

Table 4-2 Waterbodies Delineated in Survey Area

QHEI – Scoring		Notes: NA – Not Applicable SRW - State Resource Water PWS - Public Water Supply BW - Bathing Waters UNT – Unnamed Tributary SSH - Seasonal Salmonid Habitat AWS - Agricultural Water Supply
< 32: Limited Resource Water (LRW)		
32 to 60: Modified Warm Water Habitat (MWH)		
60 to 75: Warm Water Habitat (WWH)		
> 75: Possible Exceptional Warm Water Habitat (EW)		
HHEI – Scoring		
< 30: Class I PHWH (typically ephemeral streams)		
30 to 50 Class II PHWH (intermittent warm water streams)		
> 50: Class II or III PHWH (depending on conditions)		
> 75: Class III PHWH (perennial cool water streams)		

4.2.1 Class I Waterbodies

A total of 36 waterbodies were identified as Class I using the HHEI scoring, including 29 ditches and 7 streams. All of the ditches were considered modified, with the majority being identified as ephemeral (n=22) roadside waterbodies. In general, the ditches had a trapezoidal cross section with a narrow bankfull width and wider TOB, with grassy sloped sides. Substrate within ditches is typically fine silt material that is carried in from nearby farm fields by storm events. Any pooling that occurs is shallow and does not occur for extended periods of time.

The Class I streams were primarily ephemeral waterbodies which had more naturalized courses and less evidence of any manipulation. The Class I streams often occurred in proximity to identified wetlands, and either acted to collect overland runoff from nearby fields and transfer to a wetland, or to allow for flooding to be relieved.

4.2.2 Class II Waterbodies

The bulk of waterbodies were identified as Class II (n=61), including 48 ditches and 13 streams. The majority of ditches were considered intermittent (n=34) which is consistent with the HHEI guidance, however five ditches were considered perennial Class II due to the evidence of continuous flow but poor development of habitat along the reaches delineated. Likewise, nine ditches were identified as ephemeral but scored as a Class II waterbody due to the presence of wide channels and varied substrates with moderate pooling. The ephemeral ditches were not expected to flow year round, but instead were considered to have been delineated during ideal conditions after rain events. Five of the Class II ditches scored high enough to be considered a Class III waterbody based solely on their HHEI score. However a lack of available shade means that these ditches would be unlikely to have the required cool/cold habitat typical of Class III waterbodies, and the surrounding upland areas are consistently disturbed limiting the riparian habitat and are therefore considered Class II.

DOH-038 is a modified intermittent ditch that meanders through several active cultivated crop areas before crossing under CR 24. The ditch had moderate pooling along its course, but generally no deeper than 6 inches. The banks of the ditch had a narrow riparian buffer of shrubs and trees which provided shade along a portion of the ditch. The mix of substrates and wider bankfull width (approximately 11 feet wide) led to the ditch scoring well on the HHEI, however no QHEI was conducted since it lacks a predominance of pools at least 16 inches deep. Project related activities will likely rely on horizontal directional drilling (HDD) to install collection lines under the waterbody and thus avoid impacts. Due to DOH-038 being identified as a tributary to an identified WOTUS, the feature is considered jurisdictional.

DOH-113 is a modified intermittent ditch that flows between cultivated crop areas, passing underneath TR 179 just north of TR 148. The banks of the channel were primarily grasses and weedy species which appeared to be seasonally mowed. The ditch had moderately deep pools (up to 9 inches deep) at some of its bends, which led it to scoring highly on the HHEI. No QHEI evaluation was conducted since it lacks a predominance of pools at least 16 inches deep. The surrounding cultivated crop areas and ongoing manipulation of the banks would likely inhibit use by any significant wildlife along much of the waterbody. Due to DOH-113 being identified as a tributary to an identified WOTUS, the feature is identified as jurisdictional.

DOH-115 is a modified intermittent ditch that flows between cultivated crop areas northeast of the intersection of State Route (SR) 19 and TR 148. The banks of the channel were primarily grasses and weedy species which appeared to be seasonally mowed. The ditch had moderately deep pools (up to 6 inches deep) at some of its bends, which combined with a larger bankfull width to scoring highly on the HHEI. No QHEI evaluation was conducted since it lacks a predominance of pools at least 16 inches deep. The surrounding cultivated crop areas and ongoing manipulation of the banks would likely inhibit use by any significant wildlife along much of the waterbody. Due to DOH-115 being identified as an upland intermittent ditch and not a tributary to a WOTUS, it is not identified as jurisdictional.

DOH-119 is a modified intermittent ditch that flows north from Hensinger Road before turning and continuing out of the Survey Area. The ditch has a steep trapezoidal cross section, with the channel occurring approximately 6 feet below the TOB. The sides were covered in weedy species which appeared to be mowed seasonally. The moderate depth (6 inches) and wide bankfull width (6 feet) led to the ditch scoring highly on the HHEI, though the constant manipulation of the banks and surrounding land will likely prevent any significant wildlife occurrence in the ditch. No QHEI evaluation was conducted since it lacks a predominance of pools at least 16 inches deep. Due to DOH-119 lacking a connection to a WOTUS, it is not considered jurisdictional.

DOH-123 is a modified intermittent ditch that flows between two cultivated crop areas just east of TR 77. The ditch has a steep trapezoidal cross section, with the channel occurring approximately 10 feet below the TOB. The sides were covered in grasses which appeared to be mowed regularly. The moderate depth (6 inches) and wide bankfull width (6 feet) led to the ditch scoring highly on the HHEI, though the constant manipulation of the banks and surrounding land will likely prevent any significant wildlife occurrence in the ditch. No QHEI evaluation was conducted since it lacks a predominance of pools at least 16 inches deep. Due to DOH-123 being identified as a tributary to an identified WOTUS, the feature is considered to be jurisdictional.

The Class II streams were primarily modified (n=9) and intermittent (n=12) waterbodies. The majority of the modified streams were considered to be recovering from historic manipulation, but still not fully restored to their natural state. Stream SOH-203 was identified as an ephemeral Class II stream, primarily due to the variety of substrate and development of pooling along its length but were relatively narrow.

4.2.3 Class III Waterbodies

A total of 18 waterbodies were identified as Class III using the HHEI scoring metrics and potential for cool/cold water habitat to be present in summer, including 6 ditches and 12 streams. Due to their higher quality, Cardno recommends Project designs include rerouting or using drilling to avoid impacts these resources. Brief descriptions are provided below.

DOH-040 is a modified perennial ditch that collects water from a woodlot just east of CR 27, before flowing through a forested wetland (WOH-008) and then north. The ditch has deep plunge pools near the culverted crossings of CR 27 and CR 24, but generally holds no more than 10 inches of water in most pools. Once the ditch leaves the woodlot and flows north, it exhibits the typical characteristics of a ditch with trapezoidal cross section and grassy/weedy banks. The variety of substrate and maximum depth of pools led to the ditch scoring highly on the HHEI; however, no QHEI was conducted since it lacks a predominance of pools at least 16 inches deep. Due to DOH-040 being identified as a tributary to an identified WOTUS, the feature is identified as jurisdictional.

