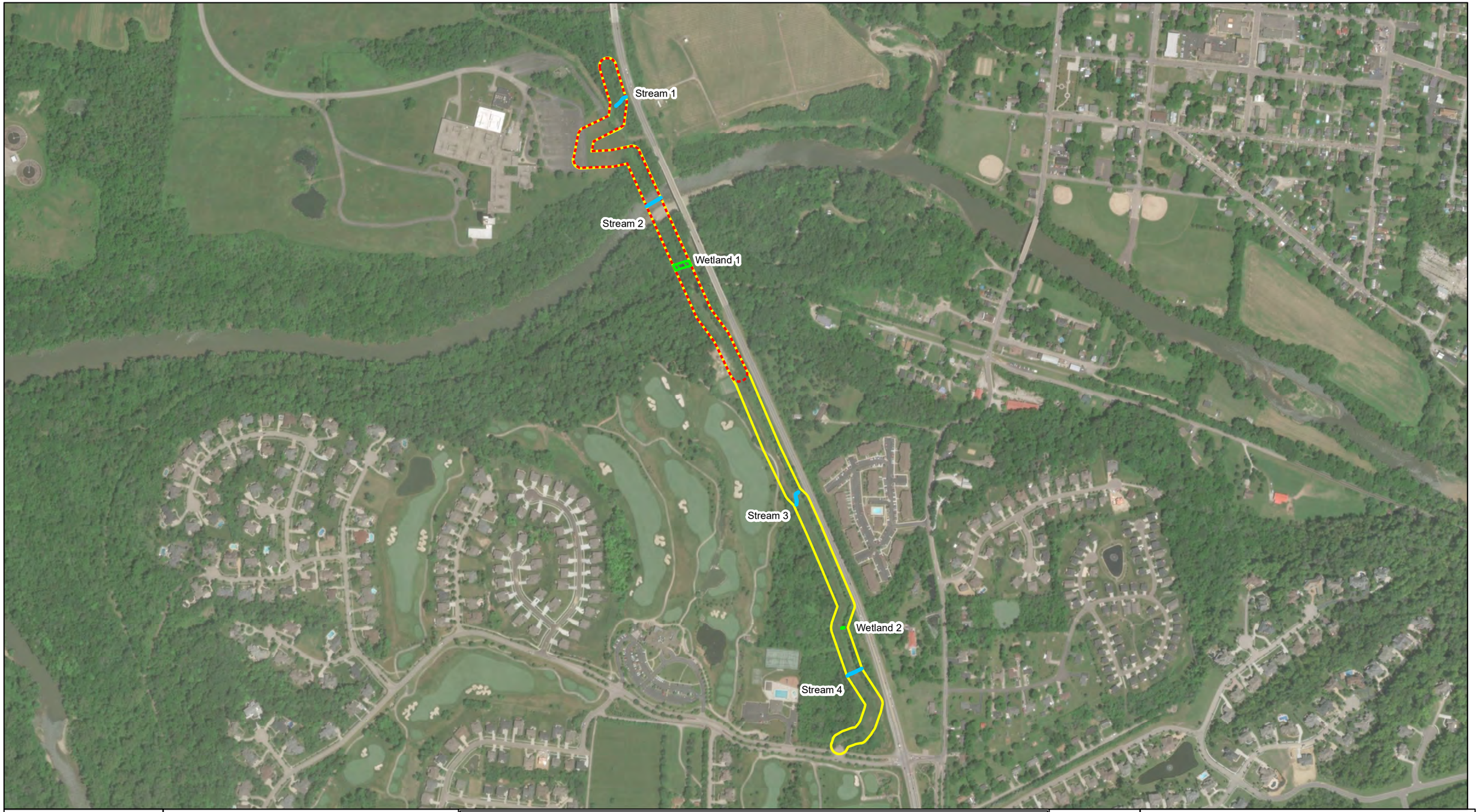


PROJECT LOCATION

WARREN COUNTY, OH

REFERENCE: USGS 7.5' TOPOGRAPHIC QUADRANGLES: LEBANON AND SOUTH LEBANON, OHIO. OBTAINED VIA ESRI USA TOPO, NATIONAL GEOGRAPHIC TOPO, AND USGS, ACCESSED 01/2017.

N

0 250 500 1,000 Feet

Stream

Delineated Wetland

Project Area

Survey Area

DUKE ENERGY.

Cardno

FIGURE:4

WATERS OF THE U.S. DELINEATION
F5484 – 138kV COLUMBIA SUBSTATION
REBUILD AND EXTENSION
DUKE ENERGY
IDENTIFIED FEATURES

DRAWN BY: DKT DATE: 10/2/2018
CHECKED: CAJ APPROVED: JT

R:\Projects\15\156\156720M_DukeEnergy9193\M59_SOW22_5484 138kVColumbiaSubstation\GIS\MXD\WDR\20181002_F4_Delineation.mxd

DUKE ENERGY
5484 – 138kV Columbia Substation

APPENDIX

A

SITE PHOTOGRAPHS

Photo 1. Stream 1, ephemeral, facing downstream.

Photo 2. Stream 2, Little Miami River, looking downstream.

Photo 3. Overview of Wetland 1, located adjacent to Little Miami River.

Photo 4. Stream 3, intermittent, facing upstream.

Photo 5. View of Wetland 2, facing west.

Photo 6. Stream 4, intermittent, facing downstream.

DUKE ENERGY
5484 – 138kV Columbia Substation

APPENDIX

B

HHEI FORMS

Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 26

SITE NAME/LOCATION: Stream 1 - Duke Energy: Columbia Substation
SITE NUMBER: Stream 1 | RIVER BASIN: Little Miami River | DRAINAGE AREA (mi^2): <1
LENGTH OF STREAM REACH (ft): 75 | LAT: 39.370295 | LONG: -84.226376 | RIVER CODE: N/A | RIVER MILE: N/A
DATE: 7/5/2018 | SCORER: Danielle K. Thompson | COMMENTS:

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: [X] NONE / NATURAL CHANNEL [ ] RECOVERED [ ] RECOVERING [ ] RECENT OR NO RECOVERY

1. SUBSTRATE (Est. % of every type of substrate present. Check *ONLY* 2 predominant substrate *TYPE* boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is A + B.

TYPE	PERCENT	TYPE	PERCENT
[ ] BLDR SLABS **[16 pts]**		[X] SILT **[3 PTS]**	65
[ ] BOULDER (>256mm) **[16 pts]**		[ ] LEAF PACK/WOODY DEBRIS **[3 PTS]**	
[ ] BEDROCK **[16 PTS]**		[ ] FINE DETRITUS **[3 PTS]**	
[ ] COBBLE (65-256mm) **[12 pts]**	10	[ ] CLAY or HARDPAN **[0 PT]**	
[X] GRAVEL (2-64mm) **[9 pts]**	20	[ ] MUCK **[0 PT]**	
[ ] SAND (<2mm) **[6 pts]**	5	[ ] ARTIFICIAL **[3 PTS]**	

Total of Percentages of Bldr Slabs, Boulder, Cobble, & Bedrock: 10 (A) → **SCORE OF 2 MOST PREDOMINANT SUBSTRATE TYPES:** 12

TOTAL NUMBER OF SUBSTRATE TYPES: 4 (B)

HHEI Metric Points — Substrate Max = 40: 16 (A + B)

2. Maximum Pool Depth (*Measure the maximum pool depth within the 61m (200')* evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):

- [ ] >30 centimeters **[20 pts]**
- [ ] >22.5 - 30 cm **[30 pts]**
- [ ] >10 - 22.5 cm **[25 pts]**
- [ ] >5 cm - 10 cm **[15 pts]**
- [X] <5 cm **[5 pts]**
- [ ] NO WATER OR MOIST CHANNEL **[0 pts]**

COMMENTS: | **MAXIMUM POOL DEPTH (centimeters):** 3

Pool Depth Max = 30: 5

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):

- [ ] >4.0 meters (>13') **[30 pts]**
- [ ] >3.0 m - 4.0 m (>9'7" - 13') **[25 pts]**
- [ ] >1.5 m - 3.0 m (>4'8" - 9'7") **[20 pts]**
- [ ] >1.0 m - 1.5 m (>3'3" - 4'8") **[15 pts]**
- [X] ≤1.0 m (≤ 3'3") **[5 pts]**

COMMENTS: | **AVERAGE BANKFULL WIDTH (meters)** 0.6

Bankfull Width Max = 30: 5

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY * NOTE: River Left (L) and Right (R) as looking downstream

RIPARIAN WIDTH (Per Bank) L	L	R	FLOODPLAIN QUALITY (Most Predominant per Bank) L	L	R		L	R
[ ]	[ ]	Wide >10m	[ ]	[ ]	Mature Forest, Wetland		[ ]	[ ] Conservation Tillage
[ ]	[ ]	Moderate 5-10m	[ ]	[ ]	Immature Forest, Shrub, or Old Field		[ ]	[ ] Urban or Industrial
[X]	[X]	Narrow <5m	[X]	[X]	Residential, Park, New Field		[ ]	[ ] Open Pasture, Row Crop
[ ]	[ ]	None	[ ]	[ ]	Fenced Pasture		[ ]	[ ] Mining or Construction

Comments:

FLOW REGIME (*At Time of Evaluation*) (Check *ONLY* one box):

- [ ] Stream Flowing
- [ ] Subsurface flow with isolated pools (Interstitial)
- [ ] Moist Channel, isolated pools, no flow (Intermittent)
- [X] Dry channel, no water (Ephemeral)

Comments:

SINUOSITY (Number of bends per 61m (200ft) of channel) (Check *ONLY* one box):

- [ ] None
- [X] 0.5
- [ ] 1.0
- [ ] 1.5
- [ ] 2.0
- [ ] 2.5
- [ ] 3.0
- [ ] >3

STREAM GRADIENT ESTIMATE

- [ ] Flat (0.5ft/100ft)
- [ ] Flat to Moderate
- [ ] Moderate (2ft/100ft)
- [X] Moderate to Severe
- [ ] Severe (10ft/100ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed): Stream 1

QHEI PERFORMED? ☐ Yes ☑ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

☑ WWH Name: Little Miami River Distance from Evaluated Stream 700 LF

☐ CWH Name: _____ Distance from Evaluated Stream _____

☐ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name: South Lebanon (OH) NRCS Soil Map Page: N/A NRCS Soil Map Stream Order N/A

County: Warren Township/City: Union Township

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipition: 7/3/2018 Quantity: 0.1

Photographer Information: 2 Photos

Elevated Turbidity? (Y/N): N Canopy (% open): 100

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. And attach results) Lab Number _____

Field Measures: Temp (°C) N/A Dissolved Oxygen (mg/l) N/A pH (S.U.) N/A Conductivity (µmhos/cm) N/A

Is the sampling reach representative of the stream? (Y/N) N If not, please explain: Sampling reach only within the 100 foot corridor and may not indicate the entire stream characteristics

Additional comments/description of pollution impacts _____

BIOTIC EVAULATION

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appopriate field data sheets from the Primary Hedwater Habitat Assessment Manual)

Fish observed? (Y/N) N Voucher(Y/N) N Salamander Observed? (Y/N) N Voucher? (Y/N) N

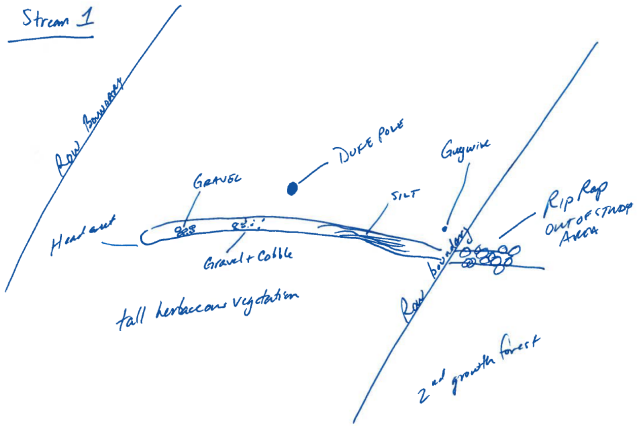
Frogs or Tadpoles Observed? (Y/N) N Voucher(Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) N

Comments Regarding Biology _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of Interest for site evaluation and a narrative description of the stream's location

FLOW →



Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 53

SITE NAME/LOCATION: Stream 3 - Duke Energy: Columbia Substation
SITE NUMBER: Stream 3 | RIVER BASIN: Little Miami River | DRAINAGE AREA (mi^2): <1
LENGTH OF STREAM REACH (ft): 75 | LAT: 39.363028 | LONG: -84.221885 | RIVER CODE: N/A | RIVER MILE: N/A
DATE: 7/5/2018 | SCORER: Danielle K. Thompson | COMMENTS:

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: [X] NONE / NATURAL CHANNEL [ ] RECOVERED [ ] RECOVERING [ ] RECENT OR NO RECOVERY

1. SUBSTRATE (Est. % of every type of substrate present. Check *ONLY* 2 predominant substrate *TYPE* boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is A + B.

TYPE	PERCENT	TYPE	PERCENT
[ ] BLDR SLABS **[16 pts]**		[X] SILT **[3 PTS]**	45
[X] BOULDER (>256mm) **[16 pts]**	40	[ ] LEAF PACK/WOODY DEBRIS **[3 PTS]**	
[ ] BEDROCK **[16 pts]**		[ ] FINE DETRITUS **[3 PTS]**	
[ ] COBBLE (65-256mm) **[12 pts]**		[ ] CLAY or HARDPAN **[0 PT]**	
[ ] GRAVEL (2-64mm) **[9 pts]**	10	[ ] MUCK **[0 PT]**	
[ ] SAND (<2mm) **[6 pts]**	5	[ ] ARTIFICIAL **[3 PTS]**	

Total of Percentages of Bldr Slabs, Boulder, Cobble, & Bedrock: 40 (A)

SCORE OF 2 MOST PREDOMINANT SUBSTRATE TYPES: 19

TOTAL NUMBER OF SUBSTRATE TYPES: 4 (B)

HHEI Metric Points
Substrate Max = 40: 23
A + B

2. Maximum Pool Depth (*Measure the maximum pool depth within the 61m (200')* evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):

- [ ] >30 centimeters **[20 pts]**
- [ ] >22.5 - 30 cm **[30 pts]**
- [X] >10 - 22.5 cm **[25 pts]**
- [ ] >5 cm - 10 cm **[15 pts]**
- [ ] <5 cm **[5 pts]**
- [ ] NO WATER OR MOIST CHANNEL **[0 pts]**

COMMENTS: | **MAXIMUM POOL DEPTH (centimeters):** 10

Pool Depth Max = 30: 25

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):

- [ ] >4.0 meters (>13') **[30 pts]**
- [ ] >3.0 m - 4.0 m (>9'7" - 13') **[25 pts]**
- [ ] >1.5 m - 3.0 m (>4'8" - 9'7") **[20 pts]**
- [ ] >1.0 m - 1.5 m (>3'3" - 4'8") **[15 pts]**
- [X] ≤1.0 m (≤ 3'3") **[5 pts]**

COMMENTS: | **AVERAGE BANKFULL WIDTH (meters)** 0.6

Bankfull Width Max = 30: 5

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY * NOTE: River Left (L) and Right (R) as looking downstream

L	R	RIPARIAN WIDTH (Per Bank)
[ ]	[ ]	Wide >10m
[ ]	[ ]	Moderate 5-10m
[X]	[X]	Narrow <5m
[ ]	[ ]	None

L	R	FLOODPLAIN QUALITY (Most Predominant per Bank)
[ ]	[ ]	Mature Forest, Wetland
[ ]	[ ]	Immature Forest, Shrub, or Old Field
[X]	[X]	Residential, Park, New Field
[ ]	[ ]	Fenced Pasture

L	R	
[ ]	[ ]	Conservation Tillage
[ ]	[ ]	Urban or Industrial
[ ]	[ ]	Open Pasture, Row Crop
[ ]	[ ]	Mining or Construction

Comments:

FLOW REGIME (*At Time of Evaluation*) (Check *ONLY* one box):

- [ ] Stream Flowing
- [ ] Subsurface flow with isolated pools (Interstitial)
- [X] Moist Channel, isolated pools, no flow (Intermittent)
- [ ] Dry channel, no water (Ephemeral)

Comments:

SINUOSITY (Number of bends per 61m (200ft) of channel) (Check *ONLY* one box):

- [ ] None
- [X] 0.5
- [ ] 1.0
- [ ] 1.5
- [ ] 2.0
- [ ] 2.5
- [ ] 3.0
- [ ] >3

STREAM GRADIENT ESTIMATE

[ ] Flat (0.5ft/100ft) [ ] Flat to Moderate [ ] Moderate (2ft/100ft) [X] Moderate to Severe [ ] Severe (10ft/100ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed): Stream 3

QHEI PERFORMED? ☐ Yes ☑ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

☑ WWH Name: Little Miami River Distance from Evaluated Stream 1200 LF

☐ CWH Name: _____ Distance from Evaluated Stream _____

☐ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name: South Lebanon (OH) NRCS Soil Map Page: N/A NRCS Soil Map Stream Order N/A

County: Warren Township/City: Hamilton Township

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipition: 7/3/2018 Quantity: 0.1

Photographer Information: 2 Photos

Elevated Turbidity? (Y/N): N Canopy (% open): 100

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. And attach results) Lab Number _____

Field Measures: Temp (°C) N/A Dissolved Oxygen (mg/l) N/A pH (S.U.) N/A Conductivity (µmhos/cm) N/A

Is the sampling reach representative of the stream? (Y/N) N If not, please explain: Sampling reach only within the 100 foot corridor and may not indicate the entire stream characteristics

Additional comments/description of pollution impacts _____

BIOTIC EVAULATION

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appopriate field data sheets from the Primary Hedwater Habitat Assessment Manual)

Fish observed? (Y/N) N Voucher(Y/N) N Salamander Observed? (Y/N) N Voucher? (Y/N) N

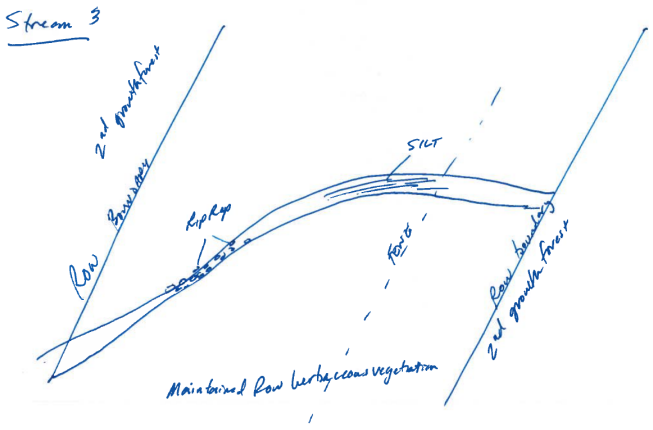
Frogs or Tadpoles Observed? (Y/N) N Voucher(Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) N

Comments Regarding Biology _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of Interest for site evaluation and a narrative description of the stream's location

FLOW →



Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 67

SITE NAME/LOCATION: Stream 4 - Duke Energy: Columbia Substation
SITE NUMBER: Stream 4 | RIVER BASIN: Little Miami River | DRAINAGE AREA (mi^2): <1
LENGTH OF STREAM REACH (ft): 75 | LAT: 39.363028 | LONG: -84.221885 | RIVER CODE: N/A | RIVER MILE: N/A
DATE: 7/5/2018 | SCORER: Danielle K. Thompson | COMMENTS:

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: [ ] NONE / NATURAL CHANNEL [ ] RECOVERED [X] RECOVERING [ ] RECENT OR NO RECOVERY

1. SUBSTRATE (Est. % of every type of substrate present. Check *ONLY* 2 predominant substrate *TYPE* boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is A + B.

