municipalities, to inform them about the project, address questions/concerns, and to demonstrate PSE&G's commitment to put its best foot forward for the communities of New Jersey.
- In addition, PSE&G will investigate and identify potential community organizations that could either support or oppose the project. This may include environmental groups and local fisheries, and other associations.

4) **Federal Outreach:** PSE&G views federal agencies as highly valuable stakeholders. Adequate communication with federal agencies, such as BOEM and USEPA, will be required to achieve a successful bid.

7.2.5 STATE & LOCAL OUTREACH

As details are finalized, PSE&G will create a stronger focus to establish and maintain positive relationships with local and county officials. Communication methods and tools will be utilized much similar to those of the standard transmission and other utility projects.

1) **Communication Methods**

- Communication with Municipal/Local/County Officials
    - Communications between PSE&G and local government officials will be conducted to facilitate the project's success. These communications efforts will mainly be conducted via phone calls, zoom meetings, emails, and in-person meetings.

- Development and Creation of Local Content
    - Provide detailed educational materials about the project to stakeholders
- Use of Local Subs/Contractors
    - Identify local contractors in impacted legislative districts who could support PSE&G and help engage key stakeholders
- Municipal and County Relations
    - Leverage and cultivate relationships to work with local elected officials and administrators, to address any conflicts that may arise throughout the project
- Community Relations (for contractors)
    - Update and present community relations presentation to all employees and contractors working on the project to reiterate PSE&G's commitment to being a good neighbor and to help manage a positive PSE&G brand image
- Public/Community Workshop
    - PSE&G will conduct public workshops for the community, municipalities, and other local stakeholders where information about the project can be provided. A public workshop offers an informal and informational session for the community to learn about project need, schedule, future plans, and other project-specific questions they may have. Questions can be addressed on a one-to-one basis with company experts. This also allows stakeholders to have input on the project.
- Virtual Public/Community Workshops
    - In light of today's virtual working environment, PSE&G has developed a valuable method to successfully conduct Public and Community Workshops via Zoom and other platforms. These virtual workshops provide a more accessible method for stakeholders and members of the community to learn about projects, provide input, and ask project experts questions. PSE&G has found these meetings to be very valuable and informative to the community and other key stakeholders.
- Responding to Public Inquiries
    - From the inception of the project and throughout construction and restoration, the Outreach team will field and respond to any inquiries from the public. Generally, prior to, and during construction, the most frequent inquiries from customers involve the construction schedule, noise, aesthetics/landscaping, and potential traffic concerns.
- Door Hangers/Construction Updates
    - Door hangers will be used by the Public Affairs & Outreach Representatives to provide timely notification to the community that construction is about to occur on or near their property. Placed on doors or other prominent fixtures where they are intended to be easily observed, these door hangers will offer a brief description of the project and the construction activities. In addition, it notifies the property owner that a construction activity is about to occur, and directs customers to the Project website and hotline if there are any questions or concerns. A resident letter may be used in addition to the door hanger, to provide additional explanation of the work and the community benefits of the work. Door hanger and letter notifications will generally occur within two weeks prior to the

start of the construction event. Responsibility: Hangers are developed and distributed by the Project Outreach Team.

- Project Hotline
    - A dedicated phone line for the general public to ask questions or voice concerns about the Project. To facilitate responses, the Outreach representative will request direct contact information from caller (street address/email/phone number). The Project commitment is to provide the first response within 24 hours or the next business day if received on a weekend or holiday.
- Email Updates
    - Updates will be emailed on an as-needed basis to town officials, police, fire, ambulance, bus companies and any stakeholder expressing interest. The update will consist of a status report and projection for the next activity.
- Website
    - A dedicated webpage that provides an overview of the Project; interactive map of the route; construction schedule; frequently asked questions; contact information; and other information regarding the Project. A link to the Project's website will be available to each affected town's official website.
- Contact Handouts
    - If needed, business card-sized project information/contact cards may be carried by survey and testing personnel and other workers performing duties on site. They will serve as Project briefs to interested parties encountered by workers.
- News Releases/Media Relations
    - If needed, news releases will be issued as various Project announcements are made and milestones are met. Coordination will also be required if there is a need to respond to media inquiries regarding the project. All releases will be posted on the Project website.

