WATERS OF THE UNITED STATES
JURISDICTIONAL EVALUATION & WETLAND DELINEATION

for

Cobey Creek – Residential Development
JACKSON COUNTY, MISSOURI

PREPARED BY

HABITAT ARCHITECTS
It's the "Nature" of our Business
3904 East 185th Street
Belton, MO 64012

APRIL, 2017

HABITAT ARCHITECTS PROJECT NO. 118-17

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1.0 INTRODUCTION

JCM Development, LLC is planning to construct a mixed-use development in the City of Lee's Summit, Missouri. The site is described as an approximately 100 acre residential property north of Highway 150 and west of Doc Henry Road (Figure A-1). The project is geographically located in the SE ¼ of Section 29, Township 47N, Range 31W, Jackson County, Missouri (Figure A-2). As a measure to assure compliance with the Clean Water Act, Habitat Architects, LLC (***Habitat***) was contracted to complete a waters of the U.S. Jurisdictional Evaluation and Wetland Delineation for the project site.

As part of the investigation, ***Habitat*** conducted a field site visit to identify wetlands and other waters of the U.S. on the site. The investigation also included a review of resource maps and aerial photography for the site.

The following report is a discussion of jurisdictional waters of the U.S. present on the property. The contents of this report include the review of the subject property to determine the presence/absence of any water features including wetlands, tributaries and open waters. Supporting documentation including figures, photographs, and wetland data sheets are provided as appendices.

The Corps of Engineers (COE) has jurisdiction over all waters of the U.S. and is the regulating authority for decisions regarding the occurrence of wetlands and waters of the U.S. on subject properties. The contents of this report are not valid without official concurrence from the COE. **Discharges of dredged or fill materials in waters of the U.S., including wetlands, require prior authorization from the COE under Section 404 of the Clean Water Act (33 USC 1344).**

2.0 METHODOLOGY

The jurisdictional evaluation and wetland delineation was conducted according to the guidelines of the 1987 Corps of Engineers Wetlands Delineation Manual, Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0) and other Corps guidance. The wetland delineation was completed utilizing a (Level 3) routine method for delineating in which both off-site and on-site data collection was evaluated to determine results.

The survey included a preliminary review of existing data as well as on-site field verification and survey.

A desktop review of existing data and resource maps was completed prior to the project site field visit. The desktop review was performed to better understand the topography, hydrology, soils and natural resources on the project site. Resource mapping and conclusions of the desktop review are provided in Section 3.0 Existing Data.

A field survey was conducted to identify and map wetlands and jurisdictional waters. Sample plots were established and wetland determination data forms were completed to characterize the wetland areas and adjacent uplands. Vegetation, soil conditions, and hydrologic indicators were recorded at each of these sample plots (see Appendix C). Photographs were taken and are included as a photograph log in Appendix B. Tributaries were identified by observing the presence of a defined bed and bank, as well as a discernible ordinary high water mark (OHWM). Average widths of tributaries were measured at the OHWM. Sample points and wetland boundaries were surveyed using a global positioning system (GPS). Dimensions of jurisdictional waters are based on GPS data, scaled measurements from spatially referenced aerial photography and recorded field observations. Data point forms and photograph logs are included in Appendices B and C as appropriate. A final Waters of the U.S. and Wetland Boundary Map (Figure D-2) is included in Appendix D.

3.0 EXISTING DATA

Habitat completed an in-house review of available resource data to assist in the identification of wetlands and tributaries on the project site. A summary of the mapped and field verified data are provided below.

- U.S. Geologic Survey (USGS): 7.5 - Minute Topographic Map (Figure A-2)
- Natural Resource Conservation Service (NRCS): Soils Survey (Figure A-3)
- U.S. Fish & Wildlife Service (USFWS): National Wetlands Inventory (NWI) (Figure A-4)
- Aerial Photography (Figure A-5)

3.1 USGS TOPOGRAPHIC MAP, PLEASANT HILL, MO QUADRANGLE

Review of the topographic map (Figure A-2) depicts the site as being open ground. The site generally slopes from southwest to northeast. Elevations range from 1020 feet above Mean Sea Level (M.S.L.) at the highest points in the southwest to 970 feet M.S.L. at the northeast corner of the property where hydrology exits the site. A blue-line tributary is depicted on the eastern half of the property flowing north and off the property ultimately discharging into Big Creek approximately ½ mile northeast of the property. A single impoundment is also depicted in the central portion of the property.

3.2 SOILS SURVEY OF JACKSON COUNTY, MISSOURI

Three soil types occur on the project site (Figure A-3). Site soils are described in more detail below. Soil map units and major components listed as hydric soils are noted.