TYPE	PERCENT	TYPE	PERCENT
[ ] BLDR SLABS **[16 pts]**		[X] SILT **[3 PTS]**	65
[X] BOULDER (>256mm) **[16 pts]**	30	[ ] LEAF PACK/WOODY DEBRIS **[3 PTS]**	
[ ] BEDROCK **[16 PTS]**		[ ] FINE DETRITUS **[3 PTS]**	
[ ] COBBLE (65-256mm) **[12 pts]**	5	[ ] CLAY or HARDPAN **[0 PT]**	
[ ] GRAVEL (2-64mm) **[9 pts]**		[ ] MUCK **[0 PT]**	
[ ] SAND (<2mm) **[6 pts]**		[ ] ARTIFICIAL **[3 PTS]**	

Total of Percentages of Bldr Slabs, Boulder, Cobble, & Bedrock: 35 (A) → 19

SCORE OF 2 MOST PREDOMINANT SUBSTRATE TYPES: 19 **TOTAL NUMBER OF SUBSTRATE TYPES:** 3 (B)

HHEI Metric Points — Substrate Max = 40: 22 **A + B**

2. Maximum Pool Depth (*Measure the maximum pool depth within the 61m (200')* evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):

- [ ] >30 centimeters **[20 pts]**
- [ ] >22.5 - 30 cm **[30 pts]**
- [X] >10 - 22.5 cm **[25 pts]**
- [ ] >5 cm - 10 cm **[15 pts]**
- [ ] <5 cm **[5 pts]**
- [ ] NO WATER OR MOIST CHANNEL **[0 pts]**

COMMENTS: **MAXIMUM POOL DEPTH (centimeters):** 15

Pool Depth Max = 30: 25

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):

- [ ] >4.0 meters (>13') **[30 pts]**
- [ ] >3.0 m - 4.0 m (>9'7" - 13') **[25 pts]**
- [X] >1.5 m - 3.0 m (>4'8" - 9'7") **[20 pts]**
- [ ] >1.0 m - 1.5 m (>3'3" - 4'8") **[15 pts]**
- [ ] ≤1.0 m (≤ 3'3") **[5 pts]**

COMMENTS: **AVERAGE BANKFULL WIDTH (meters):** 2.1

Bankfull Width Max = 30: 20

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY * NOTE: River Left (L) and Right (R) as looking downstream

RIPARIAN WIDTH (Per Bank) L	L	R	FLOODPLAIN QUALITY (Most Predominant per Bank) L	L	R		L	R
[ ]	[ ]	Wide >10m	[ ]	[ ]	Mature Forest, Wetland		[ ]	[ ] Conservation Tillage
[ ]	[ ]	Moderate 5-10m	[ ]	[ ]	Immature Forest, Shrub, or Old Field		[ ]	[ ] Urban or Industrial
[X]	[X]	Narrow <5m	[X]	[X]	Residential, Park, New Field		[ ]	[ ] Open Pasture, Row Crop
[ ]	[ ]	None	[ ]	[ ]	Fenced Pasture		[ ]	[ ] Mining or Construction

Comments:

FLOW REGIME (*At Time of Evaluation*) (Check *ONLY* one box):

- [ ] Stream Flowing
- [ ] Subsurface flow with isolated pools (Interstitial)
- [X] Moist Channel, isolated pools, no flow (Intermittent)
- [ ] Dry channel, no water (Ephemeral)

Comments:

SINUOSITY (Number of bends per 61m (200ft) of channel) (Check *ONLY* one box):

- [ ] None
- [X] 0.5
- [ ] 1.0
- [ ] 1.5
- [ ] 2.0
- [ ] 2.5
- [ ] 3.0
- [ ] >3

STREAM GRADIENT ESTIMATE

[ ] Flat (0.5ft/100ft) [ ] Flat to Moderate [ ] Moderate (2ft/100ft) [ ] Moderate to Severe [X] Severe (10ft/100ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed): Stream 4

QHEI PERFORMED? ☐ Yes ☑ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

☑ WWH Name: Little Miami River Distance from Evaluated Stream 1200 LF

☐ CWH Name: _____ Distance from Evaluated Stream _____

☐ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name: South Lebanon (OH) NRCS Soil Map Page: N/A NRCS Soil Map Stream Order N/A

County: Warren Township/City: Hamilton Township

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipition: 7/3/2018 Quantity: 0.1

Photographer Information: 2 Photos

Elevated Turbidity? (Y/N): N Canopy (% open): 100

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. And attach results) Lab Number _____

Field Measures: Temp (°C) N/A Dissolved Oxygen (mg/l) N/A pH (S.U.) N/A Conductivity (µmhos/cm) N/A

Is the sampling reach representative of the stream? (Y/N) N If not, please explain: Sampling reach only within the 100 foot corridor and may not indicate the entire stream characteristics

Additional comments/description of pollution impacts _____

BIOTIC EVAULATION

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appopriate field data sheets from the Primary Hedwater Habitat Assessment Manual)

Fish observed? (Y/N) N Voucher(Y/N) N Salamander Observed? (Y/N) N Voucher? (Y/N) N

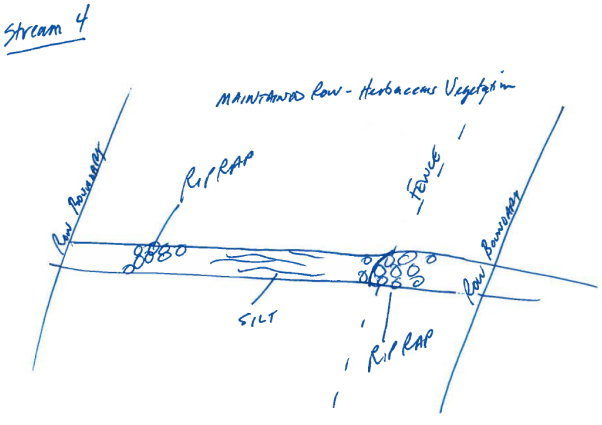
Frogs or Tadpoles Observed? (Y/N) N Voucher(Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) N

Comments Regarding Biology _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of Interest for site evaluation and a narrative description of the stream's location

FLOW →



DUKE ENERGY
5484 – 138kV Columbia Substation

APPENDIX

C

OHIO RAPID ASSESSMENT METHOD 5.0 FORM AND USACE WETLAND DELINEATION DATA SHEETS

ORAM v 5.0 Field Form Quantitative Rating

Site: Wetland 1 - RFO	Rater(s): D.K. Thompson	Date: July 5, 2018

Project: Duke Energy: Columbia Substation

2	2
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

- [ ] >50 acres (>20.2ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- [ ] 10 to <25 acres (4 to <10.1ha) (4 pts)
- [ ] 3 to <10 acres (1.2 to <4ha) (3 pts)
- [X] 0.3 to <3 acres (0.12 to <1.2ha) (2 pts)
- [ ] 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- [ ] <0.1 acres (0.04ha) (0 pts)

14	16
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [X] WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- [X] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrubland, young second growth forest. (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [ ] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

24	40
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3)
- [X] Precipitation (1)
- [X] Seasonal/Intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [X] 100 year floodplain (1)
- [X] Between stream/lake and other human use (1)
- [X] Part of wetland/upland (e.g. forest), complex (1)
- [X] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 (27.6in) (3)
- [ ] 0.4 to 0.7m (15.7 to 27.6in) (2)
- [X] <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check.

- [ ] Semi- to permanently inundated/saturated (4)
- [X] Regularly inundated/saturated (3)
- [ ] Seasonally inundated (2)
- [ ] Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- [X] None or none apparent (12)
- [ ] Recovered (7)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] tile
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other

16	56
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- [X] None or none apparent (4)
- [ ] Recovered (3)
- [ ] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [X] Fair (3)
- [ ] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [X] None or none apparent (9)
- [ ] Recovered (6)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] sedimentation
- [ ] dredging
- [ ] farming
- [ ] nutrient enrichment

56
subtotal this page

ORAM v 5.0 Field Form Quantitative Rating

Site: Wetland 1 - RFO	Rater(s): D.K. Thompson	Date: July 5, 2018

-2
subtotal this page

Site:	Duke Energy: Columbia Substation

max 10 pts | subtotal

Metric 5. Special Wetlands

Check all that apply and score as indicated.

- [ ] Bog (10)
- [ ] Fen (10)
- [ ] Old growth forest (10)
- [ ] Mature forested wetland (5)
- [ ] Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- [ ] Lake Erie coastal/tributary wetland-restricted hydrology (5)
- [ ] Lake Plain Sand Prairies (Oak Openings) (10)
- [ ] Relict Wet Prairies (10)
- [ ] Known occurrence state/federal threatened or endangered species (10)
- [ ] Significant migratory songbird/water fowl habitat or usage (10)
- [ ] Category 1 Wetland. See Question 1 Qualitative Rating (-10)
- [ ] Not Applicable (0)

-2 | -2

max 20 pts | subtotal

Metric 6. Plant communities, interspersion, microtopograhy.

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [1] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [ ] Open water
- [ ] Other

6b. Horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4)
- [ ] Moderate (3)
- [ ] Moderately low (2)
- [X] Low (1)
- [ ] None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- [X] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [0] Vegetated hummocks/tussocks
- [1] Coarse woody debris >15cm (6in)
- [0] Standing dead >25cm (10in) dbh
- [0] Amphibian breading pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but no always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

54 Grand Total (max 100 pts)

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories at the following address: http://www.epa.state.oh.us/dsw/401/401.html

Comments:

ORAM v 5.0 Field Form Quantitative Rating

Site: Wetland 2 - PEM	Rater(s): D.K. Thompson	Date: July 5, 2018

Project: Duke Energy: Columbia Substation

0	0
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

- [ ] >50 acres (>20.2ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- [ ] 10 to <25 acres (4 to <10.1ha) (4 pts)
- [ ] 3 to <10 acres (1.2 to <4ha) (3 pts)
- [ ] 0.3 to <3 acres (0.12 to <1.2ha) (2 pts)
- [ ] 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- [X] <0.1 acres (0.04ha) (0 pts)

6	6
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [ ] WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- [X] NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [X] LOW. Old field (>10 years), shrubland, young second growth forest. (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [ ] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

14	20
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3)
- [X] Precipitation (1)
- [X] Seasonal/Intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [ ] 100 year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g. forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [ ] >0.7 (27.6in) (3)
- [ ] 0.4 to 0.7m (15.7 to 27.6in) (2)
- [X] <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check.

- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3)
- [X] Seasonally inundated (2)
- [ ] Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- [ ] None or none apparent (12)
- [X] Recovered (7)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] tile
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [X] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [X] other

10	30
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- [X] None or none apparent (4)
- [ ] Recovered (3)
- [ ] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [X] Fair (3)
- [ ] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [X] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [X] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] sedimentation
- [ ] dredging
- [ ] farming
- [ ] nutrient enrichment

30
subtotal this page

ORAM v 5.0 Field Form Quantitative Rating

Site: Wetland 2 - PEM	Rater(s): D.K. Thompson	Date: July 5, 2018

1	subtotal this page

Site: Duke Energy: Columbia Substation

	max 10 pts	subtotal

Metric 5. Special Wetlands

Check all that apply and score as indicated.

- [ ] Bog (10)
- [ ] Fen (10)
- [ ] Old growth forest (10)
- [ ] Mature forested wetland (5)
- [ ] Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- [ ] Lake Erie coastal/tributary wetland-restricted hydrology (5)
- [ ] Lake Plain Sand Prairies (Oak Openings) (10)
- [ ] Relict Wet Prairies (10)
- [ ] Known occurrence state/federal threatened or endangered species (10)
- [ ] Significant migratory songbird/water fowl habitat or usage (10)
- [ ] Category 1 Wetland. See Question 1 Qualitative Rating (-10)
- [ ] Not Applicable (0)

1	1	max 20 pts	subtotal

Metric 6. Plant communities, interspersion, microtopograhy.

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [1] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [ ] Open water
- [ ] Other

6b. Horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4)
- [ ] Moderate (3)
- [ ] Moderately low (2)
- [X] Low (1)
- [ ] None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [X] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

- [0] Vegetated hummocks/tussocks
- [0] Coarse woody debris >15cm (6in)
- [0] Standing dead >25cm (10in) dbh
- [0] Amphibian breading pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
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3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but no always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

31	Grand Total (max 100 pts)

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories at the following address: http://www.epa.state.oh.us/dsw/401/401.html

Comments:

WETLAND DETERMINATION DATA FORM -- Midwest Region

Project/Site: Duke Energy: Columbia Substation - Wetland 1 City/County: Union Twp, Warren Count Sampling Date: 7/5/2018

Applicant/Owner: Duke Energy State: OH Sampling Point: DP1

Investigator(s): Danielle K. Thompson; James Crumpler Section, Township, Range: n/a

Landform (hillslope, terrace, etc.): Oxbow Local relief (concave, convex, none): concave

Slope (%): 2% Lat: 39.367542 Long: -84.225674 Datum: NAD83 UTM16N

Soil Map Unit Name: Riverwash NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS -- Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area**	
Hydric Soil Present?	Yes X	No ____	**within a Wetland?**	Yes X No ____
Wetland Hydrology Present?	Yes X	No ____		

Remarks:

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *None*			UPL
2.			
3.			
4.			
5.			
		= Total Cover	

Sapling/Shrub Stratum (Plot size: 15' radius)			
1. *None*			UPL
2.			
3.			
4.			
5.			
		= Total Cover	

Herb Stratum (Plot size: 5' radius)			
1. *Phalaris arundinacea*	80%	Yes	FACW
2. *Impatiens capensis*	10%	No	FACW
3. *Carex frankii*	5%	No	OBL
4. *Toxicodendron radicans*	5%	No	FAC
5. *Ficaria verna*	30%	Yes	FAC
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
	130%	= Total Cover	

Woody Vine Stratum (Plot size: 30' radius)			
1. *None*			UPL
2.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

	Total % Cover of:		Multiply by:
	That Are OBL, FACW, or FAC:		A/B
OBL species	5%	x1 =	0.05
FACW species	90%	x2 =	1.8
FAC species	35%	x3 =	1.05
FACU species		x4 =	
UPL species		x5 =	
Column Totals:	1.30 (A)		2.9 (B)

Prevalence Index = B/A = 2.23

Hydrophytic Vegetation Indicators:

____ 1-Rapid Test for Hydrophytic Vegetation

X 2-Dominance Test is >50%

X 3-Prevalence Index is ≤3.0[1]

____ 4-Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16"	10YR 4/2	90	10YR 4/6	10	C	M	Sandy Loam	Sand and Gravel inclusions

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators[3]:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)

Test Indicators of Hydric Soils:

- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]The hydric soil indicators have been updated to comply with the *Field Indicators of Hydric Soils in the United States* , Version 8.0, 2016.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- X Water Marks (B1)
- X Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X No ___	Depth (inches):	4
Water Table Present?	Yes ___ No X	Depth (inches):	>18"
Saturation Present? (includes capillary fringe)	Yes ___ No X	Depth (inches):	>18"

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM -- Midwest Region

Project/Site: Duke Energy: Columbia Substation - Wetland 1 City/County: Union Twp, Warren Count Sampling Date: 7/5/2018

Applicant/Owner: Duke Energy State: OH Sampling Point: DP2

Investigator(s): Danielle K. Thompson; James Crumpler Section, Township, Range: n/a

Landform (hillslope, terrace, etc.): Oxbow Local relief (concave, convex, none): concave

Slope (%): 15% Lat: 39.367464 Long: -84.225635 Datum: NAD83 UTM16N

Soil Map Unit Name: Riverwash NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS -- Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area**	
Hydric Soil Present?	Yes ____	No X	**within a Wetland?**	Yes ____ No X
Wetland Hydrology Present?	Yes ____	No X		

Remarks:

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Platanus occidentalis*	30%	Yes	FACW
2. *Populus deltoides*	30%	Yes	FAC
3.			
4.			
5.			
	60%	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15' radius)			
1. *Platanus occidentalis*	10%	Yes	FACW
2. *Salix nigra*	20%	Yes	OBL
3.			
4.			
5.			
	30%	= Total Cover	

Herb Stratum (Plot size: 5' radius)			
1. *Phalaris arundinacea*	50%	Yes	FACW
2. *Impatiens capensis*	2%	No	FACW
3. *Solidago canadensis*	30%	Yes	FACU
4. *Toxicodendron radicans*	5%	No	FAC
5. *Solidago altissima*	10%	No	FACU
6. *Urtica dioica*	20%	No	FACW
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
	117%	= Total Cover	

