



September 23, 2016

Mr. Steve Lane, CPESC, AICP, PMP
Senior Environmental Scientist
Duke Energy Corporation
139 East Fourth Street, Room EM740
Cincinnati, OH 45202

Dear Mr. Lane:

Subject: Running Buffalo Clover Survey Report
Line D000B Pipeline Replacement Project
Cincinnati, Hamilton County, Ohio
CEC Project 153-230

Civil & Environmental Consultants, Inc. (CEC) is pleased to present the attached running buffalo clover (RBC) survey report for the Duke Energy Corporation (Duke Energy) Line D000B Pipeline Replacement Project, located in Cincinnati, Hamilton County, Ohio. CEC's services were provided in accordance with the Master Consulting Services Agreement, effective June 1, 2015, between Duke Energy and CEC, and our revised proposal dated February 1, 2016. We appreciate the opportunity to be of service to Duke Energy on this project. Please call us if you have any questions regarding the attached report.

Sincerely,

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

Dustin M. Giesler
Staff Scientist

Joseph A. Van Skaik
Project Manager

Attachment: Running Buffalo Clover Survey Report

RUNNING BUFFALO CLOVER SURVEY REPORT
LINE D000B PIPELINE REPLACEMENT PROJECT
CINCINNATI, HAMILTON COUNTY, OHIO

PREPARED FOR:

DUKE ENERGY CORPORATION
139 EAST FOURTH STREET
CINCINNATI, OHIO 45202

PREPARED BY:

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
CINCINNATI, OHIO

CEC Project 153-230

September 23, 2016



Civil & Environmental Consultants, Inc.

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EXECUTIVE SUMMARY

On May 16, 18, and 19, 2016, Civil & Environmental Consultants, Inc. conducted a running buffalo clover (RBC) (*Trifolium stoloniferum*; federally-listed endangered) survey within the Duke Energy Corporation's (Duke Energy) Line D000B Pipeline Replacement Project study corridor (Project area), located in Cincinnati, Hamilton County, Ohio. The total potential RBC habitat that was surveyed was approximately 5.06 acres or about 6 percent of the total Project area. The remaining areas within the Project study corridor do not provide suitable habitat conditions for the RBC based on one or more of the following habitat considerations: extent of disturbance, solar exposure, soil saturation, and/or a dense understory. No RBC individuals or populations were observed during the survey. The survey was conducted following standard methods for endangered plant surveys, as approved by the United States Fish and Wildlife Service (USFWS), which included species-specific surveys within potentially suitable habitat during the timeframe when local RBC populations were within a vegetative state that allowed for positive identification of this species. Therefore, it is CEC's professional opinion that the proposed project is not likely to adversely affect the RBC.

1.0 INTRODUCTION

This report presents the findings of a running buffalo clover (RBC) (*Trifolium stoloniferum*; federally-listed endangered) survey conducted by Civil & Environmental Consultants, Inc. (CEC) for the Duke Energy Corporation (Duke Energy) within the Line D000B Pipeline Replacement study corridor, located in Cincinnati's East End, Hamilton County, Ohio. CEC understands that Duke is proposing to replace approximately 3.45 miles (18,200 feet) of a single existing 20- and 24-inch spiral welded bare steel high pressure natural gas pipeline with a new 24-inch corrosion protected steel pipe. The variable width Project study corridor, averaging 200-foot wide, is approximately 3.45 miles in length and totals approximately 84.2 acres and was extended beyond the pipeline easement and associated workspace. The pipeline easement is at maximum 50 feet in width, with another 20 to 50 feet of additional temporary workspace where available. Approximately 2.47 miles or 13,303 feet of the replacement pipeline is proposed to be collocated within the existing pipeline ROW, while the remaining 0.98 mile (5,162 feet) of replacement pipeline will be located within new pipeline ROW. Approximately 96 percent (4,939 feet) of the new pipeline ROW will be located in areas previously disturbed, including Kellogg Avenue, unnamed private roads, and several businesses. The existing pipeline is proposed to be abandoned in-place.

CEC conducted a RBC species habitat assessment, followed by a presence-absence survey within the Project study corridor on May 16, 18, and 19, 2016. The habitat survey revealed approximately 5.06 acres or about 6 percent of the Project study corridor met the habitat considerations as potential RBC habitat (Figures 4-19). CEC subsequently conducted a RBC survey on the potential habitat that was identified in the Project area. The survey was conducted following standard methods and guidelines for endangered plant surveys, as approved by the USFWS, which included a species-specific survey within potentially suitable habitat during the flowering period from late spring to early summer, as to allow for positive identification of the species. Detailed information on RBC life history and distribution, survey methods employed, and survey results are included in this report.

2.0 BACKGROUND

The Project study corridor is located entirely within Cincinnati's East End neighborhood. The Project area is bound by Duke Energy's East End natural gas distribution center to the north, the Little Miami River to the south, State Route 52 to the east, and the Ohio River to the west. Topography within the Project area consists of level to gently sloping terrain, with a steeply sloped embankment at the southern extent of the Project area. Elevations within the Project study corridor are mapped to range from approximately 470 feet to 515 feet above mean sea level (AMSL). Hydrologic features within the Project area include six wetlands (Figures 3-19). Drainage within the Project area is to the Little Miami and Ohio Rivers. The full extent of the Project study corridor is located within the Federal Emergency Management Agency (FEMA) 100-year floodplain.

The general types of habitats where the RBC survey was conducted included mowed park habitat with scattered overstory trees, periodically disturbed trail habitat that is located on an embankment that formerly functioned as a railroad corridor, mixed early successional/right-of-way (ROW) habitat, and second growth floodplain forest habitat (Figures 4-19). Representative photographs of the habitats are provided in Appendix A. The RBC survey was conducted within the Project area based on the presence of potentially suitable RBC survey habitat and the potential for this species to occur within Hamilton, Ohio (Appendix B).

3.0 RUNNING BUFFALO NATURAL HISTORY

3.1 REASON FOR LISTING

RBC was listed by the USFWS as federally endangered on July 6, 1987 (50 FR 21478-21480) (USFWS 2007). Specific threats identified by the RBC Recovery Team in 1995 were: 1) any irreversible, catastrophic disturbance, such as road construction that completely destroys the habitat and/or kills all plants and seeds within the path of the disturbance; 2) the closing of forest canopies through succession to the point of severe shading, leading to reduced flower and fruit production; 3) the elimination of bison leading to reduced seed dispersal and release of competing vegetation; 4) low population size and associated fragility and susceptibility to catastrophe (including genetic diversity concerns); 5) excessive herbivory; 6) viral and fungal diseases; 7) reduction in pollinators; and 8) competition from non-native, invasive plant species (USFWS 2007).

3.2 DESCRIPTION

RBC is a member of the Fabaceae (pea) family that produces erect flowering stems, 10 to 30 centimeters (cm) tall, that send out long basal runners (stolons) (USFWS 2007). The basal runners root at the nodes and produce leaves that have 1 to 2 cm long ovate-lanceolate stipules, whose tips gradually narrow to a distinctive point (USFWS 2007). The plant produces 9 to 12 millimeter (mm) long round white flowers from mid-April to June, with fruiting occurring from May to July. A single plant is defined as an individual rooted crown (USFWS 2007). These crowns may occur singly or be attached to other rooted crowns by stolons. Brooks (1983) provides a more comprehensive description of this species.

3.3 DISTRIBUTION

Historically, RBC was found from the central plains to the Appalachian Mountains. The species was once considered extinct until a single population was rediscovered in West Virginia in 1983 (Brooks 1983). Since then, populations have been discovered in Indiana, Kentucky, Missouri,

and Ohio. Current populations are divided into three regions based on proximity to each other and overall habitat similarities. These regions are Appalachian (West Virginia and southeastern Ohio), Bluegrass (southwestern Ohio, central Kentucky, and southeast Indiana), and Ozark (Missouri) (USFWS 2007). A total of 108 populations of RBC are currently known from Ohio, Indiana, Kentucky, Missouri, and West Virginia (NatureServe 2015; USFWS 2007, 2008).

3.4 HABITAT

Habitat for RBC typically includes locations with partial or filtered sunlight and with moist, fertile soils that have been exposed to long-term moderate patterns of disturbance (CPC 2016). It is thought that large herbivores like bison and cattle provided the necessary scarification of the soil for plants to germinate. Populations of this species are often found in the ecotone between forest and tallgrass prairie habitats (CPC 2016).

