Muckshaw - Johnstown 765kV

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	109
Project title	Muckshaw - Johnstown 765kV
Project description	Reinforce AEP system by adding 765kV and 345 kV transmission and substations to strengthen transmission network.
Email	Proprietary & Confidential Information
Project in-service date	06/2031
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. A-10-A) Campbell Creek - Newlove 765kV (Indiana Portion)
2. A-10-B) Campbell Creek - Newlove 765kV (Ohio Portion)
3. A-113-A) Newlove - Madison 345kV
4. A-114-A) Matville - Biers Run 345kV Loop-In
5. A-115-A) Matville - Bixby 345kV Loop-In

6. A-126-C) Cole - Hayden 345kV
7. A-127-B) Cole - Beatty 345kV
8. A-12-A) Newlove - Matville 765kV
9. A-132-A) Celtic - Marysville 345kV
10. A-134-A) Muckshaw - Campbell Creek 765kV
11. A-136-A) Buckeye Lake - Johnstown 765kV
12. A-136-B) Matville - Beatty 345kV
13. A-140-B) Newlove - Melissa 138kV
14. A-140-C) Newlove - Melissa 138kV
15. A-17-B) Matville - Adkins 345kV Loop-In
16. A-18-A) Matville - Buckeye Lake 765kV
17. A-20-A) Bixby/Kirk - West Millersport 345kV Loop-In
18. A-21-A) Bixby/Ohio Central - West Millersport 345kV Loop-In
19. A-70-A) Matville - Altanta 345kV Loop-In
20. A-99-A) Campbell Creek - Desoto 345kV
21. A-11-B) Newlove 765kV Substation
22. A-135-A) Johnstown 765kV Substation
23. A-19-B) Buckeye Lake 765kV Substation
24. A-92-C) Muckshaw 765kV Substation
25. A-98-C) Campbell Creek 765kV Substation
26. A-13-E) Matville 765kV Substation
27. A-103-A) North Titus Melissa - London 138kV double circuit/London - Beatty 138kV single circuit
28. A-14-A) Marysville - Matville 765kV Loop-In
29. A-72-A) Matville - Flatlick 765kV Loop-In
30. A-108-A) Melissa substation upgrades
31. A-112-A) Madison substation upgrades
32. A-118-C) West Millersport substation upgrades
33. A-119-B) Bixby terminal equipment upgrades
34. A-124-B) Cole substation upgrade

35. A-125-A) Hayden substation upgrade
36. A-131-B) Celtic substation upgrade
37. A-139-A) Cosgray 345kV substation upgrade
38. A-150-A) Bethel circuit breaker replacement
39. A-151-A) Babbit circuit switcher replacement
40. A-15-B) Marysville substation upgrade
41. A-23-A) Kirk substation upgrade
42. A-149-A) Beacon substation upgrade
43. A-97-A) Desoto substation upgrade
44. A-158-A) Greentown substation upgrade
45. A-159-A) Dublin reactor addition
46. A-160-B) Beatty substation upgrades
47. A-161-A) Wilson series reactor addition
48. A-162-A) Roberts

Greenfield Transmission Line Component

Component title	A-10-A) Campbell Creek - Newlove 765kV (Indiana Portion)	
Project description	Proprietary & Confidential Information	
Point A	Campbell Creek	
Point B	Newlove	
Point C		
	Normal ratings	Emergency ratings
Summer (MVA)	6904.000000	7690.000000
Winter (MVA)	8180.000000	8874.000000
Conductor size and type	6 bundled 715 KCMIL ACSR/GA2 Redwing	
Nominal voltage	AC	

Nominal voltage	765
Line construction type	Overhead
General route description	The approximately 30-mile route exits the proposed Campbell Creek substation and heads southeast, paralleling the Selma Parker to Delaware 138kV corridor where feasible for approximately 8 miles through Delaware County and Randolph County, Indiana. The route then turns east for the remaining approximately 22 miles through Randolph County to the Indiana - Ohio border where it continues as component A-10-B.
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 1,184 ft above sea level to a low of 952 ft above sea level. The Project is entirely located within 2 Level IV ecoregions including Loamy High Lime Till Plains, and Whitewater Interlobate Area. According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, wetlands, hay/pasture. shrub/scrub, and developed, open space.
Right-of-way width by segment	The route will have a 200 ft ROW width. The proposed ROW will be an expansion of existing transmission line corridors for approximately 20% of the route length, the remainder will be 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).

Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses numerous aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, multiple 100-year floodplains are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. Major watercourses crossed by the Project include the White River, which may require agency authorizations for navigable water crossings. No fatal flaws have been identified for the Project. Multiple previously recorded archaeological sites, architectural resources, and one cemetery were recorded within vicinity of the route. However, no historic districts are crossed by the proposed route. Five federally listed species (2 endangered, 2 proposed, and 1 experimental population) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No 'Major Federal Action' that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.
Tower characteristics	The proposed structures will mostly be single circuit 765kV lattice self-supporting or guyed-v towers in a horizontal conductor configuration. Delta configuration may be required in some locations. All angle structures will be self-supporting. 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	$148,884,564.00
Component cost (in-service year)	$168,449,220.00

Greenfield Transmission Line Component

Component title	A-10-B) Campbell Creek - Newlove 765kV (Ohio Portion)
Project description	Proprietary & Confidential Information
Point A	Campbell Creek
Point B	Newlove
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	6904.000000	7690.000000
Winter (MVA)	8180.000000	8874.000000

Conductor size and type	6 bundled 715 KCMIL ACSR/GA2 Redwing
Nominal voltage	AC
Nominal voltage	765
Line construction type	Overhead
General route description	The approximately 71-mile route continues where component A-10-A ended at the Indiana - Ohio border. The route travels east for approximately 62 miles through Darke County, Miami County, and Clark County, Ohio before turning south northeast of Springfield, Ohio for the remaining approximately 9 miles.

Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 1,180 ft above sea level to a low of 832 ft above sea level. The Project is located across 3 Level IV ecoregions including Darby Plains, Mad River Interlobate Area, Loamy High Lime Till Plains. According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, wetlands, and hay/pasture. The remaining land cover is composed of evergreen forest, mixed forest, herbaceous, shrub/scrub, open water, and barren land.
Right-of-way width by segment	The route will have a 200 ft ROW width. The proposed ROW will be greenfield.
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).
Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses numerous aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, multiple 100-year floodplains are crossed by the route. This represents total amount of features crossed by the route & impacts from the Project would be significantly less. Major watercourses crossed by the Project include the Stillwater, Mad, and Great Miami Rivers, some of which may require agency authorizations for navigable water and State Scenic River crossings. No fatal flaws have been identified for the Project. Multiple previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the vicinity of the route. However, no historic districts are crossed by the proposed route. Nine federally listed species (4 endangered, 2 threatened, 2 proposed, and 1 Experimental population) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. See Attachment 08 – Permitting Plan.
Tower characteristics	The proposed structures will mostly be single circuit 765kV lattice self-supporting or guyed-v towers in a horizontal conductor configuration. Delta configuration may be required in some locations. All angle structures will be self-supporting. 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	$348,769,076.00
Component cost (in-service year)	$394,600,196.00

Greenfield Transmission Line Component

Component title	A-113-A) Newlove - Madison 345kV	
Project description	Proprietary & Confidential Information	
Point A	Newlove	
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	2 bundled 1033 KCMIL ACSS/MA3 54/7 Curlew	

Nominal voltage	AC
Nominal voltage	345
Line construction type	Overhead
General route description	The approximately 9-mile route heads south from the proposed Newlove substation to the existing Madison substation in Clark County, Ohio.
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 812 ft above sea level to a low of 785 ft above sea level. The Project is located entirely within the Darby Plains Level IV ecoregion. According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, wetlands, hay/pasture. shrub/scrub, and developed, open space.
Right-of-way width by segment	The majority of the route, approximately 99%, will have a ROW width of 150 ft. Approximately 1% of the route will have a ROW width of 125 ft in more congested areas. The proposed ROW will be greenfield.
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).

Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing process. The proposed route crosses numerous aquatic resources, including wetlands and waterbodies but most features could be spanned & avoided with minimal impacts. According to FEMA, multiple 100-year floodplains are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. Major watercourses crossed by the Project include the Little Miami & North Fork Little Miami Rivers, some of which may require agency authorizations for navigable water & State Scenic River crossings. No fatal flaws have been identified for the Project. Multiple previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the vicinity of the route. However, no historic districts are crossed by the proposed route. Three federally listed species (2 endangered, and 1 proposed) have known ranges along the proposed route. No critical habitat for federally listed species intersect the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.
Tower characteristics	The proposed structures will be double circuit 345kV steel monopole in a vertical conductor configuration utilizing braced post insulators. All structures will be self-supporting. 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	$36,528,618.00
Component cost (in-service year)	$41,328,778.00

Greenfield Transmission Line Component

Component title	A-114-A) Matville - Biers Run 345kV Loop-In
Project description	Proprietary & Confidential Information
Point A	Matville
Point B	Biers Run
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	2228.000000	2292.000000
Winter (MVA)	2396.000000	2452.000000

Conductor size and type	2 bundled 1033 KCMIL ACSS/MA3 54/7 Curlew
Nominal voltage	AC
Nominal voltage	345
Line construction type	Overhead
General route description	The approximately 2-mile route heads south from the proposed Matville substation before connecting with the existing Bixby - Beirs Run corridor.
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 1,141 ft above sea level to a low of 1,069 ft above sea level. The Project is located entirely within the Loamy High Lime Till Plains Level IV ecoregion. According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, hay/pasture, and developed, open space.

Right-of-way width by segment	The route will have a 150 ft ROW width. The proposed ROW will be greenfield.
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).
Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses numerous aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, no 100-year floodplains or regulatory floodways are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. No major watercourses are crossed by the Project which will require agency authorizations for navigable water and State Scenic River crossings. No fatal flaws have been identified for the Project. No previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the immediate vicinity of the proposed project. Also, no historic districts are crossed by the proposed route. Nine federally listed species (5 endangered, 2 threatened, and 2 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. See Attachment 08 – Permitting Plan.
Tower characteristics	The proposed structures will be single circuit 345kV steel monopole in a vertical conductor configuration utilizing braced post insulators. All structures will be self-supporting. 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	$8,668,726.00
Component cost (in-service year)	$9,807,867.00

Greenfield Transmission Line Component

Component title	A-115-A) Matville - Bixby 345kV Loop-In
Project description	Proprietary & Confidential Information
Point A	Matville
Point B	Bixby
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	2228.000000	2292.000000
Winter (MVA)	2396.000000	2452.000000

Conductor size and type	2 bundled 1033 ACSS/MA3 54/7 Curlew
Nominal voltage	AC
Nominal voltage	345
Line construction type	Overhead
General route description	The approximately 2-mile route heads south from the proposed Matville substation before connecting with the existing Bixby - Beirs Run corridor.

Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 1,141 ft above sea level to a low of 1,069 ft above sea level. The Project is located entirely within the Loamy High Lime Till Plains Level IV ecoregion. According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, and developed, open space.
Right-of-way width by segment	The route will have a 150 ft ROW width. The proposed ROW will be greenfield.
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).
Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses multiple aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, no 100-year floodplains or regulated floodways are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. No major watercourses are crossed by the which will require agency authorizations for navigable water or State Scenic River crossings. No fatal flaws have been identified for the Project. No previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the centerline. Also, no historic districts are crossed by the proposed centerline. Three listed species (1 endangered, and 2 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.
Tower characteristics	The proposed structures will be single circuit 345kV steel monopole in a vertical conductor configuration utilizing braced post insulators. All structures will be self-supporting. 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	$9,671,083.00
Component cost (in-service year)	$10,941,942.00

Greenfield Transmission Line Component

Component title	A-126-C) Cole - Hayden 345kV
Project description	Proprietary & Confidential Information
Point A	Cole
Point B	Hayden
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	1972.000000	2032.000000
Winter (MVA)	2123.000000	2174.000000
Conductor size and type	2 bundled 1033 ACSS/MA3 54/7 Curlew	
Nominal voltage	AC	

Nominal voltage	345
Line construction type	Overhead
General route description	The approximately 10-mile route heads north from the existing Cole substation to the Hayden substation in Franklin County, Ohio.
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 1,141 ft above sea level to a low of 1,069 ft above sea level. The Project is located entirely within the Loamy High Lime Till Plains Level IV ecoregion. According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, wetlands, hay/pasture. shrub/scrub, and developed, open space.
Right-of-way width by segment	The route will have a 150 ft ROW width. The proposed ROW will be greenfield.
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).
Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses multiple aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, multiple 100-year floodplains are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. No major watercourses are crossed by the which will require agency authorizations for navigable water or State Scenic River crossings. No fatal flaws have been identified for the Project. Multiple previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the route. However, no historic districts are crossed by the proposed route. Ten federally listed species (6 endangered, 2 threatened, and 2 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.

Tower characteristics	The proposed structures will be single circuit 345kV steel monopole in a delta conductor configuration utilizing braced post insulators. All structures will be self-supporting. 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	$36,830,744.00
Component cost (in-service year)	$41,670,606.00

Greenfield Transmission Line Component

Component title	A-127-B) Cole - Beatty 345kV
Project description	Proprietary & Confidential Information
Point A	Cole
Point B	Beatty
Point C	

	Normal ratings	Emergency ratings

Summer (MVA)	2228.000000	2292.000000
Winter (MVA)	2396.000000	2452.000000
Conductor size and type	2 bundled 1033 ACSS/MA3 54/7 Curlew	
Nominal voltage	AC	
Nominal voltage	345	
Line construction type	Overhead	
General route description	The approximately 10-mile route heads east from the existing Beatty substation for approximately 3 miles, paralleling the existing Beatty to Cole 345kV corridor where feasible, before turning north and continuing to parallel the corridor where feasible for the remaining approximately 7 miles through Franklin County, Ohio.	
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 924 ft above sea level to a low of 842 ft above sea The Project is located entirely within the Loamy High Lime Till Plains Level IV ecoregion. According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, wetlands, hay/pasture, shrub/scrub, and developed, open space.	
Right-of-way width by segment	The route will have a 150 ft ROW width. The proposed ROW will be an expansion of existing transmission line corridors for approximately 45% of the route length, the remainder will be 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).	

Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses numerous aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, one 100-year floodplain are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. No major watercourses are crossed by the which will require agency authorizations for navigable water or State Scenic River crossings. No fatal flaws have been identified for the Project. Multiple previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the vicinity of the proposed project. However, no historic districts are crossed by the proposed route. Eleven federally listed species (6 endangered, 2 threatened, and 3 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No 'Major Federal Action' that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.
Tower characteristics	The majority, approximately 92% of the proposed structures will be single circuit 345kV steel monopole in a delta conductor configuration utilizing braced post insulators. Approximately 8% of the proposed structures will be single circuit 345kV 3-Pole structures with horizontal conductor configuration for transmission crossings. All structures will be self-supporting. 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	$37,504,619.00
Component cost (in-service year)	$42,433,034.00

Greenfield Transmission Line Component

Component title	A-12-A) Newlove - Matville 765kV
Project description	Proprietary & Confidential Information
Point A	Newlove
Point B	Matville
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	6904.000000	7690.000000
Winter (MVA)	8180.000000	8874.000000

Conductor size and type	6 bundled 715 KCMIL ACSR/GA2 Redwing
Nominal voltage	AC
Nominal voltage	765
Line construction type	Overhead
General route description	The approximately 33-mile route exits the proposed Newlove substation and heads east, paralleling the North Titus - London 138kV corridor where feasible, before turning southeast to parallel the Marysville - Flatlick 765kV corridor where feasible before terminating at the proposed Matville substation. The route travels through Clark County, Madison County, and Pickaway County, Ohio.

Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 1,193 ft above sea level to a low of 840 ft above sea level. The Project is located entirely within 2 Level IV ecoregions including Loamy High Lime Till Plains and Darby Plains. According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, wetlands, hay/pasture. shrub/scrub, and developed, open space.
Right-of-way width by segment	The route will have a 200 ft ROW width. The proposed ROW will be an expansion of existing transmission line corridors for approximately 14% of the route length, the remainder will be 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).
Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses numerous aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, multiple 100-year floodplains are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. Major watercourses crossed by the Project include the Little Miami river, which will require agency authorizations for State Scenic River crossings No fatal flaws have been identified for the Project. Multiple previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the route. However, no historic districts are crossed by the proposed route. Ten federally listed species (6 endangered, 2 threatened, and 2 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.
Tower characteristics	The proposed structures will mostly be single circuit 765kV lattice self-supporting or guyed-v towers in a horizontal conductor configuration. Delta configuration may be required in some locations. All angle structures will be self-supporting. 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	$168,163,664.00
Component cost (in-service year)	$190,261,752.00

Greenfield Transmission Line Component

Component title	A-132-A) Celtic - Marysville 345kV	
Project description	Proprietary & Confidential Information	
Point A	Celtic	
Point B	Marysville	
Point C		
	Normal ratings	Emergency ratings
Summer (MVA)	2228.000000	2292.000000
Winter (MVA)	2396.000000	2452.000000
Conductor size and type	2 bundled 1033 ACSS/MA3 54/7 Curlew	

Nominal voltage	AC
Nominal voltage	345
Line construction type	Overhead
General route description	The approximately 20-mile route heads southeast from Marysville along the Maliszewski to Marysville 765kV corridor for 4 miles before turning further southward for the remaining approximately 16 miles through Union County, Ohio.
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 1,049 ft above sea level to a low of 943 ft above sea level. The Project is entirely located within 2 Level IV ecoregions including Clayey High Lime Till Plains, and Loamy High Lime Till Plains. According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, hay/pasture, shrub/scrub, open water, and developed, open space.
Right-of-way width by segment	The route will have a 150 ft ROW width. The proposed ROW will be an expansion of existing transmission line corridors for approximately 20% of the route length, the remainder will be 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).

Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses numerous aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, one 100-year floodplain boundary are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. No major watercourses are crossed by the which will require agency authorizations for navigable water or State Scenic River crossings. No fatal flaws have been identified for the Project. Multiple previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the vicinity of the route. However, no historic districts are crossed by the proposed route. Six federally listed species (3 endangered, 1 threatened, and 2 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.
Tower characteristics	The majority, approximately 95% of the proposed structures will be double circuit 345kV steel monopole in a vertical conductor configuration utilizing braced post insulators. Approximately 5% of the proposed structures will be single circuit 345kV 3-Pole structures with horizontal conductor configuration for transmission crossings. All structures will be self-supporting. 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	$73,685,866.00
Component cost (in-service year)	$83,368,795.00

Greenfield Transmission Line Component

Component title	A-134-A) Muckshaw - Campbell Creek 765kV
Project description	Proprietary & Confidential Information
Point A	Muckshaw
Point B	Campell Creek
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	6904.000000	7690.000000
Winter (MVA)	8180.000000	8874.000000

Conductor size and type	6 bundled 715 KCMIL ACSR/GA2 Redwing
Nominal voltage	AC
Nominal voltage	765
Line construction type	Overhead
General route description	The approximately 98-mile route exits the proposed Muckshaw substation and heads south adjacent to the existing Dumont to Greentown 765kV corridor where feasible for approximately 60 miles through Marshall County, Fulton County, Miami County, and Tipton County, Indiana. The route then turns southeast and continues for the remaining approximately 38 miles through Grant County, Madison County, and Delaware County, Indiana.

Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 983 ft above sea level to a low of 646 ft above sea level. The Project is located entirely within the Clayey High Lime Till Plains Level IV ecoregion. According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, wetlands, hay/pasture. shrub/scrub, and developed, open space.
Right-of-way width by segment	The route will have a 200 ft ROW width. The proposed ROW will be an expansion of existing transmission line corridors for approximately 17% of the route length, the remainder will be 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).
Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing process. The proposed route crosses numerous aquatic resources, including wetlands, waterbodies, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, multiple 100-year floodplains are crossed by the route. This represents total amount of features crossed by the route & impacts from the Project would be significantly less. Four major watercourses (Tippecanoe, Eel, Mississinewa, and Wabash Rivers) are crossed by the which may require agency authorizations for navigable water or State Scenic River crossings. No fatal flaws have been identified for the Project. Multiple previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the vicinity of the proposed route. However, no historic districts are crossed by the route. Twelve federally listed species (5 endangered, 3 threatened, 3 proposed, & 1 experimental) have known ranges along the proposed route. The critical habitat for 3 federally listed mussel species intersect the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route.
Tower characteristics	The proposed structures will mostly be single circuit 765kV lattice self-supporting or guyed-v towers in a horizontal conductor configuration. Delta configuration may be required in some locations. All angle structures will be self-supporting. 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	$480,800,631.00
Component cost (in-service year)	$543,981,785.00

Greenfield Transmission Line Component

Component title	A-136-A) Buckeye Lake - Johnstown 765kV	
Project description	Proprietary & Confidential Information	
Point A	Buckeye Lake	
Point B	Johnstown	
Point C		
	Normal ratings	Emergency ratings
Summer (MVA)	6904.000000	7690.000000
Winter (MVA)	8180.000000	8874.000000
Conductor size and type	6 bundled 715 KCMIL ACSR/GA2 Redwing	

Nominal voltage	AC
Nominal voltage	765
Line construction type	Overhead
General route description	The approximately 22-mile route exits the proposed Buckeye Lake substation and travels north through Fairfield County and Licking County, Ohio before terminating at the Johnstown substation near the existing Kammer to Maliszewski 765kV corridor.
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 1,292 ft above sea level to a low of 887 ft above sea level. The Project is located across 2 Level IV ecoregions including Loamy High Lime Till Plains and Low Lime Drift Plain. According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, wetlands, and hay/pasture, shrub/scrub, and developed, open space.
Right-of-way width by segment	The route will have a 200 ft ROW width. The proposed ROW will be greenfield.
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).
Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses numerous aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, multiple 100-year floodplains are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. No major watercourses are crossed by the which will require agency authorizations for navigable water or State Scenic River crossings. No fatal flaws have been identified for the Project. Multiple previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the vicinity of the route. However, no historic districts are crossed by the proposed route. Five federally listed species (1 endangered, 2 threatened, and 2 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.

Tower characteristics	The proposed structures will mostly be single circuit 765kV lattice self-supporting or guyed-v towers in a horizontal conductor configuration. Delta configuration may be required in some locations. All angle structures will be self-supporting. 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	$119,834,945.00
Component cost (in-service year)	$135,582,240.00

Greenfield Transmission Line Component

Component title	A-136-B) Matville - Beatty 345kV
Project description	Proprietary & Confidential Information
Point A	Matville
Point B	Beatty
Point C	

	Normal ratings	Emergency ratings

Summer (MVA)	2228.000000	2292.000000
Winter (MVA)	2396.000000	2452.000000
Conductor size and type	2 bundled 1033 KCMIL ACSS/MA3 54/7 Curlew	
Nominal voltage	AC	
Nominal voltage	345	
Line construction type	Overhead	
General route description	The approximately 12-mile route travels east for approximately 2 miles and then turns north for the remaining approximately 10 miles, with the entire route located within Pickaway County and Franklin County, Ohio.	
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 884 ft above sea level to a low of 726 ft above sea level. The Project is located entirely within the Loamy High Lime Till Plains Level IV ecoregion. According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, wetlands, hay/pasture. shrub/scrub, and developed, open space.	
Right-of-way width by segment	The route will have a 150 ft ROW width. The proposed ROW will be greenfield.	
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).	

Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project route and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses numerous aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, multiple 100-year floodplains are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. One major watercourse (Big Darby Creek) is crossed by the which will require agency authorizations for navigable water or Scenic River crossings. No fatal flaws have been identified for the Project. Multiple previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the vicinity of the route. However, no historic districts are crossed by the proposed route. Nine federally listed species (5 endangered, 2 threatened, and 2 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No 'Major Federal Action' that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.
Tower characteristics	The proposed structures will be single circuit 345kV steel monopole in a delta conductor configuration utilizing braced post insulators. All structures will be self-supporting. 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	$44,046,225.00
Component cost (in-service year)	$49,834,260.00

Greenfield Transmission Line Component

Component title	A-140-B) Newlove - Melissa 138kV
Project description	Proprietary & Confidential Information
Point A	Newlove
Point B	Melissa
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	1025.000000	1056.000000
Winter (MVA)	1102.000000	1129.000000

Conductor size and type	2 bundled 1272 KCMIL ACSS/MA3 54/19 Pheasant
Nominal voltage	AC
Nominal voltage	138
Line construction type	Overhead
General route description	The approximately 2-mile route travels east paralleling the East Springfield to London 138 kV where feasible.
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 1,122 ft above sea level to a low of 1,081 ft above sea level. The Project is located within one Level IV ecoregion (Darby Plains). According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, hay/pasture and developed, open space.

Right-of-way width by segment	The route will have a 100 ft ROW width. The proposed ROW will be greenfield.
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).
Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses multiple aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, no 100-year floodplains or regulated floodways are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. No major watercourses are crossed by the which will require agency authorizations for navigable water or State Scenic River crossings. No fatal flaws have been identified for the Project. No previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the vicinity of the route. Also, no historic districts are crossed by the proposed route. Two listed species (1 endangered, and 1 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.
Tower characteristics	The proposed structures will be double circuit 138kV steel monopole in a vertical conductor configuration utilizing braced post insulators. All structures will be self-supporting. 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	$13,171,443.00
Component cost (in-service year)	$14,902,280.00

Greenfield Transmission Line Component

Component title	A-140-C) Newlove - Melissa 138kV
Project description	Proprietary & Confidential Information
Point A	Newlove
Point B	Melissa
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	1025.000000	1056.000000
Winter (MVA)	1102.000000	1129.000000

Conductor size and type	2 bundled 1272 KCMIL ACSS/MA3 54/19 Pheasant
Nominal voltage	AC
Nominal voltage	138
Line construction type	Overhead
General route description	The approximately 2-mile route travels east paralleling the East Springfield to London 138 kV where feasible.

Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 1,122 ft above sea level to a low of 1,081 ft above sea level. The Project is located within one Level IV ecoregion (Darby Plains). According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, hay/pasture and developed, open space.
Right-of-way width by segment	The route will have a 100 ft ROW width. The proposed ROW will be greenfield.
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).
Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses multiple aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, no 100-year floodplains or regulated floodways are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. No major watercourses are crossed by the which will require agency authorizations for navigable water or State Scenic River crossings. No fatal flaws have been identified for the Project. No previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the vicinity of the route. Also, no historic districts are crossed by the proposed route. Two listed species (1 endangered, and 1 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.
Tower characteristics	The proposed structures will be single circuit 138kV steel monopole in a vertical conductor configuration utilizing braced post insulators. All structures will be self-supporting. 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	$8,562,784.00
Component cost (in-service year)	$9,688,004.00

Greenfield Transmission Line Component

Component title	A-17-B) Matville - Adkins 345kV Loop-In	
Project description	Proprietary & Confidential Information	
Point A	Matville	
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	2 bundled 1033 KCMIL ACSS/MA3 54/7 Curlew	
Nominal voltage	AC	

Nominal voltage	345
Line construction type	Overhead
General route description	The approximately 2-mile route heads east from the proposed Matville substation to the existing Atlanta - Adkins 345kV transmission line.
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 854 ft above sea level to a low of 813 ft above sea level. The Project is located entirely within one Level IV ecoregion (Loamy High Lime Till Plains). According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, and developed, open space.
Right-of-way width by segment	The route will have a 150 ft ROW width. The proposed ROW will be greenfield.
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).
Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses multiple aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, no 100-year floodplains or regulated floodways are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. No major watercourses are crossed by the which will require agency authorizations for navigable water or State Scenic River crossings. No fatal flaws have been identified for the Project. No previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the centerline. Also, no historic districts are crossed by the proposed centerline. Three listed species (1 endangered, and 2 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route.

Tower characteristics	The majority, approximately 60% of the proposed structures will be double circuit 345kV steel monopole in a vertical conductor configuration utilizing braced post insulators. Approximately 40% of the proposed structures will be single circuit 345kV 3-Pole structures with horizontal conductor configuration for the transmission line crossing. All structures will be self-supporting. 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	$9,932,359.00
Component cost (in-service year)	$11,237,554.00

Greenfield Transmission Line Component

Component title	A-18-A) Matville - Buckeye Lake 765kV
Project description	Proprietary & Confidential Information
Point A	Matville
Point B	Buckeye Lake
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	6904.000000	7690.000000
Winter (MVA)	8180.000000	8874.000000
Conductor size and type	6 bundled 715 KCMIL ACSR/GA2 Redwing	
Nominal voltage	AC	
Nominal voltage	765	
Line construction type	Overhead	
General route description	The approximately 36-mile route heads east from the proposed Matville substation for 20 miles before turning northeast for the remaining approximately 16 miles before terminating at the proposed Buckeye Lake substation . The route travels through Pickaway County and Licking County, Ohio.	
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 1,163 ft above sea level to a low of 660 ft above sea level. The Project is located entirely within the Loamy High Lime Till Plains Level IV ecoregion. The proposed Project area largely consists of cultivated cropland, deciduous forest, wetlands, hay/pasture. shrub/scrub, and developed, open space.	
Right-of-way width by segment	The majority of the route, approximately 99%, will have a ROW width of 200 ft. Approximately 1% of the route will have a ROW width of 175 ft in more congested areas. The proposed ROW will be greenfield.	
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).	

Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing process. The proposed route crosses numerous aquatic resources, including wetlands and waterbodies but most features could be spanned & avoided with minimal impacts. According to FEMA, multiple 100-year floodplains are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. Major watercourses crossed by the Project include the Big Darby Creek, Scioto River, and Hocking River, some of which will require agency authorizations for navigable water and State Scenic River crossings. No fatal flaws have been identified for the Project. Multiple previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the route. However, no historic districts are crossed by the proposed route. Eleven listed species (6 endangered, 2 threatened, and 3 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & a detailed routing process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.
Tower characteristics	The proposed structures will mostly be single circuit 765kV lattice self-supporting or guyed-v towers in a horizontal conductor configuration. Delta configuration may be required in some locations. All angle structures will be self-supporting. 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	$200,707,941.00
Component cost (in-service year)	$227,082,614.00

Greenfield Transmission Line Component

Component title	A-20-A) Bixby/Kirk - West Millersport 345kV Loop-In
Project description	Proprietary & Confidential Information
Point A	Bixby
Point B	West Millersport
Point C	Kirk

	Normal ratings	Emergency ratings
Summer (MVA)	2228.000000	2292.000000
Winter (MVA)	2396.000000	2452.000000

Conductor size and type	2 bundled 1033 KCMIL ACSS/MA3 54/7 Curlew
Nominal voltage	AC
Nominal voltage	345
Line construction type	Overhead
General route description	The approximately 6-mile route travels south from the existing Kirk - Bixby 345kV transmission corridor to the West Millersport substation paralleling the West Millersport to Kirk 345 kV corridor where feasible. The entire route is located in Licking County and Fairfield County, Ohio.

Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 1,106 ft above sea level to a low of 915 ft above sea level. The Project is located entirely within one Level IV ecoregion (Loamy High Lime Till Plains). According to the NLCD, the Project area largely consists of cultivated cropland and developed, open space. According to the NLCD, the Project area largely consists of cultivated cropland, shrub/scrub, deciduous forest, and developed, open space.
Right-of-way width by segment	The route will have a 150 ft ROW width. The proposed ROW will be an expansion of existing transmission line corridors for approximately 68% of the route length, the remainder will be 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).
Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project route and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses numerous aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, no 100-year floodplains or regulated floodways are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. No major watercourses are crossed by the which will require agency authorizations for navigable water or State Scenic River crossings. No fatal flaws have been identified for the Project. Multiple previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the vicinity of the proposed route. However, no historic districts are crossed by the proposed route. Four listed species (1 endangered, 1 threatened, and 2 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.
Tower characteristics	The proposed structures will be double circuit 345kV steel monopole in a vertical conductor configuration utilizing braced post insulators. All structures will be self-supporting. 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	$26,422,311.00
Component cost (in-service year)	$29,894,421.00

Greenfield Transmission Line Component

Component title	A-21-A) Bixby/Ohio Central - West Millersport 345kV Loop-In
Project description	Proprietary & Confidential Information
Point A	Bixby
Point B	West Millersport
Point C	Ohio Central

	Normal ratings	Emergency ratings
Summer (MVA)	2228.000000	2292.000000
Winter (MVA)	2396.000000	2452.000000

Conductor size and type	2 bundled 1033 KCMIL ACSS/MA3 54/7 Curlew
Nominal voltage	AC
Nominal voltage	345
Line construction type	Overhead
General route description	The approximately 4-mile route travels south from the existing Ohio Central - Bixby 345kV transmission corridor to the West Millersport substation, with the entire route located in Licking County and Fairfield County, Ohio.
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 947 ft above sea level to a low of 886 ft above sea level. The Project is located entirely within one Level IV ecoregion (Loamy High Lime Till Plains). According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, and developed, open space.
Right-of-way width by segment	The route will have a 150 ft ROW width. The proposed ROW will be an expansion of existing transmission line corridors for approximately 33% of the route length, the remainder will be 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).

Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses numerous aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, a single 100-year floodplain is crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. No major watercourses are crossed by the which will require agency authorizations for navigable water or State Scenic River crossings. No fatal flaws have been identified for the Project. Multiple previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the vicinity of the route. However, no historic districts are crossed by the proposed route. Five listed species (1 endangered, 2 threatened, and 2 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.
Tower characteristics	The majority, approximately 80%, of the proposed structures will be double circuit 345kV steel monopole in a vertical conductor configuration. Approximately 20% of the structures will be single circuit 345kV steel monopole in a vertical conductor configuration. All structures will be self-supporting. 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	$28,202,860.00
Component cost (in-service year)	$31,908,948.00

Greenfield Transmission Line Component

Component title	A-70-A) Matville - Altanta 345kV Loop-In
Project description	Proprietary & Confidential Information
Point A	Matville
Point B	Atlanta
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	2228.000000	2292.000000
Winter (MVA)	2396.000000	2452.000000

Conductor size and type	2 bundled 1033 KCMIL ACSS/MA3 54/7 Curlew
Nominal voltage	AC
Nominal voltage	345
Line construction type	Overhead
General route description	The approximately 2-mile route heads east from the proposed Matville substation to the existing Atlanta - Adkins 345kV transmission line.
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 849 ft above sea level to a low of 812 ft above sea level. The Project is located entirely within one Level IV ecoregion (Loamy High Lime Till Plains). According to the NLCD, the Project area largely consists of cultivated cropland and developed, open space.

Right-of-way width by segment	The route will have a 150 ft ROW width. The proposed ROW will be greenfield.
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).
Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route crosses multiple aquatic resources, including wetlands, lakes/ponds, and streams but most features could be spanned & avoided with minimal impacts. According to FEMA, no 100-year floodplains or regulated floodways are crossed by the route. This represent total amount of features crossed by the route & impacts from the Project would be significantly less. No major watercourses are crossed by the which will require agency authorizations for navigable water or State Scenic River crossings. No fatal flaws have been identified for the Project. No previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the vicinity of the centerline. Also, no historic districts are crossed by the proposed centerline. Three listed species (1 endangered, and 2 proposed) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route. See Attachment 08 – Permitting Plan.
Tower characteristics	The majority, approximately 60% of the proposed structures will be double circuit 345kV steel monopole in a vertical conductor configuration utilizing braced post insulators. Approximately 40% of the proposed structures will be single circuit 345kV 3-Pole structures with horizontal conductor configuration for the transmission line crossing. All structures will be self-supporting. 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	$11,842,430.00
Component cost (in-service year)	$13,398,622.00

Greenfield Transmission Line Component

Component title	A-99-A) Campbell Creek - Desoto 345kV
Project description	Proprietary & Confidential Information
Point A	Campell Creek
Point B	Desoto
Point C	

	Normal ratings	Emergency ratings
Summer (MVA)	2228.000000	2396.000000
Winter (MVA)	2292.000000	2452.000000

Conductor size and type	2 bundled 1033 KCMIL ACSS/MA3 54/7 Curlew
Nominal voltage	AC
Nominal voltage	345
Line construction type	Overhead

General route description	The approximately 0.5 mile route heads southeast from proposed Campbell Creek substation.
Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, flat lands, with elevation within the Project ranging from a high of 962 ft above sea level to a low of 947 ft above sea level. The Project is located entirely within one Level IV ecoregion (Loamy High Lime Till Plains). According to the NLCD, the Project area largely consists of cultivated cropland and developed, open space.
Right-of-way width by segment	The route will have a 150 ft ROW width. The proposed ROW will be greenfield.
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).
Environmental impacts	Environmental constraints were evaluated within the vicinity of the proposed project centerline and are manageable through avoidance, minimization, and mitigation strategies incorporated at the onset of the routing/siting process. The proposed route does not cross any aquatic resources, including wetlands, lakes/ponds, or streams. According to FEMA, no 100-year floodplains or regulated floodways are crossed by the route. No major watercourses are crossed by the which will require agency authorizations for navigable water or State Scenic River crossings. No fatal flaws have been identified for the Project. No previously recorded archaeological sites, cemeteries, & architectural resources were recorded within the vicinity of the centerline. Also, no historic districts are crossed by the proposed centerline. Three listed species (1 endangered, 1 proposed, and 1 experimental population) have known ranges along the proposed route. No critical habitat for any federally listed species intersects the route. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination, mitigation, & an in-depth routing/siting process.No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed route.
Tower characteristics	The proposed structures will be single circuit 345kV steel monopole in a delta conductor configuration utilizing braced post insulators. All structures will be self-supporting. 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	$3,199,168.00
Component cost (in-service year)	$3,619,565.00

Greenfield Substation Component

Component title	A-11-B) Newlove 765kV Substation
Project description	Proprietary & Confidential Information
Substation name	Newlove
Substation description	AC Air Insulated Substation (AIS): New proposed 765-345-138kV Substation. New 765kV Breaker and a Half (BAAH) switchyard with two (2) bays, two (2) line terminals, seven (7) 765kV, 5000A, 63kAIC breakers, two (2) 765kV, 300MVAR shunt line reactors, one (1) 765-345kV, 2400 MVA transformer bank, one (1) 765-138kV, 2000 MVA transformer bank. New 345kV BAAH switchyard with two (2) bays, three (3) line terminals, five (5) 345kV, 5000A, 63kAIC breakers, two (2) 345-138kV, 850 MVA transformer banks.
Nominal voltage	AC
Nominal voltage	765/345/138

Transformer Information

Name	Capacity (MVA)

Transformer	765-345kV Xfrm #1		2400
	High Side	Low Side	Tertiary
Voltage (kV)	765	345	
	Name		Capacity (MVA)
Transformer	765-138kV Xfrm #1		2000
	High Side	Low Side	Tertiary
Voltage (kV)	765	138	
	Name		Capacity (MVA)
Transformer	345-138kV Xfrm #1		850
	High Side	Low Side	Tertiary
Voltage (kV)	345	138	
	Name		Capacity (MVA)
Transformer	345-138kV Xfrm #2		850
	High Side	Low Side	Tertiary
Voltage (kV)	345	138	

Major equipment description

AC Air Insulated Substation (AIS): New proposed 765-345-138kV Substation. New 765kV Breaker and a Half (BAAH) switchyard with two (2) bays, two (2) line terminals, seven (7) 765kV, 5000A, 63kAIC breakers, two (2) 765kV, 300MVAR shunt line reactors, one (1) 765-345kV, 2400 MVA transformer bank, one (1) 765-138kV, 2000 MVA transformer bank. New 345kV BAAH switchyard with two (2) bays, three (3) line terminals, five (5) 345kV, 5000A, 63kAIC breakers, two (2) 345-138kV, 850 MVA transformer banks.

Normal ratings	Emergency ratings

Summer (MVA)	6904.000000	7690.000000
Winter (MVA)	8180.000000	8874.000000
Environmental assessment	Environmental constraints were evaluated within the proposed substation parcel and are manageable through avoidance, minimization, and mitigation strategies. The proposed parcel contains one of NWI-mapped wetland/waterbody. According to FEMA, no portion of the proposed substation parcel contains any 100-year floodplains or regulated floodways. No major watercourses are located within the proposes parcel. However, it is assumed any overland flow will drain to North Fork Little Miami River and its downstream tributaries. No fatal flaws have been identified for the Project. Based on publicly available data, no previously recorded archaeological sites, cemeteries, or architectural resources were recorded within the immediate vicinity of the proposed substation parcel. Additionally, no historic districts located within the immediate vicinity of the Site. Two federally listed species (1 endangered and 1 threatened) have known ranges within the vicinity of the site. No critical habitat was identified within the vicinity of the proposed substation parcel. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination and mitigation. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed project. See Attachment 08 – Permitting Plan.	