Woody Vine Stratum (Plot size: 30' radius)			
1. *Vitis riparia*	5%	Yes	FACW
2.			
	5%	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 86% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	A/B
That Are OBL, FACW, or FAC:			
OBL species	20%	x1 =	0.2
FACW species	117%	x2 =	2.34
FAC species	35%	x3 =	1.05
FACU species	40%	x4 =	1.6
UPL species		x5 =	
Column Totals:	2.12 (A)		5.19 (B)

Prevalence Index = B/A = 2.45

Hydrophytic Vegetation Indicators:

____ 1-Rapid Test for Hydrophytic Vegetation

X 2-Dominance Test is >50%

____ 3-Prevalence Index is ≤3.0[1]

____ 4-Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16"	10YR 4/3	90	10YR 4/6	10	C	M	Sandy Loam	Sand and Gravel inclusions

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators[3]:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Test Indicators of Hydric Soils:

- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]The hydric soil indicators have been updated to comply with the *Field Indicators of Hydric Soils in the United States* , Version 8.0, 2016.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___ No X	Depth (inches):	>18"
Water Table Present?	Yes ___ No X	Depth (inches):	>18"
Saturation Present? (includes capillary fringe)	Yes ___ No X	Depth (inches):	>18"

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM -- Midwest Region

Project/Site: Duke Energy: Columbia Substation - Wetland 2 City/County: Union Twp, Warren Count Sampling Date: 7/5/2018

Applicant/Owner: Duke Energy State: OH Sampling Point: DP3

Investigator(s): Danielle K. Thompson; James Crumpler Section, Township, Range: n/a

Landform (hillslope, terrace, etc.): Stream Terrace Local relief (concave, convex, none): concave

Slope (%): 2% Lat: 39.361303 Long: -84.221256 Datum: NAD83 UTM16N

Soil Map Unit Name: Hickory Clay Loam NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS -- Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area**	
Hydric Soil Present?	Yes X	No ____	**within a Wetland?**	Yes X No ____
Wetland Hydrology Present?	Yes X	No ____		

Remarks:

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *None*			UPL
2.			
3.			
4.			
5.			
		= Total Cover	

Sapling/Shrub Stratum (Plot size: 15' radius)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	

Herb Stratum (Plot size: 5' radius)			
1. *Typha X glauca*	25%	Yes	OBL
2. *Carex vulpinoidea*	50%	Yes	FACW
3. *Scirpus atrovirens*	20%	No	OBL
4. *Carex frankii*	25%	Yes	OBL
5. *Impatiens capensis*	10%	No	FACW
6. *Solidago canadensis*	5%	No	FACU
7. *Salix nigra*	2%	No	OBL
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
	137%	= Total Cover	

Woody Vine Stratum (Plot size: 30' radius)			
1.			
2.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
That Are OBL, FACW, or FAC:			A/B
OBL species	72%	x1 =	0.72
FACW species	60%	x2 =	1.2
FAC species		x3 =	
FACU species	5%	x4 =	0.2
UPL species		x5 =	
Column Totals:	1.37 (A)		2.12 (B)

Prevalence Index = B/A = 1.55

Hydrophytic Vegetation Indicators:

- X 1-Rapid Test for Hydrophytic Vegetation
- X 2-Dominance Test is >50%
- X 3-Prevalence Index is ≤3.0[1]
- ____ 4-Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16"	10YR 4/2	90	10YR 4/6	10	C	M	Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators[3]:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)

Test Indicators of Hydric Soils:

- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]The hydric soil indicators have been updated to comply with the *Field Indicators of Hydric Soils in the United States* , Version 8.0, 2016.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- X Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X No ___	Depth (inches):	1"
Water Table Present?	Yes ___ No X	Depth (inches):	>18"
Saturation Present? (includes capillary fringe)	Yes X No ___	Depth (inches):	4"

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM -- Midwest Region

Project/Site: Duke Energy: Columbia Substation - Wetland 2 City/County: Union Twp, Warren Count Sampling Date: 7/5/2018

Applicant/Owner: Duke Energy State: OH Sampling Point: DP4

Investigator(s): Danielle K. Thompson; James Crumpler Section, Township, Range: n/a

Landform (hillslope, terrace, etc.): Stream Terrace Local relief (concave, convex, none): concave

Slope (%): 2% Lat: 39.361267 Long: -84.221227 Datum: NAD83 UTM16N

Soil Map Unit Name: Hickory Clay Loam NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS -- Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area**	
Hydric Soil Present?	Yes ____	No X	**within a Wetland?**	Yes ____ No X
Wetland Hydrology Present?	Yes ____	No X		

Remarks:

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Robinia pseudoacacia*	10%	Yes	FACU
2. *Fraxinus americana*	10%	Yes	FACU
3.			
4.			
5.			
	20%	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15' radius)			
1. *Lonicera maackii*	25%	Yes	UPL
2.			
3.			
4.			
5.			
	25%	= Total Cover	

Herb Stratum (Plot size: 5' radius)			
1. *Solidago canadensis*	30%	Yes	FACU
2. *Trifolium repens*	20%	No	FACU
3. *Trifolium hybridum*	10%	No	FACU
4. *Melilotus officinalis*	25%	Yes	FACU
5. *Toxicodendron radicans*	10%	No	FAC
6. *Fraxinus americana*	2%	No	FACU
7. *Carex frankii*	10%	No	OBL
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
	107%	= Total Cover	

Woody Vine Stratum (Plot size: 30' radius)			
1. *Vitis riparia*	5%	Yes	FACW
2.			
	5%	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 17% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
That Are OBL, FACW, or FAC:			A/B
OBL species	10%	x1 =	0.1
FACW species	5%	x2 =	0.1
FAC species	10%	x3 =	0.3
FACU species	107%	x4 =	4.28
UPL species	25%	x5 =	1.25
Column Totals:	1.57 (A)		6.03 (B)

Prevalence Index = B/A = 3.84

Hydrophytic Vegetation Indicators:

____ 1-Rapid Test for Hydrophytic Vegetation
____ 2-Dominance Test is >50%
____ 3-Prevalence Index is ≤3.0[1]
____ 4-Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16"	10YR 4/3	98	10YR 4/6	2	C	M	Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators[3]:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Test Indicators of Hydric Soils:

- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]The hydric soil indicators have been updated to comply with the *Field Indicators of Hydric Soils in the United States* , Version 8.0, 2016.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___ No X	Depth (inches):	>18"
Water Table Present?	Yes ___ No X	Depth (inches):	>18"
Saturation Present? (includes capillary fringe)	Yes ___ No X	Depth (inches):	>18"

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

DUKE ENERGY
5484 – 138kV Columbia Substation

APPENDIX

D

ENDANGERED, THREATENED, AND RARE SPECIES CORRESPONDENCE

July 16, 2018

Mr. Dan Everson
United States Fish and Wildlife Service
Ecological Services Field Office
4625 Morse Road, Suite 104
Columbus, OH 43230

Cardno

11121 Canal Road
Cincinnati, Ohio 45241
USA

Phone 513 489 2402
Fax 513 489 2404

www.cardno.com

RE: F5484 kV 138 Columbia Substation Project
Rare, Threatened, and Endangered Species Consultation
South Lebanon and Hamilton Township, Warren County, Ohio

Dear Mr. Everson:

Duke Energy (Duke) is proposing to expand the existing transmission line approximately 550 LF to facilitate the construction of the new Columbia Substation in addition to the removal and replacement of approximately 0.4 miles of existing transmission line, encompassing a total study corridor of 6.1 acres of existing 100-foot wide Duke Energy transmission line corridor Right-Of-Way (ROW). A field investigation of the study corridor was conducted on July 5, 2018.

The project study area is located in the Village of South Lebanon and Hamilton Township, Warren County, Ohio. The location of the proposed Project is depicted on the attached South Lebanon (OH) USGS 7.5-minute topographic map excerpt (Figure 1).

Cardno was contracted by Duke to perform a boundary delineation and assessment of regulated waters, including wetlands, streams, ditches, and/or other federally regulated open waters, rare, threatened, endangered, and special habitat located within the proposed 0.4 miles of existing 100-ft wide ROW. The project study area was dominated by maintained ROW and secondary growth forest vegetation assemblages. Cardno botanists and ecologists conducted a habitat assessment to identify the presence of regulated waters, and potential Indiana bat (*Myotis sodalis*), Northern long-eared bat (*Myotis septentrionalis*), and Running Buffalo Clover *(Trifolium stoloniferum)* habitat.

In accordance with the USFWS Section 7 ESA coordination requirements; the Project study area and its habitat characteristics has been summarized for you below.

1. Location data including latitude and longitude of the project area, site address, and county.

South Lebanon, Hamilton Township, Warren County, Ohio

Initiates: Duke Energy Structure 163 (39.3709, -84.2266)
Terminates: Duke Energy Structure 155 (39.3658, -84.2236)

2. A detailed project description, including layout of any new construction.

The proposed F5484 138kV Columbia Substation Project is necessary in order to facilitate the construction of the new Duke Columbia Substation as well as maintain the integrity of existing Duke structures to ensure adequate power supplies to current and future utility customers in the area. The project is also needed to ensure safety within the existing easements and remain in compliance with current transmission line standards. The transmission line route consists of an existing transmission line corridor and Duke Energy easement.

Construction will be accomplished largely through the use of bucket trucks with truck-mounted augers for structure installation and other construction vehicles transporting cable spools to install the transmission cable along the route. Excavation will be restricted to the locations where the installation of new structures (12 electrical poles) will occur. Earth moving activities are anticipated to be minimal. The extent of access disturbance can vary widely dependent upon many factors, including density and type of surface, vegetative cover, weather conditions, and the type of vehicles moving over the area. The existing vegetation will be preserved to the maximum extent practicable.

Project construction is expected to begin in Fall 2018.

3. A detailed description of onsite habitat, including the size, location, and quality of streams, wetlands, forested areas, and other natural areas, and proposed impacts.

The proposed F5484 kV138 Columbia Substation Project is linear in scope and will take place entirely within existing transmission line corridor and Duke Energy easement (Figure 1 & 2). Six potentially regulated waters including one ephemeral stream (Stream 1), two intermittent streams (Stream 3 and Stream 4), one perennial USGS-Little Miami River (Stream 2), one palustrine emergent wetland (Wetland 2), and one riverine forested wetland (Wetland 1) were identified within the project's Study Area. Specific attention was given to the presence of habitat suitable for federally endangered and threatened species – specifically, the Indiana bat (*Myotis sodalist),* the Northern Long-Eared bat (*Myotis septentrionalis),* and Running Buffalo Clover *(Trifolium stoloniferum).* To evaluate the potential habitat for rare, threatened, and endangered species a general site reconnaissance of the project study area was performed by Cardno botanists and ecologists. The result of these habitat assessments can be found below.

Maintained ROW
The maintained ROW vegetation assemblage dominated the majority of the project study area. Vegetation present in this habitat type consisted of Canada Goldenrod (*Solidago canadensis), Frank's Sedge (Carex frankii), White Ash seedlings (Fraxinus americana), Black Locust seedlings (Robinia pseudoacacia)*, Amur Honey Suckle *(Lonicera maackii*), Kentucky Bluegrass (*Poa pratensis*), Tall Fescue (*Festuca arundinacea*), Poison Ivy (*Toxicodendron radicans*), Grape Vine (*Vitis riparia*), Daisy Flea Bane (*Erigeron annuus*), White Clover (*Trifolium repens*), and Red Clover (*Trifolium pretense*). Although a formal study was not part of this scope, no potential habitat for listed species was identified within this habitat.

Secondary Growth Forest
The secondary growth forest vegetation assemblage was located adjacent to the actively maintained ROW as well as within the riparian corridor of the Little Miami River (Stream 2). Dominant canopy species in this habitat type consisted of White Ash (*Fraxinus americana*), Bur Oak (*Quercus macrocarpa*), and Black Walnut (*Juglans nigra*). Less dominant species in this habitat type included Black Locust (*Robinia pseudoacacia*), Silver Maple (*Acer saccharinum*), Bitternut Hickory (*Carya cordiformis*), and Tree of Heaven (*Ailanthus altissima*). Understory vegetation was dominated by dense Bush Honeysuckle and Multiflora Rose (*Rosa multiflora*) with lesser amounts of White Ash *and* Tree of Heaven seedlings.

4. A description of the forested habitat onsite, including type of forest, and presence of dead trees, split branches or trunks, and exfoliating bark, and proposed impacts.

Approximately 2.5 acres of the study area consisted of secondary growth forest located outside the actively maintained ROW and along the riparian corridor of the Little Miami River (Stream 2). Approximately 0.02 acres of secondary growth forest may need to be cleared to accommodate proposed access route from Duke Energy Structure 158 to Structure 161. Additionally, one dead ash tree will be cleared near Duke Energy Structure 162.

5. Photographs representative of all cover types on the site and encompassing views of the entire site.

See the attached photograph log.

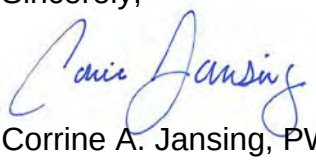
6. Conclusion

Based on the physical site characteristics, the site contains the site contains moderate quality habitat for the federally endangered Indiana and NLE bat based on the woody species composition and intensity of surrounding land use. All tree clearing activities will be conducted during the USFWS recommended winter tree clearing window between November 15 and March 31.

We are requesting a review by your office and a written response regarding effects on federally listed threatened and/or endangered species and their critical habitat within the vicinity of the project area. Enclosed for your review are the project location map, aerial map and photograph log.

If you have any questions concerning this request or would like additional information, please do not hesitate to contact me at (513) 833-6392 or Cori.Jansing@cardno.com.

Sincerely,

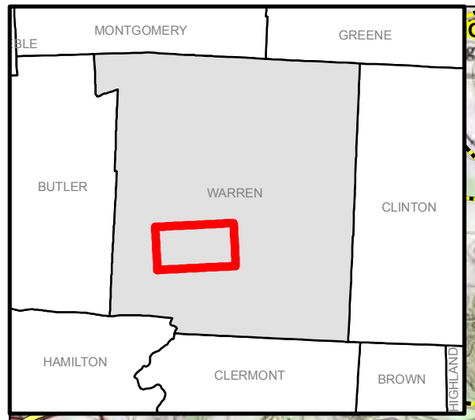


Corrine A. Jansing, PWS
Botanist, Project Scientist
for Cardno, Inc.

Enc: USGS map, Aerial Map, Site Plans, Photo Log

ATTACHMENTS:

PROJECT LOCATION MAP
PROJECT AERIAL MAP
SITE PLANS
PHOTOGRAPH LOG



WARREN COUNTY

LEBANON

SOUTH LEBANON

MASON

DEERFIELD

U.S. MILITARY RESERVATION (ORDNANCE PLANT)

Columbia Substation West

Columbia Substation West

INTERCHANGE 28

INTERCHANGE 24

71

US-22

PROJECT LOCATION

WARREN COUNTY, OH

REFERENCE: USGS 7.5' TOPOGRAPHIC QUADRANGLE: LEBANON AND SOUTH LEBANON, OHIO. OBTAINED VIA ESRI USA TOPO, NATIONAL GEOGRAPHIC TOPO, AND USGS, ACCESSED 01/2017.

N

0 1,000 2,000 Feet

- Project Centerline
- Interstate
- State Highway
- US Highway
- Railroad
- County Boundary
- Municipal Boundary
- Existing Facility

DUKE ENERGY.

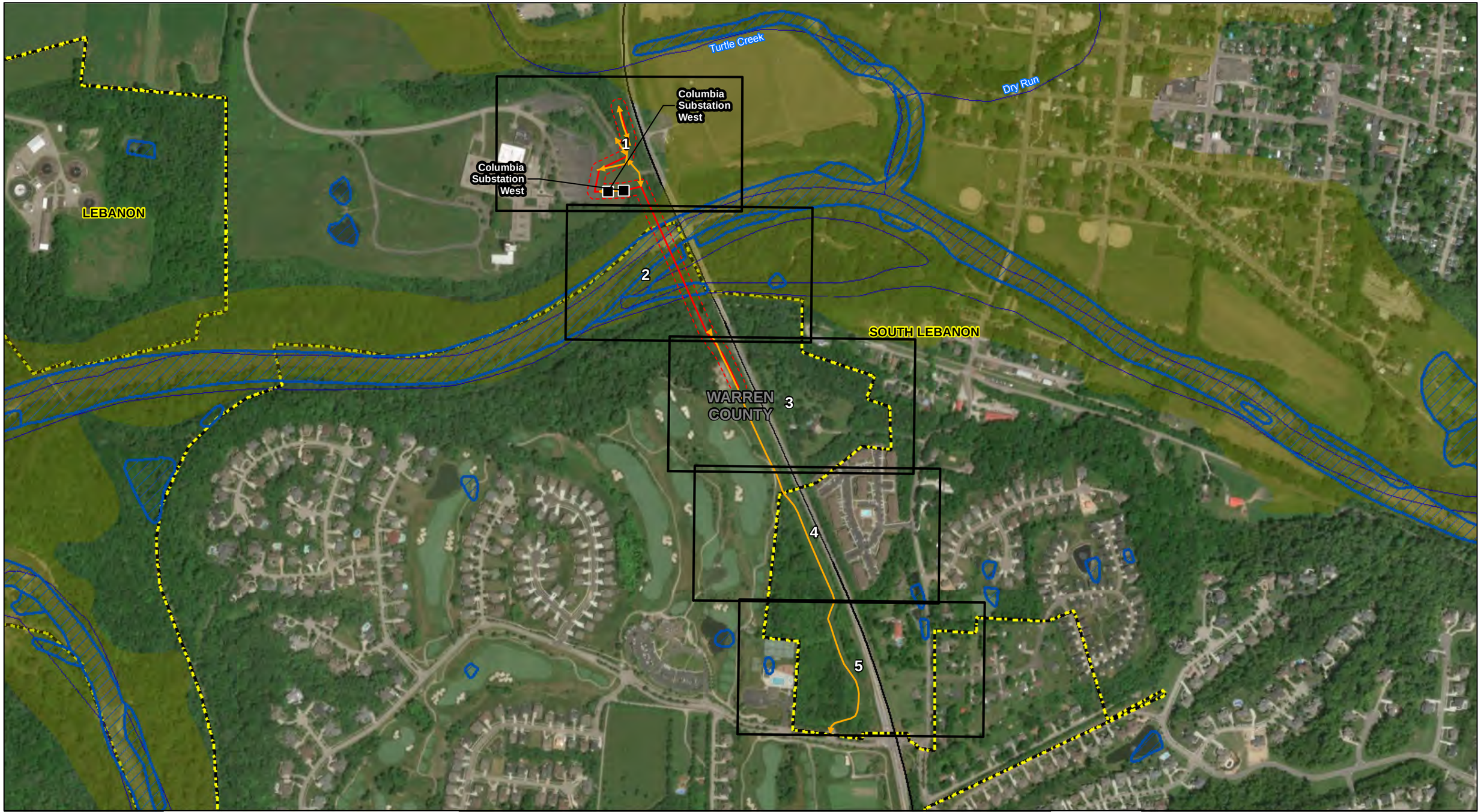
Cardno Shaping the Future

FIGURE 1

LINE ENVIRONMENTAL ASSESSMENT
F5484 – 138kV COLUMBIA SUBSTATION
REBUILD AND EXTENSION
DUKE ENERGY
PROJECT VICINITY MAP

DRAWN BY: COD DATE: 7/5/2018
CHECKED: CJ APPROVED: JT

R:\Projects\15\156\156720M_DukeEnergy9193\M59_SOW22_5484 138kVColumbiaSubstation\GIS\MXD\LineEnvironmentAssessment\L1_Project_Vicinity_M59.mxd