(10000) *Arisburg silt loam, 1 to 5 percent slopes.* Very deep, somewhat poorly drained soils formed in loess. These soils are located on summits, shoulders, and backslopes on uplands.

(10116) *Sampsel silty clay loam, 2 to 5 percent slopes.* Deep and very deep, poorly drained, slowly permeable soils that formed in residuum from alkaline or calcareous shale or colluviums and alluvium from shale associated materials.

(10117) *Sampsel silty clay loam, 5 to 9 percent slopes.* Deep and very deep, poorly drained, slowly permeable soils that formed in residuum from alkaline or calcareous shale or colluviums and alluvium from shale associated materials.

3.3 NATIONAL WETLANDS INVENTORY, PLEASANT HILL, MO QUADRANGLE

There are **NO** polygons depicted on the NWI map for the project area (Figure A-4).

3.4 NATIONAL AGRICULTURAL IMAGERY PROGRAM (NAIP), 2016

A review of recent aerial photography (Figure A-5) shows the site as almost entirely open ground with sporadic trees. The density of trees appears more in the west central portion of the property with the trees remaining consistent around an existing home and driveway.

4.0 FIELD INVESTIGATION RESULTS

On April 11, 2017, ***Habitat*** staff conducted a pedestrian surveys of the project area to identify natural resources including wetlands and tributaries. The site is approximately 80% open ground with the remaining 20% being wooded. A description of resources identified within the project limits is presented below.

4.1 TRIBUTARIES AND OTHER DRAINAGES

A drainage is a tributary when it contributes flow to a traditional navigable water or interstate water, either directly, indirectly or by means of other tributaries. Tributaries may be physically characterized by the presence of a channel with a defined bed and bank. The bed of a stream is the bottom of the channel while the banks are considered the lateral constraints and identified by the existence of an ordinary high water mark (OHWM), (RGL No. 05-05). Tributaries include traditional navigable waters (TNW's), relatively permanent waters and non-relatively permanent waters. Tributaries are described as they occur within the project area in more detail below. Other drainages including ditches, swales and erosional features are also described when their presence is pertinent to potential jurisdiction of other waters.

4.1.1 DITCHES

Ditches excavated wholly in and draining uplands and that do not carry a relatively permanent flow of water are not jurisdictional under the Clean Water Act. However, natural streams that have been converted to ditches (e.g., channelized, straightened or relocated) may be considered tributaries and jurisdictional. When this is the case, the resource is described in the tributaries section below. Man-made ditches are described here since they may contribute a surface hydrologic connection between an adjacent

wetland and a TNW (USACE, 2007). Typical examples of this type of feature are roadside drainages.

There are NO ditches on the project site.

4.1.2 VEGETATED SWALES

Vegetated swales are channels with no ordinary high water mark (OHWM) or bed and bank. They are vegetated across the bottom and are well drained. Water flows briefly through these features immediately after a precipitation event and quickly drains. These features include only swales that are drained well enough to not meet wetland criteria. When wetland criteria are met, the resource is described in the wetland section below. Vegetated swales are mapped in this report to emphasize possible connections between other water features. Typical examples of this type of feature are farm swales in uplands.

Vegetated Swales Found on the Property

There are two vegetated swales found on the property.

SWALE 1

Swale 1 (S-1) begins as a vague swale below open water (OW-1). The swale is fully vegetated and carries overland flows east (Photos 5, 6 & 7). The swale goes under a residential driveway through a culvert. Upon discharging the downstream side of the culvert the swale begins to show evidence of erosion due to velocities (Photo 8). Eventually, flows increase east of the driveway enough for the swale to transition into an erosive drainage (Photo 9) before then discharging into Non-RPW-1. The swale is fully vegetated and is in uplands.

Swale (S-1) is NOT a jurisdictional water of the U.S.

SWALE 2

Swale 2 (S-2) is a wooded corridor through uplands. The wooded corridor was filled over time by landscaping materials including lumber, plant pots, etc. (Photo 19). The swale becomes slightly more defined after it flows north under the residential driveway. At that point the swale becomes more confined but remains

vegetated (Photo 17). Eventually, flows increase through the swale enough to become erosive and transitions into Non-RPW-1. The swale is fully vegetated and is in uplands.

Swale (S-2) is NOT a jurisdictional water of the U.S.

4.1.3 EROSIONAL DRAINAGES

Erosional drainages (e.g., gullies, rills) are channels formed by excessive runoff during precipitation events and characterized by low volume, infrequent or short duration flow events. Water flows briefly through these features immediately after a precipitation event and quickly drains. This type of feature differs from a swale because it lacks vegetation across the bottom. Erosional drainages are generally the result of human disturbance and restriction of native vegetation growth.