Outreach plan	The proposer is committed to informing the public about the project to the greatest extent practicable while working with all interested stakeholders including landowners through a robust public outreach program to address and respond to community concerns. A well-designed public outreach program can have numerous benefits, including fostering cooperative relationships with landowners and other stakeholders, expediting the regulatory permitting process, and assisting with project development. In general, the purpose of the community outreach plan is to gain community support for the project. In the affected communities, the proposer's public outreach plan will educate the public and relevant stakeholders on specific project details to enable timely regulatory approvals and construction activities. Elements of the public outreach plan will include the following: 1) Identify potential issues at an early stage by engagement with key community stakeholders at the outset; 2) Broaden the community engagement process to identify potential and relevant community benefits that can facilitate community support for the proposed project; 3) Develop a broad base of community support for the proposed project before the regulatory agencies; and 4) Develop a comprehensive administrative record documenting the community outreach process that can be presented to the regulatory agency or, in the event of a legal challenge, to the appropriate court. The outreach plan proposes to dedicate considerable time and resources in engaging the community, and specifically the affected community during the planning process to identify highly sensitive areas in order to develop a project that has the least amount of cultural, environmental, and social impacts. The plans will reflect avoidance of impacts rather than mitigation. However, in some cases, if avoidance is not possible, then the proposer will involve landowners and other stakeholders in providing appropriate and practical mitigation measures. Public outreach activities by the proposer will begin following project award.
Land acquisition plan	See Attachment 9.
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	$234,768,631.00
Component cost (in-service year)	$265,619,157.00

Greenfield Substation Component

Component title	A-135-A) Johnstown 765kV Substation
Project description	Proprietary & Confidential Information
Substation name	Johnstown
Substation description	AC Air Insulated Substation (AIS): New proposed 765kV Substation. New 765kV Double breaker double bus (DBDB) switchyard with three (3) bays, three (3) line terminals, seven (7) 765kV, 5000A, 63kAIC breakers, one (1) 765kV, 300MVAR shunt line reactor.
Nominal voltage	AC
Nominal voltage	765

Transformer Information

None

Major equipment description	AC Air Insulated Substation (AIS): New proposed 765kV Substation. New 765kV Double breaker double bus (DBDB) switchyard with three (3) bays, three (3) line terminals, seven (7) 765kV, 5000A, 63kAIC breakers, one (1) 765kV, 300MVAR shunt line reactor.

	Normal ratings	Emergency ratings
Summer (MVA)	6904.000000	7690.000000
Winter (MVA)	8180.000000	8874.000000

Environmental assessment	Environmental constraints were evaluated within the proposed substation parcel and are manageable through avoidance, minimization, and mitigation strategies. The proposed parcel contains one of NWI-mapped wetland/waterbody. According to FEMA, no portion of the proposed substation parcel contains any 100-year floodplains or regulated floodways. No major watercourses are located within the proposes parcel. However, it is assumed any overland flow will drain to Clear Fork Licking River and its downstream tributaries. No fatal flaws have been identified for the Project. Based on publicly available data, no previously recorded archaeological sites, cemeteries, or architectural resources were recorded within the immediate vicinity of the proposed substation parcel. Additionally, no historic districts located within the immediate vicinity of the Site. Two federally listed species (1 endangered, 1 proposed) have known ranges within the vicinity of the site. No critical habitat was identified within the vicinity of the proposed substation parcel. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination and mitigation. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed project. See Attachment 08 – Permitting Plan.
Outreach plan	The proposer is committed to informing the public about the project to the greatest extent practicable while working with all interested stakeholders including landowners through a robust public outreach program to address and respond to community concerns. A well-designed public outreach program can have numerous benefits, including fostering cooperative relationships with landowners and other stakeholders, expediting the regulatory permitting process, and assisting with project development. In general, the purpose of the community outreach plan is to gain community support for the project. In the affected communities, the proposer's public outreach plan will educate the public and relevant stakeholders on specific project details to enable timely regulatory approvals and construction activities. Elements of the public outreach plan will include the following: 1) Identify potential issues at an early stage by engagement with key community stakeholders at the outset; 2) Broaden the community engagement process to identify potential and relevant community benefits that can facilitate community support for the proposed project; 3) Develop a broad base of community support for the proposed project before the regulatory agencies; and 4) Develop a comprehensive administrative record documenting the community outreach process that can be presented to the regulatory agency or, in the event of a legal challenge, to the appropriate court. The outreach plan proposes to dedicate considerable time and resources in engaging the community, and specifically the affected community during the planning process to identify highly sensitive areas in order to develop a project that has the least amount of cultural, environmental, and social impacts. The plans will reflect avoidance of impacts rather than mitigation. However, in some cases, if avoidance is not possible, then the proposer will involve landowners and other stakeholders in providing appropriate and practical mitigation measures. Public outreach activities by the proposer will begin following project award.
Land acquisition plan	See Attachment 9.

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	$116,261,958.00
Component cost (in-service year)	$131,539,734.00

Greenfield Substation Component

Component title	A-19-B) Buckeye Lake 765kV Substation
Project description	Proprietary & Confidential Information
Substation name	Buckeye Lake
Substation description	AC Air Insulated Substation (AIS): New proposed 765-345kV Substation. New 765kV Double breaker double bus (DBDB) switchyard with two (2) bays, four (4) line terminals, six (6) 765kV, 5000A, 63kAIC breakers, two (2) 765kV, 300MVAR shunt line reactors, two (2) 765-345kV, 2400 MVA transformer banks. New 345kV switchyard with two (2) line terminals, two (2) 345kV, 5000A, 63kAIC breakers.
Nominal voltage	AC
Nominal voltage	765/345

Transformer Information

	Name		Capacity (MVA)
Transformer	765-345kV Xfmr #1		2400
	High Side	Low Side	Tertiary
Voltage (kV)	765	345	

	Name		Capacity (MVA)
Transformer	765-345kV Xfmr #2		2400
	High Side	Low Side	Tertiary
Voltage (kV)	765	345	

Major equipment description

AC Air Insulated Substation (AIS): New proposed 765-345kV Substation. New 765kV Double breaker double bus (DBDB) switchyard with two (2) bays, four (4) line terminals, six (6) 765kV, 5000A, 63kAIC breakers, two (2) 765kV, 300MVAR shunt line reactors, two (2) 765-345kV, 2400 MVA transformer banks. New 345kV switchyard with two (2) line terminals, two (2) 345kV, 5000A, 63kAIC breakers.

	Normal ratings	Emergency ratings
Summer (MVA)	6904.000000	7690.000000
Winter (MVA)	8180.000000	8874.000000

Environmental assessment	Environmental constraints were evaluated within the proposed substation parcel and are manageable through avoidance, minimization, and mitigation strategies. The proposed parcel contains one of NWI-mapped wetland/waterbody. According to FEMA, no portion of the proposed substation parcel contains any 100-year floodplains or regulated floodways. No major watercourses are located within the proposes parcel. However, it is assumed any overland flow will drain to Paw Paw Creek and its downstream tributaries. No fatal flaws have been identified for the Project. Based on publicly available data, no previously recorded archaeological sites, cemeteries, or architectural resources were recorded within the immediate vicinity of the proposed substation parcel. Additionally, no historic districts located within the immediate vicinity of the Site. Four federally listed species (1 endangered, 1 threatened, and 2 proposed) have known ranges within the vicinity of the site. No critical habitat was identified within the vicinity of the proposed substation parcel. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination and mitigation. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed project. See Attachment 08 – Permitting Plan.
Outreach plan	The proposer is committed to informing the public about the project to the greatest extent practicable while working with all interested stakeholders including landowners through a robust public outreach program to address and respond to community concerns. A well-designed public outreach program can have numerous benefits, including fostering cooperative relationships with landowners and other stakeholders, expediting the regulatory permitting process, and assisting with project development. In general, the purpose of the community outreach plan is to gain community support for the project. In the affected communities, the proposer's public outreach plan will educate the public and relevant stakeholders on specific project details to enable timely regulatory approvals and construction activities. Elements of the public outreach plan will include the following: 1) Identify potential issues at an early stage by engagement with key community stakeholders at the outset; 2) Broaden the community engagement process to identify potential and relevant community benefits that can facilitate community support for the proposed project; 3) Develop a broad base of community support for the proposed project before the regulatory agencies; and 4) Develop a comprehensive administrative record documenting the community outreach process that can be presented to the regulatory agency or, in the event of a legal challenge, to the appropriate court. The outreach plan proposes to dedicate considerable time and resources in engaging the community, and specifically the affected community during the planning process to identify highly sensitive areas in order to develop a project that has the least amount of cultural, environmental, and social impacts. The plans will reflect avoidance of impacts rather than mitigation. However, in some cases, if avoidance is not possible, then the proposer will involve landowners and other stakeholders in providing appropriate and practical mitigation measures. Public outreach activities by the proposer will begin following project award.
Land acquisition plan	See Attachment 9.

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	$210,178,052.00
Component cost (in-service year)	$237,797,173.00

Greenfield Substation Component

Component title	A-92-C) Muckshaw 765kV Substation
Project description	Proprietary & Confidential Information
Substation name	Muckshaw
Substation description	AC Air Insulated Substation (AIS): New proposed 765-345kV Substation. New 765kV Double breaker double bus (DBDB) switchyard with three (3) bays, three (3) line terminals, seven (7) 765kV, 5000A, 63kAIC breakers, one (1) 765kV, 300MVAR shunt line reactor, two (2) 765-345kV, 2400 MVA transformer banks. New 345kV BAAH switchyard with three (3) bays, six (6) line terminals, nine (9) 345kV, 5000A, 63kAIC breakers.
Nominal voltage	AC
Nominal voltage	765/345

Transformer Information

	Name		Capacity (MVA)
Transformer	765-345kV Xfrm #1		2400
	High Side	Low Side	Tertiary
Voltage (kV)	765	345	

	Name		Capacity (MVA)
Transformer	765-345kV Xfrm #2		2400
	High Side	Low Side	Tertiary
Voltage (kV)	765	345	

Major equipment description

AC Air Insulated Substation (AIS): New proposed 765-345kV Substation. New 765kV Double breaker double bus (DBDB) switchyard with three (3) bays, three (3) line terminals, seven (7) 765kV, 5000A, 63kAIC breakers, one (1) 765kV, 300MVAR shunt line reactor, two (2) 765-345kV, 2400 MVA transformer banks. New 345kV BAAH switchyard with three (3) bays, six (6) line terminals, nine (9) 345kV, 5000A, 63kAIC breakers.