Project Location

REFERENCE:
ESRI WORLD IMAGERY, OBTAINED THROUGH ESRI WORLD IMAGERY MICROSOFT CORPORATION, ACCESSED 01/2017

N

0 160 320 640 Feet 1 inch = 600 feet

- Existing Facility
- Sheet Index
- Interstate
- State Highway
- US Highway
- Railroad
- NWI Wetland
- NHD Flowline
- 100yr Floodplain
- 100ft Corridor
- Project Centerline
- County Boundary
- Municipal Boundary
- Proposed Access

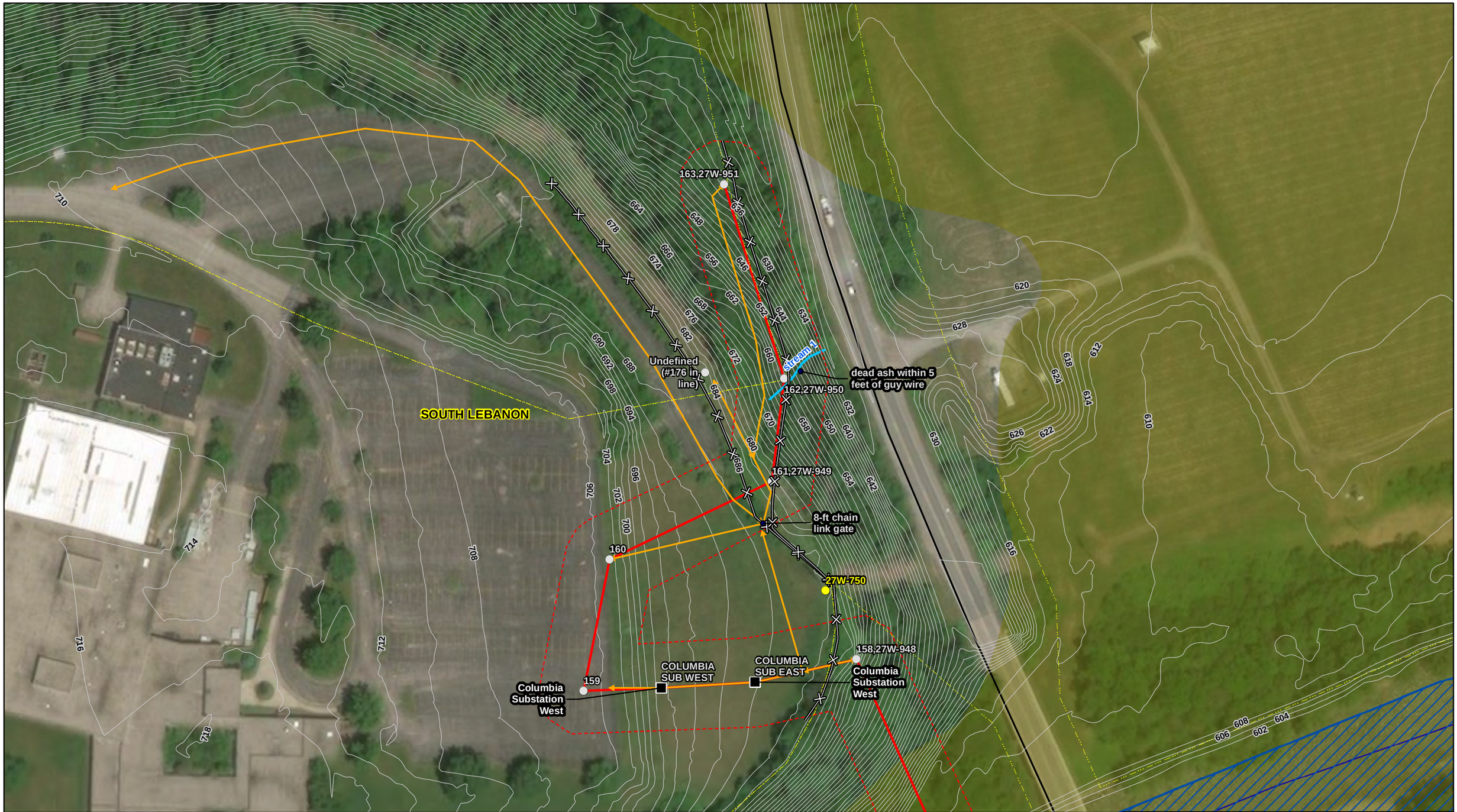
DUKE ENERGY

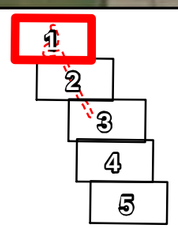
Cardno Shaping the Future

FIGURE: 2
LINE ENVIRONMENTAL ASSESSMENT
F5484 – 138kV COLUMBIA SUBSTATION
REBUILD AND EXTENSION
DUKE ENERGY
ENVIRONMENTAL ACCESS INDEX SHEET

DRAWN BY: COD DATE: 7/11/2018
CHECKED: CJ APPROVED: JT

R:\Projects\15\156\156720M_DukeEnergy9193\M59_SOW22_5484 138kVColumbiaSubstation\GIS\MXD\LineEnvironmentAssessment\L2_Access_KeyMap_M59.mxd





REFERENCE:
ESRI WORLD IMAGERY, OBTAINED THROUGH ESRI WORLD IMAGERY MICROSOFT CORPORATION, ACCESSED 01/2017

N

0 55 110 220 Feet

- Existing Facility
- Identified Feature
- Fence Line
- Proposed Structure
- Existing Structure
- Parcels
- 100ft Corridor
- Delineated Wetland
- Proposed Access
- Ditch
- Delineated Stream
- Project Centerline
- Existing Grades
- Municipal Boundary
- Interstate
- State Highway
- US Highway
- Railroad
- Little Miami River
- NWI Wetland
- NHD Flowline
- 100yr Floodplain

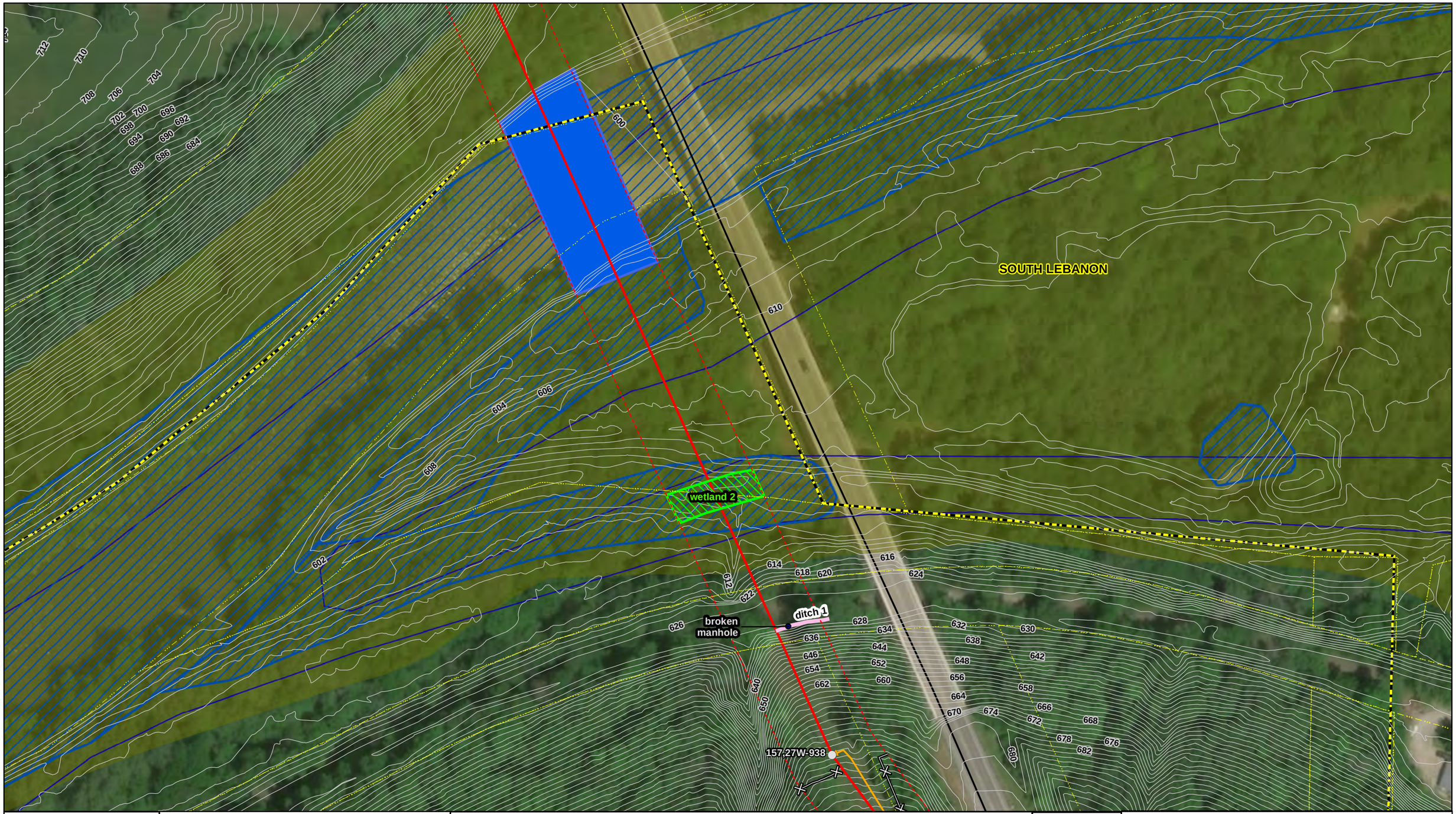
DUKE ENERGY.

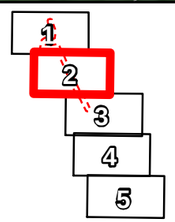
Cardno Shaping the Future

FIGURE: 2.01
LINE ENVIRONMENTAL ASSESSMENT
F5484 – 138kV COLUMBIA SUBSTATION
REBUILD AND EXTENSION
DUKE ENERGY
ENVIRONMENTAL ACCESS PLAN

DRAWN BY: COD DATE: 7/13/2018
CHECKED: CJ APPROVED: JT

\\cardno.corp\Global\US\Shared\CJFNProjects\Projects\15\156\156720M_DukeEnergy9193\M59_SOW22_5484 138kVColumbiaSubstation\GIS\MXD\LineEnvironmentAssessment\L2_Access_M59.mxd





REFERENCE:
ESRI WORLD IMAGERY, OBTAINED THROUGH ESRI WORLD IMAGERY MICROSOFT CORPORATION, ACCESSED 01/2017

N

0 55 110 220 Feet

- Existing Facility
- Identified Feature
- Fence Line
- Proposed Structure
- Existing Structure
- Parcels
- 100ft Corridor
- Delineated Wetland
- Proposed Access
- Ditch
- Delineated Stream
- Project Centerline
- Existing Grades
- Municipal Boundary
- Interstate
- State Highway
- US Highway
- Railroad
- Little Miami River
- NWI Wetland
- NHD Flowline
- 100yr Floodplain

DUKE ENERGY

Cardno Shaping the Future

FIGURE: 2.02
LINE ENVIRONMENTAL ASSESSMENT
F5484 – 138kV COLUMBIA SUBSTATION
REBUILD AND EXTENSION
DUKE ENERGY
ENVIRONMENTAL ACCESS PLAN

DRAWN BY: COD DATE: 7/13/2018
CHECKED: CJ APPROVED: JT

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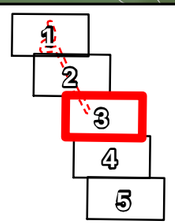

REFERENCE:
ESRI WORLD IMAGERY, OBTAINED THROUGH ESRI WORLD IMAGERY MICROSOFT CORPORATION, ACCESSED 01/2017

N

0 55 110 220 Feet

- Existing Facility
- Identified Feature
- Fence Line
- Proposed Structure
- Existing Structure
- Parcels
- 100ft Corridor
- Delineated Wetland
- Proposed Access
- Ditch
- Delineated Stream
- Project Centerline
- Existing Grades
- Municipal Boundary
- Interstate
- State Highway
- US Highway
- Railroad
- Little Miami River
- NWI Wetland
- NHD Flowline
- 100yr Floodplain

DUKE ENERGY

Cardno Shaping the Future

FIGURE: 2.03
LINE ENVIRONMENTAL ASSESSMENT
F5484 – 138kV COLUMBIA SUBSTATION
REBUILD AND EXTENSION
DUKE ENERGY
ENVIRONMENTAL ACCESS PLAN

DRAWN BY: COD DATE: 7/13/2018
CHECKED: CJ APPROVED: JT

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1 2 3 4 5

REFERENCE:
ESRI WORLD IMAGERY, OBTAINED THROUGH ESRI WORLD IMAGERY MICROSOFT CORPORATION, ACCESSED 01/2017

N

0 55 110 220 Feet

- Existing Facility
- Identified Feature
- Fence Line
- Proposed Structure
- Existing Structure
- Parcels
- 100ft Corridor
- Delineated Wetland
- Proposed Access
- Ditch
- Delineated Stream
- Project Centerline
- Existing Grades
- Municipal Boundary
- Interstate
- State Highway
- US Highway
- Railroad
- Little Miami River
- NWI Wetland
- NHD Flowline
- 100yr Floodplain

DUKE ENERGY.

Cardno Shaping the Future

FIGURE: 2.04
LINE ENVIRONMENTAL ASSESSMENT
F5484 – 138kV COLUMBIA SUBSTATION
REBUILD AND EXTENSION
DUKE ENERGY
ENVIRONMENTAL ACCESS PLAN

DRAWN BY: COD DATE: 7/13/2018
CHECKED: CJ APPROVED: JT

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148,27W-929
147,27W-928
wetland 1
146A,27W-927
SOUTH LEBANON
stream 2
146,27W-926
145,27W-925
144,27W-924
4-ft farm gate

780 782 784 786 788 790 792 794 796 798 800 802 804 806 808 810 812 814 816 818 820 822 824 826 828
752 754 756 758 760 762 764 766 768 770 772 774 776 778

1 2 3 4 5

REFERENCE:
ESRI WORLD IMAGERY, OBTAINED THROUGH ESRI WORLD IMAGERY MICROSOFT CORPORATION, ACCESSED 01/2017

N

0 55 110 220 Feet

- Existing Facility
- Identified Feature
- Fence Line
- Proposed Structure
- Existing Structure
- Parcels
- 100ft Corridor
- Delineated Wetland
- Proposed Access
- Ditch
- Delineated Stream
- Project Centerline
- Existing Grades
- Municipal Boundary
- Interstate
- State Highway
- US Highway
- Railroad
- Little Miami River
- NWI Wetland
- NHD Flowline
- 100yr Floodplain

DUKE ENERGY.