7.3 COMMUNITY ENGAGEMENT QUESTIONS

PSE&G finds extreme value in proactively engaging stakeholders early in the communication process. In order to demonstrate partnership and collaboration with stakeholders, PSE&G will work with local groups to inform them of the potential project, gather feedback, answer questions, and coordinate project details. This will serve as a critical method to ultimately mitigate any potential concerns from stakeholders. PSE&G believes there is a greater risk in not engaging stakeholders, which is why there will be active and open communication with such groups. Building and maintaining relationships with stakeholders is an essential part of PSE&G's current and future success with all projects.

1) **What community groups and stakeholders have you identified that may be interested in or impacted by this project?**

    - PSE&G took deep consideration into the various stakeholders and groups that could potentially have a greater interest or concern for the project, and through internal discussions created a key stakeholder registry which highlights the various stakeholders that will be engaged. This registry identifies federal, state, municipal, environmental, aquatic, and other stakeholders which will play an essential role in the project.

2) **How have you or will you engage community and stakeholders in this project?**

- Through using the referenced stakeholder registry, PSE&G developed a communication plan to engage each group that was identified as an essential stakeholder.
- Various meetings and strong communication efforts will be coordinated with stakeholders once the bid is awarded if ultimately selected.
- PSE&G plans to coordinate and communicate with the various key stakeholders, while also continuing to identify new stakeholders which will be imperative towards the project.

3) **What are the potential impacts of this project on the community?**

- Through the history and experience of managing transmission projects, PSE&G has gained an understanding of various potential concerns that may arise from a typical transmission project such as disruptions during construction, concerns around EMF, Ppoperty value, traffic impacts, etc.
- While conducting outreach to the various stakeholders, it is essential that PSE&G gains an understanding of the specific impacts stakeholders are concerned about so they can be address prior, during, and following the project.

4) **What are the community concerns or potential concerns about this project?**

- PSE&G understands there may be a handful of concerns on the behalf of the community and other stakeholders, such as impacts both offshore and onshore.
- Going forward PSE&G will identify public concern through coordination with key stakeholders and will work with stakeholders to ensure each concern is mitigated and addressed properly.

5) **How do you intend to address these concerns?**

- Most importantly PSE&G needs to listen and understand the specific concerns in order to address them. Through proper communication and coordination with stakeholders, PSE&G will develop solutions to address stakeholder's specific concerns.
- PSE&G will utilize its experience with transmission projects and lessons learned to implement methods that will ultimately reduce impacts to communities and other stakeholders.
- PSE&G will ensure coordination and partnerships with stakeholders to not only identify concerns, but also to address them in a satisfactory manner for all parties involved.
- Coordination and communication regarding potential concerns will commence post-bid submission and will be a main area of focus until key stakeholders feel comfortable and accepting of PSE&G's project plans going forward.

6) **As part of this project, do you plan to perform any environmental improvements in this community? If yes, describe.**

- PSE&G absolutely expects to perform environmental improvements throughout the communities that this project will serve. Through working with municipalities, environmental organizations, and other stakeholders, PSE&G will develop new concepts which will ultimately contribute towards environmental improvements within various communities.
- In PSE&G's previous history and experience navigating through transmission projects there have been numerous environmental improvements implemented. Previously, methods PSE&G has used are building green walls and eco-friendly substations, partnered with academic institutes and other environmental groups, developed detailed vegetation replacement programs, and have allocated funds and resources towards environmental improvements.
- PSE&G is open to exploring all options to ensure the Project contributes towards environmental improvements within the community.

8. SCHEDULE

The Project has an estimated schedule for the Project. Risks that could affect the Project duration may include public opposition, organized opposition groups, state siting approval, NEPA constraints, permits and clearances, environmental conditions, construction issues, and mitigation requirements, as well as other unknown conditions and assumptions identified in this document.