Additionally, others describe the habitat of this species as including mesophytic woodlands (Isely 1998), moist, well-drained disturbed woods associated with streams (Gleason and Cronquist 1991), and open woods, borders, and forest clearings (Cusick 1989). It has been reported from a variety of habitats, including mesic woodlands, savannahs, floodplains, stream banks, sandbars (especially where old trails cross or parallel intermittent streams), grazed woodlots, forested lawn areas or trails that are infrequently mowed (e.g. in cemeteries, parks, and residential lawns), old logging roads, jeep trails, skidder trails, mowed wildlife openings within mature forest, and steep ravines (USFWS 2007). No critical habitat has been designated for this species (NatureServe 2015).

3.5 RECENT HISTORY OF SPECIES IN OHIO

RBC was rediscovered in Ohio in 1988 and is listed as endangered by the state of Ohio. According to the USFWS (2007), 18 extant populations and eight extirpated populations were known from Ohio, as of 2005. Populations have been primarily found in mesic forest and lawn habitats in Hamilton, Clermont, Brown, and Lawrence counties. Most of the known populations are reportedly located on county park lands and have been managed as to protect and encourage

RBC. The first population on Federal land in Ohio was located in 2005 on Wayne National Forest (USFWS 2007).

4.0 SURVEY METHODOLOGY

4.1 LITERATURE REVIEW

A literature review of pertinent articles relating to the RBC was conducted as part of the background data acquisition activities for this study. The USFWS County Distribution List of Federally-Listed Threatened, Endangered, Proposed, and Candidate Species in Ohio was reviewed during the initial stages of this project to obtain information concerning known threatened and endangered species populations within the area (USFWS 2016). The USFWS Hamilton County, Ohio listing reported that the Project area was within the known range of the RBC, though site specific species occurrences were not known. Several additional articles from the scientific literature were obtained and reviewed for additional information of use to the field study program (as cited in the references section). This information collected prior to conducting the field study was useful in supplementing the information concerning the preferred habitat conditions of known RBC populations in the region.

4.2 PRE-SURVEY KNOWN POPULATION FIELD VERIFICATION

In addition to the literature review, a pre-survey verification of a known RBC population was conducted at the Dinsmore Woods State Nature Preserve in Boone County, Kentucky. The purpose of this verification was to determine the precise flowering period and “phenophase” of the known population. This would allow the field survey to be conducted knowing the growth condition of the species to assist in better observation and species presence determinations. During the pre-survey site verification, photographs of the condition of the existing known population were made and the specific plant growth stage was noted. In addition, attention was directed toward observation of plant associations, soils, amount of vegetative shading, duration of disturbance, and amount of disturbance that were habitat characteristics of the known RBC population. Appendix A-1 contains representative photographs of the RBC population that was observed in Dinsmore Woods State Nature Preserve, as photographed by CEC on May 6, 2016.

4.3 POTENTIAL RBC HABITAT AND PRESENCE-ABSENCE SURVEY

On May 16, 18, and 19, 2016, CEC biologist and USFWS approved RBC surveyor Joey Van Skaik conducted an RBC habitat survey, followed by an RBC presence-absence survey of the Project area. This two-phased approach involved an initial ground truthing effort to identify areas within the Project study corridor that contained suitable habitat for the RBC. The areas that were identified as potential RBC habitat were subsequently and systematically searched to determine the presence or absence of the species.

The presence-absence survey involved walking transects spaced approximately 10 to 15 feet apart, depending on the density of vegetation in the understory. Observed species of clover (*Trifolium* spp.), or with clover-like leaves, were visually reviewed when encountered. A Trimble GeoXT Global Positioning System (GPS) was used to guide the field survey relative to the limits of the Project study corridor and to establish approximate coordinates of photograph points, voucher specimen locations, and other features of interest. CEC surveyed maintained, early successional park habitat with scattered overstory trees, periodically disturbed trail habitat that is located on an embankment that formerly functioned as a railroad corridor, mixed early successional/right-of-way (ROW) habitat, and second growth floodplain forest habitat within the Project area.

Dominant plant species in the overstory, understory, and herbaceous ground cover were documented. See Appendix A-2 for representative photographs of the areas that were surveyed for RBC within the Project study corridor. It is worth noting that Appendix A-2 also includes site reconnaissance photographs that were taken as part of the wetland and waterbody delineation effort. Areas that lacked potentially suitable habitat and/or contained dense vegetation were not included in the transect survey.

5.0 RESULTS

The RBC survey results for the Project study corridor and reference population location are presented below on Table 1.

**TABLE 1
RUNNING BUFFALO CLOVER SURVEY RESULTS**

Survey Date	Site Name	Latitude	Longitude	Site Location	Habitat Type	RBC Present/ Absent
May 5, 2016	Reference Population	39.000841	-84.814890	Dinsmore Woods State Nature Preserve Boone County, Kentucky	Walking trail leading to ridge top and adjacent cemetery. Site receives periodic disturbance and filtered sunlight.	Present
May 16 & 18, 2016	1	39.080896	-84.427648	Near Four Seasons Marina and the confluence of the Little Miami and Ohio Rivers	Bottomland hardwood forest bisected by a pipeline right-of-way/early successional habitat. Site receives periodic disturbance and filtered sunlight.	Absent
May 18, 2016	2	39.082402	-84.427663	Near Four Seasons Marina and the confluence of the Little Miami and Ohio Rivers	Trail or two track habitat that is located on an embankment that formerly functioned as a railroad corridor. Site receives periodic disturbance and filtered sunlight.	Absent
May 19, 2016	3A 3B 3C 3D	39.115040 39.115381 39.115666 39.115969	-84.443193 -84.443573 -84.443945 -84.444430	Adjacent to Turkey Ridge Park, the Ohio River Trail, and Humbert Avenue	Mowed park habitat with scattered overstory trees. Site receives periodic disturbance and filtered sunlight.	Absent
May 19, 2016	4	39.118429	-84.448547	Located at Schmidt Recreation Complex and adjacent to the Ohio River Trail	Mowed park habitat with scattered overstory trees. Site receives periodic disturbance and filtered sunlight.	Absent

The observation and photo documentation of the known RBC population at the Dinsmore Woods State Nature Preserve in Boone County, Kentucky assisted significantly in identifying the stage of growth and flowering of the species in the area.

Although potentially suitable habitat for the RBC was present within the Project study corridor, no RBC individuals or populations were identified during the survey conducted by CEC on May 16, 18, and 19, 2016. Four RBC look-alikes were observed during the survey, including three plants from the leguminous pea family and one plant from the wood-sorrel family. These four species of RBC look-alikes include white clover (*Trifolium repens*), red clover (*Trifolium pratense*), low hop clover/field clover (*Trifolium campestre*), and common yellow oxalis (*Oxalis stricta*), respectively.

Site 1 is a bottomland hardwood forest bisected by an existing pipeline right-of-way that is maintained in an early successional habitat state. The site receives periodic disturbance as evidenced by the occasional mowing along the ROW and flood events from the Ohio and Little Miami Rivers. The site receives filtered solar exposure and is located on rich soil. Representative photographs of this habitat type are included in Appendix A-2.

The forested vegetation community is dominated by silver maple (*Acer saccharinum*), cottonwood (*Populus deltoids*), box elder (*Acer negundo*), and American elm (*Ulmus americana*), while the herbaceous plant community included creeping jenny (*Lysimachia nummularia*), false nettle (*Boehmeria cylindrica*), white clover (*Trifolium repens*), red clover (*Trifolium pratense*), giant ironweed (*Vernonia gigantea*), narrowleaf plantain (*Plantago lanceolata*), common yellow oxalis (*Oxalis stricta*), stickywilly (*Galium aparine*), hog peanut (*Amphicarpa bracteata*), wingstem (*Verbesina alternifolia*), violets (*Viola* spp.), poison ivy (*Toxicodendron radicans*), Canadian honewort (*Cryptotaenia canadensis*), sedges (*Carex* spp.) and stinging nettle (*Urtica dioica*).

Site 2 is a trail or two-track that is located on an embankment that formerly functioned as a railroad corridor. The site receives occasional to periodic disturbance and filtered solar exposure. Representative photographs of this habitat type are included in Appendix A-2.

Common herbaceous plant species along this trail or two-track included white clover (*Trifolium repens*), red clover (*Trifolium pratense*), black medic (*Medicago lupulina*), curly dock (*Rumex crispus*), broadleaf plantain (*Plantago major*), sedges, common chickweed (*Stellaria media*), and grasses (*Poa* and *Festuca* spp.)