Cardno Shaping the Future

FIGURE: 2.05
LINE ENVIRONMENTAL ASSESSMENT
F5484 – 138kV COLUMBIA SUBSTATION
REBUILD AND EXTENSION
DUKE ENERGY
ENVIRONMENTAL ACCESS PLAN

DRAWN BY: COD DATE: 7/13/2018
CHECKED: CJ APPROVED: JT

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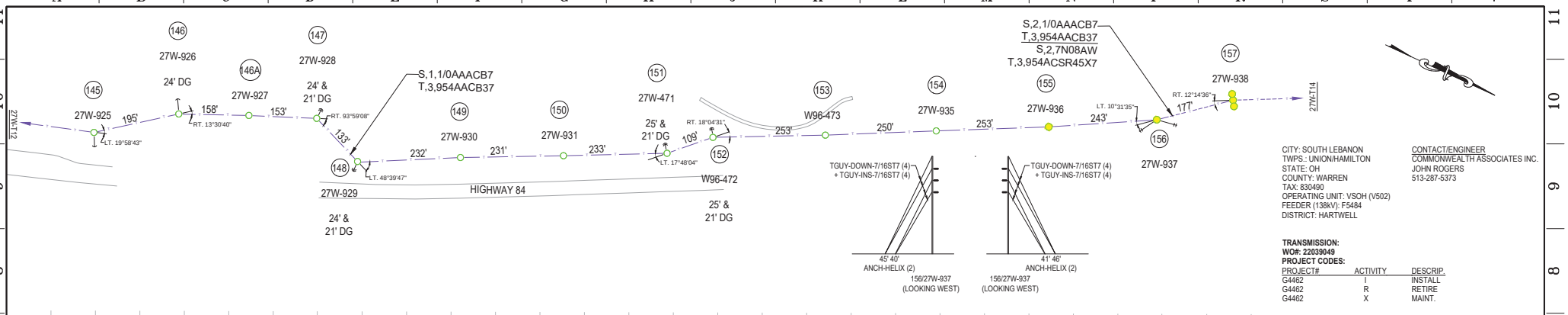
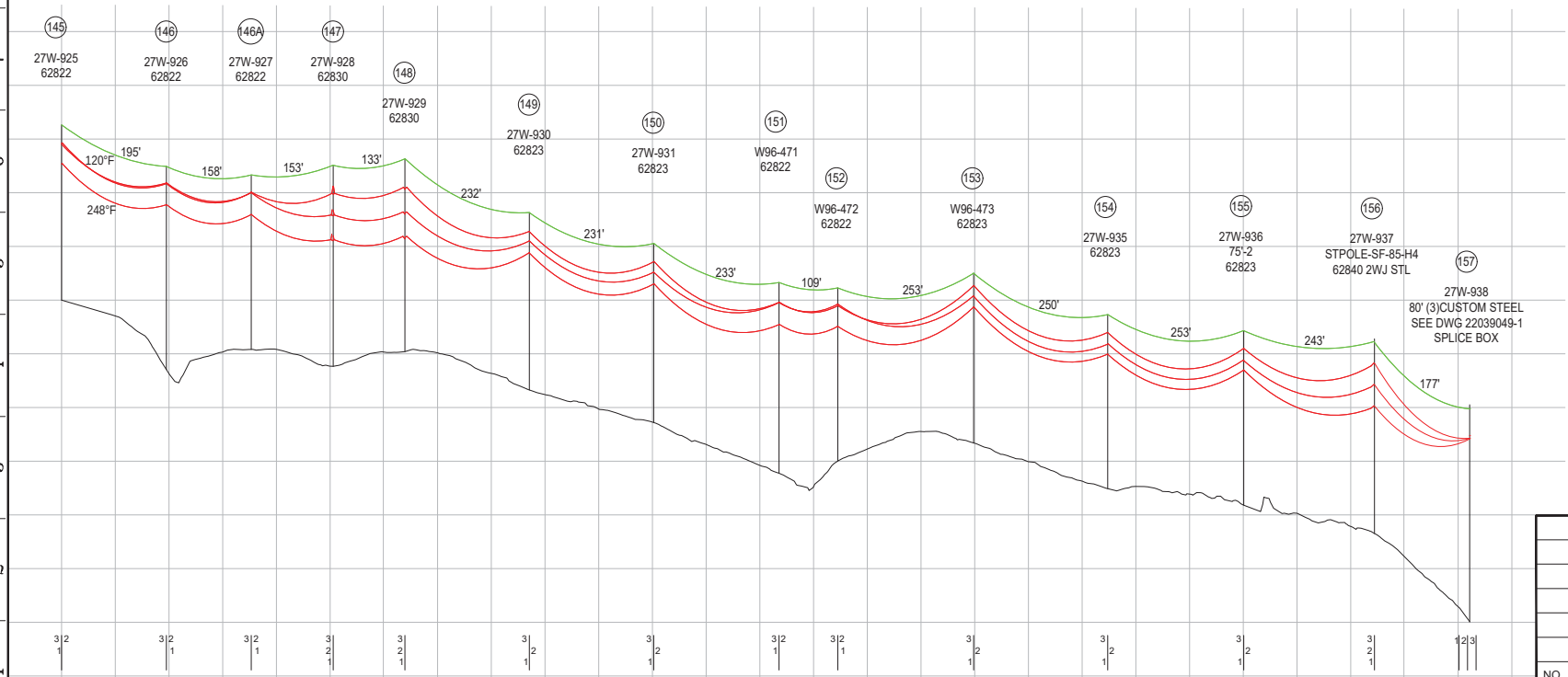


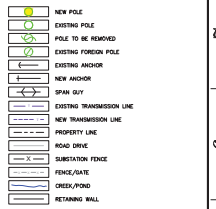
CITY: SOUTH LEBANON
TWPS.: UNION/HAMILTON
STATE: OH
COUNTY: WARREN
TAX: 830490
OPERATING UNIT: VSOH (V502)
FEEDER (138kV): F5484
DISTRICT: HARTWELL

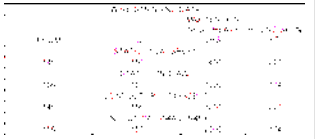
CONTACT/ENGINEER
COMMONWEALTH ASSOCIATES INC.
JOHN ROGERS
513-287-5373

TRANSMISSION:
WO#: 22039049
PROJECT CODES:

PROJECT#	ACTIVITY	DESCRIP.
G4462	I	INSTALL
G4462	R	RETIRE
G4462	X	MAINT.







NOTE:
1. DISTRIBUTION DESIGN BY OTHERS.
2. PHASING LOOKING TOWARD COLUMBIA SUB.

100' HORIZ. SCALE
20' VERT. SCALE

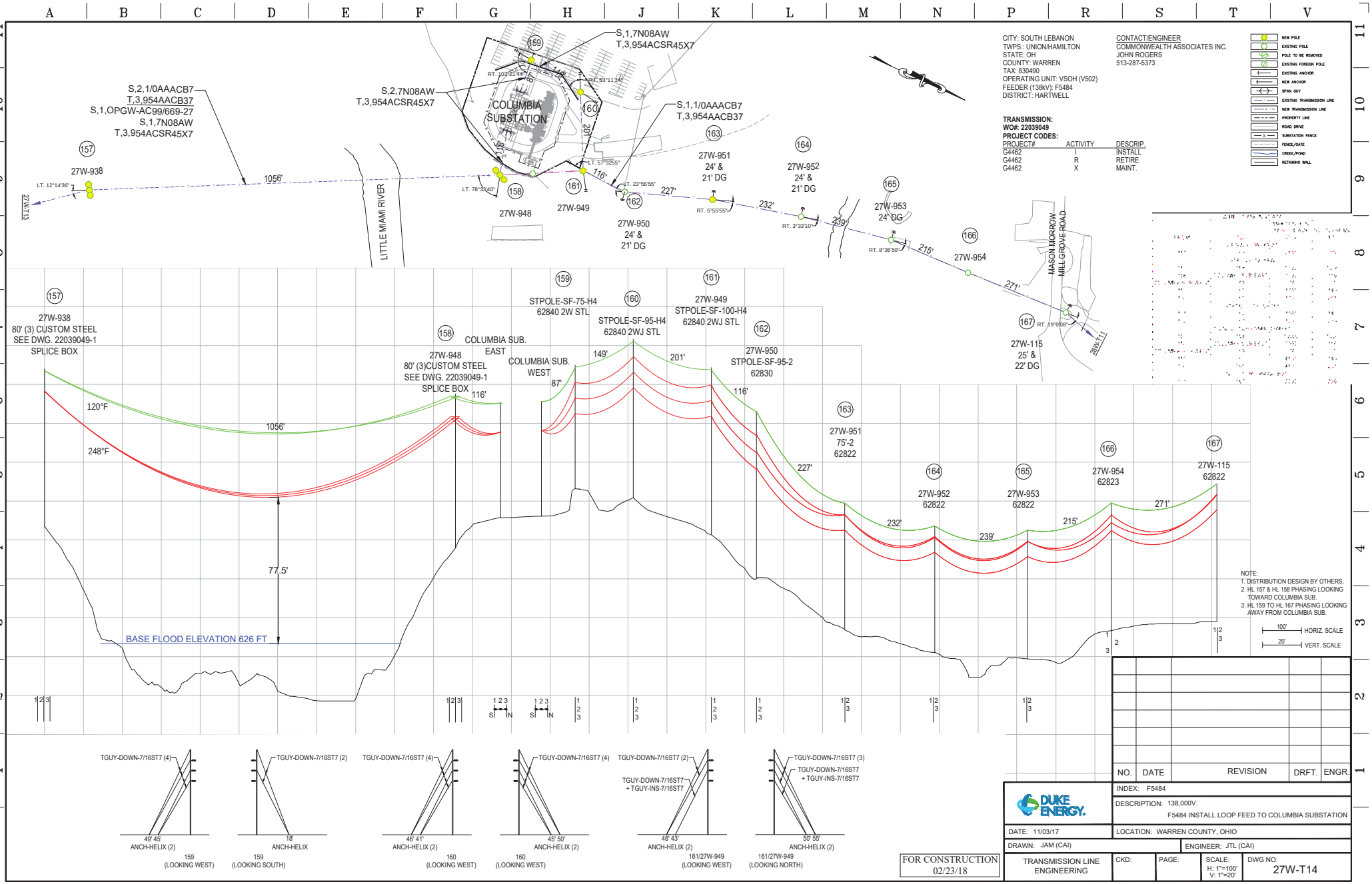
NO.	DATE	REVISION	DRFT.	ENGR.

FOR CONSTRUCTION
02/23/18

DUKE ENERGY.

INDEX: F5484
DESCRIPTION: 138,000V.
F5484 INSTALL LOOP FEED TO COLUMBIA SUBSTATION
DATE: 11/03/17
LOCATION: WARREN COUNTY, OHIO
DRAWN: JAM (CAI)
ENGINEER: JTL (CAI)

TRANSMISSION LINE ENGINEERING	CKD:	PAGE:	SCALE: H: 1"=100' V: 1"=20'	DWG NO: 27W-T13



CITY: SOUTH LEBANON
TWPS.: UNION/HAMILTON
STATE: OH
COUNTY: WARREN
TAX: 830490
OPERATING UNIT: VSOH (V502)
FEEDER (138KV): F5484
DISTRICT: HARTWELL

TRANSMISSION:
WO#: 22039049
PROJECT CODES:

PROJECT#	ACTIVITY	DESCRIP.
G4462	I	INSTALL
G4462	R	RETIRE
G4462	X	MAINT.

CONTACT/ENGINEER
COMMONWEALTH ASSOCIATES INC.
JOHN ROGERS
513-287-5373

NOTE:
1. DISTRIBUTION DESIGN BY OTHERS.
2. HL 157 & HL 158 PHASING LOOKING TOWARD COLUMBIA SUB.
3. HL 159 TO HL 167 PHASING LOOKING AWAY FROM COLUMBIA SUB.

100' HORIZ. SCALE
20' VERT. SCALE

NO.	DATE	REVISION	DRFT.	ENGR.

DUKE ENERGY.

INDEX: F5484
DESCRIPTION: 138,000V.
F5484 INSTALL LOOP FEED TO COLUMBIA SUBSTATION
DATE: 11/03/17
LOCATION: WARREN COUNTY, OHIO
DRAWN: JAM (CAI)
ENGINEER: JTL (CAI)

FOR CONSTRUCTION
02/23/18

TRANSMISSION LINE ENGINEERING

CKD:
PAGE:
SCALE: H: 1"=100' V: 1"=20'
DWG NO: 27W-T14

Photo 1. Stream 1, ephemeral, facing downstream.

Photo 2. Stream 2, Little Miami River, looking downstream.

Photo 3. Overview of Wetland 1, located adjacent to Little Miami River.

Photo 4. Ditch 1.

Photo 5. Stream 3, intermittent, facing upstream.

Photo 6. View of Wetland 2, facing west.

Photo 7: Stream 4, intermittent, facing downstream.

Photo 8: Manhole, located in Ditch 1.

July 16, 2018

Cardno

11121 Canal Road
Cincinnati, Ohio 45241
USA

Phone 513 489 2402
Fax 513 489 2404

www.cardno.com

Mr. John Kessler
Ohio Department of Natural Resources
Office of Real Estate
2045 Morse Road, Building E-2
Columbus, OH 43230

RE: F5484 kV 138 Columbia Substation Project
Rare, Threatened, and Endangered Species Consultation
South Lebanon and Hamilton Township, Warren County, Ohio

Dear Mr. Kessler:

Duke Energy (Duke) is proposing to expand the existing transmission line approximately 550 LF to facilitate the construction of the new Columbia Substation in addition to the removal and replacement of approximately 0.4 miles of existing transmission line, encompassing a total study corridor of 6.1 acres of existing 100-foot wide Duke Energy transmission line corridor Right-Of-Way (ROW). A field investigation of the study corridor was conducted on July 5, 2018.

The project study area is located in the Village of South Lebanon and Hamilton Township, Warren County, Ohio. The location of the proposed Project is depicted on the attached South Lebanon (OH) USGS 7.5-minute topographic map excerpt (Figure 1).

Cardno was contracted by Duke to perform a boundary delineation and assessment of regulated waters, including wetlands, streams, ditches, and/or other federally regulated open waters, rare, threatened, endangered, and special habitat located within the proposed 0.4 miles of existing 100-ft wide ROW. The project study area was dominated by maintained ROW and secondary growth forest vegetation assemblages. Cardno botanists and ecologists conducted a habitat assessment to identify the presence of regulated waters, and potential Indiana bat (*Myotis sodalis*), Northern long-eared bat (*Myotis septentrionalis*), and Running Buffalo Clover *(Trifolium stoloniferum)* habitat.

In accordance with the USFWS Section 7 ESA coordination requirements; the Project study area and its habitat characteristics has been summarized for you below.

1. Location data including latitude and longitude of the project area, site address, and county.

South Lebanon, Hamilton Township, Warren County, Ohio

Initiates: Duke Energy Structure 163 (39.3709, -84.2266)
Terminates: Duke Energy Structure 155 (39.3658, -84.2236)

2. A detailed project description, including layout of any new construction.

The proposed F5484 138kV Columbia Substation Project is necessary in order to facilitate the construction of the new Duke Columbia Substation as well as maintain the integrity of existing Duke structures to ensure adequate power supplies to current and future utility customers in the area. The project is also needed to ensure safety within the existing easements and remain in compliance with current transmission line standards. The transmission line route consists of an existing transmission line corridor and Duke Energy easement.

Construction will be accomplished largely through the use of bucket trucks with truck-mounted augers for structure installation and other construction vehicles transporting cable spools to install the transmission cable along the route. Excavation will be restricted to the locations where the installation of new structures (12 electrical poles) will occur. Earth moving activities are anticipated to be minimal. The extent of access disturbance can vary widely dependent upon many factors, including density and type of surface, vegetative cover, weather conditions, and the type of vehicles moving over the area. The existing vegetation will be preserved to the maximum extent practicable.

Project construction is expected to begin in Fall 2018.

3. A detailed description of onsite habitat, including the size, location, and quality of streams, wetlands, forested areas, and other natural areas, and proposed impacts.

The proposed F5484 kV138 Columbia Substation Project is linear in scope and will take place entirely within existing transmission line corridor and Duke Energy easement (Figure 1 & 2). Six potentially regulated waters including one ephemeral stream (Stream 1), two intermittent streams (Stream 3 and Stream 4), one perennial USGS-Little Miami River (Stream 2), one palustrine emergent wetland (Wetland 2), and one riverine forested wetland (Wetland 1) were identified within the project's Study Area. Specific attention was given to the presence of habitat suitable for federally endangered and threatened species – specifically, the Indiana bat (*Myotis sodalist),* the Northern Long-Eared bat (*Myotis septentrionalis),* and Running Buffalo Clover *(Trifolium stoloniferum).* To evaluate the potential habitat for rare, threatened, and endangered species a general site reconnaissance of the project study area was performed by Cardno botanists and ecologists. The result of these habitat assessments can be found below.

Maintained ROW
The maintained ROW vegetation assemblage dominated the majority of the project study area. Vegetation present in this habitat type consisted of Canada Goldenrod (*Solidago canadensis), Frank's Sedge (Carex frankii), White Ash seedlings (Fraxinus americana), Black Locust seedlings (Robinia pseudoacacia)*, Amur Honey Suckle *(Lonicera maackii*), Kentucky Bluegrass (*Poa pratensis*), Tall Fescue (*Festuca arundinacea*), Poison Ivy (*Toxicodendron radicans*), Grape Vine (*Vitis riparia*), Daisy Flea Bane (*Erigeron annuus*), White Clover (*Trifolium repens*), and Red Clover (*Trifolium pretense*). Although a formal study was not part of this scope, no potential habitat for listed species was identified within this habitat.

Secondary Growth Forest
The secondary growth forest vegetation assemblage was located adjacent to the actively maintained ROW as well as within the riparian corridor of the Little Miami River (Stream 2). Dominant canopy species in this habitat type consisted of White Ash (*Fraxinus americana*), Bur Oak (*Quercus macrocarpa*), and Black Walnut (*Juglans nigra*). Less dominant species in this habitat type included Black Locust (*Robinia pseudoacacia*), Silver Maple (*Acer saccharinum*), Bitternut Hickory (*Carya cordiformis*), and Tree of Heaven (*Ailanthus altissima*). Understory vegetation was dominated by dense Bush Honeysuckle and Multiflora Rose (*Rosa multiflora*) with lesser amounts of White Ash *and* Tree of Heaven seedlings*.*

4. A description of the forested habitat onsite, including type of forest, and presence of dead trees, split branches or trunks, and exfoliating bark, and proposed impacts.

Approximately 2.5 acres of the study area consisted of secondary growth forest located outside the actively maintained ROW and along the riparian corridor of the Little Miami River (Stream 2). Approximately 0.02 acres of secondary growth forest may need to be cleared to accommodate proposed access route from Duke Energy Structure 158 to Structure 161. Additionally, one dead ash tree will be cleared near Duke Energy Structure 162.

5. Photographs representative of all cover types on the site and encompassing views of the entire site.

See the attached photograph log.

6. Conclusion

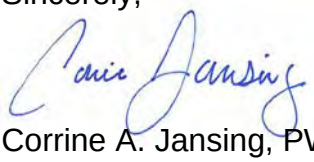
Based on the physical site characteristics, the site contains the site contains moderate quality habitat for the federally endangered Indiana and NLE bat based on the woody species composition and intensity of surrounding land use. All tree clearing activities will be conducted during the USFWS recommended winter tree clearing window between November 15 and March 31.

We are requesting a review by your office and a written response regarding effects on federally listed threatened and/or endangered species and their critical habitat within the vicinity of the

project area. Enclosed for your review are the project location map, aerial map and photograph log.

If you have any questions concerning this request or would like additional information, please do not hesitate to contact me at (513) 833-6392 or Cori.Jansing@cardno.com.