Schedules can be found in Appendix A.6.

9. PROJECT COSTS AND COST CONTAINMENT

PSE&G will utilize its formula rate to recover all prudently incurred costs associated with the implementation of this project.

9.1 OVERVIEW OF PROJECT COSTS

[redacted]

9.2 - ASSUMPTIONS

9.2.1 GENERAL

- This Project proposal was prepared based on a data/information review, technical analyses, and cost estimates that could reasonably be completed within the PJM RTEP Reliability Window.
- Detailed field surveys, soil surveys, environmental studies and investigations, wetlands mapping, investigation of subsurface conditions and title searches and reviews, were not conducted for the Project.
- The public has not been involved, and feedback has not been obtained from the public, in the evaluation of this Project.
- Due to the confidential nature of the Project, no contacts were made with any federal, state, or local agencies or with transmission owners, etc. to acquire data or information in support of the Project. As such, their input has not been incorporated into this proposal.
- This Project may encounter transmission line crossings in addition those identified in Section 3. It is assumed detailed engineering may provide opportunities to optimize the total number of crossings.
- Purchase of right-of-way, easements, or other acquisitions will be completed in a timely manner.
- Contingency not required
- All material and equipment costs are present day
- Sales Tax is included (NJ 2021)
- Labor rates (2021) are based on a 50-hour work week by all trades
- All equipment will be received when needed and no temporary accommodations will be required
- Outages will be available
- Permits will be available
- Resources will be available
- Engineering/Design is included
- Project Management is included based on standard percentage
- Construction Management is included based on standard percentage

9.2.2. PERMITTING

- Environmental remediation has not been included in the base cost of this Project.
- Permits can be acquired to construct the project.
- Permits can be acquired in environmentally sensitive and other required areas.
- A limited assessment of endangered or threatened species was conducted. More detailed assessments and the potential impacts of such conditions to Project activities to be determined after the Project has been awarded to PSE&G.
- Contaminated soil mitigation has not been identified nor included in the Project execution.

9.2.3 PROJECT DURATION

- The estimated Project schedule is a conservative, high-level estimate of the Project duration from kickoff to energization.
- Permitting schedule tasks were developed in coordination with staff familiar with projects of similar scope and nature to the Project.
- It is assumed that construction resources will be available; lack of available construction resources could delay construction of the Project.
- It is assumed that outages will be available; lack of available outages could adversely impact Project durations.
- The incumbent transmission owner schedule will align with PSE&G's schedule for the Project's projected in-service date.
- Other potential risks that could affect the Project duration may include, but are not limited to, public opposition, organized opposition groups, state siting approval, NEPA constraints, permits and clearances, construction issues, and mitigation requirements.

9.2.4 COST

- A high-level cost estimate was developed for the components of the Project that the incumbent transmission owner will be responsible for constructing, owning, operating and maintaining such Project components. Costs may vary if the incumbent's scope differs from that included in this proposal.
- It is assumed there are adequate electrical clearances for electrical distribution lines or other facilities crossing or parallel to the proposed route. This estimate does not include the cost for relocating existing distribution lines or other facilities.
- It is assumed there are adequate electrical clearances at the existing transmission line crossings. This estimate does not include the cost for relocating existing transmission facilities.
- Outages will be available in order to support the construction and energization.
- Material and equipment will be available to meet the Project schedule.
- Costs associated with potential public opposition to the Project are not included in the Project estimate.
- Litigation is not anticipated, and associated costs are not included in the proposed Project estimate.
- The detailed breakdown of cost includes risk and contingency. Unforeseen issues and force majeure may exceed planned risk and contingency.
- Proposed project detailed breakdown of cost is based on 2021 labor rates, equipment and material costs. Labor Per Diem not included.
- The estimated Project costs do not include any work associated with removal of contaminated materials and hazardous waste that may be encountered, including handling, removal, and disposal of such materials, or other environmental remediation activities.
- Excavated material is assumed suitable for backfill.