	Normal ratings	Emergency ratings
Summer (MVA)	6904.000000	7690.000000
Winter (MVA)	8180.000000	8874.000000

Environmental assessment	Environmental constraints were evaluated within the proposed substation parcel and are manageable through avoidance, minimization, and mitigation strategies. The proposed parcel does not contain any NWI-mapped wetlands/waterbodies. According to FEMA, no portion of the proposed substation parcel contains any 100-year floodplains or regulated floodways. No major watercourses are located within the proposes parcel. However, it is assumed any overland flow will drain to the Yellow River and its downstream tributaries. No fatal flaws have been identified for the Project. Based on publicly available data, no previously recorded archaeological sites, cemeteries, or architectural resources were recorded within the immediate vicinity of the proposed substation parcel. Additionally, no historic districts located within the immediate vicinity of the Site. Four federally listed species (2 endangered, 1 proposed, and 1 experimental population) have known ranges within the vicinity of the site. No critical habitat was identified within the vicinity of the proposed substation parcel. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination and mitigation. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed project. See Attachment 08 – Permitting Plan.
Outreach plan	The proposer is committed to informing the public about the project to the greatest extent practicable while working with all interested stakeholders including landowners through a robust public outreach program to address and respond to community concerns. A well-designed public outreach program can have numerous benefits, including fostering cooperative relationships with landowners and other stakeholders, expediting the regulatory permitting process, and assisting with project development. In general, the purpose of the community outreach plan is to gain community support for the project. In the affected communities, the proposer's public outreach plan will educate the public and relevant stakeholders on specific project details to enable timely regulatory approvals and construction activities. Elements of the public outreach plan will include the following: 1) Identify potential issues at an early stage by engagement with key community stakeholders at the outset; 2) Broaden the community engagement process to identify potential and relevant community benefits that can facilitate community support for the proposed project; 3) Develop a broad base of community support for the proposed project before the regulatory agencies; and 4) Develop a comprehensive administrative record documenting the community outreach process that can be presented to the regulatory agency or, in the event of a legal challenge, to the appropriate court. The outreach plan proposes to dedicate considerable time and resources in engaging the community, and specifically the affected community during the planning process to identify highly sensitive areas in order to develop a project that has the least amount of cultural, environmental, and social impacts. The plans will reflect avoidance of impacts rather than mitigation. However, in some cases, if avoidance is not possible, then the proposer will involve landowners and other stakeholders in providing appropriate and practical mitigation measures. Public outreach activities by the proposer will begin following project award.

Land acquisition plan	See Attachment 9.
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	$303,585,368.00
Component cost (in-service year)	$343,478,979.00

Greenfield Substation Component

Component title	A-98-C) Campbell Creek 765kV Substation
Project description	Proprietary & Confidential Information
Substation name	Campbell Creek
Substation description	AC Air Insulated Substation (AIS): New proposed 765-345kV Substation. New 765kV Double breaker double bus (DBDB) switchyard with two (2) bays, two (2) line terminals, six (6) 765kV, 5000A, 63kAIC breakers, two (2) 765kV, 300MVAR shunt line reactors, one (1) 765-345kV, 2400 MVA transformer bank. New 345kV switchyard with one (1) line terminal, one (1) 345kV, 5000A, 63kAIC breaker.
Nominal voltage	AC

Nominal voltage	765/345

Transformer Information

	Name	Capacity (MVA)
Transformer	765-345kV Xfrm #1	2400

	High Side	Low Side	Tertiary
Voltage (kV)	765	345	

Major equipment description	AC Air Insulated Substation (AIS): New proposed 765-345kV Substation. New 765kV Double breaker double bus (DBDB) switchyard with three (3) bays, three (3) line terminals, seven (7) 765kV, 5000A, 63kAIC breakers, one (1) 765kV, 300MVAR shunt line reactor, two (2) 765-345kV, 2400 MVA transformer banks. New 345kV BAAH switchyard with three (3) bays, six (6) line terminals, nine (9) 345kV, 5000A, 63kAIC breakers.

	Normal ratings	Emergency ratings
Summer (MVA)	6904.000000	7690.000000
Winter (MVA)	8180.000000	8874.000000

Environmental assessment	Environmental constraints were evaluated within the proposed substation parcel and are manageable through avoidance, minimization, and mitigation strategies. The proposed parcel does not contain any NWI-mapped wetlands/waterbodies. According to FEMA, no portion of the proposed substation parcel contains any 100-year floodplains or regulated floodways. No major watercourses are located within the proposes parcel. However, it is assumed any overland flow will drain to the Yellow River and its downstream tributaries. No fatal flaws have been identified for the Project. Based on publicly available data, no previously recorded archaeological sites, cemeteries, or architectural resources were recorded within the immediate vicinity of the proposed substation parcel. Additionally, no historic districts located within the immediate vicinity of the Site. Four federally listed species (2 endangered, 1 proposed, and 1 experimental population) have known ranges within the vicinity of the site. No critical habitat was identified within the vicinity of the proposed substation parcel. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination and mitigation. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed project. See Attachment 08 – Permitting Plan.
Outreach plan	The proposer is committed to informing the public about the project to the greatest extent practicable while working with all interested stakeholders including landowners through a robust public outreach program to address and respond to community concerns. A well-designed public outreach program can have numerous benefits, including fostering cooperative relationships with landowners and other stakeholders, expediting the regulatory permitting process, and assisting with project development. In general, the purpose of the community outreach plan is to gain community support for the project. In the affected communities, the proposer's public outreach plan will educate the public and relevant stakeholders on specific project details to enable timely regulatory approvals and construction activities. Elements of the public outreach plan will include the following: 1) Identify potential issues at an early stage by engagement with key community stakeholders at the outset; 2) Broaden the community engagement process to identify potential and relevant community benefits that can facilitate community support for the proposed project; 3) Develop a broad base of community support for the proposed project before the regulatory agencies; and 4) Develop a comprehensive administrative record documenting the community outreach process that can be presented to the regulatory agency or, in the event of a legal challenge, to the appropriate court. The outreach plan proposes to dedicate considerable time and resources in engaging the community, and specifically the affected community during the planning process to identify highly sensitive areas in order to develop a project that has the least amount of cultural, environmental, and social impacts. The plans will reflect avoidance of impacts rather than mitigation. However, in some cases, if avoidance is not possible, then the proposer will involve landowners and other stakeholders in providing appropriate and practical mitigation measures. Public outreach activities by the proposer will begin following project award.

Land acquisition plan	See Attachment 9.
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	$154,108,348.00
Component cost (in-service year)	$174,359,450.00

Greenfield Substation Component

Component title	A-13-E) Matville 765kV Substation
Project description	Proprietary & Confidential Information
Substation name	Matville
Substation description	AC Air Insulated Substation (AIS): New proposed 765-345kV Substation. New 765kV breaker and a half (BAAH) switchyard with three (3) bays, four (4) line terminals, eleven (11) 765kV, 5000A, 63kAIC breakers, four (4) 765kV, 300MVAR shunt line reactors, one (1) 765-345kV, 2400 MVA transformer bank. New 345kV BAAH switchyard with three (3) bays, six (6) line terminals, nine (9) 345kV, 5000A, 63kAIC breakers.
Nominal voltage	AC

Nominal voltage	765/345

Transformer Information

	Name	Capacity (MVA)
Transformer	765-345kV Xfmr #1	2400

	High Side	Low Side	Tertiary
Voltage (kV)	765	345	

Major equipment description	AC Air Insulated Substation (AIS): New proposed 765-345kV Substation. New 765kV breaker and a half (BAAH) switchyard with three (3) bays, four (4) line terminals, eleven (11) 765kV, 5000A, 63kAIC breakers, four (4) 765kV, 300MVAR shunt line reactors, one (1) 765-345kV, 2400 MVA transformer bank. New 345kV BAAH switchyard with three (3) bays, six (6) line terminals, nine (9) 345kV, 5000A, 63kAIC breakers.

	Normal ratings	Emergency ratings
Summer (MVA)	6904.000000	7690.000000
Winter (MVA)	8180.000000	8874.000000

Environmental assessment	Environmental constraints were evaluated within the proposed substation parcel and are manageable through avoidance, minimization, and mitigation strategies. The proposed parcel contains one of NWI-mapped wetland/waterbody. According to FEMA, no portion of the proposed substation parcel contains any 100-year floodplains or regulated floodways. No major watercourses are located within the proposes parcel. However, it is assumed any overland flow will drain to Big Darby Creek and its downstream tributaries. No fatal flaws have been identified for the Project. Based on publicly available data, no previously recorded archaeological sites, cemeteries, or architectural resources were recorded within the immediate vicinity of the proposed substation parcel. Additionally, no historic districts located within the immediate vicinity of the Site. Nine federally listed species (5 endangered, 2 threatened, and 2 proposed) have known ranges within the vicinity of the site. No critical habitat was identified within the vicinity of the proposed substation parcel. If suitable habitat is identified or regulations change, agency coordination & species-specific surveys will occur. The project intends to follow suggested tree removal windows & general time of year restrictions to avoid/minimize impacts to species such as federally listed bats and migratory birds, among others. Industry standard construction BMPs & avoidance and minimization measures will be used to prevent unanticipated impacts to natural resources to the maximum extent practicable. There are no environmental concerns with the proposed project that cannot be addressed through agency coordination and mitigation. No ‘Major Federal Action’ that would invoke NEPA is anticipated to result from the proposed project. See Attachment 08 – Permitting Plan.
Outreach plan	The proposer is committed to informing the public about the project to the greatest extent practicable while working with all interested stakeholders including landowners through a robust public outreach program to address and respond to community concerns. A well-designed public outreach program can have numerous benefits, including fostering cooperative relationships with landowners and other stakeholders, expediting the regulatory permitting process, and assisting with project development. In general, the purpose of the community outreach plan is to gain community support for the project. In the affected communities, the proposer's public outreach plan will educate the public and relevant stakeholders on specific project details to enable timely regulatory approvals and construction activities. Elements of the public outreach plan will include the following: 1) Identify potential issues at an early stage by engagement with key community stakeholders at the outset; 2) Broaden the community engagement process to identify potential and relevant community benefits that can facilitate community support for the proposed project; 3) Develop a broad base of community support for the proposed project before the regulatory agencies; and 4) Develop a comprehensive administrative record documenting the community outreach process that can be presented to the regulatory agency or, in the event of a legal challenge, to the appropriate court. The outreach plan proposes to dedicate considerable time and resources in engaging the community, and specifically the affected community during the planning process to identify highly sensitive areas in order to develop a project that has the least amount of cultural, environmental, and social impacts. The plans will reflect avoidance of impacts rather than mitigation. However, in some cases, if avoidance is not possible, then the proposer will involve landowners and other stakeholders in providing appropriate and practical mitigation measures. Public outreach activities by the proposer will begin following project award.
Land acquisition plan	See Attachment 9.