DOH-041 is a modified perennial ditch located among cultivated crop areas, with a culverted crossing under TR 183. The channel was flowing at the time of the survey, with the deepest pools having approximately 8 inches of water in them. The banks of the channel were primarily grasses and weedy species which appeared to be seasonally mowed. Along the western edge of the ditch within the Survey Area, the buffer area includes a large woodlot that may have several wetlands inside. The depth of the pools and wider dimensions resulted in DOH-041 scoring higher than other agricultural ditches. The surrounding cultivated crop areas and ongoing manipulation of the banks would likely inhibit use by any significant wildlife along much of the waterbody. No QHEI evaluation was conducted since it lacks a predominance of pools at least 16 inches deep. Project related activities will likely rely on HDD to install collection lines under the waterbody and thus avoid impacts. Due to DOH-041 being identified as a tributary to an identified WOTUS, the feature is identified as jurisdictional.

DOH-116 is a modified perennial ditch that flows between cultivated crop areas between SR 19 and Trail 175, just north of CR 38. Along the northern bank are several woodlots with isolated wetlands, however they do not provide any significant shade along the majority of the ditch. As the ditch nears Trail 175 the

ditch gains a wooded riparian buffer and appears to have a more naturalized channel (including cobble substrates and several pools with small minnow-like fishes). However, the majority of the ditch is an open trapezoidal ditch with banks covered in grasses and weedy species that are seasonally mowed. The ditch had moderately deep pools (up to 6 inches deep) at some of its bends, which combined with a larger bankfull width to scoring highly on the HHEI. No QHEI evaluation was conducted since it lacks a predominance of pools at least 16 inches deep. The surrounding cultivated crop areas and ongoing manipulation of the banks would likely inhibit use by any significant wildlife along much of the waterbody. Due to DOH-116 being identified as a tributary to an identified WOTUS, the feature is identified as jurisdictional.

DOH-153 is a modified perennial ditch that flows north from CR 24 towards a woodlot. The sides were covered in grasses which appeared to be mowed regularly. The moderate depth (8 inches) and wide bankfull width (12 feet) led to the ditch scoring highly on the HHEI, though the constant manipulation of the banks and surrounding land will likely prevent any significant wildlife occurrence in the ditch. The ditch was also seen to have multiple feed tile discharges along its length, which may help create some deeper pooling areas. No QHEI evaluation was conducted since it lacks a predominance of pools at least 16 inches deep. Due to DOH-153 being identified as a tributary to an identified WOTUS, the feature is identified as jurisdictional.

DOH-216 is a modified perennial ditch that flows through a corner of the Survey Area southwest of the intersection of CR 24 and TR 80. Near the northeast end of the ditch, it abuts WOH-250 which may retain some overflow during storm events. The ditch scored highly on the HHEI due to the presence of deep pools (approximately 10 inches) and a wide bankfull width; however, the lack of complex substrate and ongoing manipulation of the surrounding landscape likely reduces the quality of habitat provided by the ditch. No QHEI evaluation was conducted since it lacks a predominance of pools at least 16 inches deep. Due to DOH-216 being identified as a tributary to an identified WOTUS, the feature is considered to be jurisdictional.

DOH-220 is a modified perennial ditch flowing alongside CR 27 just north of the intersection with TR 124. The ditch flows between cultivated crop areas and maintained residential yards before discharging to DOH-219. The ditch scored highly on the HHEI due to the presence of deep pools (approximately 6 inches) and a wide bankfull width; however, the lack of complex substrate and ongoing manipulation of the surrounding landscape likely reduces the quality of habitat provided by the ditch. No QHEI evaluation was conducted since it lacks a predominance of pools at least 16 inches deep. Due to DOH-220 being identified as a tributary to an identified WOTUS, the feature is identified as jurisdictional.

SOH-002 is a perennial naturalized stream with a mix of rocky and fine grain sediments for substrates. The channel varied in width, but averaged 18 feet wide for the majority of the feature. The TOB to TOB distance was slightly wider at 20 feet. Stream SOH-002 scored highly on the HHEI forms (74) due to variety of substrates and dominance of rocky components (such as cobble and gravel). The channel also had multiple deep pools along its course, with the deepest occurring at the bends where water depth was approximately 15 inches. Stream SOH-002 was a portion of Beaver Creek. A few small minnow-like fish were observed during the survey. Due to SOH-002 being identified as a tributary to an identified WOTUS, the feature is considered to be jurisdictional.

SOH-003 is another perennial naturalized reach of Beaver Creek, located east of SOH-002, which meanders through the Survey Area to south of the intersection of Rowe Road and TR 32. The channel was 25 feet wide with moderate pooling along the reach surveyed. The stream had a moderately complex substrate with a variety of materials including cobble, sand and silt along the highly sinuous length. Many of the bends had significantly deep pools over a foot deep. During the delineations, large fish (unidentified due to high turbidity) were observed in the pools. Due to SOH-003 being identified as a tributary to an identified WOTUS, the feature is considered to be jurisdictional.

SOH-005 is an intermittent modified reach of Owl Creek that passes under SR 19, and diagonally crosses the Survey Area. The stream on the eastern side of SR 19 was a moderately wide channel approximately 18 feet wide with isolated pools of water over cobble substrates. The eastern side of the channel also had a developed forest buffer between the channel and surrounding crop area which appeared to be recovering from historic modification. The channel to the west of SR 19 however has mowed banks and a much smaller channel area of 8 feet. The deepest pools are in the area of the SR 19 overpass, and measured approximately 8 inches deep. Due to SOH-005 being identified as a tributary to an identified WOTUS, the feature is considered to be jurisdictional.

SOH-006 is a modified perennial reach of Owl Creek flowing between SR 101 and CR 44, crossing perpendicular to the Survey Area. The stream averaged a typical bankfull width of 2 feet, but widened out significantly by the SR 778 overpass where it approached 10 feet wide. The reach of the stream by the overpass also saw the deepest pools at approximately 10 inches deep. The majority of the channel was shaded by willows and other deciduous trees, but became an open channel as it passed near a VFW hall by the intersection of SR 778 and CR 44. Though the channel lacked significant pooling in excess of 16 inches, the stream was scored on both the HHEI and QHEI forms. The wide bankfull width and presence of pools (6 inches deep) led to the waterbody scoring highly on the HHEI, but the lack of well-developed habitat led to a lower score on the QHEI. Due to SOH-006 being identified as a tributary to an identified WOTUS, the feature is considered to be jurisdictional.