Site 3 (A, B, C, and D) is mowed park habitat that is separated by Worth Street, Hoboken Alley, and Strader Avenue, respectively. This site is bound to the west by Humbert Avenue, the Ohio River Trail, Turkey Ridge Club, and the Ohio River Launch Club. The site receives periodic disturbance from occasional mowing and recreational play, varied filtered solar exposure, and is located on rich soil. Representative photographs of this habitat type are included in Appendix A-2.

The overstory vegetation includes cottonwood, hackberry (*Celtis occidentalis*), maples (*Acer* spp.), and oaks, (*Quercus* spp.), while the herbaceous plant community includes white clover, red clover, narrowleaf plantain (*Plantago lanceolata*), violets, broadleaf plantain, yellow nutsedge (*Cyperus esculentus*), common mallow (*Malva neglecta*), common purslane (*Portulaca oleracea*), and grasses.

Site 4 is mowed park habitat that is located at Schmidt Recreation Complex, adjacent to the Ohio River Trail. The site receives periodic disturbance from occasional mowing and recreational play, varied filtered solar exposure from scattered overstory trees in the area, and is located on rich soil. Representative photographs of this habitat type are included in Appendix A-2.

The overstory vegetation includes oaks and maples, while the herbaceous plant community includes white clover, red clover, dandelion (*Taraxacum officinale*), narrowleaf plantain (*Plantago lanceolata*), violets, and grasses.

6.0 CONCLUSION

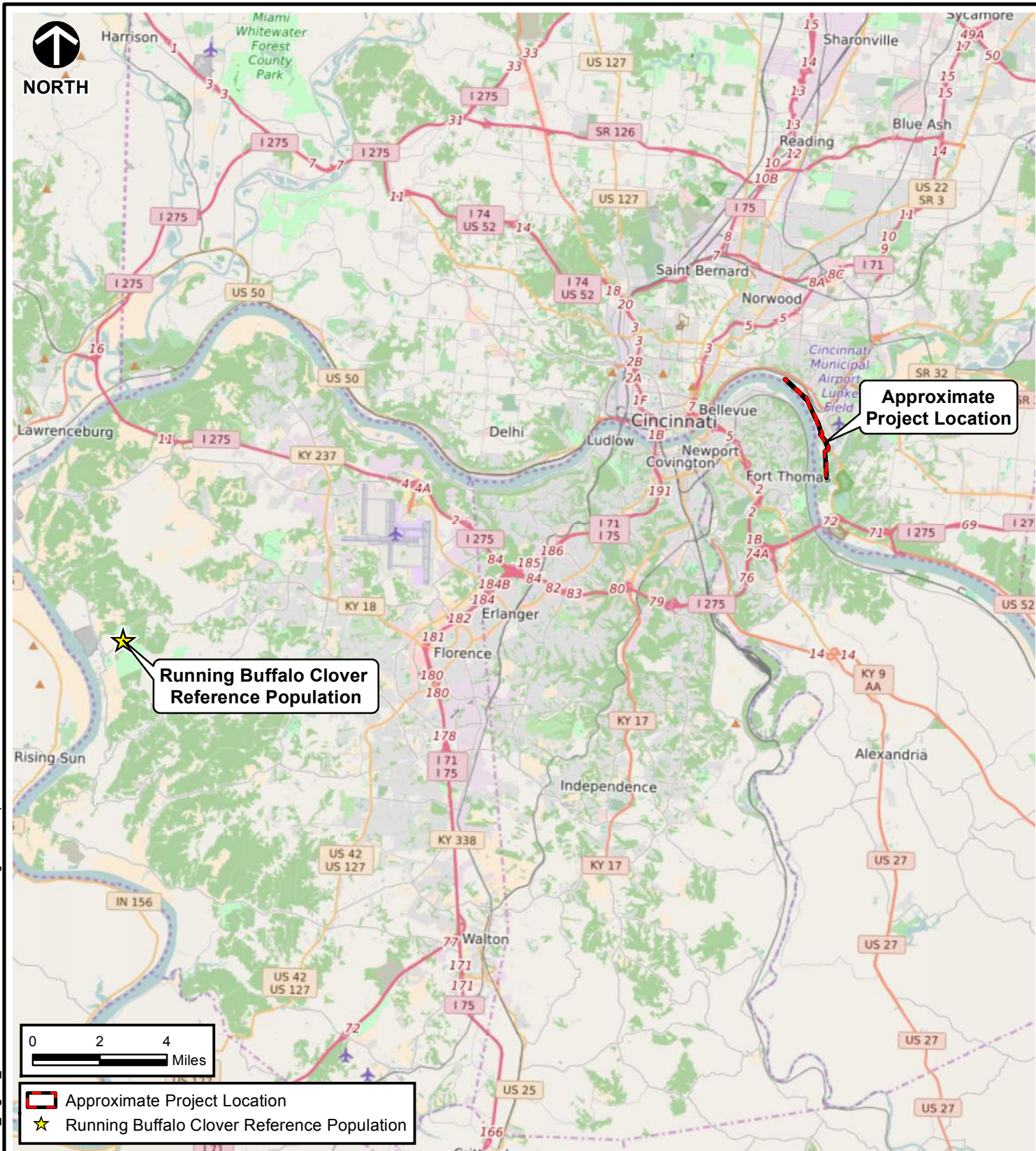
Bottomland hardwood forest and early successional habitat receiving filtered solar exposure, mowed areas, and trails are present within the Project area and surrounding vicinity. Based on the presence of these habitats, there is a potential for the presence of RBC. The RBC survey that was conducted by CEC on May 16, 18, and 19, 2016, did not reveal RBC individuals or populations within the Project area (Figures 4-19). Therefore, it is CEC's professional opinion that the proposed project is not likely to adversely affect the RBC.

7.0 REFERENCES

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FIGURES

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SOURCE: ESRI WORLD STREET MAP, 2016.



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5899 Montclair Boulevard - Cincinnati, OH 45150
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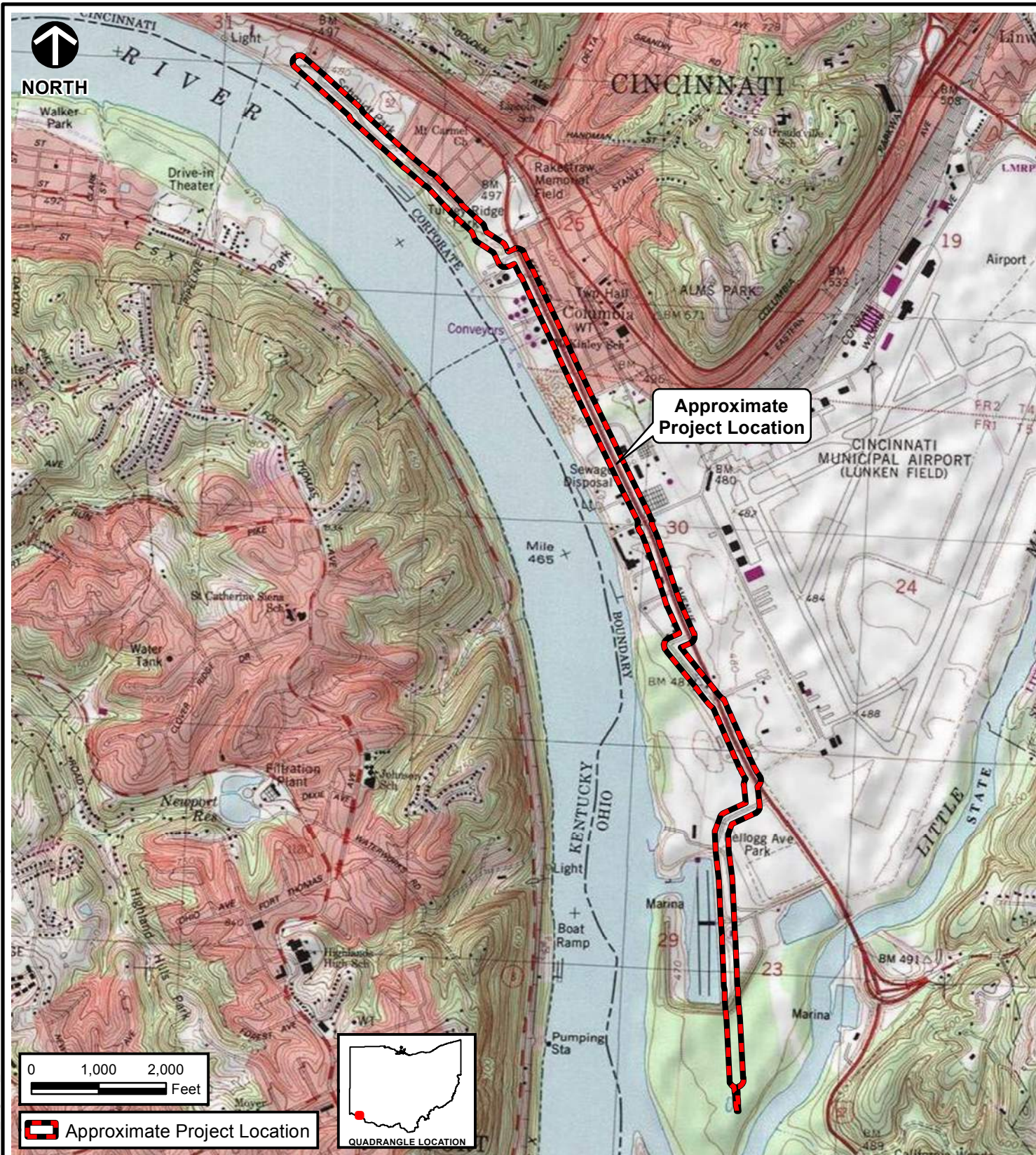
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REGIONAL LOCATION MAP

