

Central Ohio Expanded 345 kV

General Information

Proposing entity name	Proprietary & Confidential Information
Does the entity who is submitting this proposal intend to be the Designated Entity for this proposed project?	Proprietary & Confidential Information
Company proposal ID	Proprietary & Confidential Information
PJM Proposal ID	644
Project title	Central Ohio Expanded 345 kV
Project description	Expand the 345kV transmission system in central Ohio to meet 2031 and 2034 reliability needs.
Email	Proprietary & Confidential Information
Project in-service date	06/2032
Tie-line impact	Yes
Interregional project	No
Is the proposer offering a binding cap on capital costs?	Yes
Additional benefits	Proprietary & Confidential Information

Project Components

1. 82) Marysville - Celtic 345 kV Double Circuit
2. 147) Cole - Beacon 345 kV
3. 148) Cole - Beacon 345 kV
4. 158) Thistlewood - Madison 345kV Double Circuit
5. 161) Fayette - Adkins 345kV
6. 163) Adkins - Cyprus/Beirs Run 345 kV Double Circuit

7. 36) Beacon 345 kV Substation Upgrade
8. 37) Cole 345 kV Substation Upgrade
9. 99) Cyprus Substation Upgrades
10. 102) Bixby / Biers Run - Cyprus 345 kV loop-in Double Circuit
11. 106) Celtic 345 kV Substation Upgrade
12. 83) Marysville Substation Upgrade
13. 157) Thistlewood 765/345kV Substation
14. 159) Madison 345kV Substation
15. 160) Fayette 345/138kV Substation
16. 162) Adkins 765/345kV expansion

Greenfield Transmission Line Component

Component title	82) Marysville - Celtic 345 kV Double Circuit	
Project description	Proprietary & Confidential Information	
Point A	Marysville	
Point B	Celtic	
Point C		
	Normal ratings	Emergency ratings
Summer (MVA)	2228.000000	2292.000000
Winter (MVA)	2396.000000	2452.000000
Conductor size and type	2xCurlew ACSS	
Nominal voltage	AC	
Nominal voltage	345	
Line construction type	Overhead	

General route description	The proposed Marysville - Celtic 345 kV Double Circuit transmission line component originates at the Marysville substation and terminates at the Celtic substation, traversing through 1 counties, including Union County, Ohio. The line is proposed as an overhead double circuit 345 kV transmission facility. The component generally follows existing infrastructure corridors where practicable, such as major roadways, existing transmission corridors, rail corridors, and utility rights-of-way, in order to minimize environmental and land use impacts.
Terrain description	The proposed Marysville - Celtic 345 kV Double Circuit component traverses terrain that is generally characterized by relatively flat to gently rolling terrain, consisting primarily of agricultural, forested, and developed land uses. The topography along the route includes low-relief plains within the Eastern Corn Belt Plains ecoregion, with slope conditions characterized by gentle slopes ranging from approximately 0 to 5 percent. Subsurface conditions generally consist of dolostone overlain by Blount silt loam, Pewamo silty clay loam, and Glynwood silt loam. Population and development characteristics along the proposed route consist of predominantly rural and undeveloped areas, with limited residential presence and minimal population exposure along the proposed route . Please see Attachment 14 for detailed route analysis.
Right-of-way width by segment	The route will require a 150-foot-wide right-of-way (ROW).
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file) for crossing plans and locations.