Erosional drainages in the context of this report are non-jurisdictional waters of the U.S. Typically; this type of feature is seen along the edges of farm fields or in man-made ditches where vegetation lacks the vigor to withstand the velocity of flows directed into them.

Erosive Drainages Found on the Property

There are two erosive drainages found on the property. Both drainages are associated with increased hydrology through the vegetated swales and upstream of tributary formation. Both are short sections devoid of any tributary characteristics.

4.1.4 NON-RELATIVELY PERMANENT WATERS

Non-relatively permanent waters are waters that are not typically influenced by seasonal flow. Rainfall runoff is a primary source of hydrology in these systems. Upper reaches of intermittent tributaries and ephemeral tributaries are examples. This type of tributary can include unnamed intermittent tributaries not mapped on 7.5' USGS topographic maps. Non-relatively permanent waters have a defined bed and bank, an OHWM, and may be jurisdictional waters of the U.S.

Non-Relatively Permanent Waters Found on the Property

There is a single Non-Relatively Permanent Water found on the property (Non-RPW-1). An additional Non-RPW (Non-RPW-2) is noted north of the property as it may be traversed by a future utility crossing.

NON-RPW-1

Non-RPW-1 (Photos 9, 10, 11, 14 & 15) is an ephemeral tributary beginning near the confluence of two vegetated swales. The channel includes a well defined bed and bank and a discernible ordinary high water mark (OHWM). The ephemeral tributary flows northeast and off the property into a relatively permanent water approximately 2,500 feet from the property. That tributary further discharges into Big Creek an additional 2,500 feet downstream of RPW-1. The tributary is approximately 3 feet wide and 1-foot deep at the OHWM elevation.

NON-RPW-1 is a jurisdictional water of the U.S.

NON-RPW-2

Non-RPW-2 is an tributary displaying a well defined bed-and-bank and discernible ordinary high water mark. The tributary discharges into Non-RPW-1 and ultimately into Big Creek. The tributary is noted along with the approximate location of a proposed utility line corridor is shown graphically on the attached maps. Further details regarding the size and conditions of the channel would be provided during any required Section 404 permitting and the selection of a final utility crossing location.

NON-RPW-2 is a jurisdictional water of the U.S.

4.1.5 RELATIVELY PERMANENT WATERS

Relatively permanent waters are non-navigable water bodies with continuous flow, at least seasonally. Typically, a tributary that flows for at least three months of the year would be considered relatively permanent water. This type of tributary can include unnamed intermittent and perennial tributaries not mapped on 7.5' USGS topographic maps.

RPW-1

RPW-1 is a tributary displaying a well defined bed-and-bank and discernible ordinary high water mark. The tributary discharges directly into Big Creek. The tributary is noted along with the approximate location of a proposed utility line corridor on the attached maps. Further details regarding the size and conditions of the channel would be provided during any required Section 404 permitting and the selection of a final crossing location.

RPW-1 is a jurisdictional water of the U.S.

4.2 OPEN WATERS

Open waters are un-vegetated bodies of water such as ponds and lakes. These features may be jurisdictional if connected to jurisdictional waters. Open waters identified within the project limits are depicted on Figure D-1.

Open Waters Found on the Property

There is one open water feature found on the property.

OW-1

Open Water 1 (OW-1; Photo 4) is a 0.06 acre man-made pond created in uplands. The pond has no outfall structure and any overflow hydrology flows over the dam and into a vegetated swale (S-1).

Open Water OW-1 is <u>NOT</u> a jurisdictional water of the U.S.

4.3 WETLANDS

Wetlands are those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas. (33 CFR 328.3(b), Section 404 of the Clean Water Act).

Wetlands Found on the Property

There is a single wetland found on the property (Figures D-1 and D-2). Data sheets are located in Appendix C.

W-1

Wetland W-1 (Data Point 1, Photo 20) is a very small (0.02 ac.) wetland that is located adjacent to Non-RPW-1. The wetland appears to be influenced by additional hydrology entering Non-RPW-1 from the northwest and a slight flattening of the tributary grade at that location. The wetland is dominated in the center by Carex species and Kentucky bluegrass (*Poa pratensis*) with black willow (*Salix nigra*) and rough-leaf dogwood (*Cornus drummondii*) at the boundary of uplands. Soils are very dark (7.5YR 2.5/1) with distinct, common (5%) bright mottles (5YR 4/6) beginning at 12 inches below the surface. Wetland hydrology is supported for long durations during the growing season and is likely inundated or saturated often.