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SOURCE: PORTION OF THE USGS 7.5-MINUTE SERIES TOPOGRAPHIC QUADRANGLE MAP OF NEWPORT, KENTUCKY-OHIO - 1984.



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5899 Montclair Boulevard - Cincinnati, OH 45150

513-985-0226 - 800-759-5614

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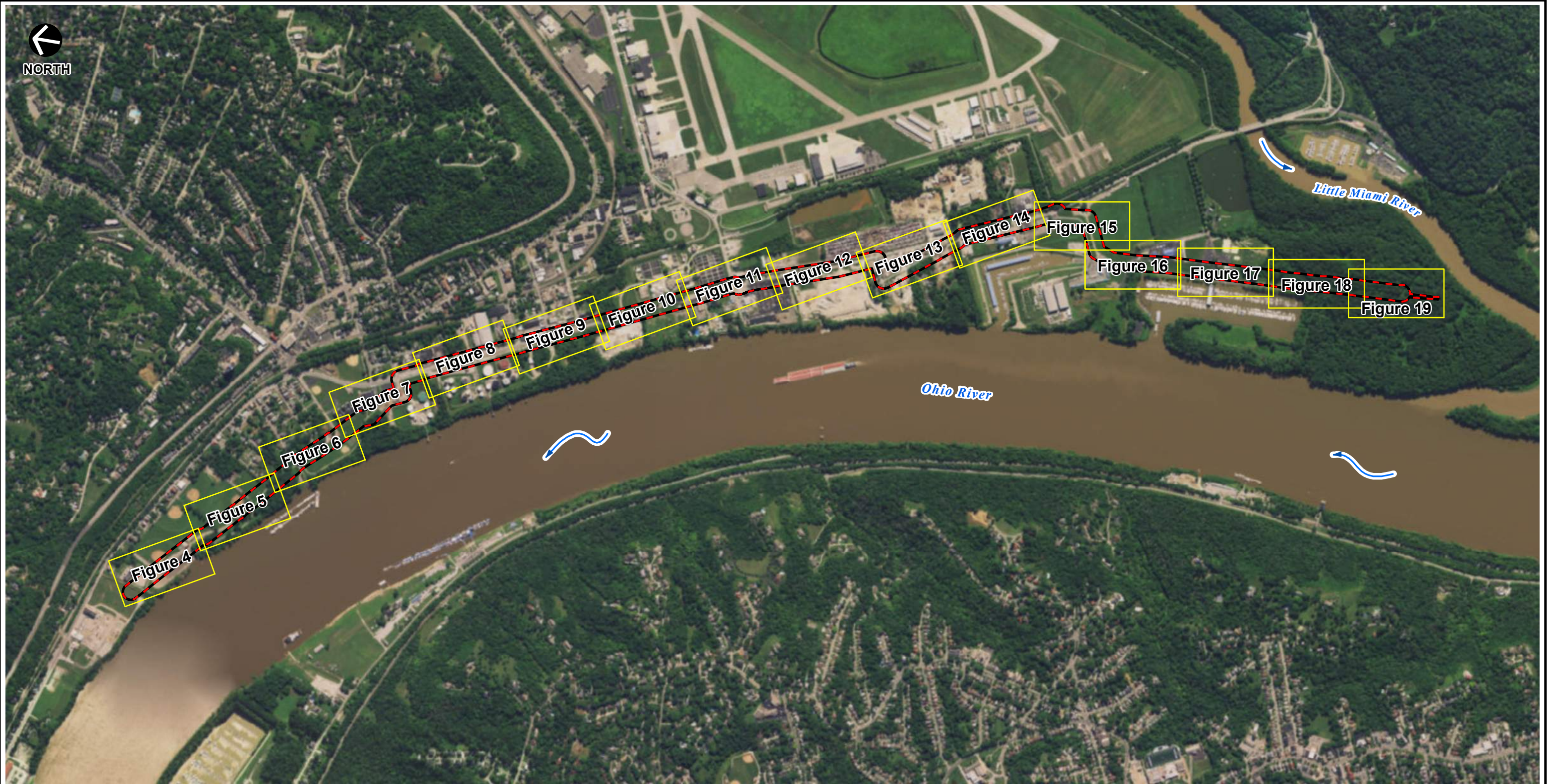
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PROJECT LOCATION MAP

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SOURCE: USDA FSA NATIONAL AGRICULTURAL IMAGERY PROGRAM (NAIP) HAMILTON COUNTY MOSAIC. IMAGE DATE: 2015.

 Variable Width Study Corridor

600 0 600 1,200
Feet



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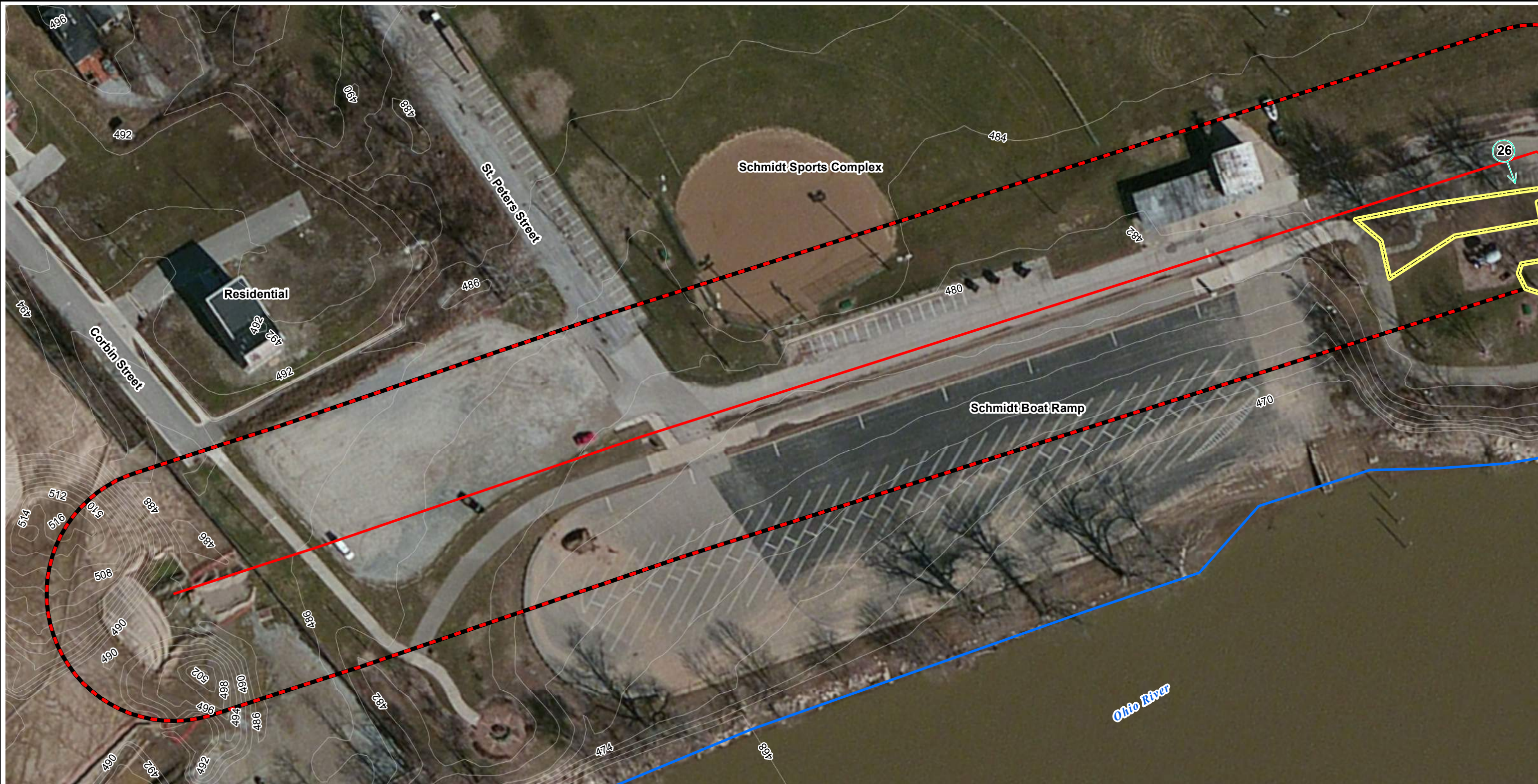
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RUNNING BUFFALO CLOVER SURVEY
INDEX MAP

