
Final Report

Permitting Analysis for the Hope Creek to Red Lion and Southern Delaware River Crossing Artificial Island Window Project Routes

Prepared for
PJM Interconnection

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CH2MHILL®

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Introduction

1.1 Introduction and Background

In April 2013, PJM Interconnection, LLC (PJM) opened a project proposal window which sought responses detailing technical solution alternatives aimed at improving PJM Operational Performance in the Artificial Island area. These alternatives were to be presented under a range of anticipated system conditions, and the purpose of developing these alternatives was to eliminate potential planning criteria (PJM, NERC, RFC, and Local Transmission Owner criteria) violations in the Artificial Island area.

In response, many proposals were received, and in large part they fell into three main scenarios; installing a new line adjacent to existing overhead river crossing, creating a new overhead river crossing, and creating a new submarine crossing below the bed of the Delaware River. CH2M HILL was asked to review the proposed scenarios and develop a permitting analysis which compares the scenarios with respect to anticipated major permits, time to receive the permits, and an approximate cost associated with permitting.

The submittals from respondents were at the conceptual level (as required by PJM) and did not provide detailed centerline routing, pole placement or other detailed engineering and construction information. Therefore, a permitting analysis at this stage in any project is a conceptual exercise that deals with the most likely permitting scenarios given a set of reasonable assumptions. It should not be used as the sole decision tool, but should form part of a general technical, permitting and costing estimate for the project.

1.2 Information Sources

CH2M HILL was provided with the following information sources and links with which to conduct this review and prepare the permitting analysis:

- “Constructability Analysis Artificial Island-Red Lion 500 kV Transmission Line, New Castle County, Delaware and Salem County, New Jersey.” GAI Project Number: C1110689.03, May 2014 (The GAI Report).
- “Constructability Analysis of Artificial Island Delmarva Peninsula Project Proposals.” UC Synergetic, LLC, May 30, 2014 (The UC Synergetic Report).
- Summary of environmental comments related to the two scenarios (PJM).
- Links to public and agency comments (PJM).

In addition to those information sources, CH2M HILL used publicly available Geographic Information Systems (GIS) data to preliminarily assess the impacts on local sensitive resources.

1.3 Assumptions and Limitations

The following review is limited to an assessment of anticipated major permits, permit cost estimates, and likely permit schedule. PJM also requested that CH2M HILL assess project risk as part of this permitting analysis. For the purpose of this review, risk was considered to be major issues which may affect the ability to obtain necessary permits and/or approvals to construct each project. The schedule, cost, and risk does not include right-of-way (ROW) acquisition issues, construction, routing, or design. More detailed reviews of all these issues have been conducted for each application by PJM and its consultants; therefore, CH2M HILL did not conduct an additional review of the individual Artificial Island applications.

1.4 Scope of Work

As requested by PJM, for each of the three proposed scenarios, CH2M HILL reviewed the reference documents and supplement those with additional documentation and review to provide the following information:

- A table and brief discussion of the major anticipated permits
- A summary of the process for obtaining the permits and the potential permitting risks
- A schedule for review of the permits and those that might be on the critical path
- Cost estimates associated with permit acquisition and potential environmental mitigation

A brief description of the three proposed projects is presented below.

1.4.1 Red Lion to Hope Creek Line Scenario

Under this proposed solution, a new 500kV circuit will parallel the existing 5015 line which begins at the Hope Creek substation in Salem County, New Jersey, then extends approximately 12 miles north, generally along the east side of the Delaware River before turning west for approximately five miles and crossing the Delaware River. The proposed line route is shown in Appendix C, Figure 1. A constructability analysis of five applicant proposals utilizing this option was conducted by GAI Consultants in May 2014.

1.4.2 Southern Delaware River Crossing Scenario

PJM received several proposals that fell into the Southern Delaware River crossing scenario. Based on the RFP received by CH2M HILL, PJM requested that CH2M HILL focus on two crossing scenarios, a submarine crossing and an aerial crossing of the Delaware River.

Once these scenarios cross the Delaware River, both would use approximately 2.5 to 3.5 miles of new overhead transmission lines to connect to a new substation in Delaware. Exact paths differ between proposals. Rather than studying specific proposals, PJM requested that CH2M HILL study a range of locations that could either use an overhead or submarine crossing of the Delaware River. Figure 1 in Appendix C also depicts this study area.

Document Review and Data Gathering

2.1 Document Review

CH2M HILL reviewed the “Constructability Analysis of Artificial Island Delmarva Peninsula Project Proposals” report prepared by UC Synergetic, LLC (UC, April 2014), and the “Constructability Analysis Artificial Island-Red Lion 500 kV Transmission Line” report prepared by GAI Consultants (GAI, May 2014). The information gathered during the review of these reports, was used as background information concerning the routes and construction techniques proposed for the three projects. A brief summary of these documents is provided below:

2.1.1 “Constructability Analysis of Artificial Island Delmarva Peninsula Project Proposals” Report Prepared by UC Synergetic, LLC

UC Synergetic, LLC (UCS) analyzed at the proposed routes, noted the siting and permitting requirements, estimated costs, schedule and overall ability to execute and construct the project as proposed. UC reviewed a package of five applications from respondents to the PJM Artificial Island Solicitation, all of which fell into the southern Delaware River crossings scenario, either via an overhead or submarine cable option.

UCS reported the cost range for the crossings varied from a low of \$116.3 million to \$269 million, with the submarine options comprising the most expensive options. Between the overhead and submarine options, the submarine were considered to be the most challenging in terms of obtaining environmental permit authorizations. In addition, UCS stated that in their opinion, all the applicants underestimated the costs of the submarine option. Routing, siting and permitting ranged from a low of \$690,000 (Transource) to a high of \$5.9 million (Dominion). In addition, wetland mitigation costs ranged from \$720,000 to \$10 million.

UCS considered ROW acquisition an important differentiator, as LS Power reported they had much of the proposed project ROW in their control, whereas the other applicants would have to spend time and resources acquiring the ROW without the benefit of eminent domain. Total project duration was consistent at 42 months except for Dominion who estimated 8 years. UCS commented that based on the likely opposition to the projects a more realistic schedule for obtaining permit authorizations would be 36 to 48 months.

UCS discussed the potential risks associated with the projects and considered ROW acquisition in Delaware to be the greatest schedule risk, as some of the proposals appeared to assume that condemnation/eminent domain was an available option when in fact it was not. The next most significant risk was considered to be the Delaware River crossing. All options, whether submarine or overhead, would require a Section 10 permit from the US Army Corps of Engineers (USACE). With any major project in a waterway there is always the question of what level of permitting and approval the USACE will require. UCS attempted to provide a reasoned answer through referencing recent similar projects where the USACE opted to require only an Environmental Assessment (EA) as opposed to a more time-consuming and comprehensive Environmental Impact Statement (EIS). UCS referenced the Hudson River 345 kV project, which took 6 years to permit and build, and the Bayonne Energy Center that took 5 years to permit and build. The report also cited a recently completed project over the Delaware River within existing ROW took 4 years to complete.

Visual resource impacts were considered a risk especially with the overhead option across the river and on the Delaware side of the river. Migratory Bird Treaty Act (MBTA) issues are also considered a risk. UC commented that they would expect a significant level of opposition to the projects from a number of groups including the Delaware River Basin Commission, which could elevate the risk of an EA becoming and EIS.

2.1.2 Constructability Analysis Artificial Island-Red Lion 500 kV Transmission Line Report Prepared by GAI Consultants

GAI Consultants (GAI) reviewed five applications to the PJM Artificial Island solicitation, all of which chose the Hope Creek to Red Lion route. They identified risk factors that included significant public opposition, construction difficulty, environmental constraints, and property acquisition. GAI constructed a constraint map using widely available GIS data and assessed the routes with respect to environmental and land use resources crossed. GAI used a 2,000-foot-wide corridor centered on the existing alignment to allow for project changes and reroutes. GAI commented generally, that following the existing ROW would reduce some of the project impacts, although new ROW would be required and cleared, and additional access roads would be needed.

According to GAI, the Red Lion option crosses 17,000 feet of federal land and 28,000 feet of state land, with 10 miles of the route crossing estuarine and marine wetlands. GAI indicated that it may be possible to permit this scenario under a Nationwide permit (NWP); however, the need for a Section 10 permit and the magnitude of the wetland impacts would realistically preclude a NW Permit for this project.

GAI estimated the cost for the transmission line routing and permitting at \$3 million, with an additional \$7 million for the purchase of wetland mitigation credits.

GAI concurred with the majority of the applicants that a realistic timeframe for permitting the project is 30 months, and cites most of the major permits as being critical path. Dominion was a significant outlier, stating that permitting would take up to 81 months.

The Supawna National Wildlife Reserve (NWR) crossing and Delaware River crossing are considered to be the greatest permitting challenges for the scenario according to GAI, followed by permitting for state lands and wetlands. GAI suggests the forested wetland impacts for the project could be on the order of 350 acres however, it is not clear from the information provided if this is for the 2,000 foot wide or narrower ROW.

2.2 Route Constraint Mapping

Based on review of the public comments provided by PJM, stakeholders, interest groups, and agencies have commented on the challenging nature of permitting the proposed Artificial Island Project, regardless of the scenario considered. Many of the challenges are common to contemporary transmission line development, while others are unique to the New Jersey and Delaware resources and permitting programs. The constructability analyses reports prepared by GAI and UCS, outlined in Section 2.1 of this report, analyzed many proposed solutions across a broad spectrum of considerations, including conceptual engineering, permitting, and ROW acquisition. Both reports provide an excellent summary of the potential general impacts of the proposals on the environmental resources of the area, but did not make a direct comparison between the Red Lion and Southern Delaware Crossing options. Furthermore, it is worth noting that the proposals dealt with concepts to solve a transmission problem as identified by PJM. Detailed routing and engineering was not requested as part of the application process nor would it be expected until a concept is selected. Project impacts and subsequent permitting requirements will be difficult to assess until project engineering is completed and final designs are produced. Until that time, it is typical for parameters such as route selection, tower locations, and construction techniques, to be imprecise and subject to change.

CH2M HILL collected and reviewed mapping and data available for the area, and supplemented the GAI and UCS reports with some state specific sources. This mapping data was then used to conduct a side by side comparison of the Red Lion to Hope Creek project concept, with the two southern Delaware crossing concepts. Permitting is closely related to the resources crossed, so it is important first to establish a route corridor and measure where possible the area/length of permissible resources affected. Once the resources crossed/affected are estimated, it is then possible to see whether permit triggers/thresholds are reached. This data is also used to estimate the potential mitigation needs and costs.

2.2.1 Mapping and Data Methodology

All three proposals are affected by multiple jurisdictions at the federal, regional, state, and local levels. These include jurisdictions that regulate natural resources, such as Delaware Department of Natural Resources and Environmental Control (DNREC), as well as those that regulate general development activities (e.g., Lower Alloways Creek Township Planning Board). CH2M HILL used data and information provided by PJM (primarily the EOC produced constructability reports), supplemented with state specific GIS data to assess the type and magnitude of resources crossed that would likely trigger a permit threshold. Once collected these data were presented in a permit table and the likely cost, duration, and mitigation potential was assessed. CH2M HILL reviewed the following data sets:

- Wetlands and waterbodies (e.g., National Wetland Inventory wetlands, National Hydrography Dataset streams),
- Federal and state threatened and endangered species (as available),
- Natural Resources Conservation Service (NRCS) Soils data,
- Land use classes, sensitive land use,
- Political jurisdictions (e.g. states, counties, and municipalities),
- Public lands, and
- Existing transmission, distribution, and pipelines

The data layers were combined into a constraint map for each scenario which was assessed with respect to the area, linear footage, or magnitude of each major permit-triggering resource impacted. While we acknowledge that the precise routes, corridors, and engineering details have yet to be developed, some assumptions had to be made in order to assess the likely permitting needs and resultant costs and schedule.

Assumptions

For purposes of this analysis, CH2M HILL used the following assumptions when producing the potential impacts tables:

- Red Lion to Hope Creek Scenario
 - Based on the uncertain location of the project centerline, CH2M HILL assumed a 300 foot construction corridor along either side of the existing Red Lion to Hope Creek 500kV line (for a total width of 600 feet).
 - Structure separation of 1,000 feet between each aboveground structure. Distance between structures may vary greatly in practice, but this separation distance was used to consider potential permanent impacts.
 - 200-foot buffer around each substation to provide for potential substation expansion requirements.
- Southern Delaware Crossing, Submarine Scenario
 - The option is located within potential project area cone provided by PJM
 - Aboveground structures (primarily in Delaware) are similar to Red Lion to Hope Creek assumptions
 - The option includes a new terrestrial overhead line from Salem to new substation in Delaware
- Southern Delaware Crossing, Aerial Scenario
 - Located within potential project area “cone” provided by PJM
 - Aboveground structures (primarily in Delaware) similar to Red Lion to Hope Creek assumptions

SECTION 3

Resource Impact Analysis

The following sections summarize CH2M HILL's analysis of potential impacts associated with the three scenarios provided by PJM. Note, that in the case of the two scenarios crossing the Delaware to the south (i.e., submarine and overhead scenarios), the data presented is approximated as no specific line layouts were reviewed as part of this analysis. PJM provided an area where potential projects could occur but not specific locations. A summary of the major resources crossed is shown in Table 3-1 below. Table 3-2, located at the end of this section, summarizes potential impacts associated with regulated resources.

TABLE 3-1
Resources Crossed by the Three Scenarios

| Resource Crossed | Managing Name | Crossed By Red Lion | Crossed by SDC Submarine | Crossed by SDC Overhead |
|---|------------------|------------------------|--------------------------------|----------------------------|
| Federal Lands | | (feet) | (feet) | (feet) |
| Killcohook | USACE | 10,703 | 0 | 0 |
| Supawna Meadows NWR | USFWS | 21,485 | 0 | 0 |
| Total Federal Land Crossed | | 32,188 | 0 | 0 |
| State Lands Crossed | | (feet) | (feet) | (feet) |
| Abbotts Meadow | NJDEP | 6,078 | 0 | 0 |
| Alloway Creek Restoration Site | NJDEP | 16,291 | 0 | 0 |
| Mad Horse Creek | NJDEP | 8,517 | 0 | 0 |
| Augustine Wildlife Area | DNREC | 0 | 3,500–6,500 | 3,500–6,500 |
| State Lands Total | | 30,886 | 3,500–6,500 | 3,500–6,500 |
| Local Lands | | | | |
| Local Protected Lands (feet) | Penns Grove Boro | 128 | 0 | 0 |
| Preserved Farm-SADC Direct Easement Purchase (feet) | SADC | 5,893 | 0 | 0 |
| Local Lands Total (feet) | | 6,021 | 0 | 0 |
| Streams and Floodplains Crossed | | | | |
| Streams (No.) | NJDEP/DNREC | 78 | 4-8 | 4-8 |
| NJ - FEMA 100 Floodplains (acres) | NJDEP | 784.5 | 2 | 2 |
| DE - FEMA 100 Floodplains (acres) | DNREC | 240.27 | 214 | 214 |
| Floodplains Crossed Total (acres) | | 1024.77 | 216 | 216 |
| Wetlands Crossed | | (acres) | (acres) | (acres) |
| Forested Wetlands | NJDEP/DNREC | 31.87 | 1 | 1 |
| Non-Forested Wetlands | NJDEP/DNREC | 623.93 | 49-119 | 49-120 |
| Wetlands Crossed Total | | 655.8 | 50–120 | 50–120 |

TABLE 3-1

Resources Crossed by the Three Scenarios

| Resource Crossed | Managing Name | Crossed By Red Lion | Crossed by SDC Submarine | Crossed by SDC Overhead |
|--|---------------|---------------------|--------------------------|-------------------------|
| Cultural Resources | | (feet) | | |
| Samuel Urion / Yerkes Farmstead on Lighthouse Road | | 940 | | |
| Sunken Ship Cove | | | portions | portions |
| Charted Submerged Dike | | | portions | portions |
| Delaware Bayshore Scenic Byway | | | portions | portions |

3.1 Public or Protected Lands

The three project scenarios cross several federal, state, local, or privately owned lands that are subject to protective measures, such as conservation easements.