SOH-010 is a perennial modified stream that begins in a mature woodlot and flows north between CR 38 and TR 138. The substrate of the channel was a balanced mix of cobble, gravel, sand, and silt. The southern half of the stream was forested and had several large pieces of woody debris in some of the pools. The widest and deepest parts of the stream were located in the forested portion. As the stream flowed north towards the fields, the canopy cover was reduced and the stream begins to narrow and become much shallower. The northern reach of the stream loses any significant riparian habitat and is an unshaded stream. The complexity of the substrate, wide bankfull width, and depth of pools led the stream to score highly on both the HHEI and QHEI forms. Due to SOH-010 being identified as a tributary to an identified WOTUS, the feature is considered to be jurisdictional.

SOH-011 is a naturalized perennial stream that flows between two crop areas. The stream has a narrow riparian buffer on both sides with a mix of mature trees and weedy herbaceous species which have migrated in from the edge of the nearby crops. The channel was approximately 12 feet wide and had pools approximately 18 inches deep. The substrate in the channel was a well-balanced mix of cobble, gravel, sand, and silt. During the surveys, a handful of minnow-like fishes were observed in the deeper pools. The complexity of the substrate, wide bankfull width, and depth of pools led the stream to score highly on both the HHEI and QHEI forms. Due to SOH-011 being identified as a tributary to an identified WOTUS, the feature is considered to be jurisdictional.

SOH-014 is a perennial naturalized stream that flows along a minor forest valley just west of SR 19. The stream channel was approximately 12 feet wide on average, with moderate pooling up to 18 inches deep in some of the bends. The substrate in the channel was a mix of cobble, gravel, silt, and sand with minor amounts of woody debris from the overhanging trees. During the survey, a handful of minnow-like fishes were observed swimming in the deeper parts of the channel. Due to SOH-014 being identified as a tributary to an identified WOTUS, the feature is considered to be jurisdictional.

SOH-015 is a modified perennial stream with a cobble channel approximately 7.5 feet wide which flows between cultivated crop areas. The majority of the stream has a narrow, forested buffer between it and the surrounding landuse. The wide bankfull width and moderate complexity of the substrate led to the stream scoring highly on the HHEI. Stream SOH-015 lacked a predominance of pools over 16 inches deep and so a QHEI evaluation was not completed. Due to SOH-015 being identified as a tributary to an identified WOTUS, the feature is considered to be jurisdictional.

SOH-019 is a modified perennial stream that flows perpendicular to CR 44 just west of SR 778/19. To the south of CR 44, the narrow stream flows between maintained residential yards and has little shade. The banks of the southern portion of the reach are predominately grasses and weeds, with a few isolated willow saplings. On the north side of CR 44 however, the stream widens out and deepens as it flows through a residential woodlot. The moderate pool depth and complexity of the substrates led to the stream scoring highly on the HHEI. No QHEI evaluation was completed due to the stream lacking a predominance of pools over 16 inches deep. Due to SOH-019 being identified as a reach of an identified WOTUS (Owl Creek), the feature is considered to be jurisdictional.

SOH-103 is a perennial modified stream that flows through a small woodlot just north of SR 19. The stream was relatively shallow overall, with some minor pools up to 6 inches deep, but scored highly on the HHEI due to the complex substrate and wide bankfull width. No QHEI evaluation was completed due to the stream lacking a predominance of pools over 16 inches deep. Due to SOH-103 being identified as a tributary to an identified WOTUS, the feature is considered to be jurisdictional.

SOH-154 is a forested extension of DOH-153, but was identified as having a significant difference in environmental conditions to be identified as another feature. Stream SOH-154 maintained a relatively wide bankfull distance and had several naturalized meanders as it flowed north through a woodlot. A mix of substrates, deep pools, and the wide width led to the feature scoring highly on the HHEI. No QHEI evaluation was completed due to the stream lacking a predominance of pools over 16 inches deep. Due to SOH-154 being identified as a portion of an identified WOTUS, the feature is considered to be jurisdictional.

SOH-201 is a modified perennial stream that flows through a forested wetland complex located northeast of the intersection of CR 27 and TR 136. The substrate was mostly comprised of simple silts and limited cobble which prevented the stream from scoring higher on the HHEI despite the nearby wetland complex. No QHEI evaluation was completed due to the stream lacking a predominance of pools over 16 inches deep. Due to SOH-201 being identified as a tributary to an identified WOTUS, the feature is considered to be jurisdictional.

4.2.4 Potentially Jurisdictional Delineated Waterbodies in the Survey Area

No traditional navigable waterways are located within the Survey Area. However, eight named WOTUS and their tributaries were identified in the Survey Area, including Beaver Creek, Indian Creek, Morrison Creek, Noel Ditch, Owl Creek, Pickerel Creek, Royer Ditch, and Westerhouse Ditch. Tributaries themselves may not be navigable, but have a significant impact on water quality 'down-stream' in the WOTUS. Status as a tributary was primarily assessed on the presence or absence of a USGS NHD blue line feature and possibility for flow into a larger WOTUS. Additionally, if the waterbody or wetland abutted a potentially jurisdictional feature and had a permanent or potentially permanent hydrologic connection, then both waterbodies would be considered jurisdictional. However, final determinations of jurisdiction are the responsibility of the USACE.

Seventy-six (76) delineated waterbodies were considered potentially jurisdictional within the Survey Area due to a significant nexus to a WOTUS according to the USACE guidance as outlined in Section 3.1.6. Any delineated WOTUS retained a connection to an NHD blue line feature and were either perennial or intermittent. The jurisdictional features included 52 ditches, 23 streams, and 1 pond. The majority of the jurisdictional features were portions of a WOTUS or identified as a tributary to a WOTUS. The pond, POH-001, was determined to be an impoundment of tributary waters to the Sandusky River, which still maintained hydrologic connection to down-stream features, and thereby potentially a WOTUS.

5 Conclusions

The Republic Wind Project is proposed as a 200-MW wind farm with up to 50 turbines on private lands in northern Seneca County and southeast Sandusky County, Ohio. The Project is proposed in a predominantly agricultural area. The history of land conversion and landscape manipulation for farming has reduced the land available for wetlands to develop.

Between the fall of 2016 and fall of 2018, Cardno completed field surveys of 315 parcels within the Project Area (i.e., Survey Area) that totaled approximately 20,286 acres. The majority of wetlands delineated were located in woodlots, which had remained relatively undisturbed or recovered from previous disturbance. Of the 106 wetlands delineated in the Survey Area, 12 wetlands were considered high quality wetland (Category 3), which was attributed to their larger size, buffer from surrounding landuse, and significant development of habitat within the wetlands. The majority were identified as Category 2 or Modified Category 2 by the ORAM (n=55) which is considered a moderate quality wetland. Of the 106 wetlands, 37 (approximately 84.6 acres) are considered jurisdictional according to the USACE guidance based on a hydrologic connection to a WOTUS or tributary to a WOTUS. The remaining 69 wetlands were considered isolated wetlands (Waters of the State).