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DATE: SEPTEMBER 23, 2016	DWG SCALE: 1" = 1,200'	PROJECT NO: 153-230	

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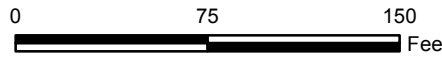
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SOURCE: USDA FSA NATIONAL AGRICULTURAL IMAGERY PROGRAM (NAIP) HAMILTON COUNTY MOSAIC. IMAGE DATE: 2015.
SOURCE: CAGIS 2-FOOT INTERVAL ELEVATION CONTOURS.

- Proposed Replacement Pipeline
- Variable Width Study Corridor
- Potential Running Buffalo Clover Habitat
- Voucher Specimen Location with Photograph Number
- Delineated Wetland
 - Palustrine Emergent (PEM)
 - Palustrine Forested (PFO)
 - Wetland Determination Sample Point Location
 - Ohio River or Backwater Area
- Existing Culvert
- 2-Foot Contour Interval
- Photograph Location and Direction
- NORTH

NOTES: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN.
NO STREAMS OR WATERBODIES WERE IDENTIFIED WITHIN THE STUDY CORRIDOR.



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RUNNING BUFFALO CLOVER SURVEY MAP			
DRAWN BY: DMG	CHECKED BY: JAV	APPROVED BY: JAV*	FIGURE NO: 4
DATE: SEPTEMBER 23, 2016	DWG SCALE: 1" = 75'	PROJECT NO: 153-230	

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SOURCE: USDA FSA NATIONAL AGRICULTURAL IMAGERY PROGRAM (NAIP) HAMILTON COUNTY MOSAIC. IMAGE DATE: 2015.
SOURCE: CAGIS 2-FOOT INTERVAL ELEVATION CONTOURS.

- Proposed Replacement Pipeline
- Variable Width Study Corridor
- Potential Running Buffalo Clover Habitat
- Voucher Specimen Location with Photograph Number
- Delineated Wetland**
 - Palustrine Emergent (PEM)
 - Palustrine Forested (PFO)
 - Wetland Determination Sample Point Location
 - Ohio River or Backwater Area
- Existing Culvert
- 2-Foot Contour Interval
- Photograph Location and Direction



0 75 150
Feet

NOTES: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN.
NO STREAMS OR WATERBODIES WERE IDENTIFIED WITHIN THE STUDY CORRIDOR.



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RUNNING BUFFALO CLOVER SURVEY MAP

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DATE:	SEPTEMBER 23, 2016	DWG SCALE:	1" = 75'	PROJECT NO:	153-230	5

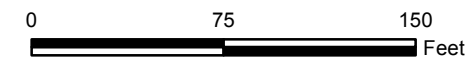
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SOURCE: CAGIS 2-FOOT INTERVAL ELEVATION CONTOURS.

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|--|---|--|-----------------------------------|
| Proposed Replacement Pipeline | Variable Width Study Corridor | Potential Running Buffalo Clover Habitat | Existing Culvert |
| Voucher Specimen Location with Photograph Number | Palustrine Emergent (PEM) | Palustrine Forested (PFO) | 2-Foot Contour Interval |
| | Wetland Determination Sample Point Location | | Photograph Location and Direction |
| | Ohio River or Backwater Area | | |

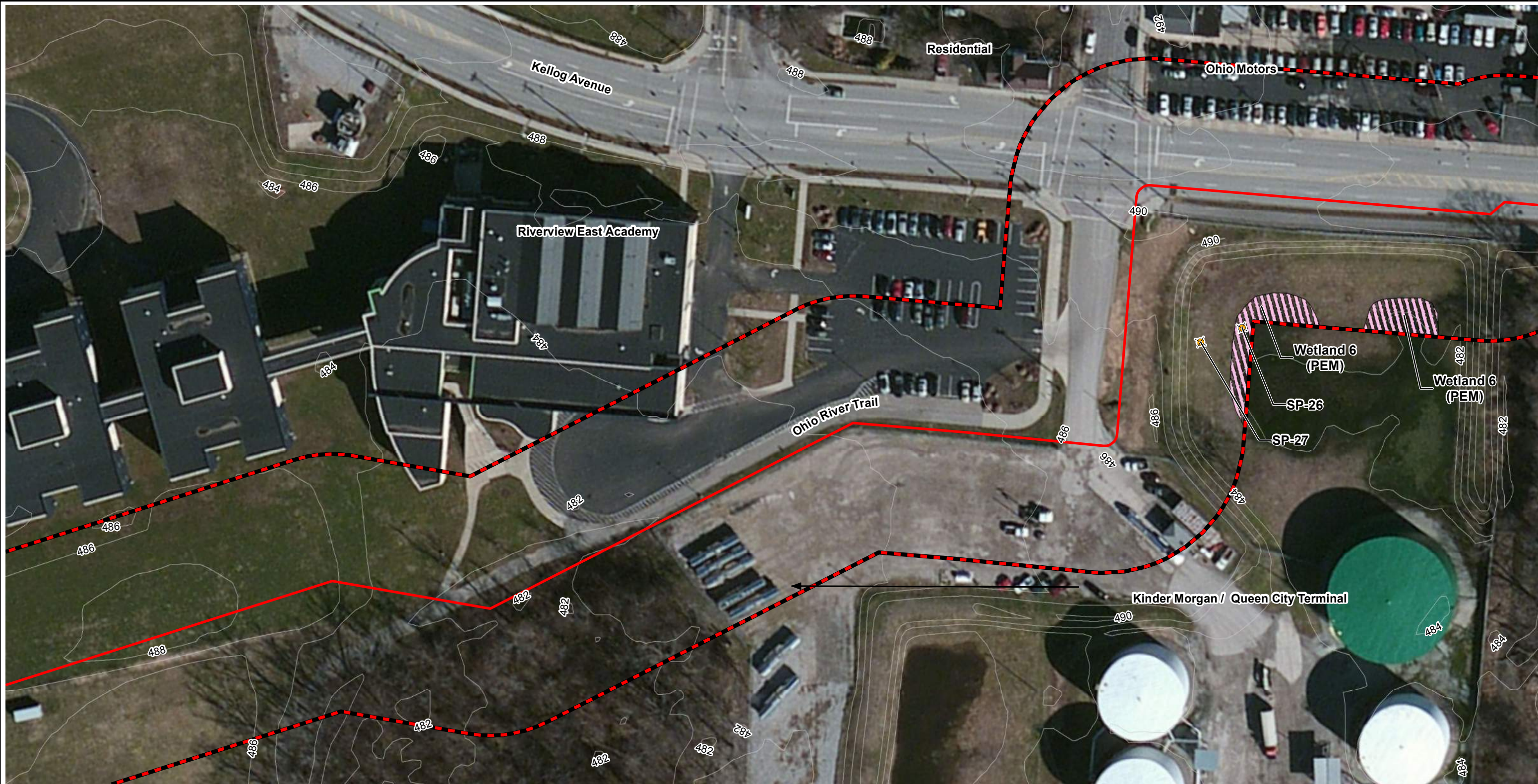


NOTES: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN.
NO STREAMS OR WATERBODIES WERE IDENTIFIED WITHIN THE STUDY CORRIDOR.