- Red Lion to Hope Creek: Approximately 16 miles of public or protected lands are crossed.
 - Supawna National Wildlife Refuge: Established in 1974, Supawna Meadows National Wildlife Refuge is located in Pennsville, NJ (Salem County) along the Delaware River estuary just north of the Salem River. This estuary is designated a Wetland of International Importance by the Ramsar Convention.
 - Kilcohook: Formerly a National Wildlife Refuge located on the east bank of the Delaware River adjacent to the current Supawna Meadows National Wildlife Refuge. It had originally been established in 1934 as a secondary sludge disposal site for use by the Army Corps of Engineers. Its status as a refuge was revoked in 1998 by the U.S. Congress and it is currently used as a confined disposal facility by the U.S. Corps of Engineers.
 - Abbots Meadow: Wildlife Management Area owned by NJDEP totaling approximately 1,460 acres.
 - Mad Horse Creek: Wildlife Management Area owned by NJDEP totaling approximately 9,320 acres.
 - Alloways Creek Restoration Site: Wetlands restoration site completed by PSE&G as part of the Estuary Enhancement Program.
- Southern Delaware Crossings: Approximately one half to two and one half miles of protected land are crossed.
 - Augustine Wildlife Area: This area is 2,667 acres in size and is owned by DNREC Division of Fish & Wildlife.
 - Note: The study area used for this analysis only included options that crossed the Augustine Wildlife Area. Expanding routing options to the south would require crossing the Cedar Swamp Wildlife Area as pointed out by some commenters. Cedar Swamp Wildlife Area, also owned by DNREC Division of Fish & Wildlife, is 5,515 acres in size.

3.2 Ecological Resources

All three proposed project scenarios cross over streams and through floodplains and wetlands as the area surrounding the southern Delaware River and Delaware Bay, in general, is dominated by estuarine and coastal plain habitats.

3.2.1 Streams

- Red Lion to Hope Creek: This project scenario crosses approximately 78 mapped streams and watercourses in addition to the Delaware River. It should be noted, that these estimates are based on a conceptual route, as no specific routing information was provided.
- Southern Delaware Crossing, Submarine and Aerial Options: These project scenarios may cross between 4 to 8 mapped streams and watercourses, which will require aerial stream crossings (excluding the Delaware River). It should be noted, that these estimates are based on a conceptual route, as no specific routing information was provided.

3.2.2 Wetlands

3.2.2.1 Red Lion to Hope Creek Scenario

New Jersey

- Based on the available GIS data, the total 600-foot wide buffer area crossing mapped wetlands in New Jersey is approximately 604 acres.
- Using the assumption that structures would be located approximately 1,000 feet apart, potential permanent impacts due to structure foundations in New Jersey are estimated to be less than one acre.
- Based on the available data, potential impacts within the 600-foot wide buffer area associated with the conversion of forested wetlands to scrub/shrub or herbaceous wetlands as necessitated by ROW clearing requirements is estimated to be approximately 30 acres in New Jersey. When calculating the potential impacts to forested wetlands due to conversion, CH2M HILL assumed that any project completed along this route would be limited to a 300-foot wide corridor as is more typical of projects of this type.

Delaware

- Based on the available GIS data, the total 600-foot wide buffer area crossing mapped wetlands in Delaware is 50 acres.
- Using the assumption that structures would be located approximately 1,000 feet apart, potential permanent impacts due to structure foundations in Delaware are less than 0.07 acre.
- Based on the available data, potential impacts within the 600-foot wide buffer area associated with the conversion of forested wetlands to scrub/shrub or herbaceous wetlands as necessitated by ROW clearing requirements is estimated to be approximately 2.4 acres in Delaware. When calculating the potential impacts to forested wetlands due to conversion, CH2M HILL assumed that any project completed along this route would be limited to a 300-foot wide corridor as is more typical of projects of this type.

3.2.2.2 New Submarine Line from Salem to New Substation in Delaware

- Analysis of the potential locations for these project scenarios indicates a range of potential wetland impacts within the 600-foot wide study area buffer of between 50 and 120 acres of wetlands. All but approximately one acre of these impacts would be located in Delaware within tidal wetland systems dominated by estuarine emergent marshes with small pockets of scrub/shrub and forested wetlands. When calculating the potential impacts to forested wetlands due to conversion, CH2M HILL assumed that any project completed along this route would be limited to a 300-foot wide corridor as is more typical of projects of this type.
- Using the assumption that structures would be located approximately 1,000 feet apart, potential permanent impacts due to structure foundations in Delaware is approximately 0.1-0.15 acre.
- Permanent impacts associated with new permanent access roads were calculated based on the assumption that a new, 24-foot wide permanent access road would be required over the entire length

of new ROW (2.5 to 3.5 miles) in Delaware. This results in additional permanent impacts between 8 and 11 acres.

3.2.2.3 New Overhead Line from Salem to New Substation in Delaware

- Analysis of the potential locations for these project scenarios indicates a range of potential wetland impacts within the 600-foot wide study area buffer of between 50 and 120 acres of wetlands. All but approximately one acre of these impacts would be located in Delaware within tidal wetland systems dominated by estuarine emergent marshes with small pockets of scrub/shrub and forested wetlands. When calculating the potential impacts to forested wetlands due to conversion, CH2M HILL assumed that any project completed along this route would be limited to a 300-foot wide corridor as is more typical of projects of this type.
- Using the assumption that structures would be located approximately 1,000 feet apart, potential permanent impacts due to structure foundations in Delaware is approximately 0.1-0.15 acre.
- Permanent impacts associated with new permanent access roads were calculated based on the assumption that a new, 24-foot wide permanent access road would be required over the entire length of new ROW (2.5 to 3.5 miles) in Delaware. This results in additional permanent impacts between 8 and 11 acres.

3.2.3 Essential Fish Habitat

All three project scenarios cross Essential Fish Habitat along the Delaware River. Potential impacts are dependent upon construction methodologies and time of year restrictions for construction. A summary of the EFH mapped in this area of the Delaware River is provided below. Note that Atlantic sturgeon EFH was not specifically mapped in this area of the Delaware River even though several commenters mentioned this habitat type. Additional coordination with the NMFS is recommended to clarify the presence or absence of specific EFH and associated timing restrictions.

3.2.4 Historic Resources

Known historic resources are mapped along the separate project scenarios. However, it must be noted that historic resources data is typically much less complete to date relative to other data sources as State Historic Preservation Offices do not have a complete list of every historic resource (historic structures or archaeological resources) available to them. Thus, both the New Jersey and Delaware State Historic Preservation Offices will very likely require further studies that could identify potentially important historic resources.

A review of published historic resources data indicates the following:

3.2.4.1 Red Lion to Hope Creek Scenario

- This project, as envisioned, crosses one mapped historic resource, the Samuel Urion/Yerkes Farmstead on Lighthouse Road in Salem County. The crossing is approximately 940 feet with the total 600 foot wide corridor crossing approximately 15.25 acres of this property. Given assumed structure span lengths, it's very possible that a limited number of structures would need to be constructed on this property with other structures likely to occur within the viewshed of this property. The presence of the existing 500kV line in the same viewshed may reduce impacts to the historic resource.

3.2.4.2 New Submarine Line from Salem to New Substation in Delaware

- A charted submerged dike is mapped within the potential project area that would include a submarine crossing of the Delaware River. These types of structures must be assessed for historic significance.
- The presence of historically significant shipwrecks within the project area must be reviewed on a project specific basis. If potential wrecks are identified, field surveys which may include underwater excavation may be required to assess the potential for impacts.

- The overland portion of the potential projects study area also includes a portion that runs through or along the Delaware Bayshore Scenic Byway. Although the Delaware Bayshore Scenic Byway may not be considered an historic resource on its own per Section 106 or through state designation, there may be significant historic resources located in proximity to this resource that would require additional study and, potentially, compensatory mitigation for visual impacts to cultural resources.

3.2.4.3 New Overhead Line from Salem to New Substation in Delaware

- The overland portion of the potential projects study area also includes a portion that runs through or along the Delaware Bayshore Scenic Byway. Although the Delaware Bayshore Scenic Byway may not be considered an historic resource on its own per Section 106 or through state designation, there may be significant historic resources located in proximity to this resource that would require additional study and, potentially, compensatory mitigation for visual impacts to cultural resources.

3.3 Summary of Resources Crossed

Based on the data and mapping gathered as part of this comparison, all three proposed scenarios will require significant permitting efforts, based on the resources crossed or potentially crossed.

Red Lion: This scenario crosses approximately 6 miles of federal land and a similar length of state land. Permits and permissions to cross these lands in addition to the wetland permits and mitigation needs will form the main permit and schedule challenges for this scenario.

Southern Delaware Crossing options both cross wetlands and potential cultural resources as well as between 3,500 to 6,500 feet of state land. Constructing a new transmission line ROW, including permanent access roads and transmission structures, through state land will be a challenge especially when combined with the wetland permitting and visual impact issues.

These issues are discussed in more detail in the Permitting Discussion in Section 4 and in the permitting tables in Appendix A.

TABLE 3-2.

Summary of Potential Impacts Associated with each Project Scenario.

| Project Scenario | Impact Location | Impact Type | Impact Acres |
|---|-----------------|---|--------------|
| Red Lion to Hope Creek | New Jersey | Permanent (foundations) ¹ | 0.5 |
| | New Jersey | Forest Conversion ² | 15 |
| | Delaware | Permanent (foundations) ³ | 0.1 |
| | Delaware | Forest Conversion ⁴ | 1.2 |
| Southern Delaware River Crossings (aerial and submarine) | Delaware | Permanent (foundations) ⁵ | 0.15 |
| | Delaware | Permanent ROW Impacts (access roads) ⁶ | 8 to 11 |

Notes:

Red Lion to Hope Creek

1. Using the assumption that structures would be located approximately 1,000 feet apart, potential permanent impacts due to structure foundations in New Jersey are estimated to be less than 1.0 acre.
2. Based on the available data, potential impacts within the 600-foot wide buffer area associated with the conversion of forested wetlands to scrub/shrub or herbaceous wetlands as necessitated by ROW clearing requirements is estimated to

be approximately 30 acres in NJ. When calculating the potential impacts to forested wetlands due to conversion, CH2M HILL assumed that any project completed along this route would be limited to a 300-foot wide corridor as is more typical of projects of this type. Thus, the 15-acre impact estimate reflects potential impacts associated with a 300-foot wide ROW.

3. Using the assumption that structures would be located approximately 1,000 feet apart, potential permanent impacts due to structure foundations in Delaware is less than 0.07 acre.
4. Based on the available data, potential impacts within the 600-foot wide buffer area associated with the conversion of forested wetlands to scrub/shrub or herbaceous wetlands as necessitated by ROW clearing requirements is estimated to be approximately 2.4 acres in Delaware. When calculating the potential impacts to forested wetlands due to conversion, CH2M HILL assumed that any project completed along this route would be limited to a 300-foot wide corridor as is more typical of projects of this type. Thus, the 1.2-acre impact estimate reflects potential impacts associated with a 300-foot wide ROW.

Southern Delaware River Crossings (aerial and submarine)

5. Using the assumption that structures would be located approximately 1,000 feet apart, potential permanent impacts due to structure foundations in Delaware is approximately 0.1-0.15 acre.
6. Impacts associated with new permanent access roads assumed a standard 24-foot wide access road for the entire length of required ROW (2.5 to 3.5 miles) in Delaware.

Permitting Discussion

CH2M HILL conducted an assessment of anticipated permits associated with all three project scenarios. The assessment included a review of federal, regional, state, and local regulatory issues that would likely have to be addressed for each of the individual project scenarios to be granted regulatory approvals to begin construction. CH2M HILL's assessment is based on our understanding of the information provided by PJM, analysis of available GIS data summarized in the previous section, understanding of applicable regulations, and professional experience with projects of similar scope in this geography. No meetings, correspondence or discussions with any regulatory officials specific to this analysis or any of the project scenarios occurred.

It is likely that all three potential project scenarios would likely encounter significant regulatory hurdles if they are to be approved for construction. Additionally, based on the comments received pertinent to each project scenario during the proposal review process provided by PJM, it is also likely that non-governmental groups will provide comments any of these project scenarios that may be recommended by PJM. All of these comments from review /commenting agencies and other groups will be closely reviewed and considered by permitting agencies with these agencies very likely to require specific responses to comments by any permit applicant. As these comments may result in a variety of additional studies and/or permit conditions to gain approval, these items could heavily impact project schedules and costs. Thus, CH2M HILL's analysis provides a range for relative risk, costs, and schedules to be considered.

Detailed individual project scenario permitting matrices that highlight major permits and approvals, processes for obtaining these permits and approvals, associated timeframes, costs, and issues associated with project risks are provided as Appendix A.

4.1 Federal Permits and Approvals

4.1.1 NEPA

The federal approval that could potentially be cause for the greatest schedule and cost impacts specific to permitting is National Environmental Policy Act (NEPA) review. The NEPA [42 U.S.C. 4321 et seq.] was signed into law on January 1, 1970. NEPA establishes national environmental policy and goals for the protection, maintenance, and enhancement of the environment and provides a process for implementing these goals within the federal agencies. NEPA review, if required, typically takes two to three years or more if an Environmental Impact Statement (EIS) is required as opposed to an Environmental Assessment, which could result in a significant reduction in permitting time.

4.1.1.1 Red Lion to Hope Creek Line

NEPA may be applicable to this project scenario for two reasons:

Aerial Crossing of the Delaware River

The USACE may require the completion of either an EA or EIS. The USACE is the federal regulatory authority responsible for administering Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act, the two primary laws governing crossings of regulated waterbodies. As impacts associated with this crossing are limited to the structure foundations that would be placed within the Delaware River, it is possible, but unlikely that USACE would require that the NEPA process is undertaken. USACE will maintain review authority associated with Section 10/404 permit requirements, and will likely find that the permitting review process will satisfy their review.

Precedence for this conclusion are found in previous USACE handlings of similar projects. For example the USACE has, after preliminary study, ruled that an EIS is not needed for a proposed overhead crossing of the James River near Williamsburg, VA. However, many national, regional and local organizations are strongly

lobbying the USACE to require an EIS for said project before they issue any necessary permits. To date, no further information is available as to the status of this case. A similar scenario is likely with an overhead crossing of the Delaware River.