Environmental impacts	Environmental constraints associated with the proposed Marysville - Celtic 345 kV Double Circuit component were evaluated within the vicinity of the proposed project centerline and are considered manageable through avoidance, minimization, and mitigation during routing, siting, design, and permitting. The proposed route crosses approximately 0.3 miles of mapped wetlands, including approximately 0.1 miles of freshwater emergent wetlands, 0.1 miles of forested wetlands, and 0.2 miles of riverine wetlands. The proposed route does not cross any major water bodies according to analysis performed with publicly available data. Most wetland and waterbody features are anticipated to be spanned or crossed with minimal permanent impacts, and applicable federal, state, and local permits and authorizations will be obtained, as required. The proposed route intersects approximately 28.9 acres of forested area. Tree clearing restrictions may apply due to the potential presence of listed endangered bat species or other protected wildlife habitat. Consultation with the USFWS may also be required depending on the results of field verification and the potential for impacts to federally protected species or habitat. Based on preliminary FEMA mapping, the route intersects approximately 0.2 miles of FEMA-designated 100-Year Flood Zones and 0.1 miles of FEMA-designated 500-Year Flood Zones. The proposed route does not cross or intersect with any historic features according to analysis performed with publicly available data. The proposed component does not cross through any identified critical habitats according to analysis performed with publicly available data. Industry-standard environmental construction best management practices ("BMPs") will be implemented to minimize impacts to natural and cultural resources. Based on environmental reviews completed to date, no fatal environmental flaws or significant constraints have been identified that would preclude permitting, construction, or operation of the Project. Identified impacts are anticipated to be manageable through standard permitting, agency coordination, route refinement, and mitigation. No Major Federal Action that would trigger preparation of a National Environmental Policy Act ("NEPA") document is currently anticipated for the proposed component.
Tower characteristics	Vertical monopole. See structure drawing set included in Attachment 10.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year \$	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information

Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	\$79,949,796.00
Component cost (in-service year)	\$88,515,789.00

Greenfield Transmission Line Component

Component title	147) Cole - Beacon 345 kV
Project description	Proprietary & Confidential Information
Point A	Cole
Point B	Beacon
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	1400.000000	1400.000000
Winter (MVA)	1400.000000	1400.000000
Conductor size and type	Two (2) 3500kcmil copper XLPE cables per phase installed in a 2 Row by 3 Column concrete encased duct bank. Each duct will have a single 3500kcmil cable.	
Nominal voltage	AC	
Nominal voltage	345	
Line construction type	Underground	

General route description	This is the underground segment of the proposed Cole - Beacon 345 kV transmission line. The component will originate at the Cole substation and terminate at the Beacon substation, traversing through 1 counties, including Franklin County, Ohio. The line is proposed as an underground single circuit 345 kV transmission facility. The component generally follows existing infrastructure corridors where practicable, such as major roadways, existing transmission corridors, rail corridors, and utility rights-of-way, in order to minimize environmental and land use impacts.
Terrain description	The proposed Cole - Beacon 345 kV (Underground) component traverses terrain that is generally characterized by relatively flat to gently rolling terrain, consisting primarily of developed, agricultural, and barren land uses. The topography along the route includes low-relief plains within the Eastern Corn Belt Plains ecoregion, with slope conditions characterized by gentle slopes ranging from approximately 0 to 5 percent. Subsurface conditions generally consist of limestone and dolostone overlain by Udorthents-Urban land complex, Crosby silt loam, and Kokomo silty clay loam. Population and development characteristics along the proposed route consist of a mixed rural-residential and suburban setting, with intermittent residential subdivisions and localized development present along select portions of the alignment; however, these areas appear limited and manageable through standard routing, siting, and stakeholder coordination practices. Please see Attachment 14 for detailed route analysis.
Right-of-way width by segment	The route will require a 30-foot-wide right-of-way (ROW).
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file) for crossing plans and locations.

Environmental impacts	Environmental constraints associated with the proposed Cole - Beacon 345 kV (Underground) component were evaluated within the vicinity of the proposed project centerline and are considered manageable through avoidance, minimization, and mitigation during routing, siting, design, and permitting. The proposed component was developed to maximize the use of existing utility and transportation corridors, previously disturbed areas, and compatible land uses, where practicable. Route alternatives were evaluated through environmental screening, aerial imagery review, GIS analysis, and constructability assessments. The project evaluated opportunities for co-location with existing infrastructure, land use considerations, permitting considerations, and other project-specific factors to avoid and minimize impacts to sensitive environmental resources, to the extent practicable. Additional details on preliminary routing and feasibility are included in Attachment 14 (Routing Supplemental Attachment). Industry-standard environmental construction Best Management Practices and Time-of-Year restrictions will be implemented to minimize impacts to natural and cultural resources encountered by the proposed project. Based on environmental reviews completed to date, no fatal environmental flaws or significant constraints have been identified that would preclude permitting, construction, or operation of the Project. Identified impacts are anticipated to be manageable through standard permitting, agency coordination, route refinement, and mitigation. Additional details on the anticipated environmental permitting approach and a description of the federal, state, and local regulatory environment is included in Attachment 8 (Environmental and Permitting Plan).
Tower characteristics	Underground Duct Bank.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year \$	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information