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	$255,822,647.00
Component cost (in-service year)	$289,439,843.00

Transmission Line Upgrade Component

Component title	A-103-A) North Titus Melissa - London 138kV double circuit/London - Beatty 138kV single circuit
Project description	Proprietary & Confidential Information
Impacted transmission line	North Titus - Melissa - London 138kV double circuit and London - Beatty 138kV single circuit
Point A	North Titus
Point B	London
Point C	Beatty

Terrain description	A detailed inspection of the USGS topographic map reveals relatively consistent, rolling terrain, with elevation within the Project ranging from a high of 1,192 ft above sea level to a low of 1,035 ft above sea level. The Project is located entirely within the Darby Plains Level IV ecoregion. According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, hay/pasture, and developed, open space.
Existing Line Physical Characteristics	
Operating voltage	138
Conductor size and type	Per transmission owner system.
Hardware plan description	Transmission owner to responsible for hardware replacement and OHGW/OPGW selection.
Tower line characteristics	Transmission owner responsible for structure replacement analysis.
Proposed Line Characteristics	

	Designed	Operating
Voltage (kV)	138.000000	138.000000
	Normal ratings	Emergency ratings
Summer (MVA)	1025.000000	1056.000000
Winter (MVA)	1102.000000	1129.000000

Conductor size and type	Transmission Owner to select conductor to achieve required ratings.
Shield wire size and type	Transmission Owner to select preferred shield wire.
Rebuild line length	35
Rebuild portion description	The entire portion from North Titus - Melissa - London - Beatty will be rebuilt. Transmission owner to determine preferred construction method for this section.
Right of way	Rebuild in existing right of way
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	$57,186,921.00
Component cost (in-service year)	$57,186,921.00

Transmission Line Upgrade Component

Component title	A-14-A) Marysville - Matville 765kV Loop-In
Project description	Proprietary & Confidential Information
Impacted transmission line	Marysville - Flatlick 765kV
Point A	Marysville
Point B	Matville
Point C	
Terrain description	A detailed inspection of the USGS topographic map reveals relatively flat lands, with elevation within the Project ranging from a high of 801 ft above sea level to a low of 794 ft above sea level. The Project is located entirely within one Level IV ecoregion (Loamy High Lime Till Plains). According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, and developed, open space.

Existing Line Physical Characteristics		
Operating voltage	765	
Conductor size and type	Per transmission owner system.	
Hardware plan description	Existing hardware will remain the same. Incumbent to select new equipment per specifications.	
Tower line characteristics	Existing hardware will remain the same. Incumbent to select new equipment per specifications.	
Proposed Line Characteristics		
	Designed	Operating
Voltage (kV)	765.000000	765.000000
	Normal ratings	Emergency ratings
Summer (MVA)	5496.000000	6667.000000
Winter (MVA)	6938.000000	8265.000000
Conductor size and type	Transmission Owner to select conductor to achieve required ratings.	
Shield wire size and type	Transmission Owner to select preferred shield wire.	
Rebuild line length	0.72	
Rebuild portion description	Tap the existing Marysville-Flatlick 765kV circuit and loop in Matville substation . Construction will include separating the existing Marysville-Flatlick 765kV circuit and extending one segment approximately 0.72 miles into Matville substation creating the Marysville-Matville 765kV circuit.	
Right of way	New right-of-way to be acquired for proposed route.	
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	$2,636,719.00
Component cost (in-service year)	$2,636,719.00

Transmission Line Upgrade Component

Component title	A-72-A) Matville - Flatlick 765kV Loop-In
Project description	Proprietary & Confidential Information
Impacted transmission line	Marysville - Flatlick 765kV
Point A	Matville
Point B	Flatlick
Point C	
Terrain description	A detailed inspection of the USGS topographic map reveals relatively flat lands, with elevation within the Project ranging from a high of 801 ft above sea level to a low of 794 ft above sea level. The Project is located entirely within one Level IV ecoregion (Loamy High Lime Till Plains). According to the NLCD, the Project area largely consists of cultivated cropland, deciduous forest, and developed, open space.
Existing Line Physical Characteristics	
Operating voltage	765
Conductor size and type	Per Transmission Owner system.

Hardware plan description	Existing hardware will remain the same. Transmission Owner to select new equipment per specifications.
Tower line characteristics	Existing hardware will remain the same. Transmission Owner to select new equipment per specifications.

Proposed Line Characteristics

	Designed	Operating
Voltage (kV)	765.000000	765.000000
	Normal ratings	Emergency ratings
Summer (MVA)	5496.000000	6667.000000
Winter (MVA)	6938.000000	8024.000000

Conductor size and type	Transmission Owner to select conductor to achieve required ratings.
Shield wire size and type	Transmission Owner to select preferred shield wire.
Rebuild line length	0.72
Rebuild portion description	Tap the existing Marysville-Flatlick 765kV circuit and loop in Matville substation . Construction will include separating the existing Marysville-Flatlick 765kV circuit and extending one segment approximately 0.72 miles into Matville substation creating the Matville-Flatlick 765kV circuit.
Right of way	New right-of-way to be acquired for proposed route.
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	$2,496,094.00
Component cost (in-service year)	$2,496,094.00

Substation Upgrade Component

Component title	A-108-A) Melissa substation upgrades
Project description	Proprietary & Confidential Information
Substation name	Melissa
Substation zone	ATSI
Substation upgrade scope	Add (4) 138kV, 5000A, 63kAIC breakers to terminate (3) new lines.

Transformer Information

None

New equipment description	Add (4) 138kV, 5000A, 63kAIC breakers to terminate (3) new lines.
Substation assumptions	Assumes upgrades can occur in existing footprint. Precise location, general arrangement, and aerial imagery were not available at time of submission.
Real-estate description	Precise substation location was not available at time of submission.
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	$4,556,250.00
Component cost (in-service year)	$4,556,250.00

Substation Upgrade Component

Component title	A-112-A) Madison substation upgrades
Project description	Proprietary & Confidential Information
Substation name	Madison
Substation zone	Dayton
Substation upgrade scope	Add (2) new 345kV breakers to create (2) line positions. Terminate (2) 345kV lines.

Transformer Information

None

New equipment description	Add two (2) 345kV, 5000A, 63kAIC breakers and two (2) line positions.
Substation assumptions	Assumes that fence line must be expanded to east to accommodate upgrades.
Real-estate description	Assumes, based on imagery and publicly available parcel data, that space is available on utility property to expand the substation.

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	$6,646,875.00
Component cost (in-service year)	$6,646,875.00

Substation Upgrade Component

Component title	A-118-C) West Millersport substation upgrades
Project description	Proprietary & Confidential Information
Substation name	West Millersport
Substation zone	AEP
Substation upgrade scope	Expand the existing 345kV breaker and a half (BAAH) switchyard with two (2) new bays, (7) 345kV breakers.

Transformer Information

None

New equipment description	Add seven (7) 345kV, 5000A, 63KAIC breakers to create (2) BAAH bays.
Substation assumptions	Assumes that fence line must be expanded to south east to accommodate upgrades.
Real-estate description	Assumes, based on imagery and publicly available parcel data, that space is available on utility property to expand the substation.
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	$19,940,625.00
Component cost (in-service year)	$19,940,625.00

Substation Upgrade Component

Component title	A-119-B) Bixby terminal equipment upgrades
Project description	Proprietary & Confidential Information
Substation name	Bixby
Substation zone	AEP

Substation upgrade scope	Transmission owner to upgrade terminal equipment

Transformer Information

None

New equipment description	Transmission owner to upgrade terminal equipment.
Substation assumptions	Assumes required equipment upgrades occur in existing footprint.
Real-estate description	Based on publicly available parcel data and imagery, upgrades are expected to fit fully within existing fence line on transmission-owner owned property.
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	$2,492,578.00
Component cost (in-service year)	$2,492,578.00

Substation Upgrade Component

Component title	A-124-B) Cole substation upgrade

Project description	Proprietary & Confidential Information
Substation name	Cole
Substation zone	AEP
Substation upgrade scope	Add (1) new 345kV breaker into existing breaker and a half (BAAH) bay to create (1) new line position. Relocate existing 345-138kV transformer into bus position. Terminate (4) 345kV lines.

Transformer Information

None

New equipment description	Add (1) new 345k, 5000A, 63kAIC breaker into existing breaker and a half (BAAH) bay to create (1) new line position.
Substation assumptions	Assumes required equipment upgrades occur in existing footprint.
Real-estate description	Based on publicly available parcel data and imagery, upgrades are expected to fit fully within existing fence line on transmission-owner owned property.
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	$3,323,438.00

Component cost (in-service year)	$3,323,438.00

Substation Upgrade Component

Component title	A-125-A) Hayden substation upgrade
Project description	Proprietary & Confidential Information
Substation name	Hayden
Substation zone	AEP
Substation upgrade scope	Expand the existing 345kV breaker and a half (BAAH) switchyard with one (1) new bay, (2) 345kV breakers. Add (1) new 345-138KV transformer.

Transformer Information

	Name	Capacity (MVA)
Transformer	Transformer 1	850

	High Side	Low Side	Tertiary
Voltage (kV)	345	138	N/A

New equipment description	Add (2) new 345k, 5000A, 63kAIC breakers to create (1) new breaker and a half (BAAH) bay and (2) new line positions. Add (1) new 345-138kV, 850 MVA transformer.
Substation assumptions	Assumes required equipment upgrades occur in existing footprint.
Real-estate description	Based on publicly available parcel data and imagery, upgrades are expected to fit fully within existing fence line on transmission-owner owned property.
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	$13,347,188.00
Component cost (in-service year)	$13,347,188.00

Substation Upgrade Component

Component title	A-131-B) Celtic substation upgrade
Project description	Proprietary & Confidential Information
Substation name	Celtic
Substation zone	Celtic
Substation upgrade scope	Expand the existing 345kV breaker and a half (BAAH) switchyard by adding (2) 345kV breakers into existing bays and creating (2) line positions.

Transformer Information

None

New equipment description	Add (2) new 345k, 5000A, 63kAIC breakers to into existing BAAH bays to create (2) line positions.
Substation assumptions	Assumes required equipment upgrades occur in existing footprint or on adjacent incumbent owned property. Substation is currently under construction.
Real-estate description	Substation is currently under construction. Based on publicly available parcel data and imagery, upgrades are expected to fit fully within existing fence line or on transmission-owner owned property.
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	$6,646,875.00
Component cost (in-service year)	$6,646,875.00

Substation Upgrade Component

Component title	A-139-A) Cosgray 345kV substation upgrade
Project description	Proprietary & Confidential Information
Substation name	Cosgray 345kV
Substation zone	AEP
Substation upgrade scope	Add (1) new 345kV breaker and capacitor bank.