Crossing through Supawna Meadows National Wildlife Refuge

This project scenario also crosses through the USFWS-owned Supawna Meadows National Wildlife Refuge. Thus, USFWS may also seek to require the completion of NEPA documentation (e.g. EA or EIS) to allow structures to be placed on its land. In lieu of initiating the NEPA process, though, USFWS also has the option of issuing a Special Use Permit for utility structures on its land. As this project scenario seeks to run in close proximity to an existing 500kV line (potentially with very similar structure alignments), USFWS is more likely to issue a Special Use Permit than if no previous structures were present.

4.1.1.2 Southern Delaware River Crossing Aerial Option

The potential for federal NEPA review of this project scenario is likely very similar to that of the Red Lion to Hope Creek line project scenario in that this project scenario also includes an overhead crossing of the Delaware that would be subject to USACE review under Section 10/404. Thus, the likelihood of NEPA review being required by USACE remains the same.

4.1.1.3 Southern Delaware River Crossing Submarine Option

The potential for federal NEPA review of this project scenario is also dependent upon the findings of USACE and the level of review that they will deem necessary for a submarine crossing of the Delaware River.

Two similar submarine river crossings in the vicinity of New York City (Hudson Transmission Project and Bayonne Energy Center) have not been required to complete the NEPA process by USACE. However, USC described two other projects, the Dominion James River Crossing project and the Champlain Hudson Power Express Project (CHPE), as examples of projects similar in nature to the proposed solution, which did require NEPA authorization.

4.1.2 Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act

The USACE is responsible for reviewing and issuing permits under Section 10 of the Rivers and Harbors Act for work affecting navigable waters of the U.S. Section 10 specifically covers activities such as construction, excavation (dredging) or disposal of materials within these waters. The USACE also issues permits for the discharge of dredge or fill materials into waters of the U.S. under Section 404 (discharge of dredge and fill material) of the Clean Water Act. All three project scenarios are subject to these regulations and permit requirements.

During the 404/Section 10 permit review process, each project scenario will also undergo detailed review by the following federal agencies:

- U.S. Coast Guard: Private Aids to Navigation within the waters of the United States.
 - Both of the overhead crossings of the Delaware River are likely to require private aids to navigation such as lights, day beacons, or buoys depending on project specific construction techniques to mark the location of construction activities. It is not anticipated to present insurmountable obstacles to approval.
 - Similarly, the submarine crossing of the Delaware River will also likely require the installation and maintenance of private aids to navigation such as lights, day beacons, or buoys depending on project specific construction techniques to mark the location of temporary cofferdams needed for HDD activities. Given the temporary nature of the proposed activities, it is assumed that permitting private aids to navigation will not pose any significant risk to the project schedule.
- Threatened & Endangered Species Consultation

- A preliminary desktop review of the general project areas indicate that there may be EFH supporting 5 species. These species include the Black Sea Bass (*Centropristis striata*), Bluefish (*Pomatomus saltatrix*), Longfin Inshore Squid (*Loligo pealeii*), Scup (*Stenotomus chrysops*) and Summer Flounder (*Paralichthys dentatus*). The presence of EFH within a project area does not necessarily exclude project activities, rather the project proponent is required to demonstrate that they have avoided, minimized and mitigated potential impacts to the extent practicable. Examples of these strategies include siting around potentially sensitive habitats so as to avoid direct impacts, constructing only during approved construction windows so as to minimize impacts to sensitive life stages, and mitigating potential impacts through the use of modified construction techniques or adaptive mitigation.
- Both of the overhead crossings of the Delaware River will require consultation with USFWS and NMFS per Section 7 of the Endangered Species Act and Magnuson-Stevens Act, respectively. For these two project scenarios, it is likely that both agencies will require specific construction phase best management practices and, possibly, timing restrictions due to known EFH mapped in the vicinity of the project scenarios. The limited aquatic impacts associated with structure foundations are not likely to present huge approval hurdles with these agencies.
- The submarine crossing of the Delaware River project scenario will require the same consultation with USFWS and NMFS. Submarine cable installation technologies typically result in short term and temporary impacts to benthic habitat, it is not anticipated that the presence of EFH within the generic project areas will result in significant permitting risk. However, under this project scenario, NMFS and other federal review entities will closely scrutinize proposed construction techniques to determine potential permanent and temporary impacts. The applicant will be required to formally consult with NMFS and develop comprehensive mitigation plans to address these potential impacts.

4.1.3 Delaware River Basin Commission

The Delaware River Basin Commission (DRBC) is an interstate agency responsible for the conservation and management of water resources for the 12,500 square mile Delaware River watershed that includes parts of New Jersey, New York, Pennsylvania, and Delaware. All public and private projects proposed within the Basin that will substantially affect water resources (e.g., water withdrawal from surface water, groundwater, effluent, and floodplain development) must obtain DRBC approval. The DRBC has also established minimum restrictions for floodplain development along non-tidal streams in the four-state basin.

The DRBC must issue approvals for ground or surface water withdrawals that exceed 100,000 gallons per day averaged over a 30-day period; liquid petroleum product pipelines operating at pressures >150 psi; or projects which may have substantial effect on the water resources of the basin. Applications are reviewed at DRBC meetings which are held five times a year and typically include a public hearing.

The construction of either submarine foundations for transmission structures or submarine cable trenches may require DRBC review. Proposed construction techniques will ultimately determine the level of scrutiny conducted by DRBC with the submarine cable project scenario presenting the greatest likelihood of close and extended DRBC review.

4.2 State Permit Approvals

Below is a summary of the major state permits likely required in New Jersey. A more detailed list is provided within Appendix A.

4.2.1 New Jersey

A summary of the likely New Jersey permits is provided in the following sections. Additional information is provided in the permit tables for each scenario in Appendix A.

4.2.1.1 Wetlands

The Freshwater Wetlands Protection Act (FWPA), N.J.S.A. 13:9B authorized the State of New Jersey to establish a program for the review of activities in freshwater wetlands and transition areas. To implement the FWPA, the Department promulgated the FWPA rules, N.J.A.C. 7:7A.

In non-delegable waters (i.e. tidally influenced), the USACE retains jurisdiction under Federal law, and both Federal and State requirements apply. A project in non-delegable waters requires two permits, one from NJDEP under the Coastal Zone Management (CZM) and Coastal Permitting Program rules and one from the USACE under the Federal 404 program.

4.2.1.2 Flood Hazard Area

The Flood Hazard Area (FHA) Control Act Rules N.J.A.C. 7:13, adopted on November 5, 2007, implement the New Jersey Flood Hazard Area Control Act, N.J.S.A. 58:16A-50 et seq. Areas designated as FHA are very similar to those areas designated by FEMA as 100-year floodplain with some technical differences between the two designations.

The FHA Control Act Rules require a riparian zone adjacent to the regulated waters. The riparian zone is a buffer that extends 50 feet, 150 feet, or 300 feet from the top of bank along both sides of the regulated water depending on its classification. The removal of vegetation and the placement of impervious surfaces is limited within the riparian zone. Disturbances within either the floodplain or the riparian zone will require a permit from DLUR under the FHA Control Act Rules.

Development must comply with the permit requirements, which include stringent design standards and conditions for disturbances and the placement of structures within the flood hazard area and the riparian zone. Impacts to the FHA (e.g. foundation volume in FHA) and to riparian zones will require additional compensatory mitigation.

4.2.1.3 State Threatened & Endangered Species Review

The state of New Jersey maintains its own list of state species of special concern that must be considered as part of any activities subject to NJDEP regulations. The New Jersey Natural Heritage Program and Division of Land Use Regulation will conduct project specific reviews of special concern habitat as mapped by the state's Landscape Project (v. 3.1). Like federal threatened and endangered species habitat concerns, the state of New Jersey will likely require species-specific field studies to be completed depending on the specific layout of a project. The outcome of these field studies often result in specific permit conditions within the Freshwater Wetlands and CPP permits that may require certain best management practices be implemented during construction, timing restrictions be adhered to in specific areas of concern, and/or mitigation measures be taken if a habitat is impacted due to construction. These specific conditions can impact project construction schedules but are not typically insurmountable for projects of this type. Several other recent projects that are similar in scope and extent have been successfully completed recently in New Jersey.

4.2.1.4 New Jersey Historic Preservation Office

The New Jersey Historic Preservation Office (NJ HPO) is the state historic preservation office (SHPO) in New Jersey responsible for implementation of Section 106 of the National Historic Preservation Act. NJ HPO does not provide a permit, however, its findings are considered as part of NJDEP's natural resource permitting process. All three projects are likely to require a combination of historic resources studies that consider both aboveground historic structures within the viewshed of the proposed lines as well as potential impacts to belowground archaeological resources potentially impacted by structure foundations or other land disturbing activities. The required studies can be quite extensive and take several months to complete. However, once the NJ HPO reviews initial field study data and signs off on a protocol for protecting historic resources, projects are typically allowed to proceed if following special conditions that are issued as part of the NJDEP permits. If archaeological resources are identified during construction, however, the NJ HPO can halt the project altogether until the identified resources are studied and catalogued.

4.2.1.5 Green Acres Program

Many state, county, and municipal parks and natural areas are located within the proposed route. For state, county, and municipal parklands, as well as privately owned parklands that are purchased with public funding, a project must demonstrate compliance with the New Jersey Green Acres Program Rules, N.J.A.C. 7:36. A Green Acres diversion will be required from NJDEP for project activities and components on Green Acres-encumbered properties that are not authorized by existing easements or agreements. This applies to Green Acres designated properties both within and outside the existing ROWs. Abbotts Meadow and Mad Horse Creek Wildlife Management Areas may be Green Acres designated properties requiring diversions for crossing.

4.2.1.6 Planning & Zoning

Local planning and zoning approval would be required for any new substations or expansions to existing substations in New Jersey per the Municipal Land Use Law. This process can be completed concurrently with NJDEP permits once a site plan layout is established. Typically, the site plan review and approval process takes six to nine months to complete if required.

4.2.1.7 New Jersey Permitting Summary

Red Lion to Hope Creek: This project scenario would run through several miles of state-regulated wetlands, FHAs, threatened and endangered species habitat, and publically owned properties that would require all of the above mentioned permits or approvals from New Jersey regulatory agencies. Extensive natural resources studies and cultural resources studies will likely be required prior to any potential permit approvals being issued. Using helicopter construction techniques would greatly reduce potential impacts relative to the construction of new access roads and make this project scenario more likely to be approved. The siting of this project scenario adjacent to an existing similarly sized 500kV line may reduce some of the potential concerns that these offices within NJDEP would express, such as impacts to the viewsheds of historic structures and permanent impact to natural and cultural resources associated with new access roads. NJDEP will require mitigation for permanent impacts and will likely require specific studies associated with threatened and endangered bird species that may use this area for roosting or foraging activities. The permitting process in New Jersey will likely take a long time and any permits issued would likely include several construction and timing restrictions. However, recent history with other high voltage transmission lines on or near existing ROWs and extensive wetlands and floodplains indicates that NJDEP could approve this project scenario.

The two southern crossings of the Delaware River project scenarios: These would both require permits from NJDEP to complete construction. However, as both projects include minimal work in New Jersey, the anticipated review process specific to NJDEP regulations is much less than the Red Lion to Hope Creek project scenario. Potential impacts to historic resources at or near the shoreline may, however, serve to complicate the process if these resources are deemed eligible for the National Register per Section 106.

4.2.2 Delaware

Below is a summary of the major state permits likely required in Delaware. A more detailed list is provided within Appendix A.

4.2.2.1 Wetlands and Subaqueous Lands Permit

Authorization from the Wetlands and Subaqueous Lands Section (WSLS) is required for activities in tidal wetlands as well as tidal and non-tidal waters of the State of Delaware. DNREC has not been delegated authority for the federal 404 program in the same way that NJDEP has been, but DNREC will still conduct a concurrent review of potential impacts similar to most other states.

4.2.2.2 Subaqueous Land Lease

A lease is required for the placement of any structure, including pipelines, in underwater land channelward of the mean low water line. Projects that involve fill below the mean low water line are also subject to an

annual lease fee. All tidal underwater land within the State of Delaware below the mean low water line, except those underwater lands specifically granted by the State to a private owner, are considered to be Public Subaqueous Lands held in trust by the State of Delaware for all Delaware citizens. Impacts to the FHA (e.g., foundation volume in FHA) and to riparian zones will require additional compensatory mitigation.

4.2.2.3 Water Quality Certification

A State Water Quality Certification is required for activities requiring a USACE Section 404 permit. The WSLS issued by DNREC serves as this certification.

4.2.2.4 Endangered Species

The Wildlife Species Conservation and Research Program (WSCR) maintains information on rare plant and animal species in Delaware. Upon request, the WSCR provides applicable information on listed species through its Environmental Review Process.

4.2.2.5 Stormwater Management Plan Approval

Under Delaware Law, if a project exceeds 5,000 square feet of land disturbance, an approved Sediment and Stormwater Management Plan is required.

4.2.2.6 Delaware Department of State

In Delaware, the State Historic Preservation Office (SHPO) pursuant to the National Historic Preservation Act of 1966 (NHPA) is part of the Department of State's Division of Historical and Cultural Affairs. The location of the new structures in the viewshed of the Delaware Bayshore Scenic Byway will likely be carefully scrutinized by the Delaware SHPO. Although the Delaware Bayshore Scenic Byway may not be considered an historic resource on its own per Section 106 or through state designation, there may be significant historic resources located in proximity to this resource that would require additional study and, potential compensatory mitigation for visual impacts to cultural resources.

4.2.2.7 Summary of Delaware Permits

Red Lion to Hope Creek: This project scenario does cross areas subject to DNREC regulations. Thus, this project scenario will likely require all of the approvals described above to gain approvals for construction. As this project scenario follows existing ROW and assuming use of helicopter construction, potential impacts to regulated resources in Delaware would be anticipated to be minimal and not result in overly onerous DNREC review for the stretch of the project scenario in Delaware.

The two southern crossings of the Delaware River: These project scenarios would also both require permits from DNREC to complete construction. As both of the overhead portions of these scenarios would require new ROW impacts across wetlands, state-owned lands, and along a state historic and scenic byway, both of these project scenarios would result in impacts to all of these resources. New impacts and construction in state-owned lands would require additional state approvals that could be very difficult, costly, and time-consuming to obtain. Impacts to wetlands due to the need for new ROW would also be great depending on proposed construction techniques. Impacts to these areas would also likely occur in habitat that is home to state and federal species of concern that would likely result in additional permit conditions and mitigation requirements. Additionally, the location of the new structures in the viewshed of a listed scenic will likely be carefully scrutinized by the Delaware SHPO and result in permit conditions and expensive mitigation if deemed approvable. All of these items combined dictate that the state level permitting for these two scenarios in Delaware will be very difficult.

Estimated Permitting Costs

5.1 Mitigation Costs

For unavoidable impacts, compensatory wetland mitigation is required to replace the loss of wetland, stream, or other aquatic resource functions. USACE (or approved state authority) is responsible for determining the appropriate form and amount of compensatory mitigation required. Methods of providing compensatory mitigation include aquatic resource restoration, establishment, enhancement, and in certain circumstances, preservation. A summary of the potential mitigation costs for each scenario are presented in Table 5-1 below.