9.2.5 ENGINEERING

1) Outside Plant

- Site specific borings were not performed prior to this estimate. The subsurface conditions were assumed from geotechnical reports performed for PSE&G including but not limited to the MTB Project, Brunswick Substation, and Deans Switching Station. Steel poles supported on concrete caisson foundations are assumed for the project. Proposed foundations shall be updated during the detailed design stage based on final pole vendor

loading and any final additional site specific geotechnical data. Permanent foundation steel casing will be required in soil conditions
- All steel poles will be hot dipped galvanized.
- All steel poles will be flanged connection or slip fit. Conventional erection utilizing cranes is assumed.
- No FAA lighting is included in this estimate.
- Costs associated with any underground utility obstruction surveys and potential removals/relocations are included in the estimate but not included in the Bill of Materials (BOM).
- Costs associated with temporary materials needed for construction work, such as mats, silk socks etc. are not included in the BOM.
- It is assumed no existing distribution relocation work is needed.
- It is assumed no temporary bypasses (Shoefly) will be needed to keep lines temporarily in-service.

The Cluster 3 project has two additional unique assumptions, see below.

- The scope above was developed based on a field walk down. No engineering, structure analysis or condition assessment was performed.
- It is assumed that the existing 230-kV circuit c-1017 and the existing idle circuit carry 1590 ACSR 45/7 "lapwing" phase conductors, which meet all clearance requirements when they are operated in "paired" configuration at a maximum operating temperature of 284 deg. F.

2) Inside Plant

- Design is based on a desktop/aerial study, designs may be impacted for modifications to the stations that have not been identified on the desktop/ariel study.
- It is assumed that there are no UG obstructions/conflicts with the proposed structures/foundations.
- Existing ground grids at each substation are assumed to be appropriately sized for existing facilities. Expansion of ground grid is only limited to the upgrades alone.
- Yard lighting upgrade will be limited to the upgraded areas of the stations only.
- No noise study, mitigation design, or mitigation implementation are included.
- Clearance outages necessary to build within the station will be available and no temporary line relocations are included.
- Foundations are assumed to spread footings, drilled shafts, or pile foundations (Linden only).
- No geotechnical data was pulled/performed, below grade conditions are based on existing knowledge of the areas.
- No environmental contamination studies have been performed; it is assumed there will be minimal to no below grade contamination.
- Permitting has not been completed, project impact due to permitting restrictions from municipalities is unknown.

Please note that the cost estimates provided herein are dependent upon the various underlying assumptions, inclusions, and exclusions utilized in developing them. Actual project costs will differ and can be significantly affected by factors such as changes in the external environment, the manner in which the Project is implemented, and other factors which impact the cost basis or otherwise affect the Project.