Sincerely,

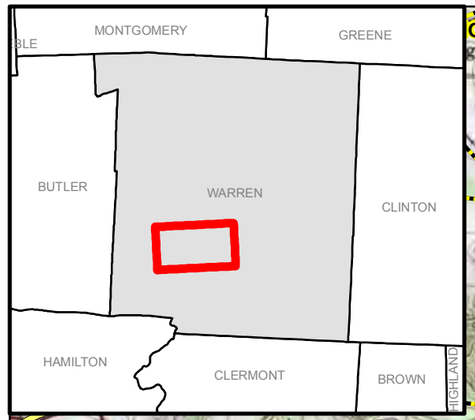


Corrine A. Jansing, PWS
Botanist, Project Scientist
for Cardno, Inc.

Enc: USGS map, Aerial Map, Site Plans, Photo Log, GIS Shapefile

ATTACHMENTS:

PROJECT LOCATION MAP
PROJECT AERIAL MAP
SITE PLANS
PHOTOGRAPH LOG



WARREN COUNTY

LEBANON

SOUTH LEBANON

MASON

DEERFIELD

U.S. MILITARY RESERVATION (ORDNANCE PLANT)

Columbia Substation West

Columbia Substation West

INTERCHANGE 28

INTERCHANGE 24

71

US-22

PROJECT LOCATION

WARREN COUNTY, OH

REFERENCE: USGS 7.5' TOPOGRAPHIC QUADRANGLE: LEBANON AND SOUTH LEBANON, OHIO. OBTAINED VIA ESRI USA TOPO, NATIONAL GEOGRAPHIC TOPO, AND USGS, ACCESSED 01/2017.

N

0 1,000 2,000 Feet

- Project Centerline
- Interstate
- State Highway
- US Highway
- Railroad
- County Boundary
- Municipal Boundary
- Existing Facility

DUKE ENERGY.

Cardno Shaping the Future

FIGURE 1

LINE ENVIRONMENTAL ASSESSMENT
F5484 – 138kV COLUMBIA SUBSTATION
REBUILD AND EXTENSION
DUKE ENERGY
PROJECT VICINITY MAP

DRAWN BY: COD DATE: 7/5/2018
CHECKED: CJ APPROVED: JT

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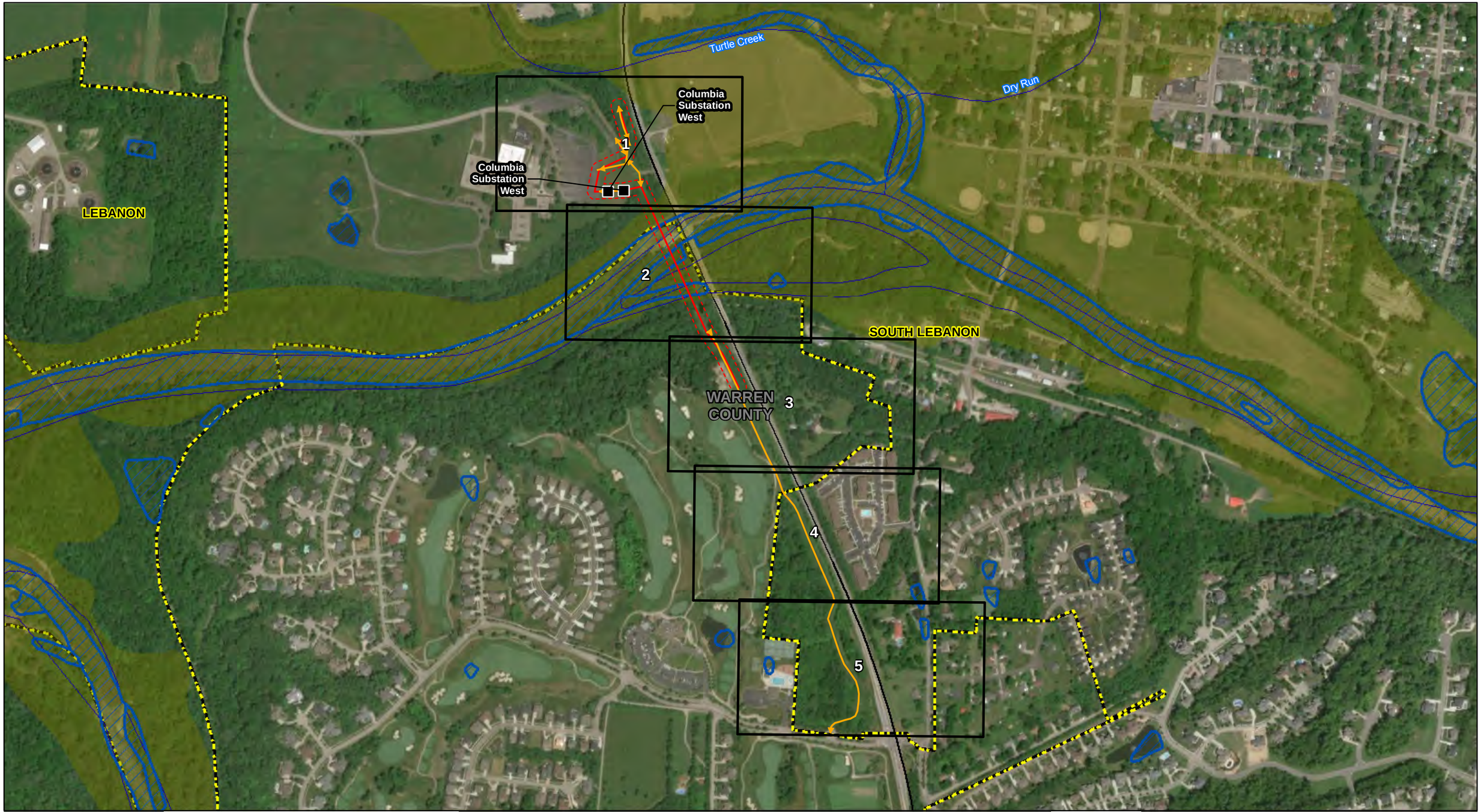

Project Location

REFERENCE:
ESRI WORLD IMAGERY, OBTAINED THROUGH ESRI WORLD IMAGERY MICROSOFT CORPORATION, ACCESSED 01/2017

N

0 160 320 640 Feet 1 inch = 600 feet

- Existing Facility
- Sheet Index
- Interstate
- State Highway
- US Highway
- Railroad
- NWI Wetland
- NHD Flowline
- 100yr Floodplain
- 100ft Corridor
- Project Centerline
- County Boundary
- Municipal Boundary
- Proposed Access

DUKE ENERGY

Cardno Shaping the Future

FIGURE: 2
LINE ENVIRONMENTAL ASSESSMENT
F5484 – 138kV COLUMBIA SUBSTATION
REBUILD AND EXTENSION
DUKE ENERGY
ENVIRONMENTAL ACCESS INDEX SHEET

DRAWN BY: COD DATE: 7/11/2018
CHECKED: CJ APPROVED: JT

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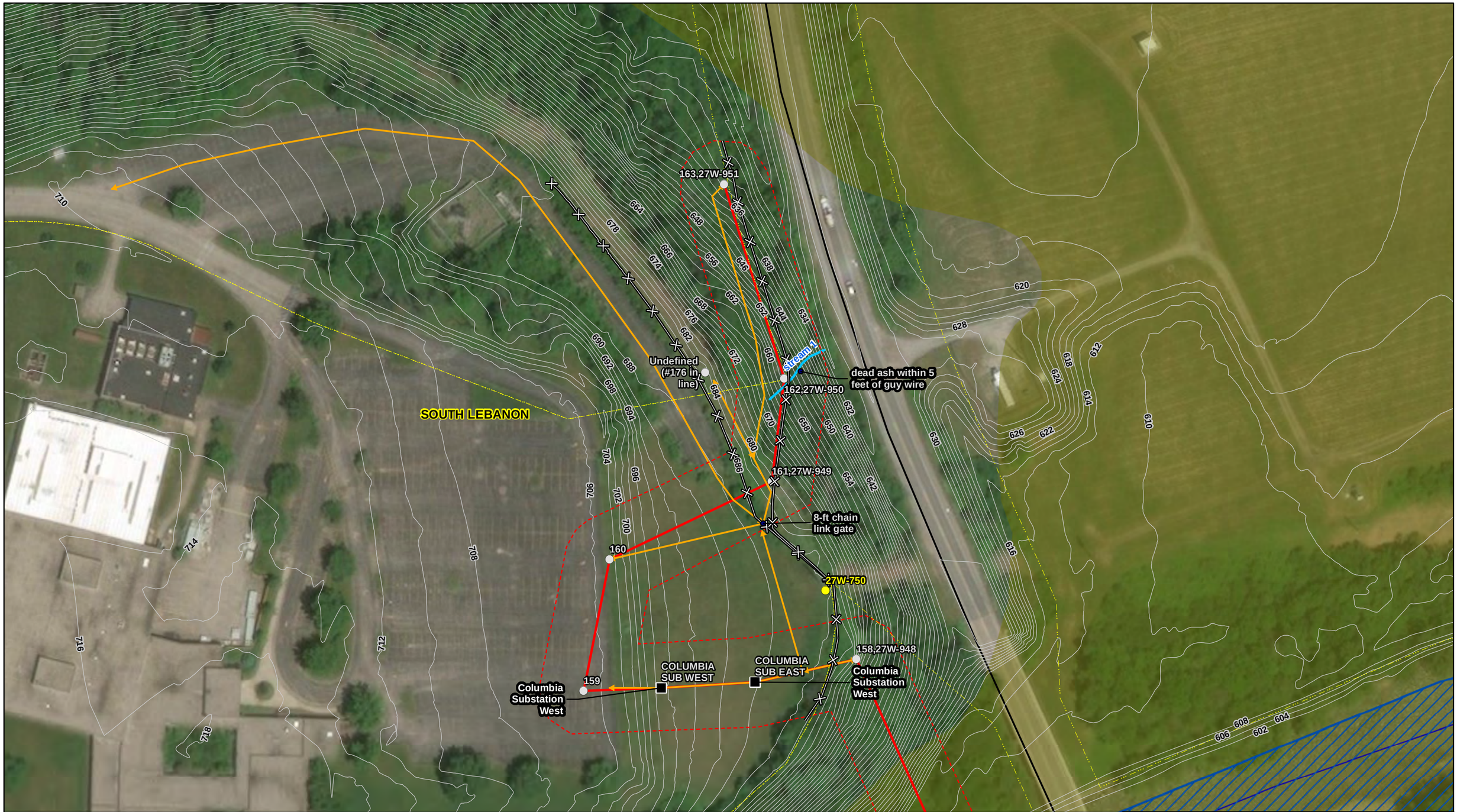

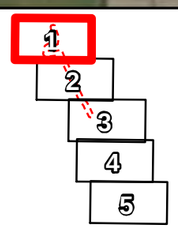

REFERENCE:
ESRI WORLD IMAGERY, OBTAINED THROUGH ESRI WORLD IMAGERY MICROSOFT CORPORATION, ACCESSED 01/2017

N

0 55 110 220 Feet

- Existing Facility
- Identified Feature
- Fence Line
- Proposed Structure
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- Parcels
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DUKE ENERGY.

Cardno Shaping the Future

FIGURE: 2.01
LINE ENVIRONMENTAL ASSESSMENT
F5484 – 138kV COLUMBIA SUBSTATION
REBUILD AND EXTENSION
DUKE ENERGY
ENVIRONMENTAL ACCESS PLAN

DRAWN BY: COD DATE: 7/13/2018
CHECKED: CJ APPROVED: JT

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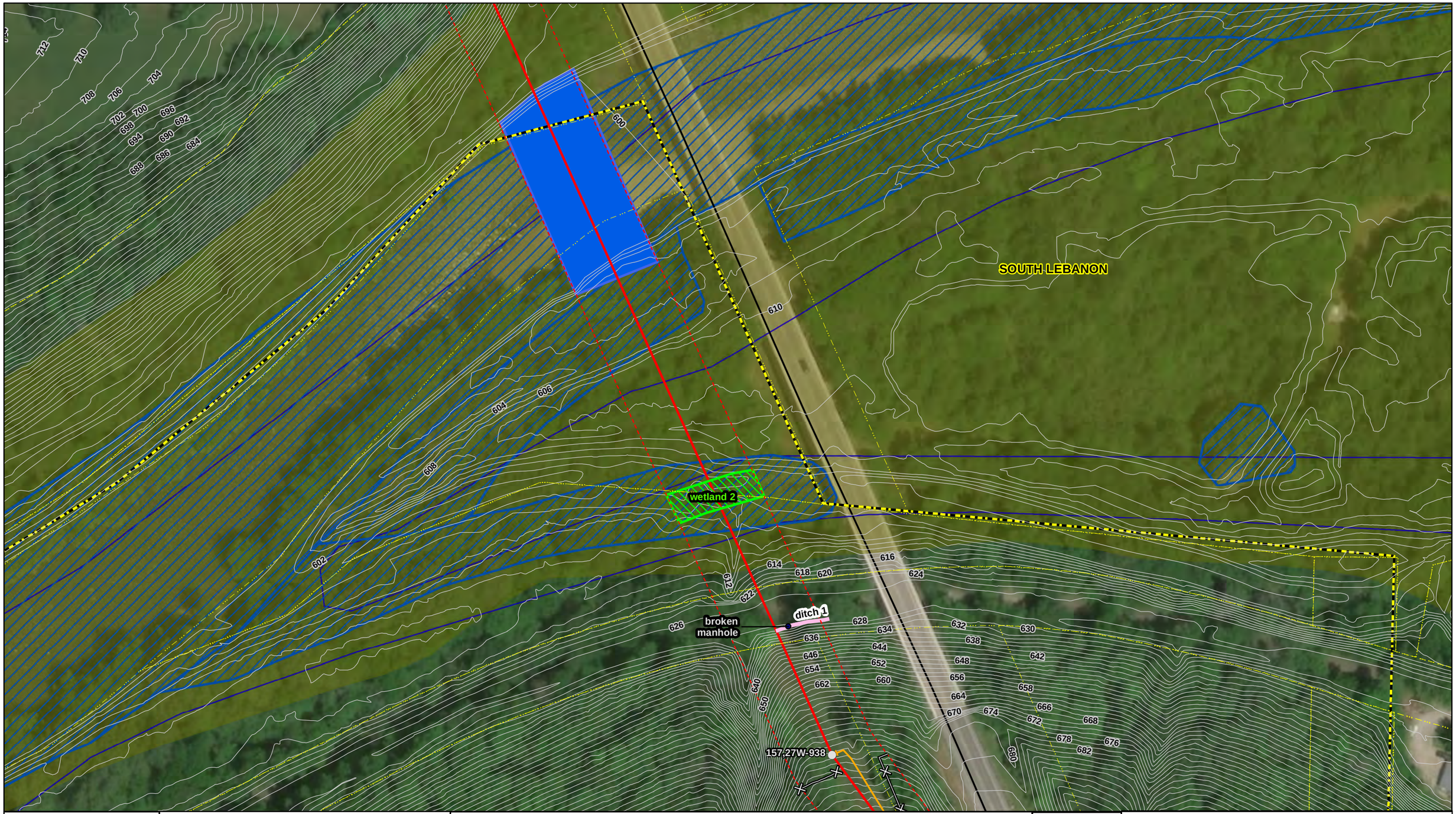

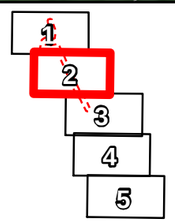

REFERENCE:
ESRI WORLD IMAGERY, OBTAINED THROUGH ESRI WORLD IMAGERY MICROSOFT CORPORATION, ACCESSED 01/2017

N

0 55 110 220 Feet

- Existing Facility
- Identified Feature
- Fence Line
- Proposed Structure
- Existing Structure
- Parcels
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- NHD Flowline
- 100yr Floodplain

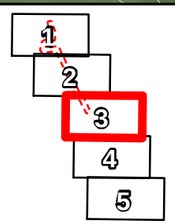
DUKE ENERGY

Cardno Shaping the Future

FIGURE: 2.02
LINE ENVIRONMENTAL ASSESSMENT
F5484 – 138kV COLUMBIA SUBSTATION
REBUILD AND EXTENSION
DUKE ENERGY
ENVIRONMENTAL ACCESS PLAN

DRAWN BY: COD DATE: 7/13/2018
CHECKED: CJ APPROVED: JT

\\cardno.corp\Global\US\Shared\CJFNProjects\Projects\15\156\156720M_DukeEnergy9193\M59_SOW22_5484 138kVColumbiaSubstation\GIS\MXD\LineEnvironmentAssessment\L2_Access_M59.mxd



REFERENCE:
ESRI WORLD IMAGERY, OBTAINED THROUGH ESRI WORLD IMAGERY MICROSOFT CORPORATION, ACCESSED 01/2017

N

0 55 110 220 Feet

- Existing Facility
- Identified Feature
- Fence Line
- Proposed Structure
- Existing Structure
- Parcels
- 100ft Corridor
- Delineated Wetland
- Proposed Access
- Ditch
- Delineated Stream
- Project Centerline
- Existing Grades
- Municipal Boundary
- Interstate
- State Highway
- US Highway
- Railroad
- Little Miami River
- NWI Wetland
- NHD Flowline
- 100yr Floodplain

DUKE ENERGY

Cardno Shaping the Future

FIGURE: 2.03
LINE ENVIRONMENTAL ASSESSMENT
F5484 – 138kV COLUMBIA SUBSTATION
REBUILD AND EXTENSION
DUKE ENERGY
ENVIRONMENTAL ACCESS PLAN

DRAWN BY: COD DATE: 7/13/2018
CHECKED: CJ APPROVED: JT

\\cardno.corp\Global\US\Shared\CJFNProjects\Projects\15\156\156720M_DukeEnergy9193\M59_SOW22_5484 138kVColumbiaSubstation\GIS\MXD\LineEnvironmentAssessment\L2_Access_M59.mxd

1 2 3 4 5

REFERENCE:
ESRI WORLD IMAGERY, OBTAINED THROUGH ESRI WORLD IMAGERY MICROSOFT CORPORATION, ACCESSED 01/2017

N

0 55 110 220 Feet

- Existing Facility
- Identified Feature
- Fence Line
- Proposed Structure
- Existing Structure
- Parcels
- 100ft Corridor
- Delineated Wetland
- Proposed Access
- Ditch
- Delineated Stream
- Project Centerline
- Existing Grades
- Municipal Boundary
- Interstate
- State Highway
- US Highway
- Railroad
- Little Miami River
- NWI Wetland
- NHD Flowline
- 100yr Floodplain

DUKE ENERGY.