Total component cost	\$67,917,426.00
Component cost (in-service year)	\$75,090,627.00

Greenfield Transmission Line Component

Component title	148) Cole - Beacon 345 kV	
Project description	Proprietary & Confidential Information	
Point A	Cole	
Point B	Beacon	
Point C		
	Normal ratings	Emergency ratings
Summer (MVA)	2228.000000	2292.000000
Winter (MVA)	2396.000000	2452.000000
Conductor size and type	2xCurlew ACSS	
Nominal voltage	AC	
Nominal voltage	345	
Line construction type	Overhead	
General route description	The proposed Cole - Beacon 345 kV (Overhead) transmission line componet originates at the Cole substation and terminates at the Beacon substation, traversing through 1 counties, including Franklin County, Ohio. The line is proposed as an overhead single circuit 345 kV transmission facility. The component generally follows existing infrastructure corridors where practicable, such as major roadways, existing transmission corridors, rail corridors, and utility rights-of-way, in order to minimize environmental and land use impacts.	

Terrain description	The proposed Cole - Beacon 345 kV (Overhead) component traverses terrain that is generally characterized by relatively flat terrain, consisting primarily of developed, agricultural, and barren land uses. The topography along the route includes low-relief plains within the Eastern Corn Belt Plains ecoregion. Subsurface conditions generally consist of limestone and dolostone overlain by Urban land-Celina complex, Crosby silt loam, and Kokomo silty clay loam. Population and development characteristics along the proposed route consist of a mixed rural-residential and suburban setting, with intermittent residential subdivisions and localized development present along select portions of the alignment; however, these areas appear limited and manageable through standard routing, siting, and stakeholder coordination practices. Please see Attachment 14 for detailed route analysis.
Right-of-way width by segment	The route will require a 150-foot-wide right-of-way (ROW).
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file) for crossing plans and locations.
Environmental impacts	Environmental constraints associated with the proposed Cole - Beacon 345 kV (Overhead) component were evaluated within the vicinity of the proposed project centerline and are considered manageable through avoidance, minimization, and mitigation during routing, siting, design, and permitting. The proposed component was developed to maximize the use of existing utility and transportation corridors, previously disturbed areas, and compatible land uses, where practicable. Route alternatives were evaluated through environmental screening, aerial imagery review, GIS analysis, and constructability assessments. The project evaluated opportunities for co-location with existing infrastructure, land use considerations, permitting considerations, and other project-specific factors to avoid and minimize impacts to sensitive environmental resources, to the extent practicable. Additional details on preliminary routing and feasibility are included in Attachment 14 (Routing Supplemental Attachment). Industry-standard environmental construction Best Management Practices and Time-of-Year restrictions will be implemented to minimize impacts to natural and cultural resources encountered by the proposed project. Based on environmental reviews completed to date, no fatal environmental flaws or significant constraints have been identified that would preclude permitting, construction, or operation of the Project. Identified impacts are anticipated to be manageable through standard permitting, agency coordination, route refinement, and mitigation. Additional details on the anticipated environmental permitting approach and a description of the federal, state, and local regulatory environment is included in Attachment 8 (Environmental and Permitting Plan).
Tower characteristics	Delta SWAK. See structure drawing set included in Attachment 10.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information

Component Cost Details - In Current Year \$

Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	\$15,670,685.00
Component cost (in-service year)	\$17,276,844.00

Greenfield Transmission Line Component

Component title	158) Thistlewood - Madison 345kV Double Circuit
Project description	Proprietary & Confidential Information
Point A	Thistlewood
Point B	Madison
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	2228.000000	2292.000000
Winter (MVA)	2396.000000	2452.000000
Conductor size and type	2xCurlew ACSS	