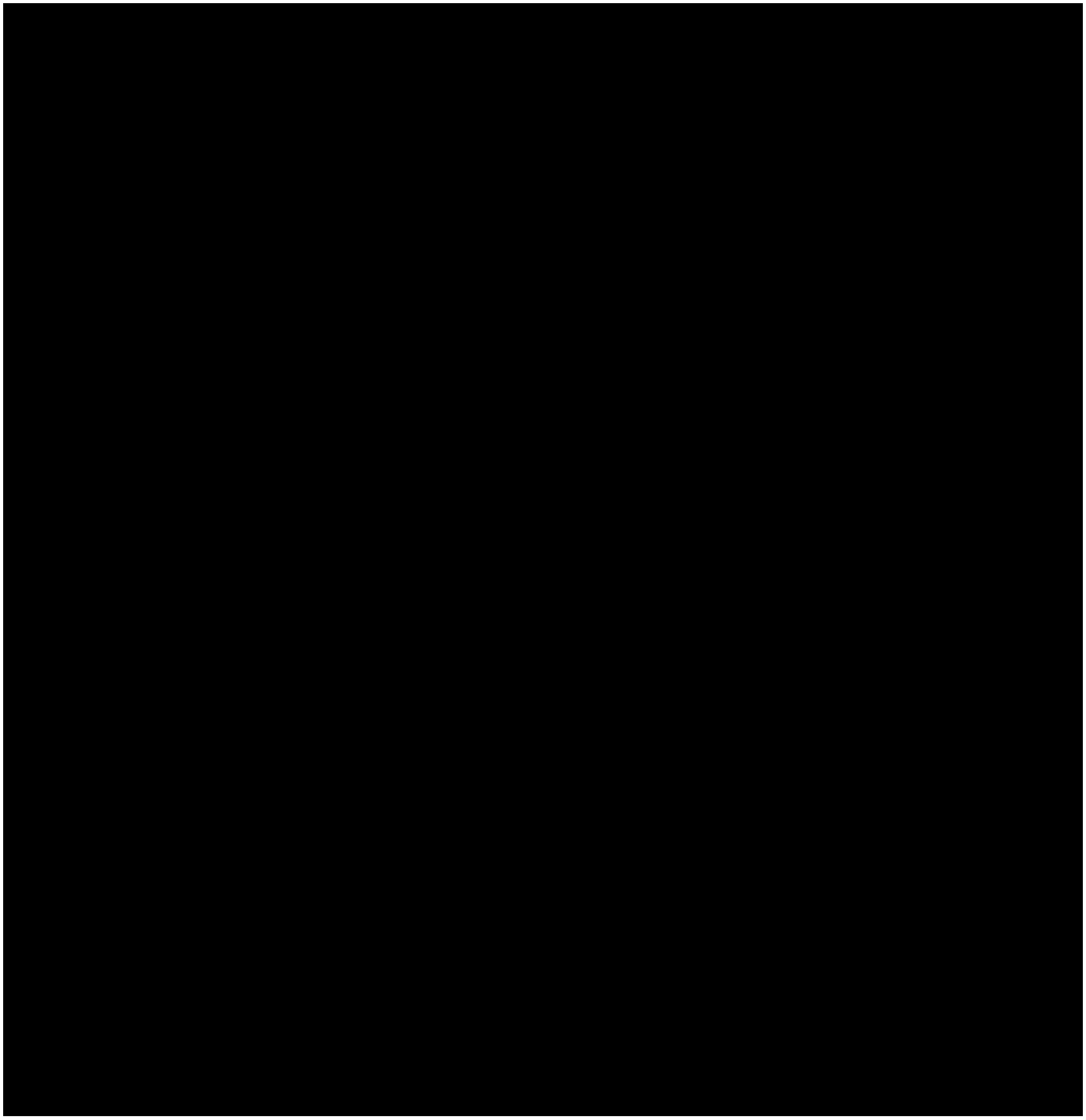
Estimate accuracy ranges are only projections based upon cost estimating methods and are not a guarantee of actual Project costs.