The approach to compensatory mitigation follows the USEPA and USACE Wetland Compensatory Mitigation Rule (March, 2008) emphasizing a watershed-level approach to compensation. Previous USEPA and USACE guidance favored mitigation in proximity of impacts, but the new Wetland Compensatory Mitigation Rule lists mitigation preferences as mitigation banks, in-lieu fee programs, and permittee-responsible mitigation. Mitigation will be required for the following impacts to wetlands:

- Impacts associated with transmission structure foundations
- Impacts associated with new access roads
- Impacts associated with conversion of forested wetlands to emergent wetlands

Mitigation Bank credits are usually purchased from a primary bank at a 1:1 ratio. That is for each acre of impact, one credit must be purchased. In general, wetland creation and restoration are afforded a ratio of 2:1. That means for every one acre of impacts for which mitigation is needed, an applicant will have to create or restore two acres of wetlands.

5.1.1 New Jersey

Under NJDEP's permitting program, compensation for the loss or degradation of a natural resource, including wetlands, may include the restoration, enhancement, creation, or preservation of an area. In order to achieve compensation, the NJDEP may allow the applicant to purchase credits from an approved wetland mitigation bank, conduct a permittee-responsible mitigation project, preserve uplands or donate wetlands as mitigation. The NJDEP may also allow for a monetary contribution to the Wetlands Mitigation Bank as an alternative compensation method.

New Jersey has several mitigation banks with specific service territories located throughout the state that provide specific habitat mitigation credit types (e.g. forested wetlands, tidal wetlands, etc.) at specific rates for each credit type. One mitigation bank, Willow Grove Lake Wetlands Mitigation Bank (operated by The Nature Conservancy), is mapped by NJDEP as servicing the area that would be impacted by all three project scenarios in New Jersey. The current mitigation credit cost at this bank is approximately \$500,000 per credit. Other potentially less expensive options may be available and could be explored if located within the watershed.

5.1.2 Delaware

Like New Jersey's permitting program, DNREC requires mitigation for impacts to wetlands. Delaware also has mitigation banks, although the banking program is not as well established or as widely used as New Jersey's program. One mitigation bank is in the vicinity of the project scenarios in Delaware and is used here as the basis for estimating a cost per credit. The current mitigation credit cost is \$70,000 per credit. Other potentially less expensive options may be available and could be explored if located within the watershed.

TABLE 5-1
Mitigation Cost Estimates

| Project Scenario | Impact Type | Impact Acres | Mitigation Ratio | Credit Cost | Total Cost |
|---|--------------------------------------|--------------|------------------|--------------|--------------------|
| Red Lion to Hope Creek | Permanent (foundations) | 0.5 | 1:1 | \$500,000 | \$250,000 |
| | Forest Conversion | 15 | 1:1 | \$500,000 | \$7.5 million |
| | Permanent (foundations) | 0.1 | 1:1 | \$70,000 | \$7,000 |
| | Forest Conversion | 1.2 | 1:1 | \$70,000 | \$84,000 |
| | | | | Total | \$7,841,000 |
| Southern Delaware River Crossings (aerial and submarine) | Permanent (foundations) | 0.15 | 1:1 | \$70,000 | \$10,500 |
| | Permanent ROW Impacts (access roads) | 8 to 11 | 1:1 | \$70,000 | \$770,000 |
| | | | | Total | \$780,500 |

Notes:

- Mitigation banks may not have the necessary credits available to compensate for all impacts.
- Impact areas are all approximations.
- As off site mitigation costs are heavily influenced by property values, both less expensive and more expensive options may be available to satisfy mitigation requirements.
- Impact acres for forest conversion are based on a 300 foot wide ROW.
- Impact acres for access roads are based on a 24 foot wide access road.

5.2 Anticipated Permitting Costs

CH2M HILL also calculated likely ranges for project scenario permitting costs given our understanding of each project scenario, likely studies required associated with permit type, and typical permit fees. Depending on specific permit conditions, the permitting costs associated with each project scenario could still increase if, for example, one of the natural resources agencies determines that special resource studies would be required in order to gain clearance for a particular project scenario. Pre-application meetings with these agencies would help to better quantify these costs. The cost estimate range associated with each permit type is also provided in the attached permit matrices in Appendix A.

TABLE 5-2
Anticipated Permitting Cost Estimates

| Project Scenario | Likely Low End Estimate | Likely High End Estimate |
|--|-------------------------|--------------------------|
| Red Lion to Hope Creek | \$2,300,000 | \$3,300,000 |
| New Submarine Crossing of Delaware River into Delaware | \$2,500,000 | \$3,800,000 |
| New Overhead Crossing of Delaware River into Delaware | \$2,100,000 | \$2,700,000 |

SECTION 6

Potential Permitting Schedules

CH2M HILL evaluated the potential schedules for gaining regulatory approvals for each of the three project scenarios provided by PJM. Two schedules were developed for each project scenario – a “likely project schedule” and the “likely worst-case schedule” (or reasonably anticipated worst case). Detailed schedule ranges for each permit or approval are provided within the permit matrices provided within Appendix A. Additionally, detailed Microsoft Project-based schedules for both cases associated with all three project scenarios are provided as Appendix B. The likely project schedule was considered to be the most likely to occur should there be reasonable outcomes to permit reviews and reasonable attempts to avoid critical resources. The likely worst case scenario was considered to occur if permit reviews and stakeholder input pushed the projects into NEPA or other longer and more involved reviews. Both are subjective and only by proceeding thought the actual reviews will we know with any certainty.

The primary driver for whether any of the project scenarios will result in the likely worst case schedule is whether or not NEPA will be required by USACE and/or USFWS. NEPA alone is typically a 24- to 36-month process that will often hold up the issuance of other state and federal permits as state and federal agencies will typically wait to issue permits until the NEPA process has been completed.

Federal and state permits, primarily those permits issued by USACE, NJDEP, and DNREC are all potential long lead time items. Those permits that deal with the review of impacts to wetlands and waterways generally take between 9 and 18 months to process. As these permits require consultation with other agencies that may require additional studies to satisfy their individual concerns, there are several stakeholders that can affect the ultimate permitting schedule.

This analysis does not take into account the timeframe for engineering design completion or the acquisition of new ROW or other property rights issues. These items can also be very long lead time items that can have significant impacts on the overall project schedule.

Below is a summary comparison of each of the three project scenarios and two alternative schedule timeframes indicating the likely project schedule and the likely worst case schedule. Based on this analysis, all three likely scenarios do not include a NEPA analysis requirement, and the likely worst case scenario entails a full EIS NEPA review. It should be noted however, that a full NEPA review of the Red Lion to Hope Creek scenario may be truncated as it is proposed to be located immediately adjacent to a previously disturbed ROW. Given that the southern crossing scenarios both proposed new ROW, it is reasonable to assume it is more likely that a full review may be required.

TABLE 6-1
Summary Permitting Timelines

| Project Scenario | Likelihood of Occurrence | Potential Duration of Permitting Activities |
|---|--------------------------|---|
| Red Lion to Hope Creek | Likely Reasonable Case | 30 months |
| | Likely Worst Case | 46 months |
| Southern Submarine Delaware River Crossing | Likely Reasonable Case | 36 months |
| | Likely Worst Case | 56 months |
| Southern Overhead Delaware River Crossing | Likely Reasonable Case | 36 months |
| | Likely Worst Case | 46 months |

SECTION 7

Conclusions

PJM requested that CH2M HILL compare the permitting needs, schedule, cost and mitigation cost for three proposed solutions to the Artificial Island Window. These were the Red Lion to Hope Creek project, and two new crossings of the Delaware River, one a submarine cable crossing, and one a new overhead transmission crossing.

TABLE 7-1

Summary Schedule, Cost, and Mitigation Information for the Three Scenarios

| Scenario | Schedule Range | Permitting Cost Range | Mitigation Cost Estimate | Risk Comment |
|--|----------------|-----------------------|--------------------------|--|
| Red Lion to Hope Creek | 30–46 months | \$2.3 M–\$3.3 M | \$7.8 M | NWR, ROW, MBTA Wooded Wetland Mitigation |
| New Submarine Crossing of Delaware River into Delaware | 36–56 months | \$2.5 M–\$3.8 M | \$0.77M/\$7.5M* | Coastal Wetlands, Public Land, EFH, NEPA, Visual |
| New Overhead Crossing of Delaware River into Delaware | 36–46 months | \$2.1 M–\$2.7 M | \$0.77M/\$7.5M* | Public Lands, Coastal Wetlands, Visual Resources, NEPA |

*Low figure represents mitigation bank purchase credits for impacts resulting from access roads, ROW clearing and structure placement. High figure represents potential off site mitigation costs for impacts from access roads, ROW and tower placement.

PJM Requested CH2M HILL perform a strictly limited comparison of the major permitting issues related to three Artificial Island transmission scenarios. These were; the Red Lion to Hope Creek 500 kV overhead transmission line, and two Southern Delaware Crossing scenarios (one new overhead line, and one submarine crossing). The review was limited to identifying major permits potentially needed for each scenario, the length of time likely needed to prepare and obtain those permits, the cost to obtain the permits and the major sources of permitting risk. The comparison did NOT include; ROW acquisition process or cost, or specific engineering considerations and construction techniques. No detailed route selection studies have been performed for these options (CH2M HILL was provided with a general route for the Red Lion to Hope Creek scenario and a “cone” of possible routes for the Southern Delaware Crossing scenarios).

No field-based ecological or cultural resources surveys have been conducted either by the applicants or by CH2M HILL. CH2M HILL did not contact permitting agencies as part of this comparison (it was not in our scope from PJM to do so). This comparison was based purely on the conceptual routes as presented, review of publically available natural resources and land use information, review of permitting triggers and processes, document review, and CH2M HILL’s permitting experience. We did obtain state specific wetland and ecological resource data to supplement the national data sets used in the broader scoped constructability analyses conducted by GAI and UCS.

The 500 kV Red Lion scenario would require a new ROW, located parallel and at the same height as the existing 5015 line. The option has a total length of 17 miles, 3 of which comprise an overhead crossing of the Delaware River. The route runs parallel to the existing line from the Salem Substation in Salem County, New Jersey, to the Red Lion Substation in Delaware. As a new line, regardless of paralleling an existing ROW, new, permanent cleared ROW will be required. While this does not change wetland contours (except if a pole/tower is located in a wetland) the main impact would be the conversion of forested wetlands to non-forested wetlands. In addition, there would be 14 miles of land use conversion from unmaintained to maintained ROW. Approximately 6 miles of this would occur within the sensitive Supawna National Wildlife Refuge.

Two Southern Delaware River Crossing scenarios were also presented as part of the comparison. Each of these scenarios would involve the creation of new ROWs across the Delaware River (one overhead, one submarine) and approximately 2.5 to 3.5 miles of new overhead transmission lines connecting to a new substation once in Delaware. PJM instructed CH2M HILL to look at general cone of interest for the new ROW rather than a specific route.

The two Southern Delaware Crossings would pass through Delaware-owned wildlife management areas and state protected wetlands. There are no existing lines or access roads in these areas, so impacts would be new. They not only would require DNREC approval for impacts to wetlands, but they would also have to get rights to cross state lands with new impacts. This factor puts both projects in the more difficult category relative to all three scenarios. In addition, overhead sections would put new lines along and/or through a scenic byway that may have cultural resources located in close proximity potentially resulting in viewshed impacts to cultural resources.

The submarine portion of the Southern Delaware Crossing has some potential to effect submerged cultural resources, but the nature and magnitude of these impacts cannot be known until specific routes and construction techniques are developed. Sedimentation impacts from construction would be localized and temporary and would likely not have a long term negative impact on the ecology of the area (especially in light of period dredging activity in the area). Based on the information provided, the southern submarine crossing could be the most difficult scenario of the three to permit due to the presence of the coastal wetlands and publically owned lands, while also potentially being the most likely to require NEPA.

Permitting of the southern overhead crossing could potentially be simplified if Augustine Wildlife Area is avoided. However, crossing this area figured in the entire study area presented to CH2M HILL. Shifting the overhead sections to the south would only shift the impacts from Augustine Wildlife to Cedar Swamp Wildlife Area, so the same potential permitting hurdles would still exist under this scenario, as well.

All three proposed scenarios share similar potential regulatory hurdles in that they all cross publically owned lands that are rich in wetlands and other sensitive resources. The permitting cost range and estimated schedule range are relatively similar between the three projects, with the submarine crossing of the Delaware River potentially requiring a slightly longer period of study and/or review. Additionally, while the estimated mitigation costs for the Red-Lion to Hope Creek Project are higher than the southern crossing options, this cost is likely not significant when compared to the entire capital cost of construction, and, as such, would not be a definitive selection factor.

Based on the information provided, the differences in relative permitting efforts will likely be associated with 1) project specific technical specifications, 2) how regulatory agencies address the need for new ROW in previously un-impacted areas (including those adjacent to but not connected to existing impacts) and 3) whether or not regulatory agencies will require a EIS as part of NEPA review. The greatest source of schedule and permitting risk is the potential for an EIS. An EIS extends the project timeline and increases the potential for adverse comment and additional studies. Based on the information reviewed, it appears the Red Lion scenario may be slightly less difficult to permit and, so long as an EIS is not required, may be permitted sooner than the other scenarios. The lack of a clear, unequivocally better choice in terms of the permitting, indicates this may not be the differentiating factor, given the ROW, engineering, design and technical factors evaluated by PJM and others.

Appendix A
Major Permits for the Three Scenarios

Table A-1 Major Permits, Approvals, and Certifications Potentially Required for the PJM Red Lion to Hope Creek Project

| Permit/Approval | Administering Agency | Component Tasks | Review Time | Approximate Cost | Risk/Comment |
|--|---|--|-------------------------------------|---------------------|--|
| Federal | | | | | |
| National Environmental Policy Act (NEPA) Consultation and Review | USACE/USFWS | <ul style="list-style-type: none"> Utilize similar field data and application components as the USACE application to submit for review. May require additional public outreach and application materials | 24 to 36 months | \$100,000-\$500,000 | Lead agency is determined during consultation. May be required for crossing of the Delaware River and/or the Supawna Meadows NWR. |
| Special Use Permit for Supawna Meadows National Wildlife Refuge | USFWS | <ul style="list-style-type: none"> Utilize similar field data and application components as the USACE application to submit for review. | 10 to 18 months | \$15,000 | Potential permitting option for Supawna Meadows NWR. USFWS may elevate review to NEPA process. |
| Clean Water Act (CWA) - Section 404 (33 USC § 1344) Individual Permit Rivers and Harbors Act, Section 10 (33 USC § 403) Executive Order 11988 - Floodplain Management; Executive Order 11990 - Protection of Wetlands | United States Army Corps of Engineers (USACE) Philadelphia District | <ul style="list-style-type: none"> Field delineation of Waters of U.S. Prepare and submit Preliminary Jurisdictional Determination Application. | 10 to 18 months | \$120,000 | New Jersey: USACE regulates activities in tidal waterways and adjacent wetlands. On March 2, 1994, New Jersey entered into an assumption agreement with the USEPA to administer the Federal wetlands program in delegable waters. Potential agency scrutiny associated with the Delaware River crossing. |
| Private Aid to Navigation (PATON) | US Coast Guard (USCG) | <ul style="list-style-type: none"> Prepare and submit application under 33CFR66. | Typically issued with USACE permits | \$10,000 | PATON may be required as a condition of USACE authorization. Coordination with both USACE and USCG will be required to ensure compliance with published regulations. Applicant is required to pay costs associated with installation, maintenance and removal of all PATON. |