Nominal voltage	AC
Nominal voltage	345
Line construction type	Overhead
General route description	The proposed Thistlewood - Madison 345kV Double Circuit transmission line component originates at the Thistlewood substation and terminates at the Madison substation, traversing through 1 county, including Clark County, Ohio. The line is proposed as an overhead double circuit 345 kV transmission facility. The component generally follows existing infrastructure corridors where practicable, such as major roadways, existing transmission corridors, rail corridors, and utility rights-of-way, in order to minimize environmental and land use impacts.
Terrain description	The proposed Thistlewood - Madison 345kV Double Circuit component traverses terrain that is generally characterized by gently rolling to rolling terrain, consisting primarily of agricultural, forested, and developed land uses. The topography along the route includes low-relief plains within the Eastern Corn Belt Plains ecoregion, with slope conditions characterized by gentle to moderate slopes ranging from approximately 0 to 10 percent. Subsurface conditions generally consist of dolostone, limestone, and shale overlain by Kokomo silty clay loam, Strawn-Crosby complex, and Miamian silt loam. Population and development characteristics along the proposed route consist of predominantly rural and undeveloped areas, with limited residential presence and minimal population exposure along the proposed route . Please see Attachment 14 for detailed route analysis.
Right-of-way width by segment	The route will require a 150-foot-wide right-of-way (ROW).
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file) for crossing plans and locations.

Environmental impacts	Environmental constraints associated with the proposed Thistlewood - Madison 345kV Double Circuit component were evaluated within the vicinity of the proposed project centerline and are considered manageable through avoidance, minimization, and mitigation during routing, siting, design, and permitting. The proposed component was developed to maximize the use of existing utility and transportation corridors, previously disturbed areas, and compatible land uses, where practicable. Route alternatives were evaluated through environmental screening, aerial imagery review, GIS analysis, and constructability assessments. The project evaluated opportunities for co-location with existing infrastructure, land use considerations, permitting considerations, and other project-specific factors to avoid and minimize impacts to sensitive environmental resources, to the extent practicable. Additional details on preliminary routing and feasibility are included in Attachment 14 (Routing Supplemental Attachment). Industry-standard environmental construction Best Management Practices and Time-of-Year restrictions will be implemented to minimize impacts to natural and cultural resources encountered by the proposed project. Based on environmental reviews completed to date, no fatal environmental flaws or significant constraints have been identified that would preclude permitting, construction, or operation of the Project. Identified impacts are anticipated to be manageable through standard permitting, agency coordination, route refinement, and mitigation. Additional details on the anticipated environmental permitting approach and a description of the federal, state, and local regulatory environment is included in Attachment 8 (Environmental and Permitting Plan).
Tower characteristics	Steel monopole. See structure drawing set included in Attachment 10.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year \$	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information

Total component cost	\$53,583,189.00
Component cost (in-service year)	\$59,350,452.00

Greenfield Transmission Line Component

Component title	161) Fayette - Adkins 345kV
Project description	Proprietary & Confidential Information
Point A	Fayette
Point B	Adkins

Point C		
	Normal ratings	Emergency ratings
Summer (MVA)	2228.000000	2292.000000
Winter (MVA)	2396.000000	2452.000000
Conductor size and type	2xCurlew ACSS	
Nominal voltage	AC	
Nominal voltage	345	
Line construction type	Overhead	
General route description	The proposed Fayette - Adkins 345kV line (Single circuit, double circuit capable) transmission line componet originates at the Fayette substation and terminates at the Adkins substation, traversing through 3 counties, including Fayette County, Madison County, and Pickaway County, Ohio. The line is proposed as an overhead single circuit 345 kV transmission facility. The component generally follows existing infrastructure corridors where practicable, such as major roadways, existing transmission corridors, rail corridors, and utility rights-of-way, in order to minimize environmental and land use impacts.	