Of the 123 waterbody features delineated in the Survey Area, 32 stream reaches were identified in the Survey Area. Eighteen (18) of the delineated waterbodies (including 12 streams and 6 ditches) scored highly enough on the HHEI score to be considered Class III waterbodies. Eighty-three (83) of the waterbodies were identified as ditches. Of the 123 delineated waterbodies, 76 were considered jurisdictional according to the USACE guidance due to connections to potential tributaries to WOTUS features. The remaining 47 waterbodies were considered Waters of the State.

The findings of this investigation represent a delineation survey of the Survey Area for surface waters, including all Waters of the State and federally jurisdictional WOTUS. This report represents a professional estimate of the Survey Area's potential surface waters and is based upon on implementation of applicable field methods and the professional judgment of Cardno. Final verification of their boundaries and jurisdictional status for regulatory purposes can only be completed through a Jurisdictional Determination review by the USACE or their duly appointed representative.

6 References

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Republic Wind Project

APPENDIX

A

TYPICAL SITE PHOTOS

Apex Republic Wind Project, Seneca and Sandusky County Ohio
Wetland and Waterbody Field Delineation Surveys
Photolog
Fall 2016 Though Fall 2018

Photo: Typical Modified Ephemeral Waterbody

Date: 9/28/16

Description: Photo of ditch DOH-001 which was typical for most ephemeral ditches in the Delineation Area. The channel lacked any standing water which indicated it likely flowed during larger storm events. And due to the constant mowing of the banks and input from field tile, the waterbody was considered modified. The combination of lacking habitat and constant disturbance meant the waterbody was of low biological quality.



Photo: Typical Naturalized Ephemeral Waterbody

Date: 4/25/17

Description: Stream SOH-108 was identified as an ephemeral waterbody due to the presence of a defined bed and bank and indications of flow (as evidenced by sticks and snags). Unlike a modified waterbody, the naturalized ephemeral waterbodies lacked signs of recent man-made disturbance. Although the features lacked disturbance, the lack of consistent water meant biological utilization was likely low.



Apex Republic Wind Project, Seneca and Sandusky County Ohio
Wetland and Waterbody Field Delineation Surveys
Photolog
Fall 2016 Through Fall 2018

Photo: Typical Modified Intermittent Waterbody

Date: 10/03/16

Description: Photo of ditch DOH-038 which was typical for most intermittent ditches in the Delineation Area. The channel had pockets of standing water throughout its length. Due to the constant mowing of the banks and input from field tile, the waterbody was considered modified. Modified ditches such as this feature often had limited potential for significant biological utilization due to the constant disturbance of the banks.



10/03/2016 17:10

Photo: Typical Naturalized Intermittent Waterbody

Date: 9/29/16

Description: Stream SOH-004 was identified as an intermittent waterbody due to the presence of a defined bed and bank and pockets of standing water. This particular waterbody had signs of recovery from historic modification in the form of mature trees growing along straightened channels. Naturalized intermittent streams were considered to have a higher biological utilization than modified features due to the presence of habitat along the banks.



09/29/2016 11:57

Apex Republic Wind Project, Seneca and Sandusky County Ohio
Wetland and Waterbody Field Delineation Surveys
Photolog
Fall 2016 Through Fall 2018

Photo: Typical Modified Perennial Waterbody

Date: 10/03/16

Description: Photo of ditch DOH-041 which was typical for most perennial ditches in the Delineation Area. The channel had flowing water throughout approximately 6 inches deep. Due to the constant mowing of the banks and input from field tile, the waterbody was considered modified. Modified ditches such as this feature often had limited potential for significant biological utilization due to the constant disturbance of the banks.



Photo: Typical Naturalized Perennial Waterbody

Date: 9/29/16

Description: Stream SOH-011 was typical of the perennial naturalized streams in the Delineation Area. Such waterbodies had significant flowing water, and often had pools over a foot deep. The naturalized waterbodies had mature trees along the banks which in turn deposited woody debris in the channel. The availability of habitat within the channel and lower levels of disturbance from surrounding landuse meant that the naturalized perennial waterbodies could potentially see high biological utilization.



Apex Republic Wind Project, Seneca and Sandusky County Ohio
Wetland and Waterbody Field Delineation Surveys
Photolog
Fall 2016 Through Fall 2018

Photo: Typical Category 1 Wetland

Date: 9/30/16

Description: Typical low quality palustrine emergent wetland found in the Delineation Area. This wetland (WOH-002) was located in a small depressional area along a roadside. The presence of invasive narrow leaf cattail (*Typha angustifolia*), lack of buffers from surrounding landuse, and lack of standing water led to the wetland scoring as a Category 1 wetland on the ORAM forms.



Photo: Typical Modified Category 2 Wetland

Date: 10/01/16

Description: Photo of wetland WOH-003, which was a mix of emergent and forested wetland. Due to the historic modification of the wetland area adjacent to the crop area, the wetland had lost some of its functions. However when scoring on the ORAM form, the forested portion (which extends to the left in the photo) indicated the wetland could increase its score and recover some of its lost functions; which led to it scoring as a Modified Category 2 on the ORAM forms.



Apex Republic Wind Project, Seneca and Sandusky County Ohio
Wetland and Waterbody Field Delineation Surveys
Photolog
Fall 2016 Through Fall 2018

Photo: Typical Category 2 Wetland

Date: 10/02/16

Description: Wetland WOH-005 was identified as high scoring Category 2 wetland. The feature scored highly despite the lack of standing water due to its location inside a woodlot (which acted as a buffer between surrounding landuse) and the amount of woody debris and dead standing trees which could be utilized for habitat.

This wetland was typical of the forested wetlands, which often exhibited sparsely vegetated concave surfaces and root buttressing.



Photo: Typical Category 3 Wetland

Date: 10/02/16

Description: Photo of wetland WOH-008, which was a mix of emergent and forested wetland. The wetland was the largest wetland identified in the Delineation Area. The wetland had a high interspersed vegetation types, high amount of dead standing and woody debris, and was relatively large which led to it scoring highly on the ORAM.



Apex Republic Wind Project, Seneca and Sandusky County Ohio
Wetland and Waterbody Field Delineation Surveys
Photolog
Fall 2016 Through Fall 2018

Photo: Typical Wetland Soils

Date: 10/02/16

Description: The soils in many of the wetlands exhibited similar characteristics. Often the soils were darkly colored with brighter pockets of redox concentrations. The redox concentrations occur when soils are saturated for a significant portion of the season.

Wetland soils often had clay components as well which helped the soils retain water for longer periods.



Photo: Typical Upland Soils

Date: 10/03/16

Description: Upland soils in the Delineation Area were often brightly colored dry loams, with minor amounts of clay in the matrix. This composition allowed for water to pass more easily to deeper depths.