Table A-1 Major Permits, Approvals, and Certifications Potentially Required for the PJM Red Lion to Hope Creek Project

| Permit/Approval | Administering Agency | Component Tasks | Review Time | Approximate Cost | Risk/Comment |
|--|---|---|-------------------------------------|-------------------|---|
| Endangered Species Act (ESA) Section 7 Consultation Magnuson-Stevens Fisheries Conservation & Management Act (MSFCMA) Marine Mammal Protection Act (MMPA) | U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS) | <ul style="list-style-type: none"> Desktop review of publicly available data. Submit letters of concurrence to NMFS for review. | Typically issued with USACE permits | \$50,000 | Desktop review and consultation with agencies may result in additional survey of Threatened and Endangered (T&E) habitat. Review times vary among projects based on species and seasonality of surveys. |
| Endangered Species Act (ESA) Section 7 Consultation Bald and Golden Eagle Protection Act (BGEPA) Migratory Bird Treaty Act (MBTA) of 1918 (Public Law 65-186) Executive Order 13186 - Responsibilities of Federal Agencies To Protect Migratory Birds | United States Fish and Wildlife Service (USFWS) | <ul style="list-style-type: none"> Desktop review of publicly available data. Submit letters of concurrence to NMFS for review. | Typically issued with USACE permits | \$100,000 | Desktop review and consultation with agencies may result in additional survey of Threatened and Endangered (T&E) habitat. Review times vary among projects based on species and seasonality of surveys. Specific species studies may be required. |
| Working in or over navigable waters | USCG | <ul style="list-style-type: none"> Consultation with USCG regarding proposed construction activities, techniques and schedules. | 4 to 6 months | \$15,000-\$40,000 | Multiple structures in navigable water. Close coordination required with USCG and USACE. |
| Consultation for Farmland Conversion Impact under the FPPA (7 CFR 658) | USDA Natural Resources Conservation Service (NRCS) | <ul style="list-style-type: none"> Utilize similar field data and application components as the USACE application to submit for review. | 8 to 12 months | \$15,000 | Project traverses active farmland, which requires consultation with USDA. Existing corridor in the same ROW may reduce impact. |
| Filing of Notification of Proposed Construction or Alteration (FAA Form 7460-1) | Federal Aviation Administration | <ul style="list-style-type: none"> Complete notification online at FAA Website based on equipment height for each structure | 45 days prior to construction | \$4,500 | FAA may require markings for tall structures or stream crossings. |

Table A-1 Major Permits, Approvals, and Certifications Potentially Required for the PJM Red Lion to Hope Creek Project

| Permit/Approval | Administering Agency | Component Tasks | Review Time | Approximate Cost | Risk/Comment |
|--|---|---|--|---------------------|--|
| Multi-State | | | | | |
| Delaware River Basin Compact (US Public Law 87-328) and state laws in DE and PA | Delaware River Basin Commission (DRBC), Project Review Section | <ul style="list-style-type: none"> Prepare and submit Project for approval by Commission | 6 to 9 months | \$25,000-\$40,000 | <p>Required for surface withdrawals and floodplain development within the DRBC jurisdiction</p> <p>Commission meetings occur 5 times per year</p> |
| State – New Jersey | | | | | |
| Freshwater Wetlands (FWW) Individual Permit and Section 401 Water Quality Certification | New Jersey Department of Environmental Protection (NJDEP), Division of Land Use Regulation (DLUR) | <ul style="list-style-type: none"> Field delineation of freshwater wetlands. Prepare and submit Letter of Interpretation and FWW IP Application. | 9 to 12 months | \$280,000-\$300,000 | Mitigation is required for permanent impacts to wetlands and transition areas. If helicopter construction is used, then permanent impacts likely required for structure foundations and conversion of forested wetlands due to NERC requirements. If new permanent access roads are required, then impacts to wetlands would include all access roads. |
| Flood Hazard Area (FHA) Individual Permit | NJDEP DLUR | <ul style="list-style-type: none"> Desktop delineation and calculation of FHA elevations. Preparation of Plans and reports Submit FHA IP Application | 4 to 6 months (typically issued concurrently with FWW/WFD) | \$125,000 | Project corridor in New Jersey is primarily mapped in floodplain. If helicopter construction is used, then permanent impacts likely required for structure foundations. If new permanent access roads are required, then impacts to FHA would include access roads. |
| Waterfront Development (WFD) Individual Permit and Coastal Zone Management Federal Consistency | NJDEP DLUR | <ul style="list-style-type: none"> Similar to FWW IP application. | 9 to 12 months | \$280,000-\$300,000 | Mitigation is required for permanent impacts to wetlands and transition areas. If helicopter construction is used, then permanent impacts likely required for structure foundations and conversion of forested wetlands due to NERC requirements. If new permanent access roads are required, then impacts to wetlands would include all access roads. |

Table A-1 Major Permits, Approvals, and Certifications Potentially Required for the PJM Red Lion to Hope Creek Project

| Permit/Approval | Administering Agency | Component Tasks | Review Time | Approximate Cost | Risk/Comment |
|--|---|--|-----------------------------------|-----------------------|--|
| Tidelands License/Grant | NJDEP Bureau of Tidelands | <ul style="list-style-type: none"> Submit Tidelands Application with WFD IP Coordinate with Bureau of Tidelands for issuance | 1 to 2 months after WFD IP issued | \$70,000 | Most of the project is located within tidal areas as such will require significant Tidelands Licenses. |
| Freshwater Wetlands General Permit 12 (GP-12) – Geotechnical Borings | NJDEP DLUR | <ul style="list-style-type: none"> Field delineation of freshwater wetlands utilized in other permits. Prepare and submit GP-12 Application | 3 to 6 months | \$15,000 - \$18,000 | Requires locations of geotechnical borings. Timing restrictions and permit conditions may apply. |
| Coastal Permit 27 – Geotechnical Borings | NJDEP DLUR | <ul style="list-style-type: none"> Field delineation of coastal wetlands utilized in other permits. Prepare and submit GP-27 Application | 3 to 6 months | \$15,000 - \$18,000 | Requires locations of geotechnical borings. Timing restrictions and permit conditions may apply. |
| Archaeological and Historic Consultation Section 106 Review | State Historic Preservation Office (SHPO) – NJDEP | <ul style="list-style-type: none"> Desktop review of publicly available data Submit findings to SHPO for review | 10 to 18 months | \$100,000 - \$250,000 | SHPO review includes Native American Graves Protection and Repatriation Act (NAGPRA), Historic Structures Viewshed analysis, and Archaeology. Special permit conditions may require extensive additional archaeological studies. Project is proposed adjacent to existing 500kV line, so impacts to viewshed are less likely than a line built on new ROW. |
| State T&E Consultation (New Jersey Natural Heritage Program) | NJDEP DLUR | <ul style="list-style-type: none"> Desktop review of publicly available data. Submit letters of concurrence to agencies for review. Complete any required T&E field studies | 6 to 12 months | \$10,000 - \$100,000 | Findings could result in additional field studies and/or construction timing restrictions and permit conditions. |
| Reforestation Plan (No Net Loss Reforestation Act) | NJ Division of Parks and Forestry | <ul style="list-style-type: none"> Forest Habitat Identification Consultation with NJ Forestry Development of Reforestation Plan | 6 to 12 months | \$50,000- \$100,000 | Impacts to forested areas in state lands require a NNL reforestation plan. |
| Green Acres Diversion | NJDEP | <ul style="list-style-type: none"> ID Green Acres properties and easements. Prepare and submit application | 12 to 18 months | \$150,000 | Consultation with Green Acres and review of easements Potential long lead time for areas that cross NJ Public lands |

Table A-1 Major Permits, Approvals, and Certifications Potentially Required for the PJM Red Lion to Hope Creek Project

| Permit/Approval | Administering Agency | Component Tasks | Review Time | Approximate Cost | Risk/Comment |
|--|---|--|--|-----------------------|---|
| Miscellaneous NJ State Permits and Approvals | NJDEP | <ul style="list-style-type: none"> Construction Dewatering Permit Water Allocation/Short Term Water Use Permit-by-rule 5G3 Stormwater Construction Permit Air Quality Permit | 1 to 3 months after FWW/WFD/FHA permit is issued | \$17,500 | Permit requirements dependent on construction techniques |
| Plan Release to Local Municipality authorizing Municipal Construction Permit | NJ Department of Community Affairs | <ul style="list-style-type: none"> Submit engineering plans to DCA for review | 3 to 6 months | \$110,000 | Required approval prior to building permits |
| State – Delaware | | | | | |
| Wetlands and Subaqueous Lands Permit Application and Section 401 Water Quality Certification | DE Department of Natural Resources and Environmental Control (DNREC) – Office of Environmental Protection - Division of Water | <ul style="list-style-type: none"> Field delineation of wetlands. Prepare and submit permit application. | 9 to 12 months | \$280,000 - \$300,000 | Mitigation is required for permanent impacts to wetlands. If helicopter construction is used, then permanent impacts likely required for structure foundations and conversion of forested wetlands due to NERC requirements. If new permanent access roads are required, then impacts to wetlands would include all access roads. |
| Coastal Zone Management Federal Consistency | DNREC - Delaware Coastal Zone Management Program (DCMP) | <ul style="list-style-type: none"> Prepare and submit application package | 9 to 12 months | \$5,000 - \$10,000 | Reviewed as part of Wetlands and Subaqueous Lands permit application. |
| Miscellaneous DE State Permits and Approvals | DNREC | <ul style="list-style-type: none"> Air Permits NPDES General Permit for Storm Water Discharges Associated With Industrial Activity Water Allocation Permit | 1 to 3 months | \$17,500 | Dependent upon construction techniques. |

Table A-1 Major Permits, Approvals, and Certifications Potentially Required for the PJM Red Lion to Hope Creek Project

| Permit/Approval | Administering Agency | Component Tasks | Review Time | Approximate Cost | Risk/Comment |
|--|---|--|-----------------|----------------------|--|
| National Pollutant Discharge Elimination System (NPDES) Sediment and Stormwater Plan Construction Permit | DE DNREC – Office of Environmental Protection - Division of Watershed Stewardship | <ul style="list-style-type: none"> Preparation of Erosion & Sediment Control Plan and associated stormwater management report. | 2 to 4 months | \$7,000 - \$11,000 | Dependent upon construction techniques. |
| Environmental Review for Species of Special Concern | Wildlife Species Conservation & Research Program Division of Fish and Wildlife | <ul style="list-style-type: none"> Desktop review of publicly available data. Submit letters of concurrence to agencies for review. Complete any required T&E field studies | 6 to 12 months | \$10,000 - \$100,000 | Findings could result in additional field studies and/or construction timing restrictions and permit conditions. |
| Historical and Cultural Review | DE State Historic Preservation Office | <ul style="list-style-type: none"> Desktop review of publicly available data Submit findings to SHPO for review | 10 to 18 months | \$50,000 | SHPO review includes Native American Graves Protection and Repatriation Act (NAGPRA), Historic Structures Viewshed analysis, and Archaeology. Special permit conditions may require extensive additional archaeological studies. |
| NJ County and Municipal Permits and Approvals | | | | | |
| Cumberland-Salem District Soil Erosion and Sediment Control (SESC) Plan Approval | Cumberland-Salem Soil Conservation District | Preparation of Erosion & Sediment Control Plan and associated stormwater management report. | 2 to 4 months | \$17,000 - \$25,000 | Dependent upon construction techniques. |
| Site Plan and Zoning Approval | Municipal Planning and Zoning Board | <ul style="list-style-type: none"> Complete site plan design for substation Prepare and submit site plan application Consultation and public meetings with local planning board | 6 months | \$12,000 - \$18,000 | Planning Board approval required. |
| Local Building and Road Opening Permits | Municipal Building Department | <ul style="list-style-type: none"> Submit engineering plans to municipal building department for review | 3 to 6 months | \$110,000 | Required approval for building permits |
| DE County and Municipal Permits and Approvals | | | | | |

Table A-1 Major Permits, Approvals, and Certifications Potentially Required for the PJM Red Lion to Hope Creek Project

| Permit/Approval | Administering Agency | Component Tasks | Review Time | Approximate Cost | Risk/Comment |
|--|-------------------------------------|--|---------------|---------------------|---|
| Erosion & Sediment Control Plan Approval | New Castle Conservation District | <ul style="list-style-type: none"> Preparation of Erosion & Sediment Control Plan and associated stormwater management report. | 2 to 4 months | \$7,000 - \$11,000 | Dependent upon construction techniques. |
| Site Plan and Zoning Approval | Municipal Planning and Zoning Board | <ul style="list-style-type: none"> Complete site plan design for substation Prepare and submit site plan application Consultation and public meetings with local planning board | 6 months | \$12,000 - \$18,000 | Planning Board approval required. |
| Local Building and Road Opening Permits | Municipal Building Department | <ul style="list-style-type: none"> Submit engineering plans to municipal building department for review | 3 to 6 months | \$110,000 | Required approval for building permits |

Table A-2 Major Permits, Approvals, and Certifications Potentially Required for the PJM Southern Marine Project

| Permit/Approval | Administering Agency | Component Tasks | Review Time | Approximate Cost | Risk/Comment |
|--|---|--|-------------------------------------|-----------------------|--|
| Federal | | | | | |
| National Environmental Policy Act (NEPA) Consultation and Review | USACE/USFWS | <ul style="list-style-type: none"> Utilize similar field data and application components as the USACE application to submit for review. May require additional public outreach and application materials | 24 to 36 months | \$100,000 - \$500,000 | USACE may require EIS for trenching under the Delaware River in a navigable channel associated with EFH. |
| Clean Water Act (CWA) - Section 404 (33 USC § 1344) Individual Permit Rivers and Harbors Act, Section 10 (33 USC § 403) Executive Order 11988 - Floodplain Management; Executive Order 11990 - Protection of Wetlands | United States Army Corps of Engineers (USACE) Philadelphia District | <ul style="list-style-type: none"> Field delineation of Waters of U.S. Prepare and submit Preliminary Jurisdictional Determination Application. | 10 to 18 months | \$120,000 | <p>New Jersey: USACE regulates activities in tidal waterways and adjacent wetlands. On March 2, 1994, New Jersey entered into an assumption agreement with the USEPA to administer the Federal wetlands program in delegable waters.</p> <p>Likely agency scrutiny associated with the Delaware River crossing. Special conditions for trenching under EFH habitat in Delaware are likely and would affect construction techniques and timing restrictions.</p> |
| Private Aid to Navigation (PATON) | US Coast Guard (USCG) | <ul style="list-style-type: none"> Prepare and submit application under 33CFR66. | Typically issued with USACE permits | \$10,000 | PATON may be required as a condition of USACE authorization. Coordination with both USACE and USCG will be required to ensure compliance with published regulations. Applicant is required to pay costs associated with installation, maintenance and removal of all PATON. |