Terrain description	The proposed Fayette - Adkins 345kV line (Single circuit, double circuit capable) component traverses terrain that is generally characterized by relatively flat terrain, consisting primarily of agricultural, forested, and developed land uses. The topography along the route includes low-relief plains within the Eastern Corn Belt Plains ecoregion. Subsurface conditions generally consist of dolostone overlain by Brookston silty clay loam, Kokomo silty clay loam, and Crosby silt loam. Population and development characteristics along the proposed route consist of predominantly rural and undeveloped areas, with limited residential presence and minimal population exposure along the proposed route . Please see Attachment 14 for detailed route analysis.
Right-of-way width by segment	The route will require a 150-foot-wide right-of-way (ROW).
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file) for crossing plans and locations.
Environmental impacts	Environmental constraints associated with the proposed Fayette - Adkins 345kV line (Single circuit, double circuit capable) component were evaluated within the vicinity of the proposed project centerline and are considered manageable through avoidance, minimization, and mitigation during routing, siting, design, and permitting. The proposed component was developed to maximize the use of existing utility and transportation corridors, previously disturbed areas, and compatible land uses, where practicable. Route alternatives were evaluated through environmental screening, aerial imagery review, GIS analysis, and constructability assessments. The project evaluated opportunities for co-location with existing infrastructure, land use considerations, permitting considerations, and other project-specific factors to avoid and minimize impacts to sensitive environmental resources, to the extent practicable. Additional details on preliminary routing and feasibility are included in Attachment 14 (Routing Supplemental Attachment). Industry-standard environmental construction Best Management Practices and Time-of-Year restrictions will be implemented to minimize impacts to natural and cultural resources encountered by the proposed project. Based on environmental reviews completed to date, no fatal environmental flaws or significant constraints have been identified that would preclude permitting, construction, or operation of the Project. Identified impacts are anticipated to be manageable through standard permitting, agency coordination, route refinement, and mitigation. Additional details on the anticipated environmental permitting approach and a description of the federal, state, and local regulatory environment is included in Attachment 8 (Environmental and Permitting Plan).
Tower characteristics	Steel monopole. See structure drawing set included in Attachment 10.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year \$	

Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	\$91,885,004.00
Component cost (in-service year)	\$102,054,029.00

Greenfield Transmission Line Component

Component title	163) Adkins - Cyprus/Beirs Run 345 kV Double Circuit	
Project description	Proprietary & Confidential Information	
Point A	Adkins	
Point B	Cyprus/Biers Run	
Point C		
	Normal ratings	Emergency ratings
Summer (MVA)	2228.000000	2292.000000
Winter (MVA)	2396.000000	2452.000000
Conductor size and type	2xCurlew ACSS	
Nominal voltage	AC	

Nominal voltage	345
Line construction type	Overhead
General route description	The proposed Adkins - Cyprus/Beirs Run 345kV Double Circuit transmission line component originates at the Adkins substation and terminates at the Cyprus/Biers Run substation, traversing through 1 counties, including Pickaway County, Ohio. The line is proposed as an overhead double circuit 345 kV transmission facility. The route is primarily located within agricultural, developed, and barren terrain and follows existing right-of-way for approximately 75% of the route and will require new right-of-way for approximately 25% of the route. The component generally follows existing infrastructure corridors where practicable, such as major roadways, existing transmission corridors, rail corridors, and utility rights-of-way, in order to minimize environmental and land use impacts.
Terrain description	The proposed Adkins - Cyprus/Beirs Run 345kV Double Circuit component traverses terrain that is generally characterized by relatively flat terrain, consisting primarily of agricultural, developed, and barren land uses. The topography along the route includes low-relief plains within the Eastern Corn Belt Plains ecoregion. Subsurface conditions generally consist of dolostone and limestone overlain by Kokomo silty clay loam, Miamian-Lewisburg silt loams, and Crosby silt loam. Population and development characteristics along the proposed route consist of predominantly rural and undeveloped areas, with limited residential presence and minimal population exposure along the proposed route . Please see Attachment 14 for detailed route analysis.
Right-of-way width by segment	The proposed 345 kV transmission line will utilize a 150-foot-wide right-of-way (ROW) along the route. Approximately 75% of the proposed route is anticipated to parallel, co-locate within, or expand upon existing transmission or utility corridors, while the remaining approximately 25% of the route will consist of new greenfield ROW.
Electrical transmission infrastructure crossings	See Attachment 4 (Google Earth .kmz file) for crossing locations.
Civil infrastructure/major waterway facility crossing plan	See Attachment 5 (Crossing Plan) and Attachment 4 (Google Earth .kmz file) for crossing plans and locations.