Apex Republic Wind Project, Seneca and Sandusky County Ohio
Wetland and Waterbody Field Delineation Surveys
Photolog
Fall 2016 Though Fall 2018

Photo: Typical Crop Area

Date: 10/02/16

Description: The majority of the Delineation Area consisted of active crop areas. The crops encountered during the surveys included soybeans and corn. The crop areas often had small windrows of trees which served to denote property lines.



Photo: Typical Crop Area

Date: 10/17/17

Description: many of the crop areas also had grassy swales between fields. These swales were designed to convey stormwater runoff from the fields and into nearby ditches or streams. Due to a lack of identifiable ordinary high water mark and upland vegetation, swales are not considered wetlands or waterbodies.



Apex Republic Wind Project, Seneca and Sandusky County Ohio
Wetland and Waterbody Field Delineation Surveys
Photolog
Fall 2016 Though Fall 2018

Photo: Typical Forested Woodlot

Date: 10/17/17

Description: Understory development in woodlots varied between parcel, and likely reflected historic disturbance and land use. Some woodlots had relatively dense understories dominated by blackberry (*Rubus* spp.) and grasses; while others might be relatively sparse and dominated by saplings.



Photo: Typical Forested Woodlot

Date: 10/02/16

Description: The woodlots in the Delineation Area varied in species variety with some woodlots being dominated by American beech (*Fagus grandifolia*), and others a mix of multiple hickory (*Carya* sp.), maples (*Acer* sp.), and oaks (*Quercus* sp.).

Many of the woodlots had evidence of historic logging due to the presence of flat topped tree stumps and overgrown roads.

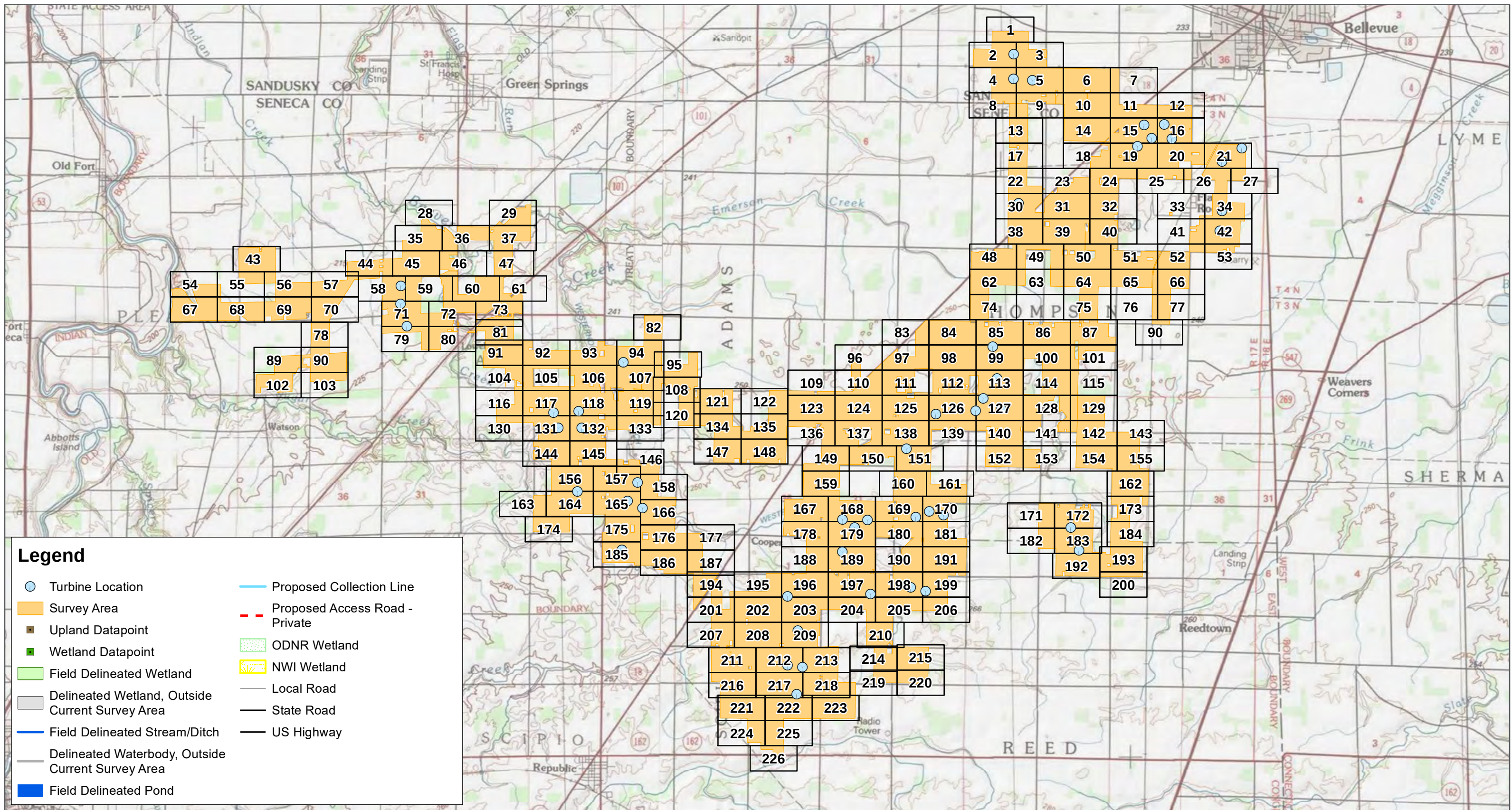


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APPENDIX

B

WETLAND AND WATERBODY MAPS



Legend

- Turbine Location
- Survey Area
- Upland Datapoint
- Wetland Datapoint
- Field Delineated Wetland
- Delineated Wetland, Outside Current Survey Area
- Field Delineated Stream/Ditch
- Delineated Waterbody, Outside Current Survey Area
- Field Delineated Pond
- Proposed Collection Line
- Proposed Access Road - Private
- ODNR Wetland
- NWI Wetland
- Local Road
- State Road
- US Highway



Data Source: ESRI, Apex (2016)