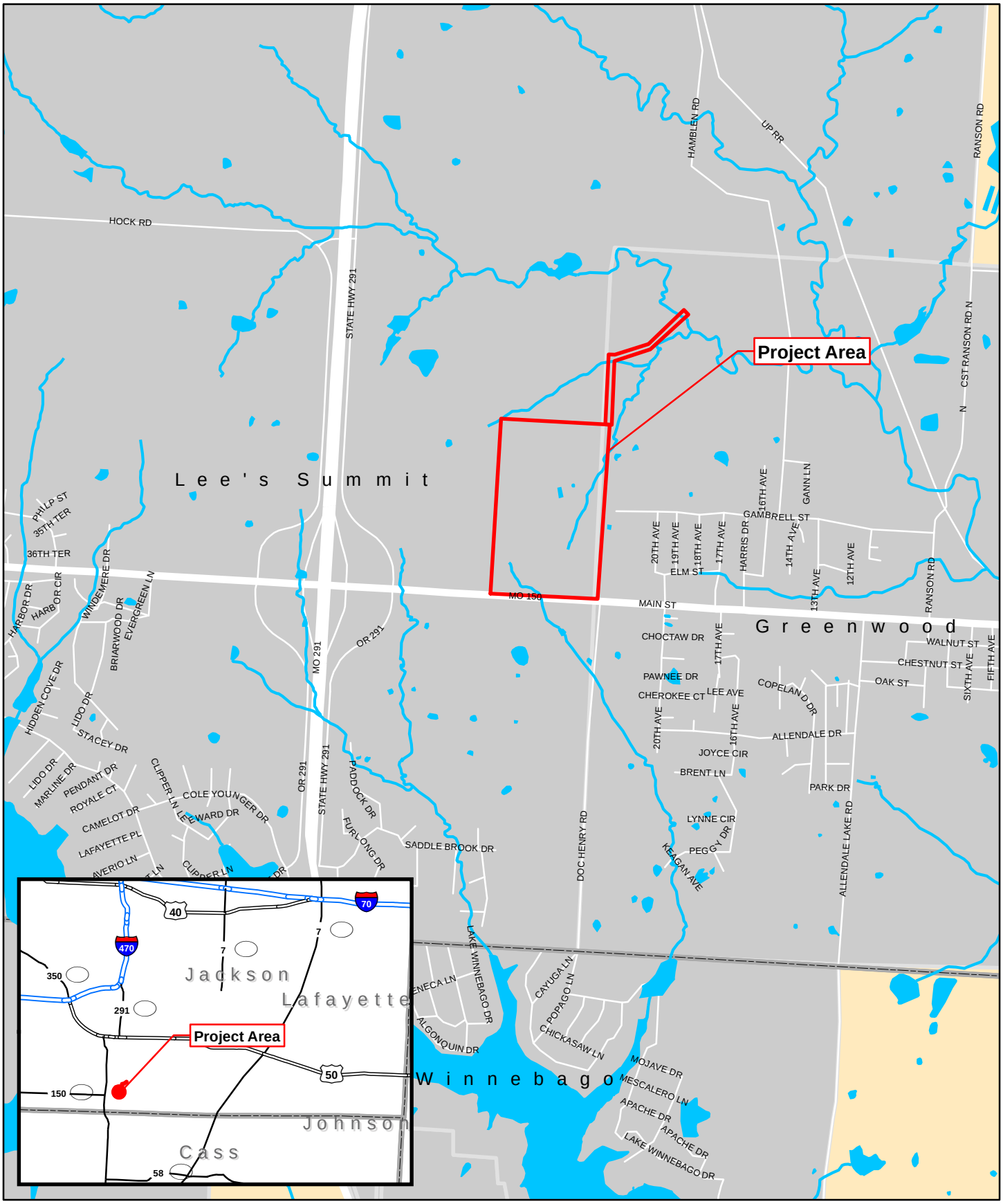
Wetland 1 (W-1) is a jurisdictional water of the U.S.

5.0 CLEAN WATER ACT (40 CFR PARTS 22, 230-233)

Discharges of dredged or fill materials in waters of the U.S., including wetlands, require prior authorization from the COE under Section 404 of the Clean Water Act (33 USC 1344). A Section 404 permit should be obtained for unavoidable impacts to any jurisdictional resources. Those resources identified on the project site, which are considered jurisdictional, are represented on Figure D-2. The contents of this report do not imply jurisdiction but provide the basis for a determination if required for Section 404 permitting activities.