Table A-2 Major Permits, Approvals, and Certifications Potentially Required for the PJM Southern Marine Project

| Permit/Approval | Administering Agency | Component Tasks | Review Time | Approximate Cost | Risk/Comment |
|--|---|---|-------------------------------------|----------------------|--|
| Endangered Species Act (ESA) Section 7 Consultation Magnuson-Stevens Fisheries Conservation & Management Act (MSFCMA) Marine Mammal Protection Act (MMPA) | U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS) | <ul style="list-style-type: none"> Desktop review of publicly available data. Submit letters of concurrence to NMFS for review. | Typically issued with USACE permits | \$500,000 | <p>Desktop review and consultation with agencies may result in additional survey of Threatened and Endangered (T&E) habitat.</p> <p>Trenching through EFH in Delaware River may require additional consultation and surveys and result in special conditions affecting construction techniques and timing restrictions.</p> <p>Review times vary among projects based on species and seasonality of surveys.</p> |
| Endangered Species Act (ESA) Section 7 Consultation Bald and Golden Eagle Protection Act (BGEPA) Migratory Bird Treaty Act (MBTA) of 1918 (Public Law 65-186) Executive Order 13186 - Responsibilities of Federal Agencies To Protect Migratory Birds | United States Fish and Wildlife Service (USFWS) | <ul style="list-style-type: none"> Desktop review of publicly available data. Submit letters of concurrence to NMFS for review. | Typically issued with USACE permits | \$500,000 | <p>Desktop review and consultation with agencies may result in additional survey of Threatened and Endangered (T&E) habitat.</p> <p>Review times vary among projects based on species and seasonality of surveys.</p> <p>Increased impacts due to new ROW through coastal wetland habitat in Delaware will likely result in increased threatened and endangered species studies and associated permit conditions (timing restrictions and construction practices).</p> |
| Working in or over navigable waters | USCG | <ul style="list-style-type: none"> Consultation with USCG regarding proposed construction activities, techniques and schedules. | 6 to 9 months | \$40,000 - \$100,000 | Trenching under navigable water will require very close coordination with USCG and USACE. |
| Filing of Notification of Proposed Construction or Alteration (FAA Form 7460-1) | Federal Aviation Administration | <ul style="list-style-type: none"> Complete notification online at FAA Website based on equipment height for each structure | 45 days prior to construction | \$2,500 | FAA may require markings for tall structures or stream crossings. |

Table A-2 Major Permits, Approvals, and Certifications Potentially Required for the PJM Southern Marine Project

| Permit/Approval | Administering Agency | Component Tasks | Review Time | Approximate Cost | Risk/Comment |
|--|---|---|--|----------------------|--|
| Multi-State | | | | | |
| Delaware River Basin Commission (US Public Law 87-328) and state laws in DE and PA | Delaware River Basin Commission (DRBC), Project Review Section | <ul style="list-style-type: none"> Prepare and submit Project for approval by Commission | 9 to 12 months | \$75,000 - \$100,000 | <p>Required for surface withdrawals and floodplain development within the DRBC jurisdiction</p> <p>Commission meetings occur 5 times per year</p> <p>Trenching under navigable water will require very close coordination with DRBC.</p> |
| State – New Jersey | | | | | |
| Freshwater Wetlands (FWW) Individual Permit and Section 401 Water Quality Certification | New Jersey Department of Environmental Protection (NJDEP), Division of Land Use Regulation (DLUR) | <ul style="list-style-type: none"> Field delineation of freshwater wetlands. Prepare and submit Letter of Interpretation and FWW IP Application. | 6 to 9 months | \$30,000 - \$60,000 | Mitigation is required for permanent impacts to wetlands and transition areas. Limited work is proposed in and around New Jersey wetlands. |
| Flood Hazard Area (FHA) Individual Permit | NJDEP DLUR | <ul style="list-style-type: none"> Desktop delineation and calculation of FHA elevations. Preparation of Plans and reports Submit FHA IP Application | 4 to 6 months (typically issued concurrently with FWW/WFD) | \$35,000 | Project corridor in New Jersey is primarily mapped in floodplain. Limited work is proposed in and around New Jersey wetlands. |
| Waterfront Development (WFD) Individual Permit and Coastal Zone Management Federal Consistency | NJDEP DLUR | <ul style="list-style-type: none"> Similar to FWW IP application. | 6 to 9 months | \$30,000 - \$70,000 | Mitigation is required for permanent impacts to wetlands and transition areas. Limited work is proposed in and around New Jersey wetlands. |
| Tidelands License/Grant | NJDEP Bureau of Tidelands | <ul style="list-style-type: none"> Submit Tidelands Application with WFD IP Coordinate with Bureau of Tidelands for issuance | 1 to 2 months after WFD IP issued | \$70,000 | Limited impacts to potential Tidelands areas in NJ. |

Table A-2 Major Permits, Approvals, and Certifications Potentially Required for the PJM Southern Marine Project

| Permit/Approval | Administering Agency | Component Tasks | Review Time | Approximate Cost | Risk/Comment |
|--|---|--|--|---------------------|---|
| Freshwater Wetlands General Permit 12 (GP-12) – Geotechnical Borings | NJDEP DLUR | <ul style="list-style-type: none"> Field delineation of freshwater wetlands utilized in other permits. Prepare and submit GP-12 Application | 3 to 6 months | \$7,000 - \$10,000 | Requires locations of geotechnical borings. Timing restrictions and permit conditions may apply. |
| Coastal Permit 27 – Geotechnical Borings | NJDEP DLUR | <ul style="list-style-type: none"> Field delineation of coastal wetlands utilized in other permits. Prepare and submit GP-27 Application | 3 to 6 months | \$7,000 - \$10,000 | Requires locations of geotechnical borings. Timing restrictions and permit conditions may apply. |
| Archaeological and Historic Consultation Section 106 Review | State Historic Preservation Office (SHPO) – NJDEP | <ul style="list-style-type: none"> Desktop review of publicly available data Submit findings to SHPO for review | 6 to 9 months | \$10,000 | Limited work is proposed in New Jersey primarily in previously impacted areas. |
| State T&E Consultation (New Jersey Natural Heritage Program) | NJDEP DLUR | <ul style="list-style-type: none"> Desktop review of publicly available data. Submit letters of concurrence to agencies for review. Complete any required T&E field studies | 6 to 12 months | \$10,000 - \$20,000 | Limited work is proposed in New Jersey primarily in previously impacted areas. Findings could result in additional field studies and/or construction timing restrictions and permit conditions. |
| Miscellaneous NJ State Permits and Approvals | NJDEP | <ul style="list-style-type: none"> Construction Dewatering Permit Water Allocation/Short Term Water Use Permit-by-rule 5G3 Stormwater Construction Permit Air Quality Permit | 1 to 3 months after FWW/WFD/FHA permit is issued | \$17,500 | Permit requirements dependent on construction techniques |
| Plan Release to Local Municipality authorizing Municipal Construction Permit | NJ Department of Community Affairs | <ul style="list-style-type: none"> Submit engineering plans to DCA for review | 3 to 6 months | \$110,000 | Required approval prior to building permits |

Table A-2 Major Permits, Approvals, and Certifications Potentially Required for the PJM Southern Marine Project

| Permit/Approval | Administering Agency | Component Tasks | Review Time | Approximate Cost | Risk/Comment |
|--|---|---|-----------------|-----------------------|---|
| State – Delaware | | | | | |
| Wetlands and Subaqueous Lands Permit Application and Section 401 Water Quality Certification | DE Department of Natural Resources and Environmental Control (DNREC) – Office of Environmental Protection - Division of Water | <ul style="list-style-type: none"> Field delineation of wetlands. Prepare and submit permit application. | 12 to 18 months | \$300,000 - \$400,000 | Mitigation is required for permanent impacts to wetlands. New ROW and structures proposed for Delaware portion of project will permanently impact wetlands and waters due to the creation of new access roads. Mitigation costs likely to be great. Wetlands impacted are within the state-owned Augustine Wildlife Area. |
| Coastal Zone Management Federal Consistency | DNREC - Delaware Coastal Zone Management Program (DCMP) | <ul style="list-style-type: none"> Prepare and submit application package | 12 to 18 months | \$10,000 - \$20,000 | Reviewed as part of Wetlands and Subaqueous Lands permit application. |
| Miscellaneous DE State Permits and Approvals | DNREC | <ul style="list-style-type: none"> Air Permits NPDES General Permit for Storm Water Discharges Associated With Industrial Activity Water Allocation Permit | 1 to 3 months | \$17,500 | Dependent upon construction techniques. |
| National Pollutant Discharge Elimination System (NPDES) Sediment and Stormwater Plan Construction Permit | DE DNREC – Office of Environmental Protection - Division of Watershed Stewardship | <ul style="list-style-type: none"> Preparation of Erosion & Sediment Control Plan and associated stormwater management report. | 2 to 4 months | \$9,000 - \$15,000 | Dependent upon construction techniques. |

Table A-2 Major Permits, Approvals, and Certifications Potentially Required for the PJM Southern Marine Project

| Permit/Approval | Administering Agency | Component Tasks | Review Time | Approximate Cost | Risk/Comment |
|--|---|--|-----------------|-----------------------|---|
| Environmental Review for Species of Special Concern | Wildlife Species Conservation & Research Program Division of Fish and Wildlife | <ul style="list-style-type: none"> Desktop review of publicly available data. Submit letters of concurrence to agencies for review. Complete any required T&E field studies | 12 to 18 months | \$100,000 - \$250,000 | New ROW and structures proposed for Delaware portion of project will permanently impact wetlands and waters due to the creation of new access roads. Wetlands impacted are within the state-owned Augustine Wildlife Area. Findings will likely result in additional field studies and/or construction timing restrictions and permit conditions. |
| Historical and Cultural Review | DE State Historic Preservation Office | <ul style="list-style-type: none"> Desktop review of publicly available data Submit findings to SHPO for review | 12 to 24 months | \$100,000 | New ROW impacts likely to require greatly increased archaeological studies due to new access roads and viewshed studies due to new structures where none previously existed. SHPO review includes Native American Graves Protection and Repatriation Act (NAGPRA), Historic Structures Viewshed analysis, and Archaeology. Special permit conditions may require extensive additional archaeological studies. |
| NJ County and Municipal Permits and Approvals | | | | | |
| Cumberland-Salem District Soil Erosion and Sediment Control (SESC) Plan Approval | Cumberland-Salem Soil Conservation District | Preparation of Erosion & Sediment Control Plan and associated stormwater management report. | 2 to 4 months | \$10,000 - \$13,000 | Dependent upon construction techniques. |
| Site Plan and Zoning Approval | Municipal Planning and Zoning Board | <ul style="list-style-type: none"> Complete site plan design for substation Prepare and submit site plan application Consultation and public meetings with local planning board | 6 months | \$12,000 - \$18,000 | Planning Board approval required. |

Table A-2 Major Permits, Approvals, and Certifications Potentially Required for the PJM Southern Marine Project

| Permit/Approval | Administering Agency | Component Tasks | Review Time | Approximate Cost | Risk/Comment |
|--|-------------------------------------|--|---------------|---------------------|---|
| Local Building and Road Opening Permits | Municipal Building Department | <ul style="list-style-type: none"> Submit engineering plans to municipal building department for review | 3 to 6 months | \$110,000 | Required approval for building permits |
| DE County and Municipal Permits and Approvals | | | | | |
| Erosion & Sediment Control Plan Approval | New Castle Conservation District | <ul style="list-style-type: none"> Preparation of Erosion & Sediment Control Plan and associated stormwater management report. | 2 to 4 months | \$9,000 - \$15,000 | Dependent upon construction techniques. |
| Site Plan and Zoning Approval | Municipal Planning and Zoning Board | <ul style="list-style-type: none"> Complete site plan design for substation Prepare and submit site plan application Consultation and public meetings with local planning board | 6 months | \$12,000 - \$18,000 | Planning Board approval required. |
| Local Building and Road Opening Permits | Municipal Building Department | <ul style="list-style-type: none"> Submit engineering plans to municipal building department for review | 3 to 6 months | \$110,000 | Required approval for building permits |

Table A-3 Major Permits, Approvals, and Certifications Potentially Required for the PJM Southern Overhead Project

| Permit/Approval | Administering Agency | Component Tasks | Review Time | Approximate Cost | Risk/Comment |
|--|---|--|-------------------------------------|-----------------------|--|
| Federal | | | | | |
| National Environmental Policy Act (NEPA) Consultation and Review | USACE/USFWS | <ul style="list-style-type: none"> Utilize similar field data and application components as the USACE application to submit for review. May require additional public outreach and application materials | 24 to 36 months | \$100,000 - \$500,000 | USACE may require EIS for trenching under the Delaware River in a navigable channel associated with EFH. |
| Clean Water Act (CWA) - Section 404 (33 USC § 1344) Individual Permit Rivers and Harbors Act, Section 10 (33 USC § 403) Executive Order 11988 - Floodplain Management; Executive Order 11990 - Protection of Wetlands | United States Army Corps of Engineers (USACE) Philadelphia District | <ul style="list-style-type: none"> Field delineation of Waters of U.S. Prepare and submit Preliminary Jurisdictional Determination Application. | 10 to 18 months | \$120,000 | <p>New Jersey: USACE regulates activities in tidal waterways and adjacent wetlands. On March 2, 1994, New Jersey entered into an assumption agreement with the USEPA to administer the Federal wetlands program in delegable waters.</p> <p>Likely agency scrutiny associated with the Delaware River crossing. Special conditions for trenching under EFH habitat in Delaware are likely and would affect construction techniques and timing restrictions.</p> |
| Private Aid to Navigation (PATON) | US Coast Guard (USCG) | <ul style="list-style-type: none"> Prepare and submit application under 33CFR66. | Typically issued with USACE permits | \$10,000 | PATON may be required as a condition of USACE authorization. Coordination with both USACE and USCG will be required to ensure compliance with published regulations. Applicant is required to pay costs associated with installation, maintenance and removal of all PATON. |

Table A-3 Major Permits, Approvals, and Certifications Potentially Required for the PJM Southern Overhead Project

| Permit/Approval | Administering Agency | Component Tasks | Review Time | Approximate Cost | Risk/Comment |
|--|---|---|-------------------------------------|---------------------|--|
| Endangered Species Act (ESA) Section 7 Consultation Magnuson-Stevens Fisheries Conservation & Management Act (MSFCMA) Marine Mammal Protection Act (MMPA) | U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS) | <ul style="list-style-type: none"> Desktop review of publicly available data. Submit letters of concurrence to NMFS for review. | Typically issued with USACE permits | \$50,000 | <p>Desktop review and consultation with agencies may result in additional survey of Threatened and Endangered (T&E) habitat.</p> <p>New ROW may require additional consultation and surveys and result in special conditions affecting construction techniques and timing restrictions.</p> <p>Review times vary among projects based on species and seasonality of surveys.</p> |
| Endangered Species Act (ESA) Section 7 Consultation Bald and Golden Eagle Protection Act (BGEPA) Migratory Bird Treaty Act (MBTA) of 1918 (Public Law 65-186) Executive Order 13186 - Responsibilities of Federal Agencies To Protect Migratory Birds | United States Fish and Wildlife Service (USFWS) | <ul style="list-style-type: none"> Desktop review of publicly available data. Submit letters of concurrence to NMFS for review. | Typically issued with USACE permits | \$500,000 | <p>Desktop review and consultation with agencies may result in additional survey of Threatened and Endangered (T&E) habitat.</p> <p>Review times vary among projects based on species and seasonality of surveys.</p> <p>Increased impacts due to new ROW through coastal wetland habitat in Delaware will likely result in increased threatened and endangered species studies and associated permit conditions (timing restrictions and construction practices).</p> |
| Working in or over navigable waters | USCG | <ul style="list-style-type: none"> Consultation with USCG regarding proposed construction activities, techniques and schedules. | 6 to 9 months | \$15,000 - \$40,000 | Work in navigable water will require very close coordination with USCG and USACE. |
| Filing of Notification of Proposed Construction or Alteration (FAA Form 7460-1) | Federal Aviation Administration | <ul style="list-style-type: none"> Complete notification online at FAA Website based on equipment height for each structure | 45 days prior to construction | \$2,500 | FAA may require markings for tall structures or stream crossings. |