Environmental impacts	Environmental constraints associated with the proposed Adkins - Cyprus/Beirs Run 345kV Double Circuit component were evaluated within the vicinity of the proposed project centerline and are considered manageable through avoidance, minimization, and mitigation during routing, siting, design, and permitting. The proposed component was developed to maximize the use of existing utility and transportation corridors, previously disturbed areas, and compatible land uses, where practicable. Route alternatives were evaluated through environmental screening, aerial imagery review, GIS analysis, and constructability assessments. The project evaluated opportunities for co-location with existing infrastructure, land use considerations, permitting considerations, and other project-specific factors to avoid and minimize impacts to sensitive environmental resources, to the extent practicable. Additional details on preliminary routing and feasibility are included in Attachment 14 (Routing Supplemental Attachment). Industry-standard environmental construction Best Management Practices and Time-of-Year restrictions will be implemented to minimize impacts to natural and cultural resources encountered by the proposed project. Based on environmental reviews completed to date, no fatal environmental flaws or significant constraints have been identified that would preclude permitting, construction, or operation of the Project. Identified impacts are anticipated to be manageable through standard permitting, agency coordination, route refinement, and mitigation. Additional details on the anticipated environmental permitting approach and a description of the federal, state, and local regulatory environment is included in Attachment 8 (Environmental and Permitting Plan).
Tower characteristics	Steel monopole. See structure drawing set included in Attachment 10.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year \$	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information

Total component cost	\$24,824,571.00
Component cost (in-service year)	\$27,475,014.00
Substation Upgrade Component	
Component title	36) Beacon 345 kV Substation Upgrade
Project description	Proprietary & Confidential Information
Substation name	Beacon
Substation zone	AEP
Substation upgrade scope	Add one (1) 345kV to spare position in the existing 345kV breaker and a half (BAAH) switchyard to terminate one (1) new line.
Transformer Information	
None	
New equipment description	Add (1) new 345kV, 5000A, 63kAIC breaker and (1) 345kV line.
Substation assumptions	Assumes sufficient space is available within the existing substation fenceline and will not require expansion.
Real-estate description	Proposed upgrade does not require additional real estate acquisition
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year \$	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information

Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	\$3,750,000.00
Component cost (in-service year)	\$4,160,638.00
Substation Upgrade Component	
Component title	37) Cole 345 kV Substation Upgrade
Project description	Proprietary & Confidential Information
Substation name	Cole
Substation zone	AEP
Substation upgrade scope	Expand the existing 345kV breaker and a half (BAAH) switchyard by adding two (2) breakers to create an additional string and terminate one (1) 345kV line.
Transformer Information	
None	
New equipment description	Add (2) new 345kV, 5000A, 63kAIC breakers and (1) 345kV line.
Substation assumptions	Assumes sufficient space is available within the existing substation fenceline and will not require expansion.
Real-estate description	Proposed upgrade does not require additional real estate acquisition
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year \$	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information

ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	\$6,000,000.00
Component cost (in-service year)	\$6,657,022.00
Substation Upgrade Component	
Component title	99) Cyprus Substation Upgrades
Project description	Proprietary & Confidential Information
Substation name	Cyprus
Substation zone	AEP
Substation upgrade scope	Expand the existing 345kV double breaker double bus (DBDB) switchyard by adding four (4) breakers to create two (2) additional bays and two (2) line terminals.
Transformer Information	
None	
New equipment description	Add (4) 345kV, 5000A, 63kAIC breakers and (2) 345kV lines.
Substation assumptions	Upgrades to this substation will require an expansion of the fence line to the North of the existing fenceline
Real-estate description	The substation fence line will require expansion to accommodate the new equipment, but no additional real estate will need to be acquired.
Construction responsibility	Proprietary & Confidential Information

Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year \$	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	\$10,000,000.00
Component cost (in-service year)	\$11,095,036.00
Transmission Line Upgrade Component	
Component title	102) Bixby / Biers Run - Cyprus 345 kV loop-in Double Circuit
Project description	Proprietary & Confidential Information
Impacted transmission line	Bixby to Biers Run
Point A	Bixby/Biers Run
Point B	Cyprus
Point C	
Terrain description	The proposed transmission line connections originate from the existing Bixby-Biers Run 345 kV transmission corridor and extends to the Cyprus Substation. The connections are configured on double-circuit structures between the existing transmission corridor and the new substation. The route traverses predominantly level to gently rolling terrain characteristic of central Ohio, consisting primarily of agricultural and open land with localized developed areas.