 Civil & Environmental Consultants, Inc. 5899 Montclair Boulevard - Cincinnati, OH 45150 513-985-0226 - 800-759-5614 www.cecinc.com		DUKE ENERGY LINE D000B PIPELINE REPLACEMENT PROJECT CINCINNATI, HAMILTON COUNTY, OHIO	
		RUNNING BUFFALO CLOVER SURVEY MAP	
DRAWN BY: DMG	CHECKED BY: JAV	APPROVED BY: JAV*	FIGURE NO: 6
DATE: SEPTEMBER 23, 2016	DWG SCALE: 1" = 75'	PROJECT NO: 153-230	

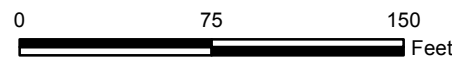
Signature on File *

P:\2015\153-230-GIS\Map\RB\153230 RBC Figure 4 19.mxd - 9/23/2016 - 11:27:56 AM (jvanskaik)



SOURCE: USDA FSA NATIONAL AGRICULTURAL IMAGERY PROGRAM (NAIP) HAMILTON COUNTY MOSAIC. IMAGE DATE: 2015.
SOURCE: CAGIS 2-FOOT INTERVAL ELEVATION CONTOURS.

- Proposed Replacement Pipeline
- Variable Width Study Corridor
- Potential Running Buffalo Clover Habitat
- Voucher Specimen Location with Photograph Number
- Delineated Wetland**
 - Palustrine Emergent (PEM)
 - Palustrine Forested (PFO)
 - Wetland Determination Sample Point Location
 - Ohio River or Backwater Area
- Existing Culvert
- 2-Foot Contour Interval
- Photograph Location and Direction



NOTES: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN.
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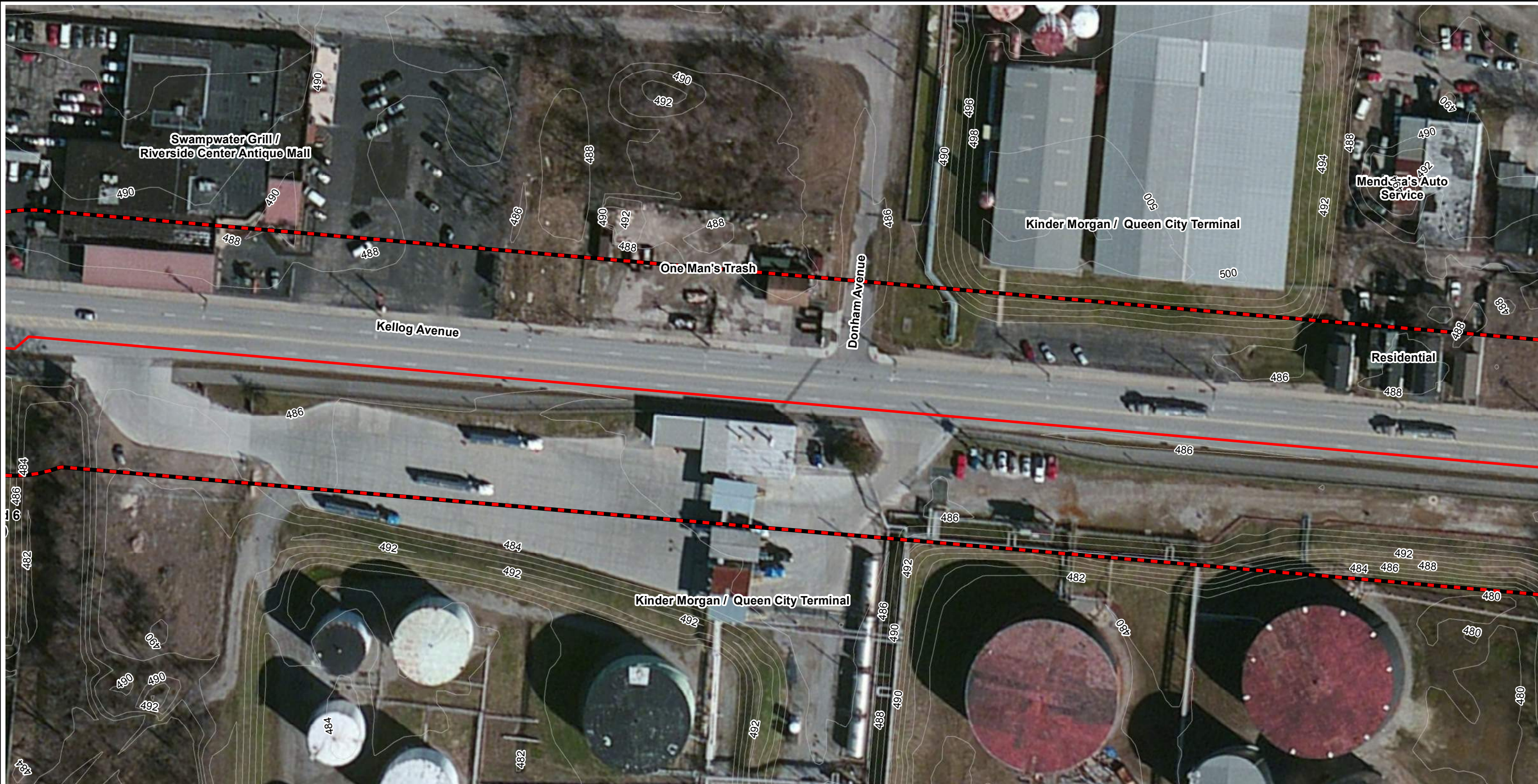
DUKE ENERGY
LINE D000B PIPELINE REPLACEMENT PROJECT
CINCINNATI, HAMILTON COUNTY, OHIO

RUNNING BUFFALO CLOVER SURVEY MAP

DRAWN BY:	DMG	CHECKED BY:	JAV	APPROVED BY:	JAV*	FIGURE NO:
DATE:	SEPTEMBER 23, 2016	DWG SCALE:	1" = 75'	PROJECT NO:	153-230	7

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P:\2015\153-230-GIS\MapRBC\153230 RBC Figure 4 19.mxd - 9/23/2016 - 11:28:06 AM (jvanskaik)



SOURCE: USDA FSA NATIONAL AGRICULTURAL IMAGERY PROGRAM (NAIP) HAMILTON COUNTY MOSAIC. IMAGE DATE: 2015.
SOURCE: CAGIS 2-FOOT INTERVAL ELEVATION CONTOURS.

- Proposed Replacement Pipeline
- Variable Width Study Corridor
- Potential Running Buffalo Clover Habitat
- Voucher Specimen Location with Photograph Number

Delineated Wetland

- Palustrine Emergent (PEM)
- Palustrine Forested (PFO)
- Wetland Determination Sample Point Location
- Ohio River or Backwater Area

- Existing Culvert
- 2-Foot Contour Interval
- Photograph Location and Direction



0 75 150 Feet

NOTES: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN.
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DRAWN BY: DMG CHECKED BY: JAV
DATE: SEPTEMBER 23, 2016 DWG SCALE: 1" = 75'

DUKE ENERGY
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CINCINNATI, HAMILTON COUNTY, OHIO

RUNNING BUFFALO CLOVER SURVEY MAP

APPROVED BY: JAV* FIGURE NO: 8
PROJECT NO: 153-230

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P:\2015\153-230-GIS\Maps\RBC\153230 RBC Figure 4 19.mxd - 9/23/2016 - 11:28:16 AM (jvanskaik)



SOURCE: USDA FSA NATIONAL AGRICULTURAL IMAGERY PROGRAM (NAIP) HAMILTON COUNTY MOSAIC. IMAGE DATE: 2015.
SOURCE: CAGIS 2-FOOT INTERVAL ELEVATION CONTOURS.