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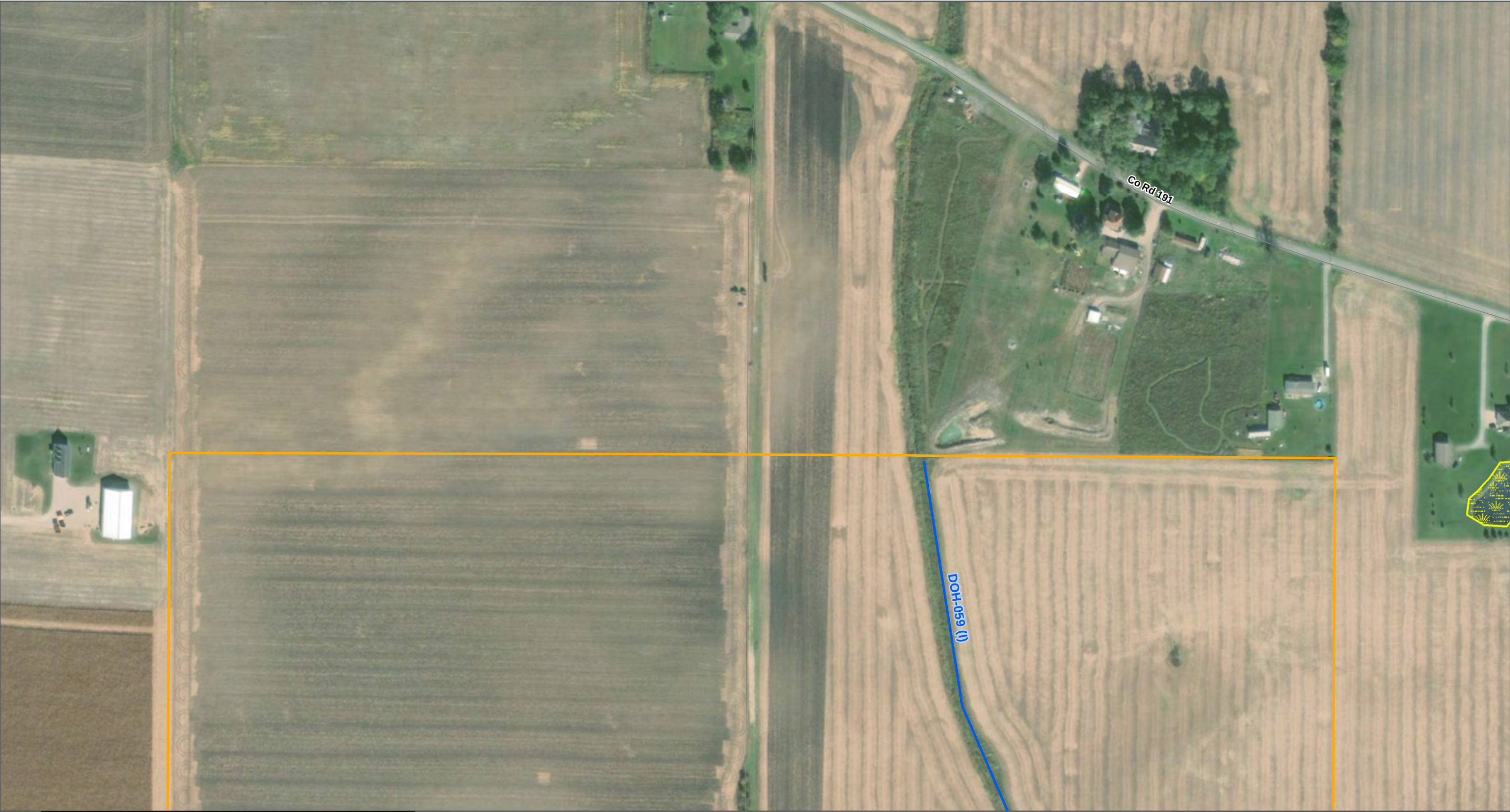


Wetland and Waterbody Maps Map Index

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Turbine Location	Field Delineated Pond
Survey Area	Proposed Collection Line
Upland Datapoint	Proposed Access Road - Private
Wetland Datapoint	ODNR Wetland
Field Delineated Wetland	NWI Wetland
Delineated Wetland, Outside Current Survey Area	Local Road
Field Delineated Stream/Ditch	State Road
Delineated Waterbody, Outside Current Survey Area	US Highway



Wetland and Waterbody Maps
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Delineated Waterbody, Outside Current Survey Area	US Highway



Wetland and Waterbody Maps
(Sheet 2 of 226)

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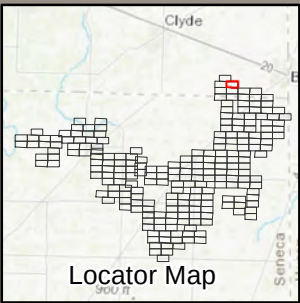


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 Delineated Waterbody, Outside Current Survey Area	 US Highway



Wetland and Waterbody Maps
(Sheet 3 of 226)

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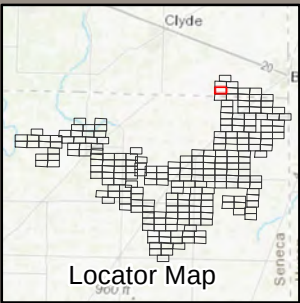


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 Field Delineated Stream/Ditch	 State Road
 Delineated Waterbody, Outside Current Survey Area	 US Highway



Wetland and Waterbody Maps
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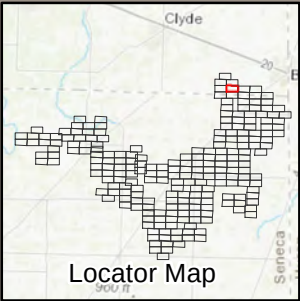
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Delineated Waterbody, Outside Current Survey Area	US Highway



Wetland and Waterbody Maps
(Sheet 5 of 226)

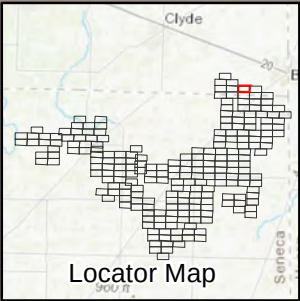
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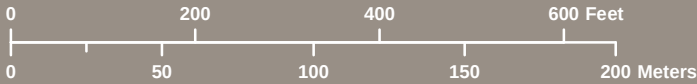


Turbine Location	Field Delineated Pond
Survey Area	Proposed Collection Line
Upland Datapoint	Proposed Access Road - Private
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Delineated Waterbody, Outside Current Survey Area	US Highway



Wetland and Waterbody Maps
(Sheet 6 of 226)

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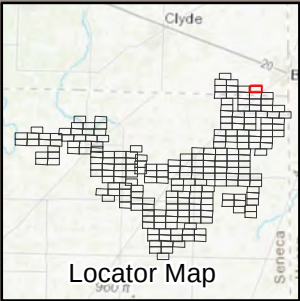


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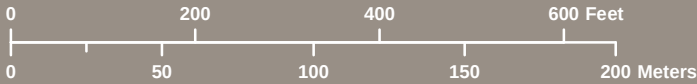


Turbine Location	Field Delineated Pond
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 Delineated Waterbody, Outside Current Survey Area	 US Highway



Wetland and Waterbody Maps (Sheet 8 of 226)

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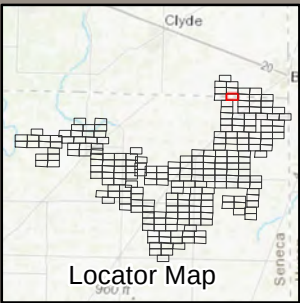


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Wetland and Waterbody Maps (Sheet 9 of 226)

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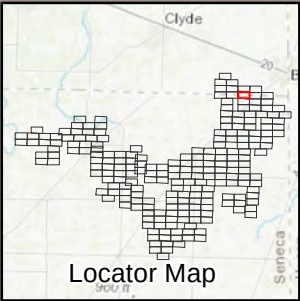