Table A-3 Major Permits, Approvals, and Certifications Potentially Required for the PJM Southern Overhead Project

| Permit/Approval | Administering Agency | Component Tasks | Review Time | Approximate Cost | Risk/Comment |
|--|---|---|--|---------------------|--|
| Multi-State | | | | | |
| Delaware River Basin Commission (US Public Law 87-328) and state laws in DE and PA | Delaware River Basin Commission (DRBC), Project Review Section | <ul style="list-style-type: none"> Prepare and submit Project for approval by Commission | 9 to 12 months | \$25,000 - \$40,000 | <p>Required for surface withdrawals and floodplain development within the DRBC jurisdiction</p> <p>Commission meetings occur 5 times per year</p> <p>Trenching under navigable water will require very close coordination with DRBC.</p> |
| State – New Jersey | | | | | |
| Freshwater Wetlands (FWW) Individual Permit and Section 401 Water Quality Certification | New Jersey Department of Environmental Protection (NJDEP), Division of Land Use Regulation (DLUR) | <ul style="list-style-type: none"> Field delineation of freshwater wetlands. Prepare and submit Letter of Interpretation and FWW IP Application. | 6 to 9 months | \$30,000 - \$50,000 | Mitigation is required for permanent impacts to wetlands and transition areas. Limited work is proposed in and around New Jersey wetlands. |
| Flood Hazard Area (FHA) Individual Permit | NJDEP DLUR | <ul style="list-style-type: none"> Desktop delineation and calculation of FHA elevations. Preparation of Plans and reports Submit FHA IP Application | 4 to 6 months (typically issued concurrently with FWW/WFD) | \$35,000 | Project corridor in New Jersey is primarily mapped in floodplain. Limited work is proposed in and around New Jersey wetlands. |
| Waterfront Development (WFD) Individual Permit and Coastal Zone Management Federal Consistency | NJDEP DLUR | <ul style="list-style-type: none"> Similar to FWW IP application. | 6 to 9 months | \$30,000 - \$70,000 | Mitigation is required for permanent impacts to wetlands and transition areas. Limited work is proposed in and around New Jersey wetlands. |
| Tidelands License/Grant | NJDEP Bureau of Tidelands | <ul style="list-style-type: none"> Submit Tidelands Application with WFD IP Coordinate with Bureau of Tidelands for issuance | 1 to 2 months after WFD IP issued | \$70,000 | Limited impacts to potential Tidelands areas in NJ. |

Table A-3 Major Permits, Approvals, and Certifications Potentially Required for the PJM Southern Overhead Project

| Permit/Approval | Administering Agency | Component Tasks | Review Time | Approximate Cost | Risk/Comment |
|--|---|--|--|---------------------|---|
| Freshwater Wetlands General Permit 12 (GP-12) – Geotechnical Borings | NJDEP DLUR | <ul style="list-style-type: none"> Field delineation of freshwater wetlands utilized in other permits. Prepare and submit GP-12 Application | 3 to 6 months | \$7,000 - \$10,000 | Requires locations of geotechnical borings. Timing restrictions and permit conditions may apply. |
| Coastal Permit 27 – Geotechnical Borings | NJDEP DLUR | <ul style="list-style-type: none"> Field delineation of coastal wetlands utilized in other permits. Prepare and submit GP-27 Application | 3 to 6 months | \$7,000 - \$10,000 | Requires locations of geotechnical borings. Timing restrictions and permit conditions may apply. |
| Archaeological and Historic Consultation Section 106 Review | State Historic Preservation Office (SHPO) – NJDEP | <ul style="list-style-type: none"> Desktop review of publicly available data Submit findings to SHPO for review | 6 to 9 months | \$10,000 | Limited work is proposed in New Jersey primarily in previously impacted areas. |
| State T&E Consultation (New Jersey Natural Heritage Program) | NJDEP DLUR | <ul style="list-style-type: none"> Desktop review of publicly available data. Submit letters of concurrence to agencies for review. Complete any required T&E field studies | 6 to 12 months | \$10,000 - \$20,000 | Limited work is proposed in New Jersey primarily in previously impacted areas. Findings could result in additional field studies and/or construction timing restrictions and permit conditions. |
| Miscellaneous NJ State Permits and Approvals | NJDEP | <ul style="list-style-type: none"> Construction Dewatering Permit Water Allocation/Short Term Water Use Permit-by-rule 5G3 Stormwater Construction Permit Air Quality Permit | 1 to 3 months after FWW/WFD/FHA permit is issued | \$17,500 | Permit requirements dependent on construction techniques |
| Plan Release to Local Municipality authorizing Municipal Construction Permit | NJ Department of Community Affairs | <ul style="list-style-type: none"> Submit engineering plans to DCA for review | 3 to 6 months | \$110,000 | Required approval prior to building permits |

Table A-3 Major Permits, Approvals, and Certifications Potentially Required for the PJM Southern Overhead Project

| Permit/Approval | Administering Agency | Component Tasks | Review Time | Approximate Cost | Risk/Comment |
|--|---|---|-----------------|-----------------------|---|
| State – Delaware | | | | | |
| Wetlands and Subaqueous Lands Permit Application and Section 401 Water Quality Certification | DE Department of Natural Resources and Environmental Control (DNREC) – Office of Environmental Protection - Division of Water | <ul style="list-style-type: none"> Field delineation of wetlands. Prepare and submit permit application. | 12 to 18 months | \$300,000 - \$350,000 | Mitigation is required for permanent impacts to wetlands. New ROW and structures proposed for Delaware portion of project will permanently impact wetlands and waters due to the creation of new access roads. Mitigation costs likely to be great. Wetlands impacted are within the state-owned Augustine Wildlife Area. |
| Coastal Zone Management Federal Consistency | DNREC - Delaware Coastal Zone Management Program (DCMP) | <ul style="list-style-type: none"> Prepare and submit application package | 12 to 18 months | \$10,000 - \$20,000 | Reviewed as part of Wetlands and Subaqueous Lands permit application. |
| Miscellaneous DE State Permits and Approvals | DNREC | <ul style="list-style-type: none"> Air Permits NPDES General Permit for Storm Water Discharges Associated With Industrial Activity Water Allocation Permit | 1 to 3 months | \$17,500 | Dependent upon construction techniques. |
| National Pollutant Discharge Elimination System (NPDES) Sediment and Stormwater Plan Construction Permit | DE DNREC – Office of Environmental Protection - Division of Watershed Stewardship | <ul style="list-style-type: none"> Preparation of Erosion & Sediment Control Plan and associated stormwater management report. | 2 to 4 months | \$9,000 - \$15,000 | Dependent upon construction techniques. |

Table A-3 Major Permits, Approvals, and Certifications Potentially Required for the PJM Southern Overhead Project

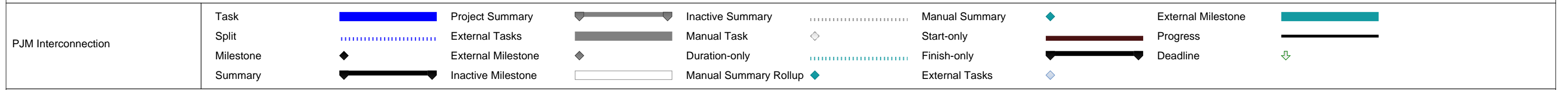
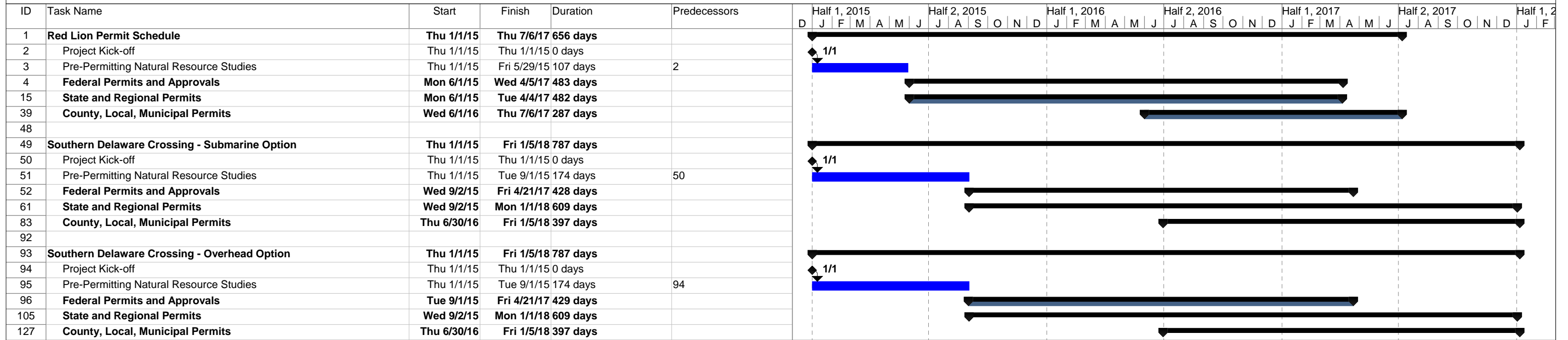
| Permit/Approval | Administering Agency | Component Tasks | Review Time | Approximate Cost | Risk/Comment |
|--|---|--|-----------------|-----------------------|---|
| Environmental Review for Species of Special Concern | Wildlife Species Conservation & Research Program Division of Fish and Wildlife | <ul style="list-style-type: none"> Desktop review of publicly available data. Submit letters of concurrence to agencies for review. Complete any required T&E field studies | 12 to 18 months | \$100,000 - \$250,000 | New ROW and structures proposed for Delaware portion of project will permanently impact wetlands and waters due to the creation of new access roads. Wetlands impacted are within the state-owned Augustine Wildlife Area. Findings will likely result in additional field studies and/or construction timing restrictions and permit conditions. |
| Historical and Cultural Review | DE State Historic Preservation Office | <ul style="list-style-type: none"> Desktop review of publicly available data Submit findings to SHPO for review | 12 to 24 months | \$100,000 | New ROW impacts likely to require greatly increased archaeological studies due to new access roads and viewshed studies due to new structures where none previously existed. SHPO review includes Native American Graves Protection and Repatriation Act (NAGPRA), Historic Structures Viewshed analysis, and Archaeology. Special permit conditions may require extensive additional archaeological studies. |
| NJ County and Municipal Permits and Approvals | | | | | |
| Cumberland-Salem District Soil Erosion and Sediment Control (SESC) Plan Approval | Cumberland-Salem Soil Conservation District | Preparation of Erosion & Sediment Control Plan and associated stormwater management report. | 2 to 4 months | \$10,000 - \$13,000 | Dependent upon construction techniques. |
| Site Plan and Zoning Approval | Municipal Planning and Zoning Board | <ul style="list-style-type: none"> Complete site plan design for substation Prepare and submit site plan application Consultation and public meetings with local planning board | 6 months | \$12,000 - \$18,000 | Planning Board approval required. |

Table A-3 Major Permits, Approvals, and Certifications Potentially Required for the PJM Southern Overhead Project

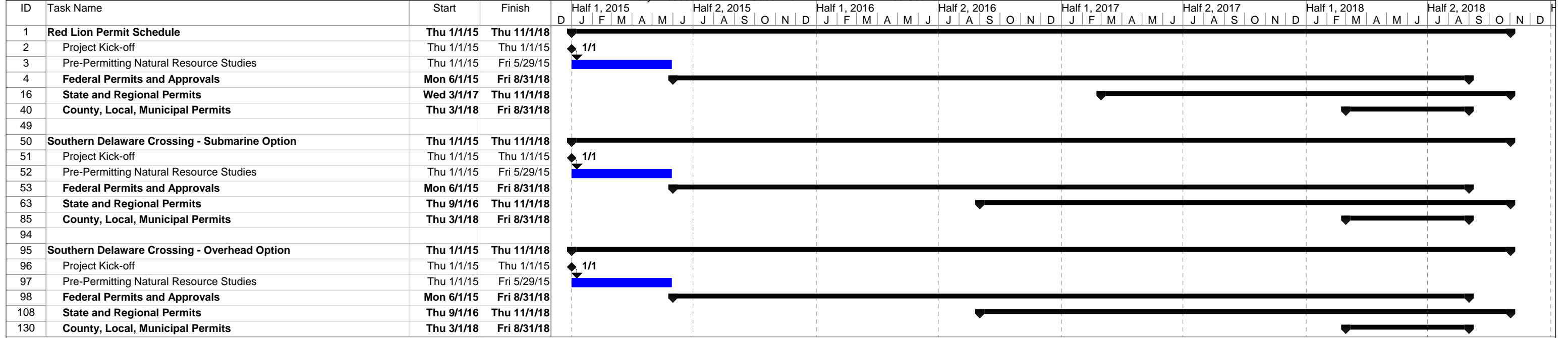
| Permit/Approval | Administering Agency | Component Tasks | Review Time | Approximate Cost | Risk/Comment |
|--|-------------------------------------|--|---------------|---------------------|---|
| Local Building and Road Opening Permits | Municipal Building Department | <ul style="list-style-type: none"> Submit engineering plans to municipal building department for review | 3 to 6 months | \$110,000 | Required approval for building permits |
| DE County and Municipal Permits and Approvals | | | | | |
| Erosion & Sediment Control Plan Approval | New Castle Conservation District | <ul style="list-style-type: none"> Preparation of Erosion & Sediment Control Plan and associated stormwater management report. | 2 to 4 months | \$9,000 - \$15,000 | Dependent upon construction techniques. |
| Site Plan and Zoning Approval | Municipal Planning and Zoning Board | <ul style="list-style-type: none"> Complete site plan design for substation Prepare and submit site plan application Consultation and public meetings with local planning board | 6 months | \$12,000 - \$18,000 | Planning Board approval required. |
| Local Building and Road Opening Permits | Municipal Building Department | <ul style="list-style-type: none"> Submit engineering plans to municipal building department for review | 3 to 6 months | \$110,000 | Required approval for building permits |