- Proposed Replacement Pipeline
- Variable Width Study Corridor
- Potential Running Buffalo Clover Habitat
- Voucher Specimen Location with Photograph Number
- Delineated Wetland**
 - Palustrine Emergent (PEM)
 - Palustrine Forested (PFO)
 - Wetland Determination Sample Point Location
 - Ohio River or Backwater Area

- Existing Culvert
- 2-Foot Contour Interval
- Photograph Location and Direction



0 75 150
Feet

NOTES: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN.
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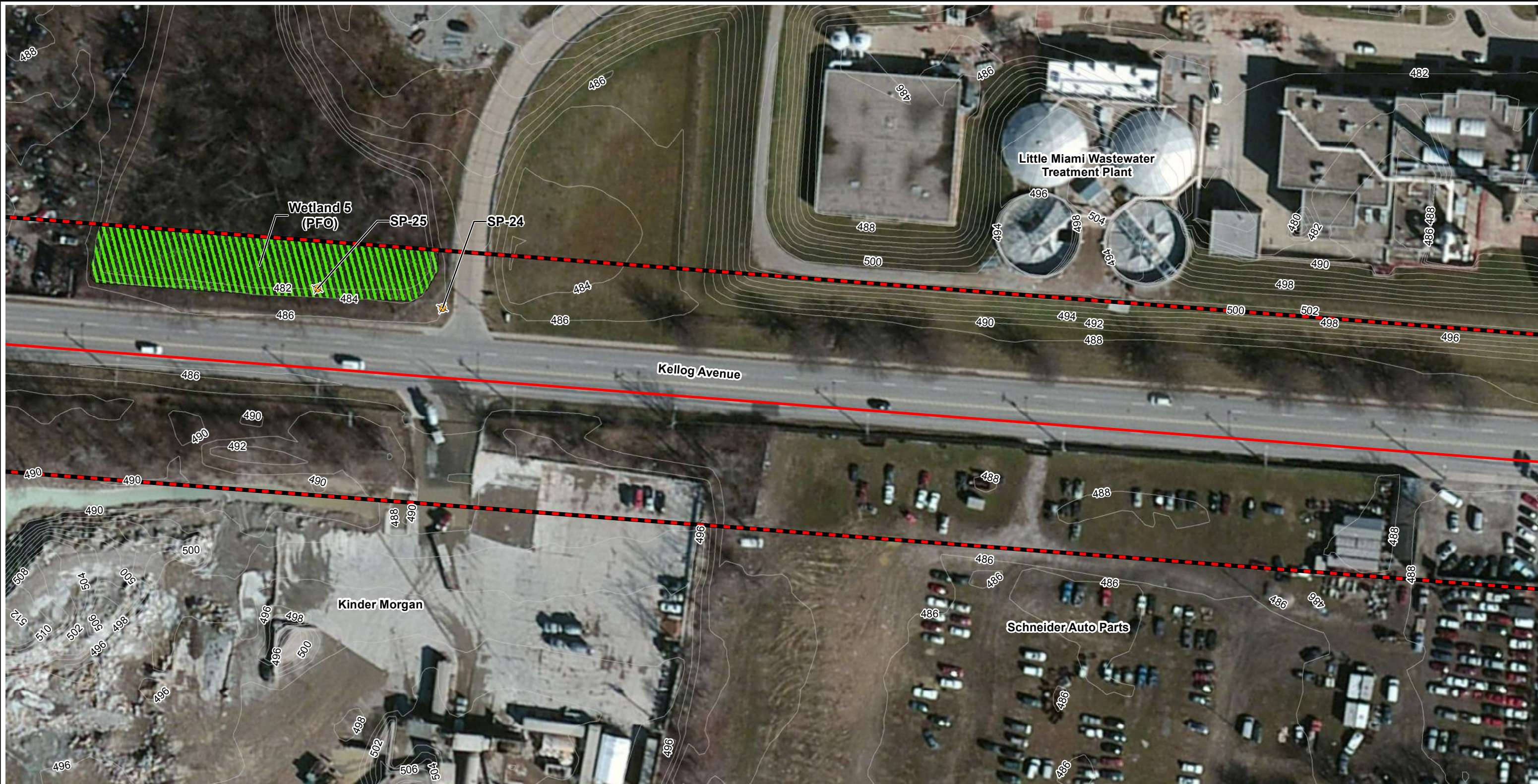
DUKE ENERGY
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CINCINNATI, HAMILTON COUNTY, OHIO

RUNNING BUFFALO CLOVER SURVEY MAP

APPROVED BY: JAV* FIGURE NO: **9**
PROJECT NO: 153-230

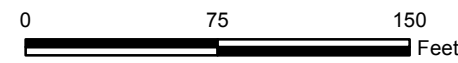
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SOURCE: USDA FSA NATIONAL AGRICULTURAL IMAGERY PROGRAM (NAIP) HAMILTON COUNTY MOSAIC. IMAGE DATE: 2015.
SOURCE: CAGIS 2-FOOT INTERVAL ELEVATION CONTOURS.

- | | | |
|--|---|-----------------------------------|
| Proposed Replacement Pipeline | Delineated Wetland | Existing Culvert |
| Variable Width Study Corridor | Palustrine Emergent (PEM) | 2-Foot Contour Interval |
| Potential Running Buffalo Clover Habitat | Palustrine Forested (PFO) | Photograph Location and Direction |
| Voucher Specimen Location with Photograph Number | Wetland Determination Sample Point Location | |
| | Ohio River or Backwater Area | |

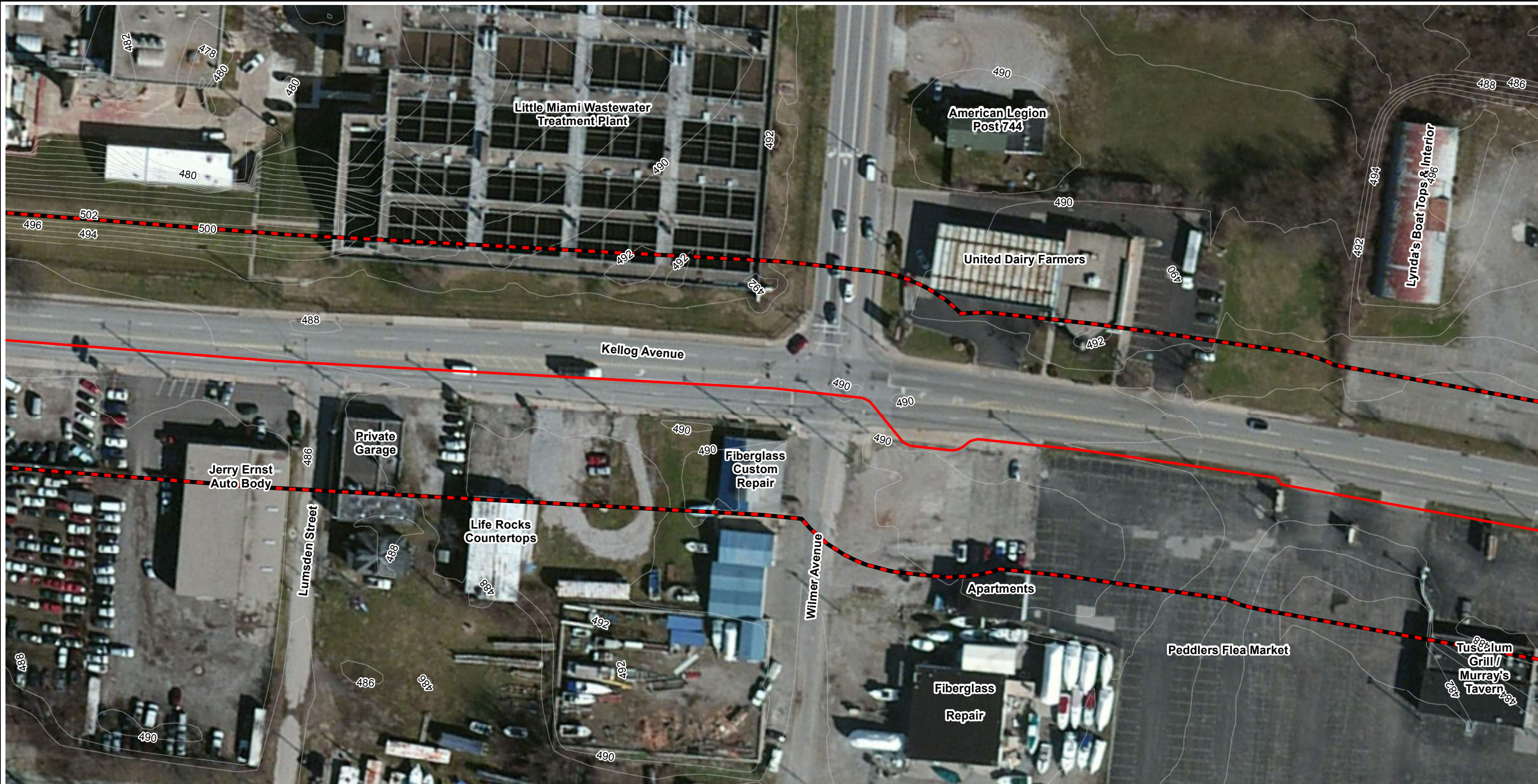


NOTES: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN.
NO STREAMS OR WATERBODIES WERE IDENTIFIED WITHIN THE STUDY CORRIDOR.