Cardno Shaping the Future

FIGURE: 2.04
LINE ENVIRONMENTAL ASSESSMENT
F5484 – 138kV COLUMBIA SUBSTATION
REBUILD AND EXTENSION
DUKE ENERGY
ENVIRONMENTAL ACCESS PLAN

DRAWN BY: COD DATE: 7/13/2018
CHECKED: CJ APPROVED: JT

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148,27W-929
147,27W-928
wetland 1
146A,27W-927
SOUTH LEBANON
stream 2
146,27W-926
145,27W-925
144,27W-924
4-ft farm gate

780 782 784 786 788 790 792 794 796 798 800 802 804 806 808 810 812 814 816 818 820 822 824 826 828
752 754 756 758 760 762 764 766 768 770 772 774 776 778

1 2 3 4 5

REFERENCE:
ESRI WORLD IMAGERY, OBTAINED THROUGH ESRI WORLD IMAGERY MICROSOFT CORPORATION, ACCESSED 01/2017

N

0 55 110 220 Feet

- Existing Facility
- Identified Feature
- Fence Line
- Proposed Structure
- Existing Structure
- Parcels
- 100ft Corridor
- Delineated Wetland
- Proposed Access
- Ditch
- Delineated Stream
- Project Centerline
- Existing Grades
- Municipal Boundary
- Interstate
- State Highway
- US Highway
- Railroad
- Little Miami River
- NWI Wetland
- NHD Flowline
- 100yr Floodplain

DUKE ENERGY.

Cardno Shaping the Future

FIGURE: 2.05
LINE ENVIRONMENTAL ASSESSMENT
F5484 – 138kV COLUMBIA SUBSTATION
REBUILD AND EXTENSION
DUKE ENERGY
ENVIRONMENTAL ACCESS PLAN

DRAWN BY: COD DATE: 7/13/2018
CHECKED: CJ APPROVED: JT

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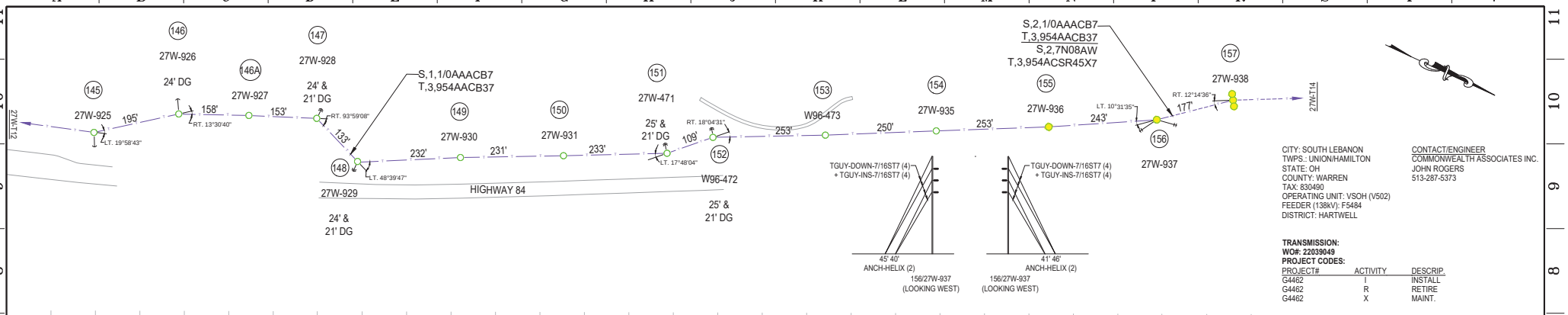
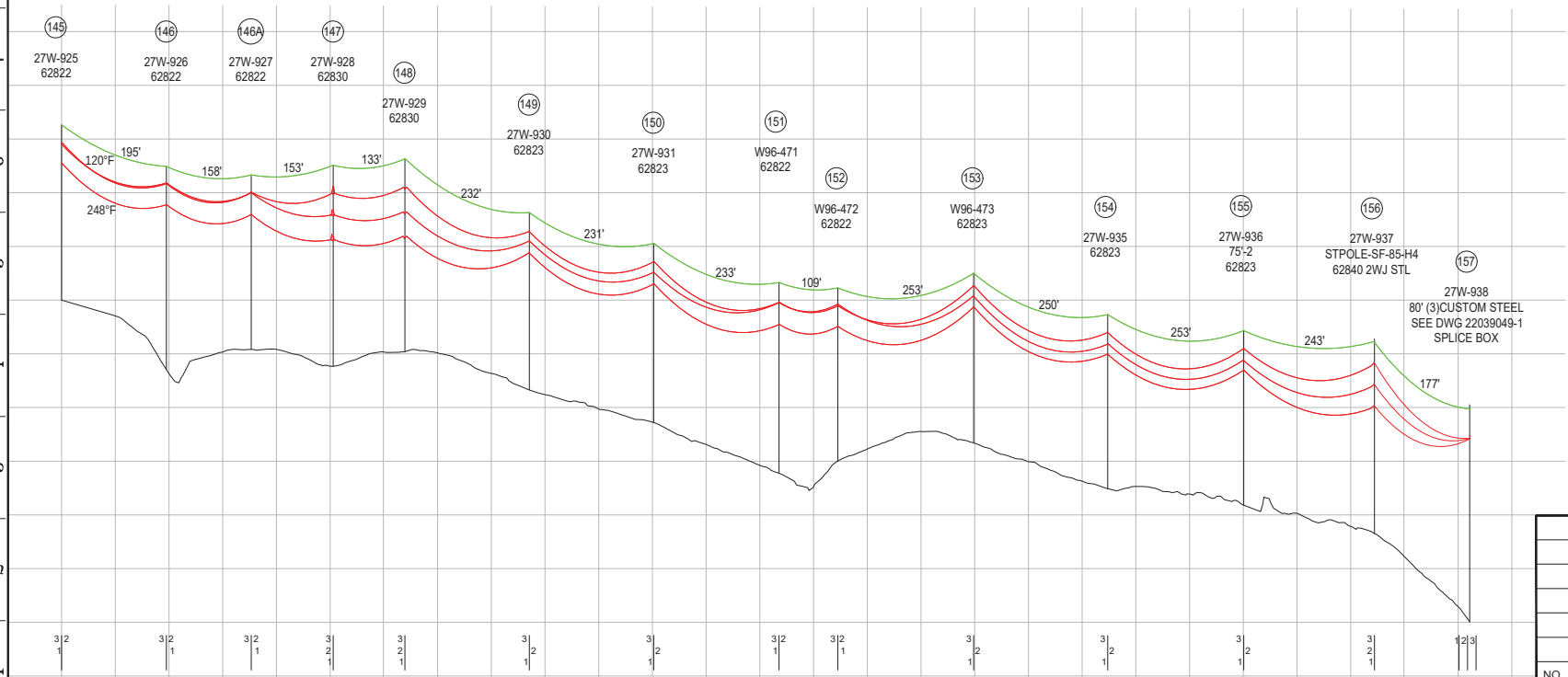


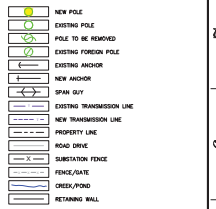
CITY: SOUTH LEBANON
TWPS.: UNION/HAMILTON
STATE: OH
COUNTY: WARREN
TAX: 830490
OPERATING UNIT: VSOH (V502)
FEEDER (138kV): F5484
DISTRICT: HARTWELL

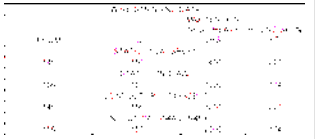
CONTACT/ENGINEER
COMMONWEALTH ASSOCIATES INC.
JOHN ROGERS
513-287-5373

TRANSMISSION:
WO#: 22039049
PROJECT CODES:

PROJECT#	ACTIVITY	DESCRIP.
G4462	I	INSTALL
G4462	R	RETIRE
G4462	X	MAINT.







NOTE:
1. DISTRIBUTION DESIGN BY OTHERS.
2. PHASING LOOKING TOWARD COLUMBIA SUB.

100' HORIZ. SCALE
20' VERT. SCALE

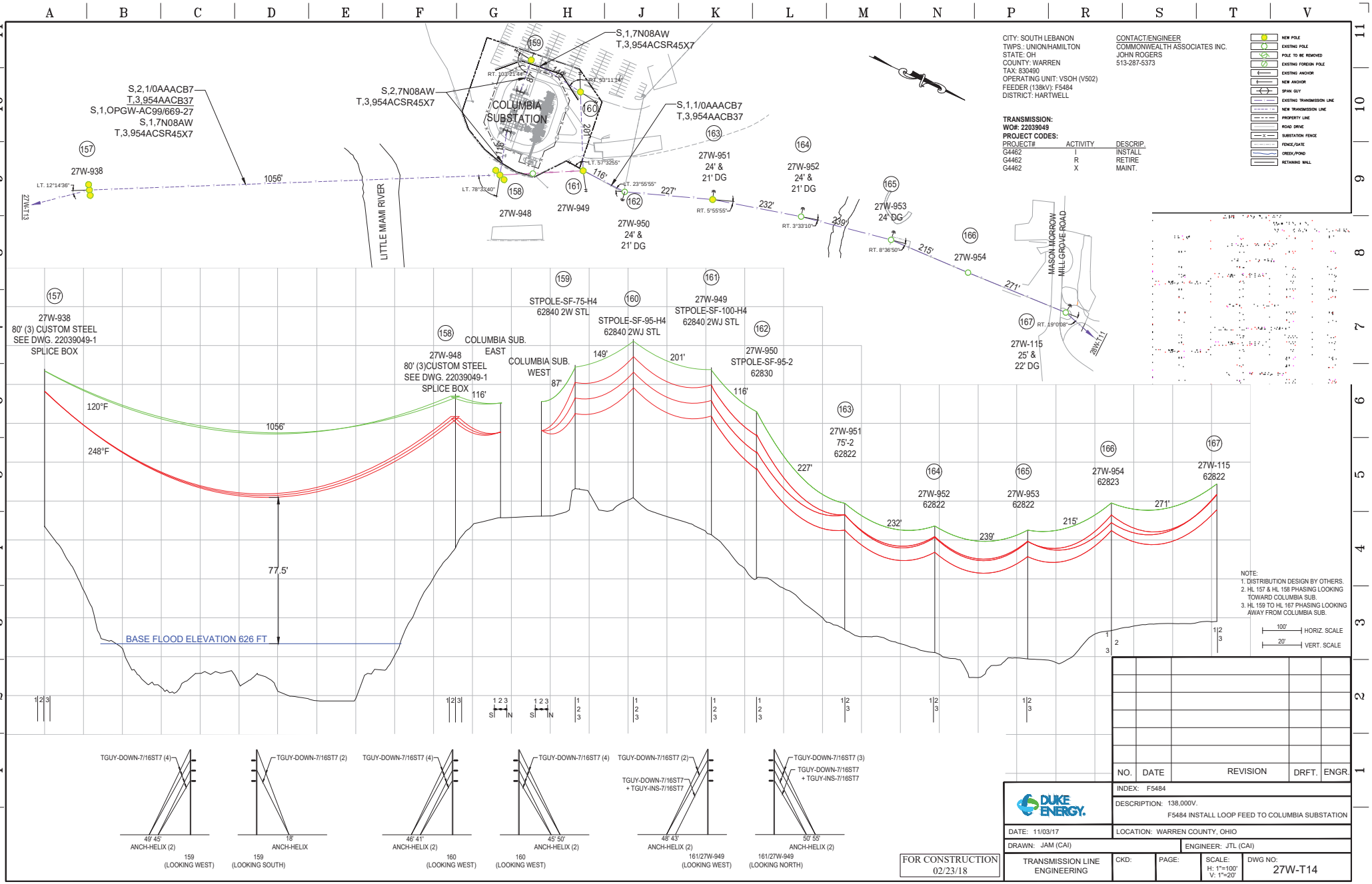
NO.	DATE	REVISION	DRFT.	ENGR.

FOR CONSTRUCTION
02/23/18

DUKE ENERGY.

INDEX: F5484
DESCRIPTION: 138,000V.
F5484 INSTALL LOOP FEED TO COLUMBIA SUBSTATION
DATE: 11/03/17
LOCATION: WARREN COUNTY, OHIO
DRAWN: JAM (CAI)
ENGINEER: JTL (CAI)

TRANSMISSION LINE ENGINEERING	CKD:	PAGE:	SCALE: H: 1"=100' V: 1"=20'	DWG NO: 27W-T13



CITY: SOUTH LEBANON
TWPS.: UNION/HAMILTON
STATE: OH
COUNTY: WARREN
TAX: 830490
OPERATING UNIT: VSOH (V502)
FEEDER (138KV): F5484
DISTRICT: HARTWELL

TRANSMISSION:
WO#: 22039049
PROJECT CODES:

PROJECT#	ACTIVITY	DESCRIP.
G4462	I	INSTALL
G4462	R	RETIRE
G4462	X	MAINT.

CONTACT/ENGINEER
COMMONWEALTH ASSOCIATES INC.
JOHN ROGERS
513-287-5373

NOTE:
1. DISTRIBUTION DESIGN BY OTHERS.
2. HL 157 & HL 158 PHASING LOOKING TOWARD COLUMBIA SUB.
3. HL 159 TO HL 167 PHASING LOOKING AWAY FROM COLUMBIA SUB.

100' HORIZ. SCALE
20' VERT. SCALE

NO.	DATE	REVISION	DRFT.	ENGR.

DUKE ENERGY.

INDEX: F5484
DESCRIPTION: 138,000V.
F5484 INSTALL LOOP FEED TO COLUMBIA SUBSTATION
DATE: 11/03/17
LOCATION: WARREN COUNTY, OHIO
DRAWN: JAM (CAI)
ENGINEER: JTL (CAI)

FOR CONSTRUCTION
02/23/18

TRANSMISSION LINE ENGINEERING

CKD:
PAGE:
SCALE: H: 1"=100' V: 1"=20'
DWG NO: 27W-T14

Photo 1. Stream 1, ephemeral, facing downstream.

Photo 2. Stream 2, Little Miami River, looking downstream.

Photo 3. Overview of Wetland 1, located adjacent to Little Miami River.

Photo 4. Ditch 1.

Photo 5. Stream 3, intermittent, facing upstream.

Photo 6. View of Wetland 2, facing west.

Photo 7: Stream 4, intermittent, facing downstream.

Photo 8: Manhole, located in Ditch 1.

Photo 9. Fence line located north of Stream 2, facing north.

Photo 10. ROW looking south towards the Little Miami River (Stream 2).

Photo 11. View of fence line within ROW.

Photo 12. Overview of Maintained ROW vegetation assemblage.

Photo 9. Fence line located north of Stream 2, facing north.

Photo 10. ROW looking south towards the Little Miami River (Stream 2).

Photo 11. View of fence line within ROW.

Photo 12. Overview of Maintained ROW vegetation assemblage.

From:	Cori Jansing
To:	Danielle Thompson
Subject:	FW: Cardno - F5484 Columbia Substation Expansion 138 kV Project, Warren County
Date:	Monday, September 24, 2018 6:35:04 AM
Attachments:	image001.jpg image002.jpg

Corrine Jansing
PROJECT SCIENTIST
CARDNO

Office +1 513 489 2402 Direct +1 513 233 7034 Mobile +1 513 833 6392
Address 11121 Canal Rd., Cincinnati (Sharonville), Ohio 45241
Email cori.jansing@cardno.com Web www.cardno.com

From: susan_zimmermann@fws.gov <susan_zimmermann@fws.gov> **On Behalf Of** Ohio, FW3
Sent: Monday, July 23, 2018 8:50 AM
To: Cori Jansing <cori.jansing@cardno.com>
Subject: Cardno - F5484 Columbia Substation Expansion 138 kV Project, Warren County

TAILS# 03E15000-2018-TA-1693

Dear Ms. Jansing,

We have received your recent correspondence regarding potential impacts to federally listed species in the vicinity of the above referenced project. There are no federal wilderness areas, wildlife refuges or designated critical habitat within the vicinity of the project area. We recommend that proposed activities minimize water quality impacts, including fill in streams and wetlands. Best management practices should be utilized to minimize erosion and sedimentation.

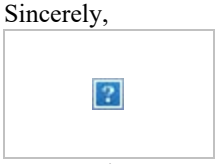
FEDERALLY LISTED, PROPOSED, AND CANDIDATE SPECIES COMMENTS: Due to the project type, size, location, and the proposed implementation of seasonal tree cutting (clearing of trees =3 inches diameter at breast height between October 1 and March 31) to avoid impacts to the federally listed endangered Indiana bat (*Myotis sodalis*) and threatened northern long-eared bat (*Myotis septentrionalis*), we do not anticipate adverse effects to any federally endangered, threatened, proposed or candidate species. Should the project design change, or during the term of this action, additional information on listed or proposed species or their critical habitat become available, or if new information reveals effects of the action that were not previously considered, consultation with the U.S. Fish and Wildlife Service (Service) should be initiated to assess any potential impacts.

If there is a federal nexus for the project (e.g., federal funding provided, federal permits required to construct), no tree clearing should occur on any portion of the project area until consultation under section 7 of the Endangered Species Act (ESA), between the Service and the federal action agency, is completed. We recommend that the federal action agency submit a determination of effects to this office, relative to the Indiana bat and northern long-eared bat, for our review and concurrence.

These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), ESA, and are consistent with the intent of the National Environmental Policy Act of 1969 and the Service's Mitigation Policy. This letter provides technical assistance only and does not serve as a completed section 7 consultation document. We recommend that the project be coordinated with the Ohio Department of Natural Resources due to the potential for the project to affect state listed species and/or state lands. Contact John Kessler, Environmental Services Administrator, at (614) 265-6621 or at john.kessler@dnr.state.oh.us.

If you have questions, or if we can be of further assistance in this matter, please contact our office at (614) 416-8993 or ohio@fws.gov.