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Wetland and Waterbody Maps
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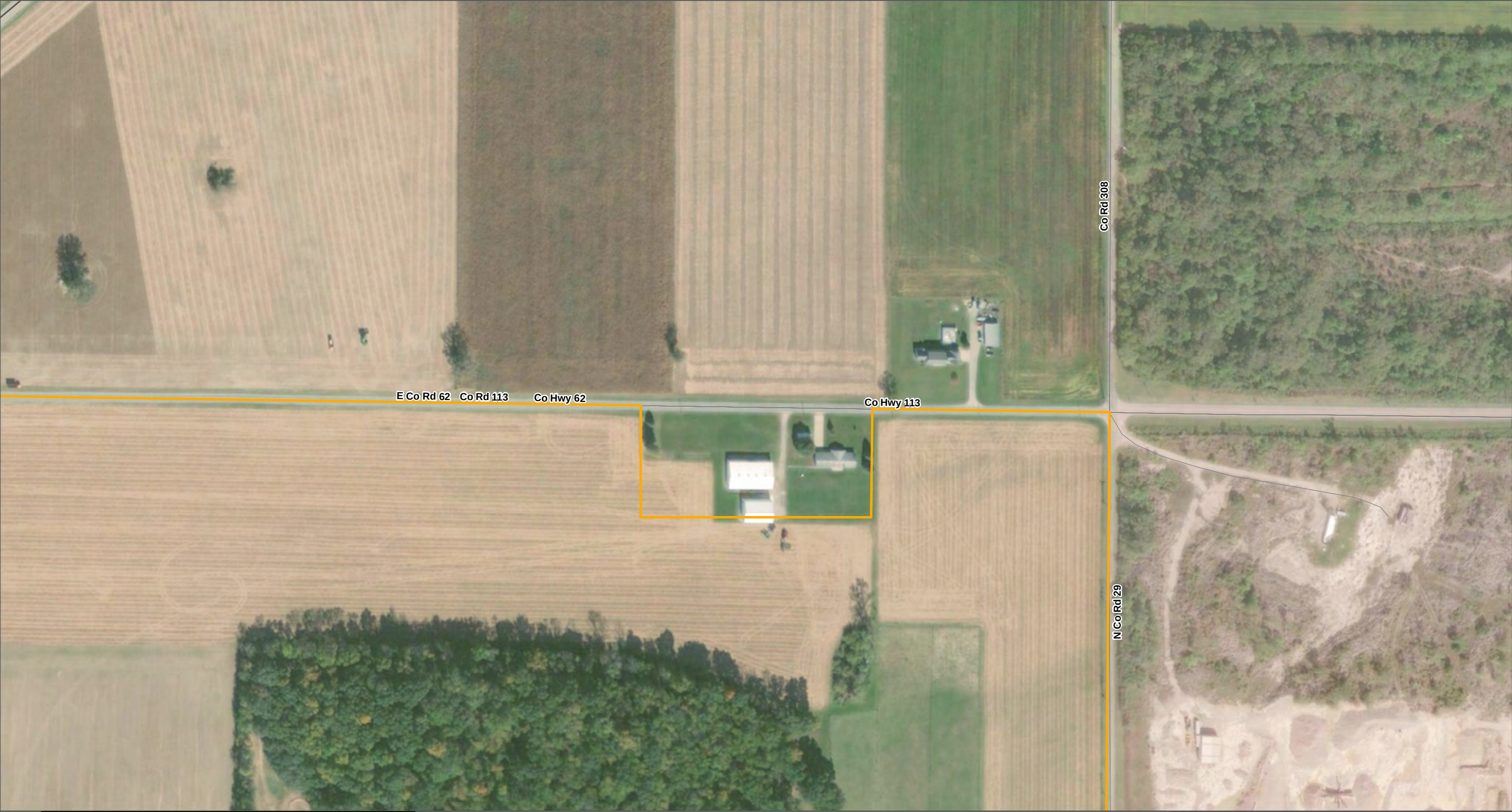


Wetland and Waterbody Maps (Sheet 11 of 226)

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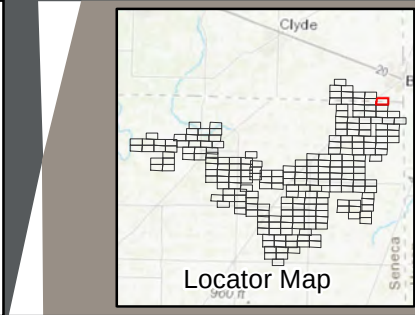


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Wetland and Waterbody Maps

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 Delineated Waterbody, Outside Current Survey Area	 US Highway



Wetland and Waterbody Maps (Sheet 13 of 226)

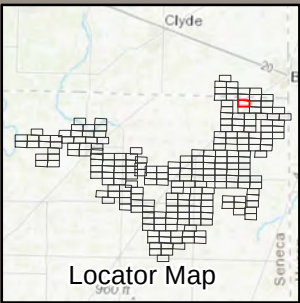
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- | | |
|---|--------------------------------|
| Turbine Location | Field Delineated Pond |
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| Upland Datapoint | Proposed Access Road - Private |
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| Field Delineated Stream/Ditch | State Road |
| Delineated Waterbody, Outside Current Survey Area | US Highway |



Wetland and Waterbody Maps
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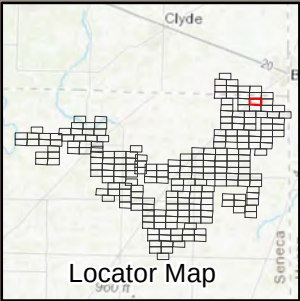
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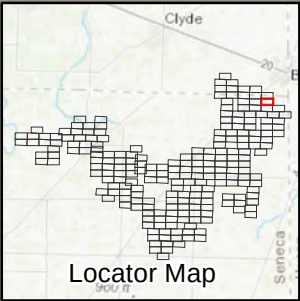
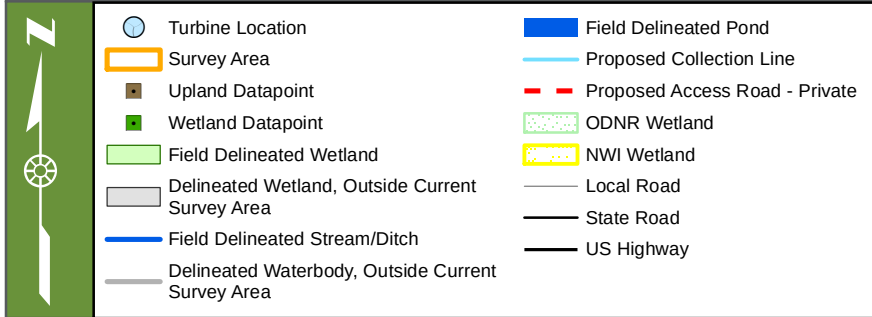