Transformer Information

None

New equipment description	Add (1) new 345kV, 5000A, 63kAIC breaker and (1) 345kV, 43.4 MVAR capacitor bank.
Substation assumptions	Assumes required equipment upgrades occur in existing footprint.

Real-estate description	Based on publicly available parcel data and imagery, upgrades are expected to fit fully within existing fence line on transmission-owner owned property.
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	$3,539,766.00
Component cost (in-service year)	$3,539,766.00

Substation Upgrade Component

Component title	A-150-A) Bethel circuit breaker replacement
Project description	Proprietary & Confidential Information
Substation name	Bethel
Substation zone	AEP
Substation upgrade scope	Replace (2) existing 138KV breakers.

Transformer Information

None

New equipment description	Replace (2) existing 138KV breakers with new 138kV, 4000A, 63kAIC breakers.
Substation assumptions	Assumes required equipment upgrades occur in existing footprint.
Real-estate description	Based on publicly available parcel data and imagery, upgrades are expected to fit fully within existing fence line on transmission-owner owned property.
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	$1,518,750.00
Component cost (in-service year)	$1,518,750.00

Substation Upgrade Component

Component title	A-151-A) Babbit circuit switcher replacement
Project description	Proprietary & Confidential Information
Substation name	Babbitt
Substation zone	AEP

Substation upgrade scope	Replace (1) existing 138KV circuit switcher.

Transformer Information

	Name	Capacity (MVA)
Transformer	NA	NA

	High Side	Low Side	Tertiary
Voltage (kV)	NA	NA	NA

New equipment description	Replace (1) existing 138KV circuit switcher with a 138KV, 2000A, 50KAIC circuit switcher.
Substation assumptions	Assumes required equipment upgrades occur in existing footprint.
Real-estate description	Based on publicly available parcel data and imagery, upgrades are expected to fit fully within existing fence line on transmission-owner owned property.
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	$759,375.00

Component cost (in-service year)	$759,375.00

Substation Upgrade Component

Component title	A-15-B) Marysville substation upgrade
Project description	Proprietary & Confidential Information
Substation name	Marysville
Substation zone	Dayton
Substation upgrade scope	Expand the existing double breaker double bus (DBDB) 765kV Switchyard by adding (1) new 765kV breaker and (1) line position. Add (1) 765-345kV transformer bank. Expand the existing 345kV breaker and a half (BAAH) switchyard by adding (3) 345kV breakers and (3) line positions.

Transformer Information

	Name	Capacity (MVA)
Transformer	Transformer 1	2400

	High Side	Low Side	Tertiary
Voltage (kV)	765	345	N/A

New equipment description	Add (1) 765kV, 5000A, 63kAIC breaker to an existing DBDB bay to create (1) line position.. Add (1) 765-345kV, 2400 MVA transformer bank. Add (3) 345kV, 5000A, 63kAIC breakers to existing BAAH bays to create (3) line positions.
Substation assumptions	Assumes required equipment upgrades can occur within existing footprint. Some line terminations may need to be reconfigured to accommodate incoming transmission lines.
Real-estate description	Based on publicly available parcel data and imagery, upgrades are expected to fit fully within existing fence line on transmission-owner owned property.
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	$77,715,234.00
Component cost (in-service year)	$77,715,234.00

Substation Upgrade Component

Component title	A-23-A) Kirk substation upgrade
Project description	Proprietary & Confidential Information
Substation name	Kirk
Substation zone	AEP
Substation upgrade scope	Transmission owner to upgrade terminal equipment.

Transformer Information

None

New equipment description	Transmission owner to upgrade terminal equipment
Substation assumptions	Assumes required equipment upgrades occur in existing footprint.
Real-estate description	Based on publicly available parcel data and imagery, upgrades are expected to fit fully within existing fence line on transmission-owner owned property.

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	$2,492,578.00
Component cost (in-service year)	$2,492,578.00

Substation Upgrade Component

Component title	A-149-A) Beacon substation upgrade
Project description	Proprietary & Confidential Information
Substation name	Beacon
Substation zone	AEP
Substation upgrade scope	Add (1) new 345kV breaker and capacitor bank.

Transformer Information

None

New equipment description	Add (1) new 345kV, 5000A, 63kAIC breaker and (1) 345kV, 43.4 MVAR capacitor bank.

Substation assumptions	Assumes required equipment upgrades occur within existing footprint. No aerial imagery was available at time of submission, however oneline indicates future cap bank is planned.
Real-estate description	Assumes required equipment upgrades occur within existing footprint. No aerial imagery was available at time of submission, however oneline indicates future cap bank is planned.
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	$3,539,766.00
Component cost (in-service year)	$3,539,766.00

Substation Upgrade Component

Component title	A-97-A) Desoto substation upgrade
Project description	Proprietary & Confidential Information
Substation name	Desoto
Substation zone	AEP

Substation upgrade scope	Expand the existing breaker and a half (BAAH) 345kV Switchyard by adding (1) 345kV breaker and one line position.

Transformer Information

None

New equipment description	Add (1) 345kV, 5000A, 63kAIC breaker and (1) line position.
Substation assumptions	Assumes required equipment upgrades occur in existing footprint.
Real-estate description	Based on publicly available parcel data and imagery, upgrades are expected to fit fully within existing fence line on transmission-owner owned property.
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	$3,323,438.00
Component cost (in-service year)	$3,323,438.00

Substation Upgrade Component

Component title	A-158-A) Greentown substation upgrade

Project description	Proprietary & Confidential Information
Substation name	Greentown
Substation zone	NA
Substation upgrade scope	Transmission owner to upgrade terminal equipment.

Transformer Information

None

New equipment description	Transmission owner to upgrade terminal equipment.
Substation assumptions	Assumes required equipment upgrades occur in existing footprint.
Real-estate description	Based on publicly available parcel data and imagery, upgrades are expected to fit fully within existing fence line on transmission-owner owned property.
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	$6,752,344.00
Component cost (in-service year)	$6,752,344.00

Substation Upgrade Component

Component title	A-159-A) Dublin reactor addition
Project description	Proprietary & Confidential Information
Substation name	Dublin
Substation zone	AEP
Substation upgrade scope	Add (1) 138kV series line reactor to the existing 138kV Switchyard.

Transformer Information

None

New equipment description	Add (1) 138kV, 2% series line reactor.
Substation assumptions	Assumes that substation upgrades can occur within existing fence line or within minor fence line expansion to west on transmission-owner owned property.
Real-estate description	Assumes upgrades can occur on transmission-owner owned property.
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	$1,142,578.00
Component cost (in-service year)	$1,142,578.00

Substation Upgrade Component

Component title	A-160-B) Beatty substation upgrades
Project description	Proprietary & Confidential Information
Substation name	Beatty
Substation zone	AEP
Substation upgrade scope	Expand the existing breaker and a half (BAAH) 345kV switchyard by adding (3) breakers to create (1) new bay and (2) line positions. Add (2) 138kV series reactors.

Transformer Information

None

New equipment description	Add (3) 345kV, 5000A, 63kAIC breakers to create (1) new BAAH bay with (2) line positions. Add (2) 138kV, series line reactors.
Substation assumptions	Assumes that fence line must be expanded to east to accommodate breaker additions and that reactor installation can occur within existing fence line.
Real-estate description	Assumes, based on imagery and publicly available parcel data, that space is available on utility property to expand the substation to the east.
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	$9,498,750.00
Component cost (in-service year)	$9,498,750.00

Substation Upgrade Component

Component title	A-161-A) Wilson series reactor addition
Project description	Proprietary & Confidential Information
Substation name	Wilson
Substation zone	AEP
Substation upgrade scope	Add (1) 138kV series line reactor to the existing 138kV Switchyard.

Transformer Information

None

New equipment description	Add (1) 138kV, 2% series line reactor.
Substation assumptions	Assumes that substation upgrade can occur within existing fenceline.
Real-estate description	Assumes that upgrade occur on transmission-owner owned property.
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	$1,142,578.00
Component cost (in-service year)	$1,142,578.00

Substation Upgrade Component

Component title	A-162-A) Roberts
Project description	Proprietary & Confidential Information
Substation name	Roberts
Substation zone	AEP
Substation upgrade scope	Add (1) 138kV series line reactor to the existing 138kV Switchyard.

Transformer Information

None

New equipment description	Add (1) 138kV, 2% series line reactor.
Substation assumptions	Assumes that substation upgrade can occur within existing fence line.
Real-estate description	Assumes that upgrade occur on transmission-owner owned property.
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	$1,142,578.00
Component cost (in-service year)	$1,142,578.00

Congestion Drivers

None

Existing Flowgates

None

New Flowgates

Proprietary & Confidential Information

Financial Information

Capital spend start date	01/2026
Construction start date	10/2029

Project Duration (In Months)	65

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. A-10-B) Campbell Creek - Newlove 765kV (Ohio Portion) - Proposer
2. A-113-A) Newlove - Madison 345kV - Proposer
3. A-114-A) Matville - Biers Run 345kV Loop-In - Proposer
4. A-115-A) Matville - Bixby 345kV Loop-In - Proposer
5. A-126-C) Cole - Hayden 345kV - Proposer
6. A-127-B) Cole - Beatty 345kV - Proposer
7. A-12-A) Newlove - Matville 765kV - Proposer
8. A-132-A) Celtic - Marysville 345kV - Proposer
9. A-136-A) Buckeye Lake - Johnstown 765kV - Proposer
10. A-136-B) Matville - Beatty 345kV - Proposer
11. A-140-B) Newlove - Melissa 138kV - Proposer
12. A-140-C) Newlove - Melissa 138kV - Proposer
13. A-17-B) Matville - Adkins 345kV Loop-In - Proposer
14. A-18-A) Matville - Buckeye Lake 765kV - Proposer
15. A-20-A) Bixby/Kirk - West Millersport 345kV Loop-In - Proposer
16. A-21-A) Bixby/Ohio Central - West Millersport 345kV Loop-In - Proposer
17. A-70-A) Matville - Altanta 345kV Loop-In - Proposer
18. A-11-B) Newlove 765kV Substation - Proposer
19. A-135-A) Johnstown 765kV Substation - Proposer
20. A-19-B) Buckeye Lake 765kV Substation - Proposer
21. A-13-E) Matville 765kV Substation - 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

None