Sincerely,



Scott Pruitt
Acting Field Supervisor

Ohio Department of Natural Resources

JOHN R. KASICH, GOVERNOR JAMES ZEHRINGER, DIRECTOR

Office of Real Estate
Paul R. Baldridge, Chief
2045 Morse Road – Bldg. E-2
Columbus, OH 43229
Phone: (614) 265-6649
Fax: (614) 267-4764

September 18, 2018

Cori Jansing
Cardno
11121 Canal Road
Cincinnati, Ohio 45241

Re: 18-852; F5484 kV 138 Columbia Substation Project

Project: The proposed project involves expanding existing line approximately 550 LF to facilitate the construction of the new Columbia Substation in addition to the removal and replacement of approximately 0.4 miles of existing transmission line.

Location: The proposed project is in South Lebanon and Hamilton Townships, Warren County, Ohio.

The Ohio Department of Natural Resources (ODNR) has completed a review of the above referenced project. These comments were generated by an inter-disciplinary review within the Department. These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the National Environmental Policy Act, the Coastal Zone Management Act, Ohio Revised Code and other applicable laws and regulations. These comments are also based on ODNR's experience as the state natural resource management agency and do not supersede or replace the regulatory authority of any local, state or federal agency nor relieve the applicant of the obligation to comply with any local, state or federal laws or regulations.

Natural Heritage Database: The Natural Heritage Database has the following records at or within a one-mile radius of the project area:

Snuffbox (*Epioblasma triquetra*), E, FE
Fawnsfoot (*Truncilla donaciformis*), T
Mountain madtom (*Noturus eleutherus*), T
Little Miami State Scenic River
Little Miami Scenic State Park – ODNR Division of Parks & Watercraft
Deerfield Gorge Scenic River Lands – ODNR Scenic Rivers Program
City of Lebanon, River Bend Land Co., TEJ Holdings, Taft Broadcast, & Tournament Players Club Scenic Rivers Easements – ODNR Scenic Rivers Program

The review was performed on the project area you specified in your request as well as an additional one-mile radius. Records searched date from 1980. This information is provided to inform you of features present within your project area and vicinity. Additional comments on some of the features may be found in pertinent sections below.

Please note that Ohio has not been completely surveyed and we rely on receiving information from many sources. Therefore, a lack of records for any particular area is not a statement that rare species or unique features are absent from that area. Although all types of plant communities have been surveyed, we only maintain records on the highest quality areas.

Statuses are defined as: E = state endangered; T = state threatened; P = state potentially threatened; SC = state species of concern; SI = state special interest; A = species recently added to state inventory, status not yet determined; X = presumed extirpated in Ohio; FE = federal endangered, FT = federal threatened, FSC = federal species of concern, FC = federal candidate species.

Fish and Wildlife: The Division of Wildlife (DOW) has the following comments.

The DOW recommends that impacts to streams, wetlands and other water resources be avoided and minimized to the fullest extent possible, and that best management practices be utilized to minimize erosion and sedimentation.

The project is within the range of the Indiana bat (*Myotis sodalis*), a state endangered and federally endangered species. The following species of trees have relatively high value as potential Indiana bat roost trees: shagbark hickory (*Carya ovata*), shellbark hickory (*Carya laciniosa*), bitternut hickory (*Carya cordiformis*), black ash (*Fraxinus nigra*), green ash (*Fraxinus pennsylvanica*), white ash (*Fraxinus americana*), shingle oak (*Quercus imbricaria*), northern red oak (*Quercus rubra*), slippery elm (*Ulmus rubra*), American elm (*Ulmus americana*), eastern cottonwood (*Populus deltoides*), silver maple (*Acer saccharinum*), sassafras (*Sassafras albidum*), post oak (*Quercus stellata*), and white oak (*Quercus alba*). Indiana bat roost trees consists of trees that include dead and dying trees with exfoliating bark, crevices, or cavities in upland areas or riparian corridors and living trees with exfoliating bark, cavities, or hollow areas formed from broken branches or tops. However, Indiana bats are also dependent on the forest structure surrounding roost trees. If suitable habitat occurs within the project area, the DOW recommends trees be conserved. If suitable habitat occurs within the project area and trees must be cut, the DOW recommends cutting occur between October 1 and March 31. If suitable trees must be cut during the summer months, the DOW recommends a net survey be conducted between June 1 and August 15, prior to any cutting. Net surveys should incorporate either nine net nights per square 0.5 kilometer of project area, or four net nights per kilometer for linear projects. If no tree removal is proposed, this project is not likely to impact this species.

The project is within the range of the club shell (*Pleurobema clava*), a state endangered and federally endangered mussel, the rayed bean (*Villosa fabalis*), a state endangered and federally endangered mussel, the snuffbox (*Epioblasma triquetra*), a state endangered and federally endangered mussel, the washboard (*Megalonaias* nervosa), a state endangered mussel, the threehorn wartyback (*Obliquaria reflexa*), a state threatened mussel, the black sandshell (*Ligumia recta*), a state threatened mussel, and the fawnsfoot (*Truncilla donaciformis*), a state threatened mussel. The DOW has reviewed this project with the assumption that in-water work within the Little Miami River will not be necessary. Therefore, this project is not likely to impact these or other mussel species.

The project is within the range of the northern brook lamprey *(Ichthyomyzon fossor*), a state endangered fish, the goldeye (*Hiodon alosoides*), a state endangered fish, the mountain brook lamprey (*Ichthyomyzon greeleyi*), a state endangered fish, the bigeye shiner (*Notropis boops*) a state threatened fish, the American eel (*Anguilla rostrata*), a state threatened fish, and the paddlefish (*Polyodon spathula*) a state threatened fish. The DOW recommends no in-water work in perennial streams from April 15 to June 30 to reduce impacts to indigenous aquatic species and

their habitat. If no in-water work is proposed in a perennial stream, this project is not likely to impact these or other aquatic species.

The project is within the range of the eastern massasauga (*Sistrurus catenatus*), a state endangered and federally threatened snake species. The eastern massasauga uses a range of habitats including wet prairies, fens, and other wetlands, as well as drier upland habitat. Due to the location, the type of habitat present at the project site and within the vicinity of the project area, and the type of work proposed, this project is not likely to impact this species.

The project is within the range of the spotted turtle (*Clemmys guttata*), a state threatened species. This species prefers fens, bogs and marshes, but is also known to inhabit wet prairies, meadows, pond edges, wet woods, and the shallow sluggish waters of small streams and ditches. Due to the location, the type of habitat present at the project site and within the vicinity of the project area, and the type of work proposed, this project is not likely to impact this species.

The project is within the range of the Kirtland's snake (*Clonophis kirtlandii*), a state threatened species. This secretive species prefers wet fields and meadows. Due to the location, the type of habitat present at the project site and within the vicinity of the project area, and the type of work proposed, this project is not likely to impact this species.

The project is within the range of the northern harrier (*Circus cyaneus*), a state endangered bird. This is a common migrant and winter species. Nesters are much rarer, although they occasionally breed in large marshes and grasslands. Harriers often nest in loose colonies. The female builds a nest out of sticks on the ground, often on top of a mound. Harriers hunt over grasslands. Due to the location, the type of habitat present at the project site, and the type of work proposed, this project is not likely to impact this species.

The project is within the range of the Sloan's crayfish (*Orconectes sloanii*), a state threatened species. Due to the location, and the habitat within the project area, this project is not likely to impact this species.

Due to the potential of impacts to federally listed species, as well as to state listed species, we recommend that this project be coordinated with the U.S. Fish & Wildlife Service.

Scenic Rivers: The Ohio Scenic Rivers Program has the following comment.

The proposed Duke Energy F5484 kv 138 Columbia Substation expansion project falls within 1,000 of the Little Miami State and National Scenic River in Warren County, Ohio. It crosses the Little Miami State and National Scenic River, the Little Miami State Park and protected conservation land owned and managed by the ODNR Scenic Rivers Program. Scenic Rivers and Park Management staff request that Cardno and Duke Energy schedule a time to meet on site to discuss the project in greater detail, including any potential real estate and mitigation needs, before the project moves forward. Please contact the ODNR regional manager, Melissa Clark at Melissa.clark@dnr.state.oh.us or (937)408-8554.

Water Resources: The Division of Water Resources has the following comment.

The local floodplain administrator should be contacted concerning the possible need for any floodplain permits or approvals for this project. Your local floodplain administrator contact information can be found at the website below.

http://water.ohiodnr.gov/portals/soilwater/pdf/floodplain/Floodplain%20Manager%20Community%20Contact%20List_8_16.pdf

ODNR appreciates the opportunity to provide these comments. Please contact John Kessler at (614) 265-6621 if you have questions about these comments or need additional information.

John Kessler
ODNR Office of Real Estate
2045 Morse Road, Building E-2
Columbus, Ohio 43229-6693
John.Kessler@dnr.state.oh.us

Attachment H

Section 10 Permit Application

October 14, 2018

Ms. Teresa Spanga
U.S. Army Corps of Engineers, Huntington District
Regulatory Branch (OR-F)
502 8th Street
Huntington, WV 25701-2070

Cardno

11121 Canal Road
Cincinnati, Ohio 45241
USA

Phone 513 489 2402
Fax 513 489 2404
www.cardno.com

www.cardno.com

Re: Section 10 Navigable Waters Permit Application
5484 – 138kV Columbia Substation Rebuild and Expansion Project
Warren County, Ohio

Dear Ms. Spanga:

Cardno is contacting the U.S. Army Corps of Engineers (USACE) on behalf of Duke Energy ("Duke"), who seeks authorization under Section 10: Navigable Waters Permit to remove existing wood utility structures and replace them with upgraded galvanized steel structures, which support a 138kV overhead power line that traverses the Little Great Miami River, near mile marker 22. The 5484 Columbia Substation Rebuild and Expansion project begins at the Duke Energy's Columbia Substation located west of State Route 48 and south of Mason Morrow Millgrove Road (39.369349, -84.226636) and terminates at Duke Energy's Structure No. 936 located west of State Route 48 and south of the Little Miami River (39.363899, -84.222795). See Appendix A.

The Columbia Substation 138kV Rebuild and Expansion Project aims to maintain and improve the quality of the electric service and reliability to the service area as well as ensure the integrity of the transmission line by replacing the existing wood structures to galvanized steel structures. The Study Area consisted of a mix of habitats including forested wetland, secondary growth deciduous forest, and scrub-shrub/maintained right-of-way (ROW). A total of two potentially regulated waters including the Little Miami River (Stream 2), and one unnamed ephemeral stream (Stream 1) and one wetland (Wetland 1) were identified within the Project Study Area (Appendix A). No identified streams will be impacted by the project; however, the structures that support Duke's existing overhead 138kV electric power line over the Little Miami River will be replaced at the same location and height of the original allowing for the same clearance of the existing line. The project activities will result in no net fill within the floodplain of the Little Miami River. See Appendix B, for project Engineering Plans.

We request verification that the project, as proposed, meets the conditions of the Section 10 USACE Permit that is required for work on structures in, over, or under navigable

waters of the United States. If you have any questions concerning this Section 10 permit authorization request, please do not hesitate to contact me at your convenience.

Sincerely,

Danielle K. Thompson
Senior Project Scientist
for Cardno

cc: Dustin Giesler, Duke Energy

Enc: Appendix A: Figures
Appendix B: Engineering Plans
Appendix C: USFWS and ODNR Correspondence

File: J156702M59
Duke Project No.: G4462

U.S. ARMY CORPS OF ENGINEERS

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT

33 CFR 325. The proponent agency is CECW-CO-R.

Form Approved - OMB No. 0710-0003 Expires: 30-SEPTEMBER-2015

Public reporting for this collection of information is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of the collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters, Executive Services and Communications Directorate, Information Management Division and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please DO NOT RETURN your form to either of those addresses. Completed applications must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and/or instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETE

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME	8. AUTHORIZED AGENT'S NAME AND TITLE (agent is not required)
First - Dustin Middle - Last - Giesler	First - Danielle Middle - K Last - Thompson
Company - Duke Energy	Company - Cardno
E-mail Address - dustin.giesler@duke-energy.com	E-mail Address - danielle.thompson@cardno.com
6. APPLICANT'S ADDRESS:	**9. AGENT'S ADDRESS:**
Address- 139 E. 4th Street	Address- 11121 Canal Rd
City - Cincinnati State - OH Zip - 45202 Country - USA	City - Cincinnati State - OH Zip - 45241 Country - USA
7. APPLICANT'S PHONE NOs. w/AREA CODE	**10. AGENTS PHONE NOs. w/AREA CODE**
a. Residence b. Business 859-380-1468 c. Fax	a. Residence b. Business 513-489-2402 c. Fax

STATEMENT OF AUTHORIZATION

11. I hereby authorize, Cardno to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

SIGNATURE OF APPLICANT DATE

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)

5484 - Columbia Substation Rebuild and Expansion

13. NAME OF WATERBODY, IF KNOWN (if applicable)	14. PROJECT STREET ADDRESS (if applicable)
Little Miami River	Address n/a
15. LOCATION OF PROJECT	City - South Lebanon State- OH Zip- 45036
Latitude: °N 39.369199 Longitude: °W -84.226046	

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions)

State Tax Parcel ID Municipality Hamilton Twp., Warren County

Section - Township - Range -

17. DIRECTIONS TO THE SITE

The 5484 Columbia Substation Rebuild and Expansion project begins at the Duke Energy's Columbia Substation located west of State Route 48 and south of Mason Morrow Millgrove Road (39.369349, -84.226636) and terminates at Duke Energy's Structure No. 936 located west of State Route 48 and south of the Little Miami River (39.363899, -84.222795). See Appendix A, Figure 2 for project corridor.

From Cincinnati take I-71 North to Exit 28 to SR-48 South, the project corridor runs parallel to SR-48 from approximately 0.25 mile north of the Little Miami River to approximately 0.25 mile south of the Little Miami River.

18. Nature of Activity (Description of project, include all features)

The Columbia Substation 138kV Rebuild and Expansion Project aims to maintain and improve the quality of the electric service and reliability to the service area as well as ensure the integrity of the transmission line by replacing the existing wood structures to galvanized steel structures. The Study Area consisted of a mix of habitats including forested wetland, secondary growth deciduous forest, and scrub-shrub/maintained right-of-way (ROW). A total of two potentially regulated waters including the Little Miami River (Stream 2), and one unnamed ephemeral stream (Stream 1) and one wetland (Wetland 1) were identified within the Project Study Area (Appendix A). No identified streams will be impacted by the project; however, the structures that support Duke's existing overhead 138kV electric power line over the Little Miami River will be replaced at the same location and height of the original allowing for the same clearance of the existing line. The project activities will result in no net fill within the floodplain of the Little Miami River. See Appendix B, for project Engineering Plans.

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

The purpose and need for the Columbia Substation 138kV Rebuild and Expansion Project is to maintain and improve the quality of the electric service and reliability to the service area as well as ensure the integrity of the transmission line by replacing the existing wood structures to galvanized steel structures.

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

No fill material will be discharged into 'Waters of the US'.

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:

Type Amount in Cubic Yards	Type Amount in Cubic Yards	Type Amount in Cubic Yards
N/A	N/A	N/A

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Acres N/A

or

Linear Feet N/A

23. Description of Avoidance, Minimization, and Compensation (see instructions)

The proposed Project will occur entirely within existing Duke Right-of-Way. No additional long term impacts to adjacent properties are anticipated as a result of the rebuild Project. Therefore, the current alignment is the only reasonable alternative available and no alternatives were considered.

24. Is Any Portion of the Work Already Complete? ☐ Yes ☒ No IF YES, DESCRIBE THE COMPLETED WORK

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list)

a. Address-

City - State - Zip -

b. Address-

City - State - Zip -

c. Address-

City - State - Zip -

d. Address-

City - State - Zip -

e. Address-

City - State - Zip -

26. List of Other Certificates or Approvals/Denials received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED

* Would include but is not restricted to zoning, building, and flood plain permits

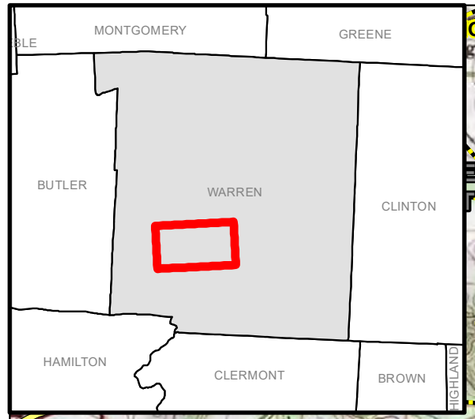
27. Application is hereby made for permit or permits to authorize the work described in this application. I certify that this information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

SIGNATURE OF APPLICANT — DATE: 10/15/18

SIGNATURE OF AGENT — DATE: 10/15/18

The Application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.



LEBANON

SOUTH LEBANON

MASON

DEERFIELD

UNION

MIAMI

Columbia Substation West

Columbia Substation East

INTERCHANGE 28

INTERCHANGE 24

71

SR-48

SR-741

US-22

TURTLE CREEK

Muddy Creek

LITTLE MIAMI RIVER

Middletown Junction

Kings Mills

U.S. MILITARY RESERVATION (ORDNANCE PLANT)

Zoar

PROJECT LOCATION

WARREN COUNTY, OH

REFERENCE: USGS 7.5' TOPOGRAPHIC QUADRANGLE: LEBANON AND SOUTH LEBANON, OHIO. OBTAINED VIA ESRI USA TOPO, NATIONAL GEOGRAPHIC TOPO, AND USGS, ACCESSED 01/2017.

N

0 1,000 2,000 Feet

- Project Centerline
- Interstate
- State Highway
- US Highway
- Railroad
- County Boundary
- Municipal Boundary
- Existing Facility

DUKE ENERGY

FIGURE 1

LINE ENVIRONMENTAL ASSESSMENT
F5484 – 138kV COLUMBIA SUBSTATION
REBUILD AND EXTENSION
DUKE ENERGY
PROJECT LOCATION

DRAWN BY: COD DATE: 9/25/2018
CHECKED: CJ APPROVED: JT

R:\Projects\15\156\156720M_DukeEnergy9193\M59_SOW22_5484 138kVColumbiaSubstation\GIS\MXD\F1_Project Location.mxd