Appendix B
Permit Schedules for the Three Scenarios

Likely Reasonable Case Permitting Timeline Three Artificial Island Scenarios

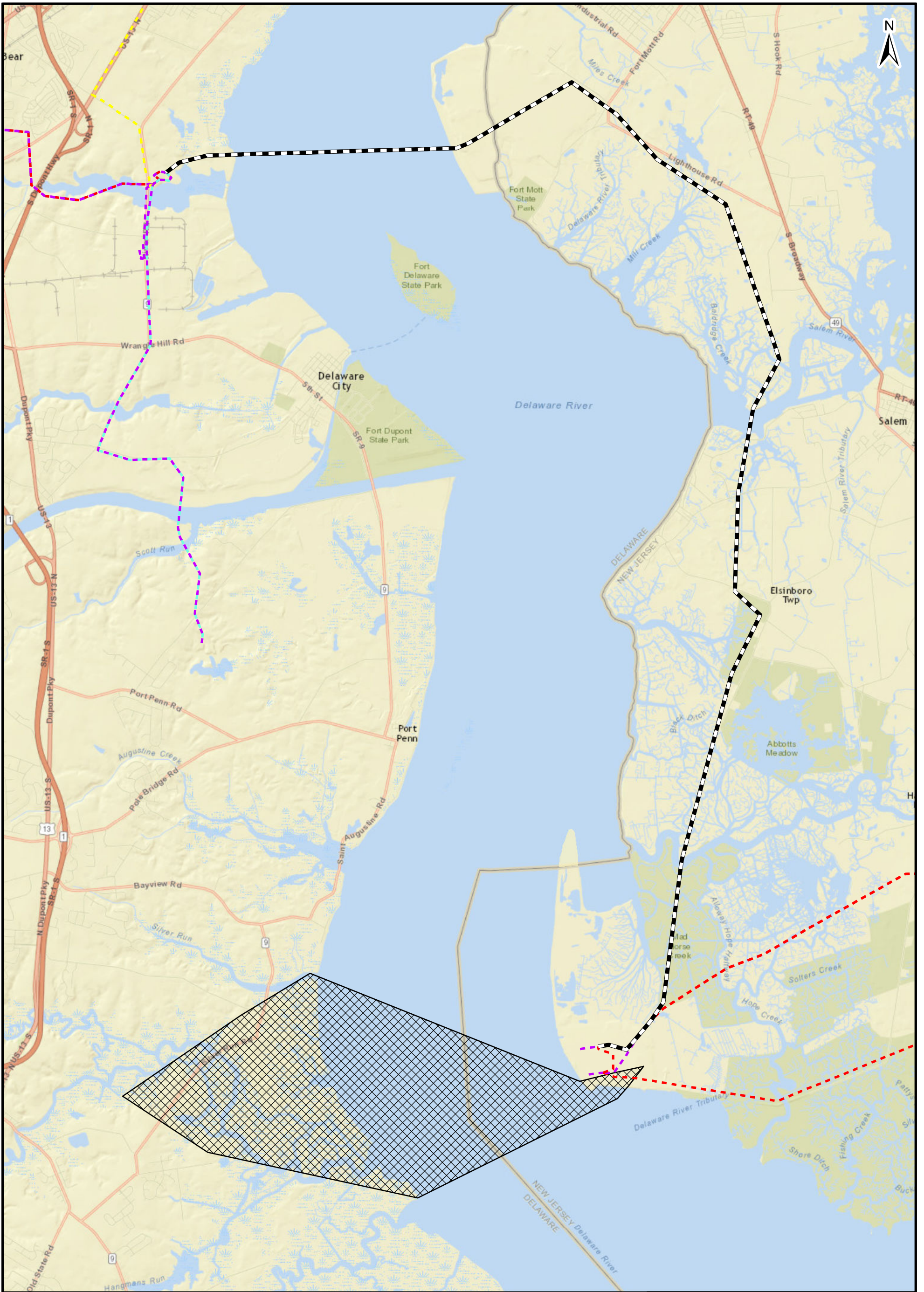


Summary "Reasonable Worst Case" Permit Timeline for Three Scenarios



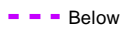
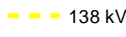




| | | | | | | | | | | | | |
|---|-----------|--|--------------------|--|--|-----------------------|--|-----------------------|--|-----------------------|--------------------|--|
| PJM Interconnection Artificial Island Projects | Task | | Project Summary | | | Inactive Summary | | Manual Summary | | | External Milestone | |
| | Split | | External Tasks | | | External Milestone | | Duration-only | | Manual Summary Rollup | | |
| | Milestone | | External Milestone | | | Duration-only | | Manual Summary Rollup | | | External Tasks | |
| | Summary | | Inactive Milestone | | | Manual Summary Rollup | | External Tasks | | | External Tasks | |

Appendix C Figures



LEGEND:

-  Proposed Red Lion to Hope Line
-  Proposed Marine or Overhead Line
- Existing Transmission Line**
-  Below 100 kV
-  138 kV
-  230 kV
-  500 kV



BASE MAP SOURCE:
ESRI, ArcMap - World Street Map

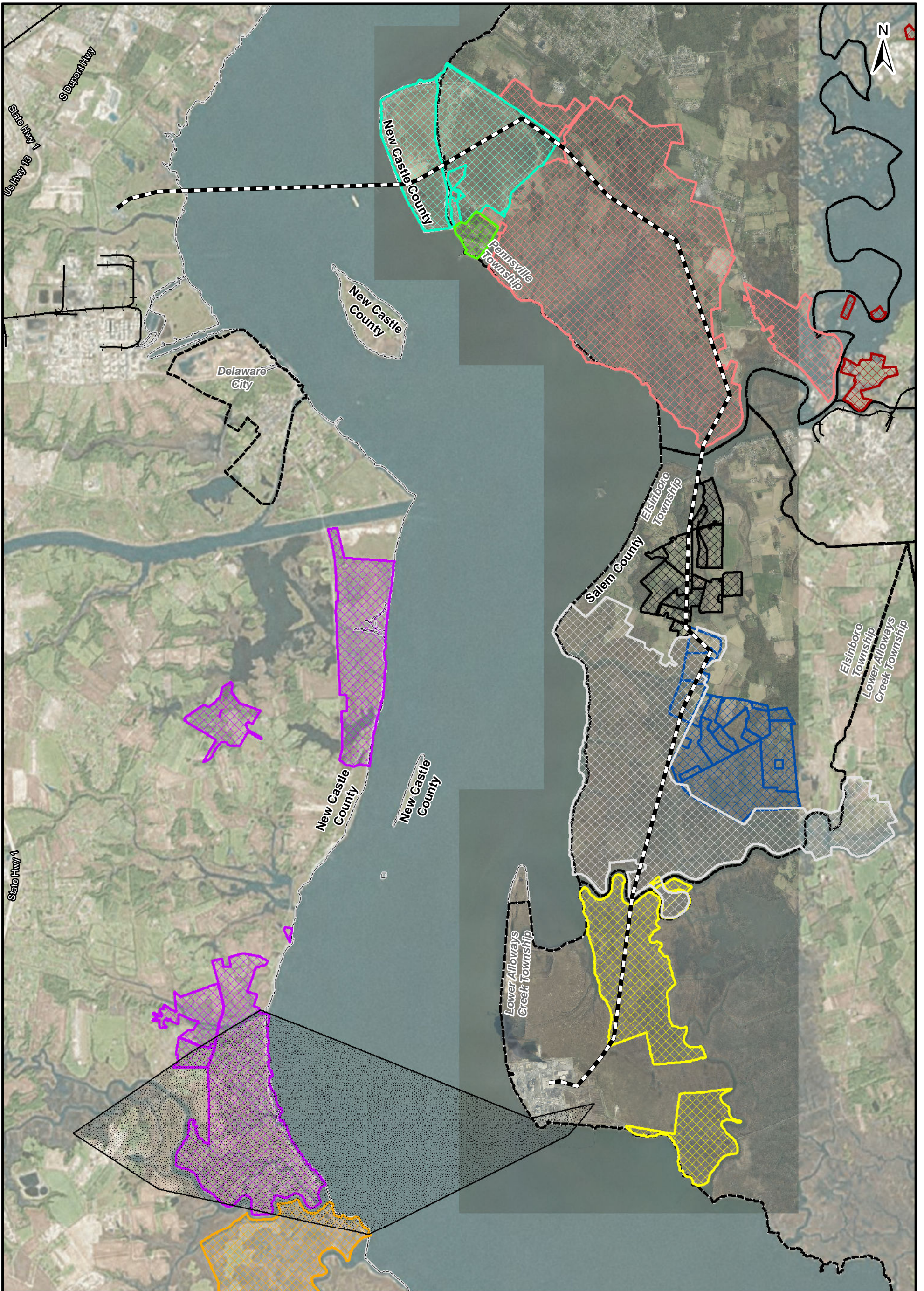


PJM Interconnection
Artificial Island Project

FIGURE 1
OVERVIEW MAP

DATE: 9/26/2014
PN: 650809





| | | | | | | | |
|---|--|---|--|---|--|--|--|
| LEGEND: Proposed Red Lion to Hope Line Proposed Marine or Overhead Line Railroad Municipality County Boundary Augustine Wildlife Area (DDNR) Cedar Swamp Wildlife Area (DDNR) Fort Mott State Park (NJ DEP) Salem River Wildlife Management Area (NJ DEP) | | Abbots Meadow (NJ DEP) Alloway Creek Restoration Site Killcohook Mad Horse Creek (NJ DEP) PresFarm-SADC Direct Easement Purchase (SADC) Supawna Meadows National Wildlife Refuge (USFWS) | | <p>Scale In Miles</p> <p>BASE MAP SOURCE: New Jersey Aerials, Salem County 2012 ESRI, ArcMap - World Imagery (Microsoft, 2010-2011)</p> | | <p>PJM Interconnection Artificial Island Project</p> | |
| FIGURE 2 POLITICAL BOUNDARIES OVERVIEW MAP | | | | | | | |
| DATE: 9/26/2014 PN: 650809 | | | | | | | |



LEGEND:

| | |
|----------------------------------|----------------------------------|
| Proposed Red Lion to Hope Line | FRESHWATER TIDAL MARSHES |
| Proposed Marine or Overhead Line | HERBACEOUS WETLANDS |
| Stream (NHD) | MANAGED WETLANDS (MODIFIED) |
| AGRICULTURAL WETLANDS | ESTUARINE SCRUB SHRUB |
| ATLANTIC WHITE CEDAR WETLANDS | OTHER |
| ESTUARINE | OTHER EMERGENT |
| ESTUARINE EMERGENT | OTHER FORESTED |
| SCRUB/SHRUB WETLANDS | SALINE MARSHES |
| FORESTED WETLANDS | OTHER SCRUB SHRUB |
| DISTURBED WETLANDS (MODIFIED) | WETLAND RIGHTS-OF-WAY (MODIFIED) |

0 4,200 8,400

Scale In Feet

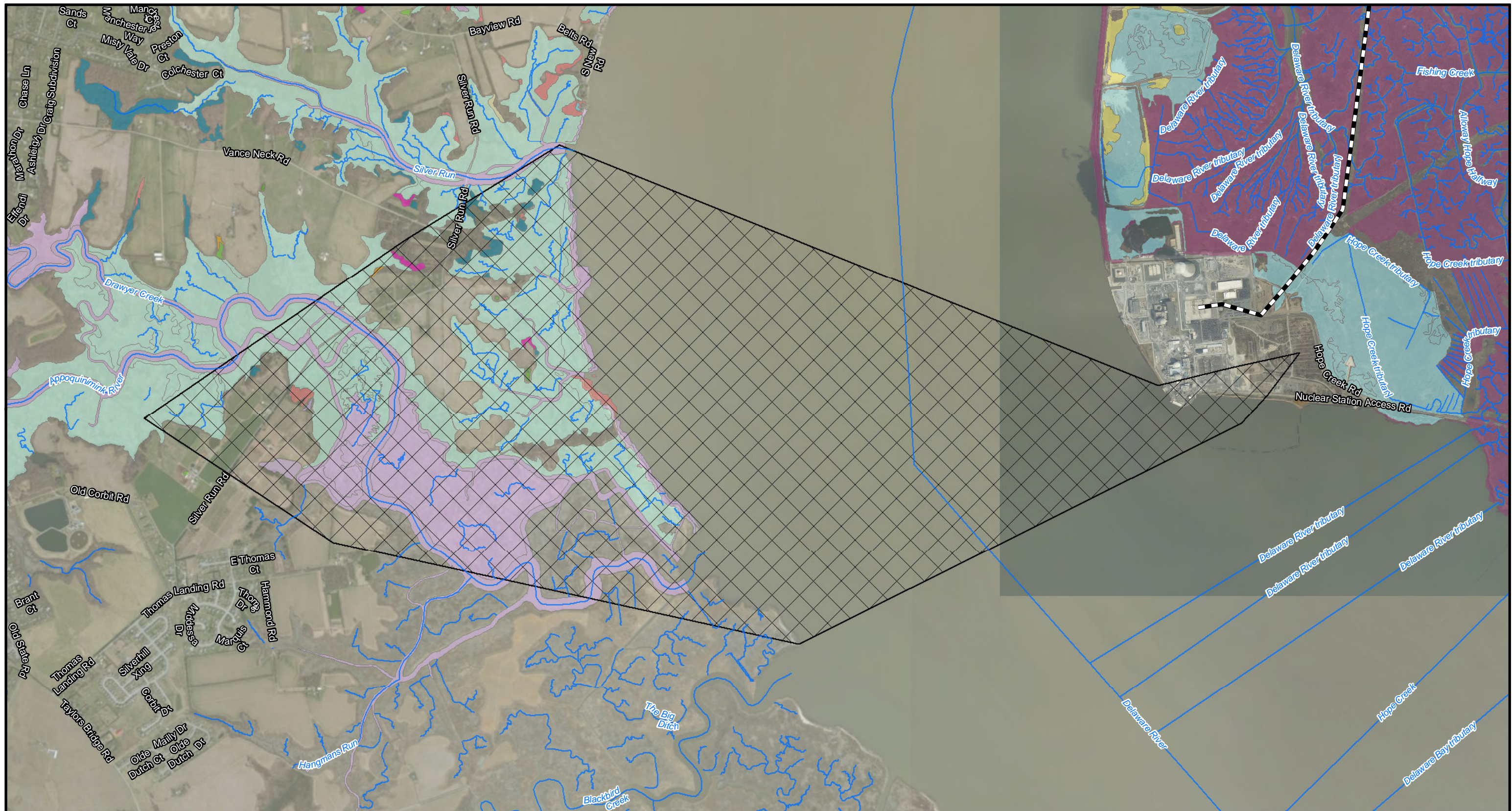
BASE MAP SOURCE:
 New Jersey Aerials, Salem County 2012
 ESRI, ArcMap - World Imagery
 (Microsoft, 2010-2011)

PJM Interconnection
 Artificial Island Project

FIGURE 3A
ECOLOGICAL CONSTRAINTS
FOR PROPOSED OVERHEAD LINE

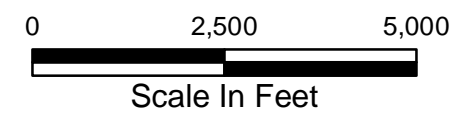
DATE: 9/26/2014
 PN: 650809

CH2MHILL




LEGEND:

| | | |
|----------------------------------|-------------------------------|----------------------------------|
| Proposed Red Lion to Hope Line | SCRUB/SHRUB WETLANDS | OTHER |
| Proposed Marine or Overhead Line | FORESTED WETLANDS | OTHER EMERGENT |
| Stream (NHD) | DISTURBED WETLANDS (MODIFIED) | OTHER FORESTED |
| AGRICULTURAL WETLANDS | FRESHWATER TIDAL MARSHES | SALINE MARSHES |
| ATLANTIC WHITE CEDAR WETLANDS | HERBACEOUS WETLANDS | OTHER SCRUB SHRUB |
| ESTUARINE | MANAGED WETLANDS (MODIFIED) | WETLAND RIGHTS-OF-WAY (MODIFIED) |
| ESTUARINE EMERGENT | ESTUARINE SCRUB SHRUB | |



BASE MAP SOURCE:
 New Jersey Aerials, Salem County 2012
 ESRI, ArcMap - World Imagery
 (Microsoft, 2010-2011)

PJM Interconnection
 Artificial Island Project

FIGURE 3B
 ECOLOGICAL CONSTRAINTS
 FOR PROPOSED MARINE/OVERHEAD LINE

DATE: 9/26/2014
 PN: 650809