Existing Line Physical Characteristics

Operating voltage	345
Conductor size and type	Incumbent / Transmission Owner to select conductor to achieve the required ratings
Hardware plan description	Matches existing facilities
Tower line characteristics	Matches existing facilities

Proposed Line Characteristics

	Designed	Operating
Voltage (kV)	345.000000	345.000000
	Normal ratings	Emergency ratings
Summer (MVA)	1409.000000	1606.000000
Winter (MVA)	1781.000000	1909.000000
Conductor size and type	Matches existing facilities	
Shield wire size and type	Matches existing facilities	
Rebuild line length	2.11	
Rebuild portion description	Cuts into existing Bixby to Biers Run 345 kV Transmission line and routes 2.15 miles north to the Cyprus Substation and back to the initial cut in point on double circuit towers; Creates a new Bixby to Cyprus 345 kV circuit connection and a new Biers Run to Cyprus 345 kV circuit connection.	
Right of way	150	
Construction responsibility	Proprietary & Confidential Information	
Benefits/Comments	Proprietary & Confidential Information	
Component Cost Details - In Current Year \$		
Engineering & design	Proprietary & Confidential Information	
Permitting / routing / siting	Proprietary & Confidential Information	

ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	\$10,000,000.00
Component cost (in-service year)	\$11,095,036.00
Substation Upgrade Component	
Component title	106) Celtic 345 kV Substation Upgrade
Project description	Proprietary & Confidential Information
Substation name	Celtic
Substation zone	AEP
Substation upgrade scope	Add one (1) 345kV breaker to the existing switchyard to create one (1) additional line terminal.
Transformer Information	
None	
New equipment description	Add (1) 345kV, 5000A, 63kAIC breaker and (1) 345kV line.
Substation assumptions	Assumes required equipment upgrades occur in existing GIS housing structure and substation footprint.
Real-estate description	Proposed upgrade does not require additional real estate acquisition
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information

Component Cost Details - In Current Year \$

Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	\$3,750,000.00
Component cost (in-service year)	\$4,160,638.00

Substation Upgrade Component

Component title	83) Marysville Substation Upgrade
Project description	Proprietary & Confidential Information
Substation name	Marysville
Substation zone	AEP
Substation upgrade scope	Add two (2) 345kV breakers to the existing switchyard to create two (2) line terminals.

Transformer Information

None	
New equipment description	Add (2) new 345kV, 5000A, 63kAIC breakers and (2) 345kV lines.
Substation assumptions	Assumes sufficient space is available within the existing substation yard to accommodate the addition of two spare breakers for the new double circuit line.

Real-estate description	Proposed upgrade does not require additional real estate acquisition
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year \$	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	\$7,000,000.00
Component cost (in-service year)	\$7,766,525.00
Substation Upgrade Component	
Component title	157) Thistlewood 765/345kV Substation
Project description	Proprietary & Confidential Information
Substation name	Thistlewood
Substation zone	ATSI
Substation upgrade scope	Add four (4) 345kV breakers into existing double breaker double bus (DBDB) switchyard to create two (2) new bays and two (2) line terminals.
Transformer Information	

None	
New equipment description	Add (4) 345kV, 5000A, 63kAIC breakers and (4) 345kV lines.
Substation assumptions	Assumes required equipment upgrades occur in existing footprint and spare position available in existing switchyard. Note that this substation has not been built yet and assumptions have been based on available data.
Real-estate description	Proposed upgrade will not require additional real estate acquisition
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year \$	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	\$12,000,000.00
Component cost (in-service year)	\$13,314,043.00
Substation Upgrade Component	
Component title	159) Madison 345kV Substation
Project description	Proprietary & Confidential Information
Substation name	Madison

Substation zone	ATSI
Substation upgrade scope	Add (3) 345kV breaker to the existing breaker and a half (BAAH) switchyard to create (2) additional line terminals.
Transformer Information	
None	
New equipment description	Add (1) 345kV, 5000A, 63kAIC breaker and (1) 345kV line.
Substation assumptions	Assumes required equipment upgrades occur in existing footprint. Spare position available in existing switchyard.
Real-estate description	Proposed upgrade does not require additional real estate acquisition
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year \$	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	\$3,750,000.00
Component cost (in-service year)	\$4,160,638.00

Substation Upgrade Component

Component title	160) Fayette 345/138kV Substation
Project description	Proprietary & Confidential Information
Substation name	Fayette
Substation zone	DAYTON
Substation upgrade scope	Add one (1) 345kV breaker to the existing breaker and a half (BAAH) switchyard to create one (1) additional line terminal.