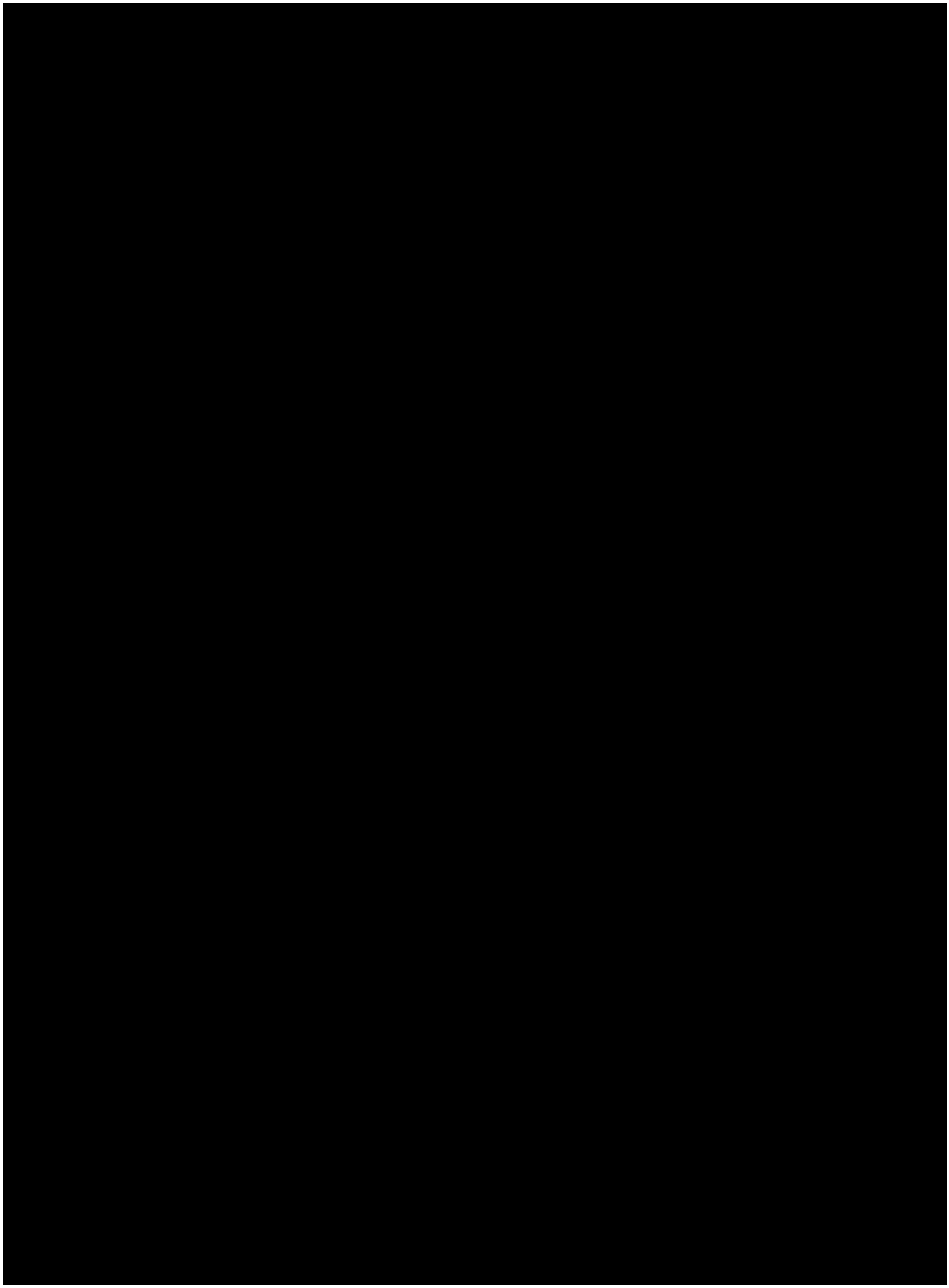
9.3 – Additional Cost Information and Containment Provisions

Additional Cost Information	No additional capital expenditures are expected.
Cost Estimate Classification	Class 4 Estimate for a feasibility study to develop estimates for the purpose of selecting preferred project options
Estimated Energy Losses	N/A
Physical or Economic Life	PSEG expects this project to have an economic life of 42 years in-line with other PSE&G transmission assets. However, this may change over time.
Description of Each Cost Structure	N/A
Fixed Revenue Requirement	N/A
Project Cost Impacts	If portions of the project are selected, the project's capex will change.
Additional Cost Control Mechanisms	N/A

10. Project Risks and Mitigation Strategy

[redacted]





10.1 SCHEDULE GUARANTEES

PSE&G is providing a good faith, educated cost & schedule estimate for this Project, subject to the unknown conditions and assumptions identified in this document. Based on PSE&G's current assessment of the risks associated with constructing this Project and the expected BPU OSW solicitation schedule, PSE&G will not be submitting an accompanying schedule guarantee but is confident that the project can be in service when needed to accommodate Phase 3 of the BPU's OSW program.

APPENDIX