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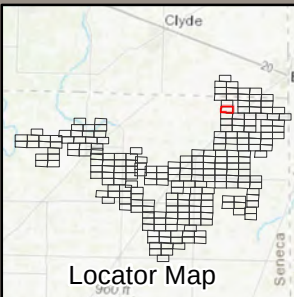


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 Delineated Waterbody, Outside Current Survey Area	 US Highway



Locator Map

Wetland and Waterbody Maps

(Sheet 17 of 226)

Republic Wind Project
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0

200

400

600

Feet

0

50

100

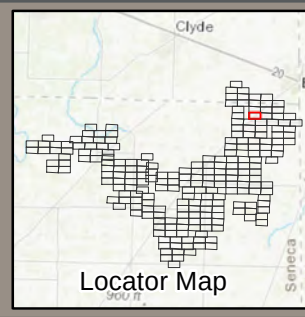
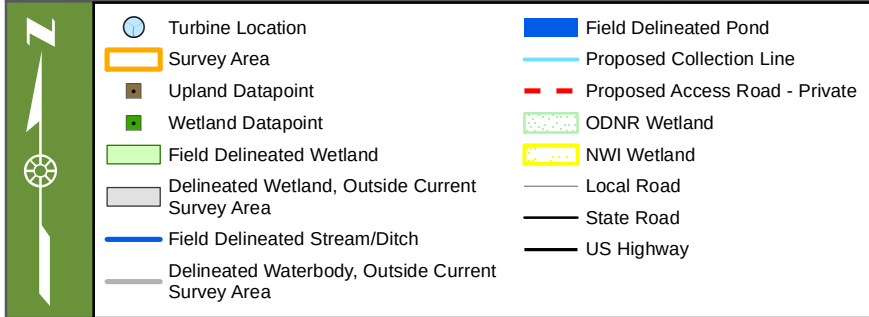
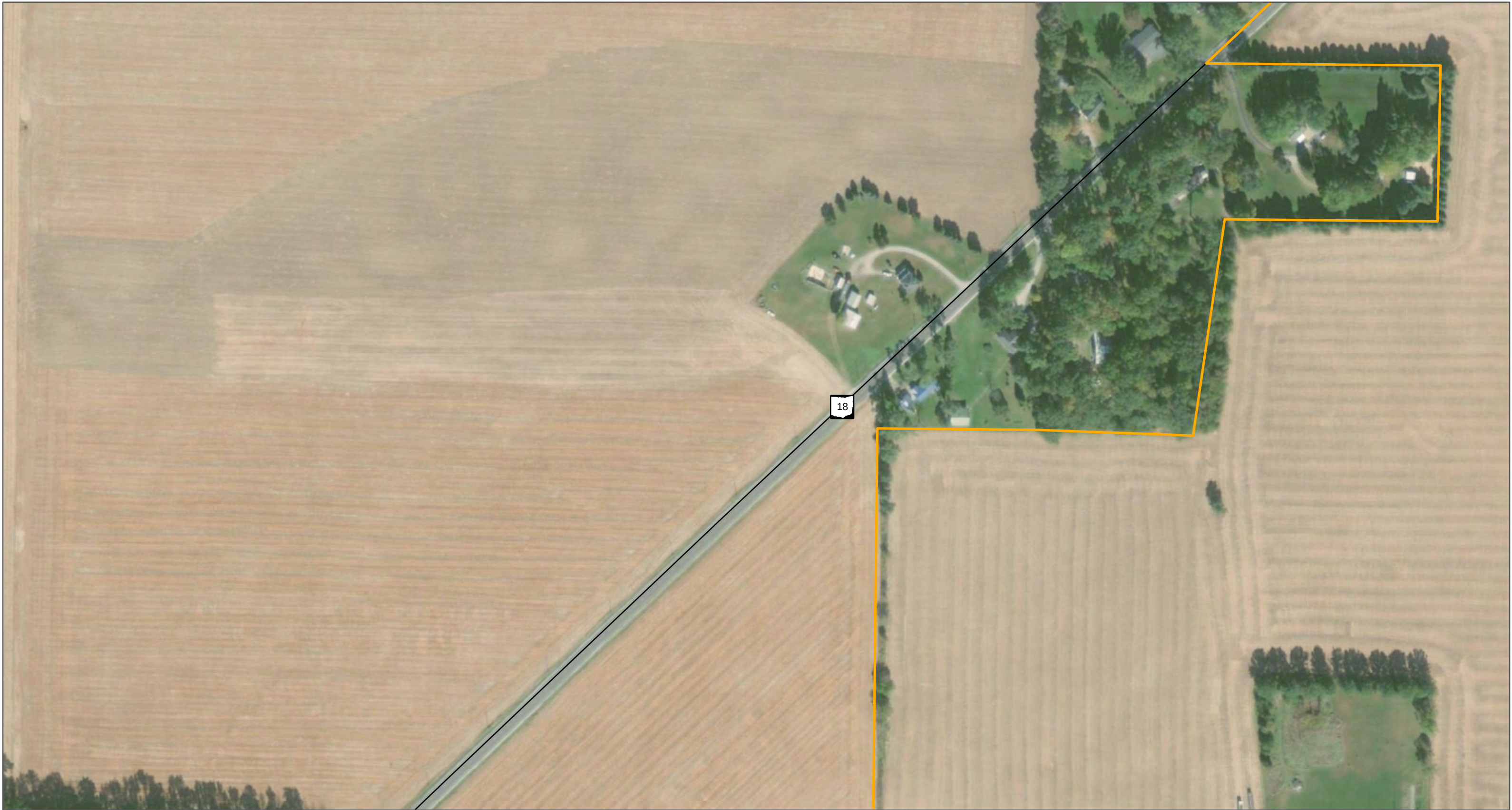
150

200

Meters



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Wetland and Waterbody Maps (Sheet 18 of 226)

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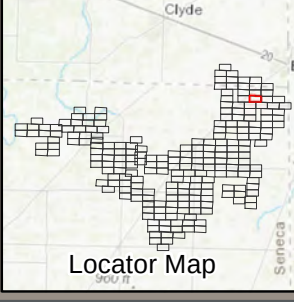


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-  Turbine Location
-  Survey Area
-  Upland Datapoint
-  Wetland Datapoint
-  Field Delineated Wetland
-  Delineated Wetland, Outside Current Survey Area
-  Field Delineated Stream/Ditch
-  Delineated Waterbody, Outside Current Survey Area
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-  NWI Wetland
-  Local Road
-  State Road
-  US Highway



Locator Map

Wetland and Waterbody Maps (Sheet 19 of 226)

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0

200

400

600 Feet

0

50

100

150

200 Meters



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Summary: Application Exhibit J Part 20 of 33 electronically filed by Teresa Orahod on behalf of Dylan F. Borchers