 Civil & Environmental Consultants, Inc. 5899 Montclair Boulevard - Cincinnati, OH 45150 513-985-0226 - 800-759-5614 www.cecinc.com		DUKE ENERGY LINE D000B PIPELINE REPLACEMENT PROJECT CINCINNATI, HAMILTON COUNTY, OHIO	
		RUNNING BUFFALO CLOVER SURVEY MAP	
DRAWN BY: DMG	CHECKED BY: JAV	APPROVED BY: JAV*	FIGURE NO: 10
DATE: SEPTEMBER 23, 2016	DWG SCALE: 1" = 75'	PROJECT NO: 153-230	

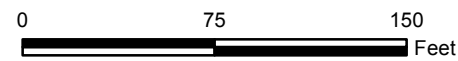
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SOURCE: USDA FSA NATIONAL AGRICULTURAL IMAGERY PROGRAM (NAIP) HAMILTON COUNTY MOSAIC. IMAGE DATE: 2015.
SOURCE: CAGIS 2-FOOT INTERVAL ELEVATION CONTOURS.

- Proposed Replacement Pipeline
- Variable Width Study Corridor
- Potential Running Buffalo Clover Habitat
- Voucher Specimen Location with Photograph Number
- Delineated Wetland
 - Palustrine Emergent (PEM)
 - Palustrine Forested (PFO)
 - Wetland Determination Sample Point Location
 - Ohio River or Backwater Area
- Existing Culvert
- 2-Foot Contour Interval
- Photograph Location and Direction



NOTES: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN.
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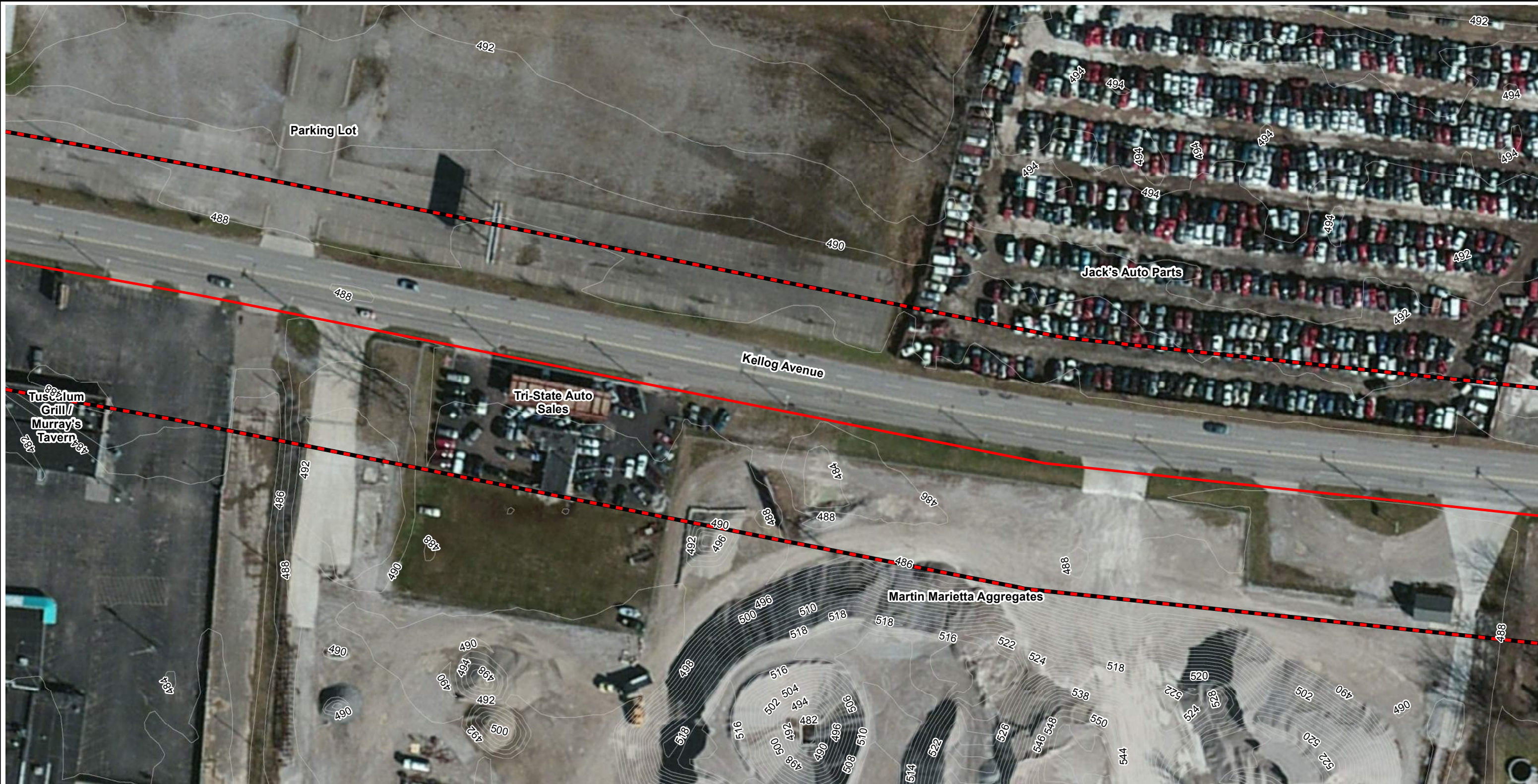
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LINE D000B PIPELINE REPLACEMENT PROJECT
CINCINNATI, HAMILTON COUNTY, OHIO

RUNNING BUFFALO CLOVER SURVEY MAP

DRAWN BY:	DMG	CHECKED BY:	JAV	APPROVED BY:	JAV*	FIGURE NO:
DATE:	SEPTEMBER 23, 2016	DWG SCALE:	1" = 75'	PROJECT NO:	153-230	11

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SOURCE: USDA FSA NATIONAL AGRICULTURAL IMAGERY PROGRAM (NAIP) HAMILTON COUNTY MOSAIC. IMAGE DATE: 2015.
SOURCE: CAGIS 2-FOOT INTERVAL ELEVATION CONTOURS.

- Proposed Replacement Pipeline
- Variable Width Study Corridor
- Potential Running Buffalo Clover Habitat
- Voucher Specimen Location with Photograph Number
- Delineated Wetland**
 - Palustrine Emergent (PEM)
 - Palustrine Forested (PFO)
 - Wetland Determination Sample Point Location
 - Ohio River or Backwater Area
- Existing Culvert
- 2-Foot Contour Interval
- Photograph Location and Direction



0 75 150 Feet

NOTES: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN.
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RUNNING BUFFALO CLOVER SURVEY MAP

DRAWN BY: DMG	CHECKED BY: JAV	APPROVED BY: JAV*	FIGURE NO: 12
DATE: SEPTEMBER 23, 2016	DWG SCALE: 1" = 75'	PROJECT NO: 153-230	

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SOURCE: USDA FSA NATIONAL AGRICULTURAL IMAGERY PROGRAM (NAIP) HAMILTON COUNTY MOSAIC. IMAGE DATE: 2015.
SOURCE: CAGIS 2-FOOT INTERVAL ELEVATION CONTOURS.

- Proposed Replacement Pipeline
- Variable Width Study Corridor
- Potential Running Buffalo Clover Habitat
- Voucher Specimen Location with Photograph Number
- Delineated Wetland**
 - Palustrine Emergent (PEM)
 - Palustrine Forested (PFO)
 - Wetland Determination Sample Point Location
 - Ohio River or Backwater Area

- Existing Culvert
- 2-Foot Contour Interval
- Photograph Location and Direction



0 75 150 Feet

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DATE:	SEPTEMBER 23, 2016	DWG SCALE:	1" = 75'	PROJECT NO:	153-230	13

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RUNNING BUFFALO CLOVER SURVEY MAP

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in

Case No(s). 17-0328-GA-BLN

Summary: Exhibit Attachment 8 Part 1 of 2 electronically filed by Ms. Emily Olive on behalf of Duke Energy Ohio and Spiller, Amy B. Ms. and Kingery, Jeanne W. Ms.