Transformer Information

None	
New equipment description	Add (1) 345kV, 5000A, 63kAIC breaker and (1) 345kV line.
Substation assumptions	Assumes required equipment upgrades occur in existing footprint. There are two spare positions available in existing switchyard.
Real-estate description	Proposed upgrade does not require additional real estate acquisition
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year \$	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information

Contingency	Proprietary & Confidential Information		
Total component cost	\$3,750,000.00		
Component cost (in-service year)	\$4,160,638.00		
Substation Upgrade Component			
Component title	162) Adkins 765/345kV expansion		
Project description	Proprietary & Confidential Information		
Substation name	Adkins		
Substation zone	AEP		
Substation upgrade scope	Expand the existing 345kV breaker and a half (BAAH) switchyard by adding ten (10) breakers to create three (3) additional bays and five (5) line terminals. Expand the Adkins 765kV substation (PJM Baseline ID: b4068.41) by adding two (2) 765-345kV transformers and two (2) 765kV breakers.		
Transformer Information			
	Name		Capacity (MVA)
Transformer	Transformer 1		2400
	High Side	Low Side	Tertiary
Voltage (kV)	765	345	
	Name		Capacity (MVA)
Transformer	Transformer 2		2400
	High Side	Low Side	Tertiary
Voltage (kV)	765	345	
New equipment description	Add (10) 345kV, 5000A, 63kAIC breakers, (5) 345kV lines, (2) 765-345kV, 2400 MVA trnsformer banks and (2) 765kV, 5000A, 63kAIC breakers.		

Substation assumptions	The proposed modification to Adkins substation requires significant expansion of the substation fence. However, the current substation layout and land owned by the incumbent utility can accommodate the proposed expansion.
Real-estate description	The substation fence line will require expansion to accommodate the new equipment, but no additional real estate will need to be acquired.
Construction responsibility	Proprietary & Confidential Information
Benefits/Comments	Proprietary & Confidential Information
Component Cost Details - In Current Year \$	
Engineering & design	Proprietary & Confidential Information
Permitting / routing / siting	Proprietary & Confidential Information
ROW / land acquisition	Proprietary & Confidential Information
Materials & equipment	Proprietary & Confidential Information
Construction & commissioning	Proprietary & Confidential Information
Construction management	Proprietary & Confidential Information
Overheads & miscellaneous costs	Proprietary & Confidential Information
Contingency	Proprietary & Confidential Information
Total component cost	\$200,000,000.00
Component cost (in-service year)	\$221,900,717.00
Congestion Drivers	
None	
Existing Flowgates	
None	

New Flowgates

Proprietary & Confidential Information

Financial Information

Capital spend start date 02/2027

Construction start date 06/2030

Project Duration (In Months) 64

Cost Containment Commitment

Cost cap (in current year) Proprietary & Confidential Information

Cost cap (in-service year) Proprietary & Confidential Information

Components covered by cost containment

1. 82) Marysville - Celtic 345 kV Double Circuit - PROPOSER
2. 147) Cole - Beacon 345 kV - PROPOSER
3. 148) Cole - Beacon 345 kV - PROPOSER
4. 158) Thistlewood - Madison 345kV Double Circuit - PROPOSER
5. 161) Fayette - Adkins 345kV - PROPOSER

Cost elements covered by cost containment

Engineering & design Yes

Permitting / routing / siting Yes

ROW / land acquisition Yes

Materials & equipment Yes

Construction & commissioning Yes

Construction management	Yes
Overheads & miscellaneous costs	Yes
Taxes	No
AFUDC	No
Escalation	No
Additional Information	Proprietary & Confidential Information
Is the proposer offering a binding cap on ROE?	Yes
Would this ROE cap apply to the determination of AFUDC?	No
Would the proposer seek to increase the proposed ROE if FERC finds that a higher ROE would not be unreasonable?	No
Is the proposer offering a Debt to Equity Ratio cap?	Proprietary & Confidential Information
Additional cost containment measures not covered above	Proprietary & Confidential Information

Additional Comments

As per confirmation by PJM, the Project Capital Expenditures Section will be automatically redacted by PJM.