Appendix A – Figures

Figure A-1: Site Location Map
Figure A-2: USGS Topographic Map
Figure A-3: NRCS Soils Survey Map
Figure A-4: National Wetland Inventory Map
Figure A-5: Site Aerial Map



NORTH

0 1,000 2,000

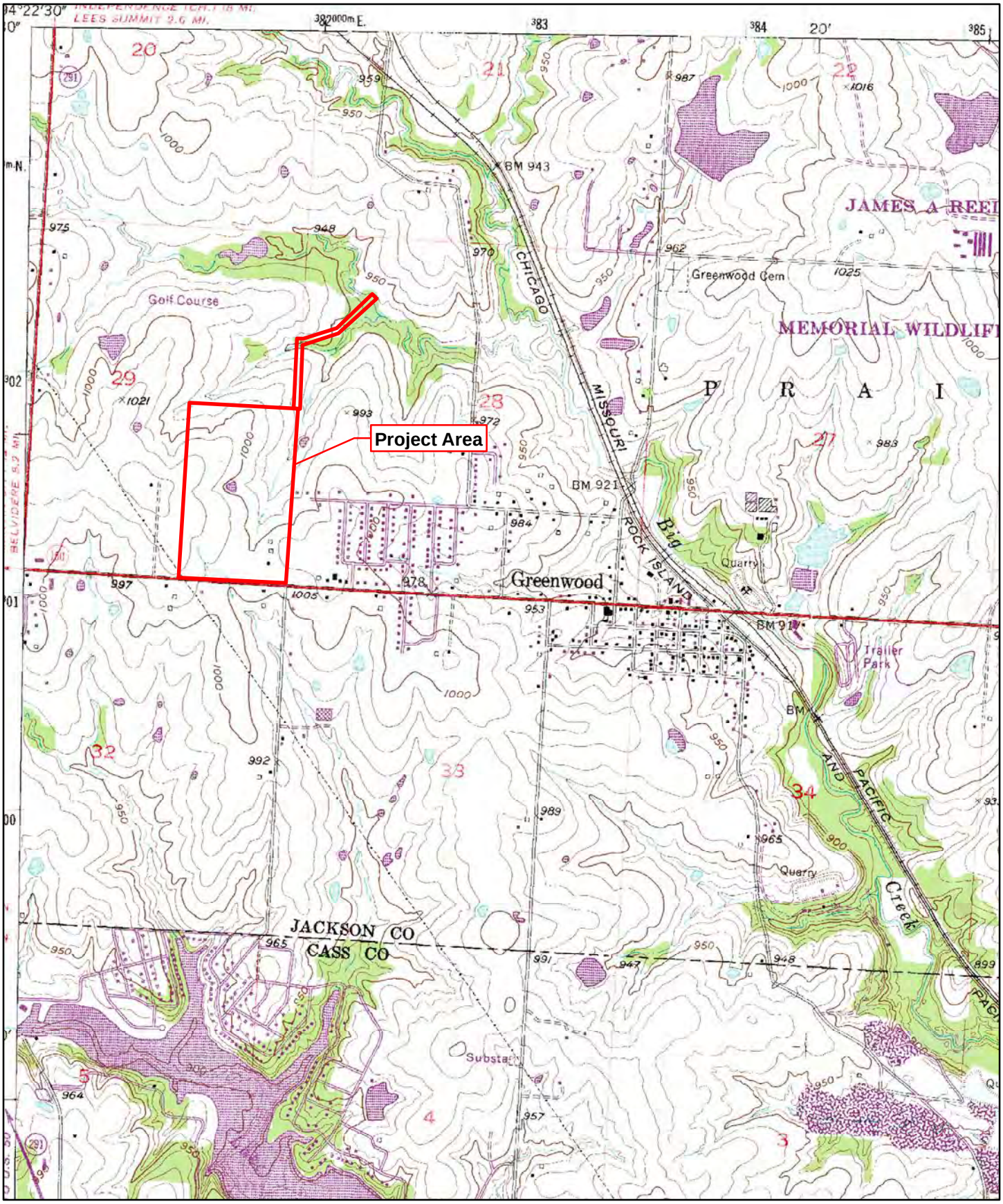
1 in. = 2,000 ft.

Source: MO Dept. of Transportation
Location: SE 1/4 of Sec 29 - T47N - R31W,
Jackson County, Missouri

FIGURE A-1
SITE VICINITY MAP

COBEY CREEK
LEE'S SUMMIT, MISSOURI

HABITAT ARCHITECTS



NORTH

0 1,000 2,000

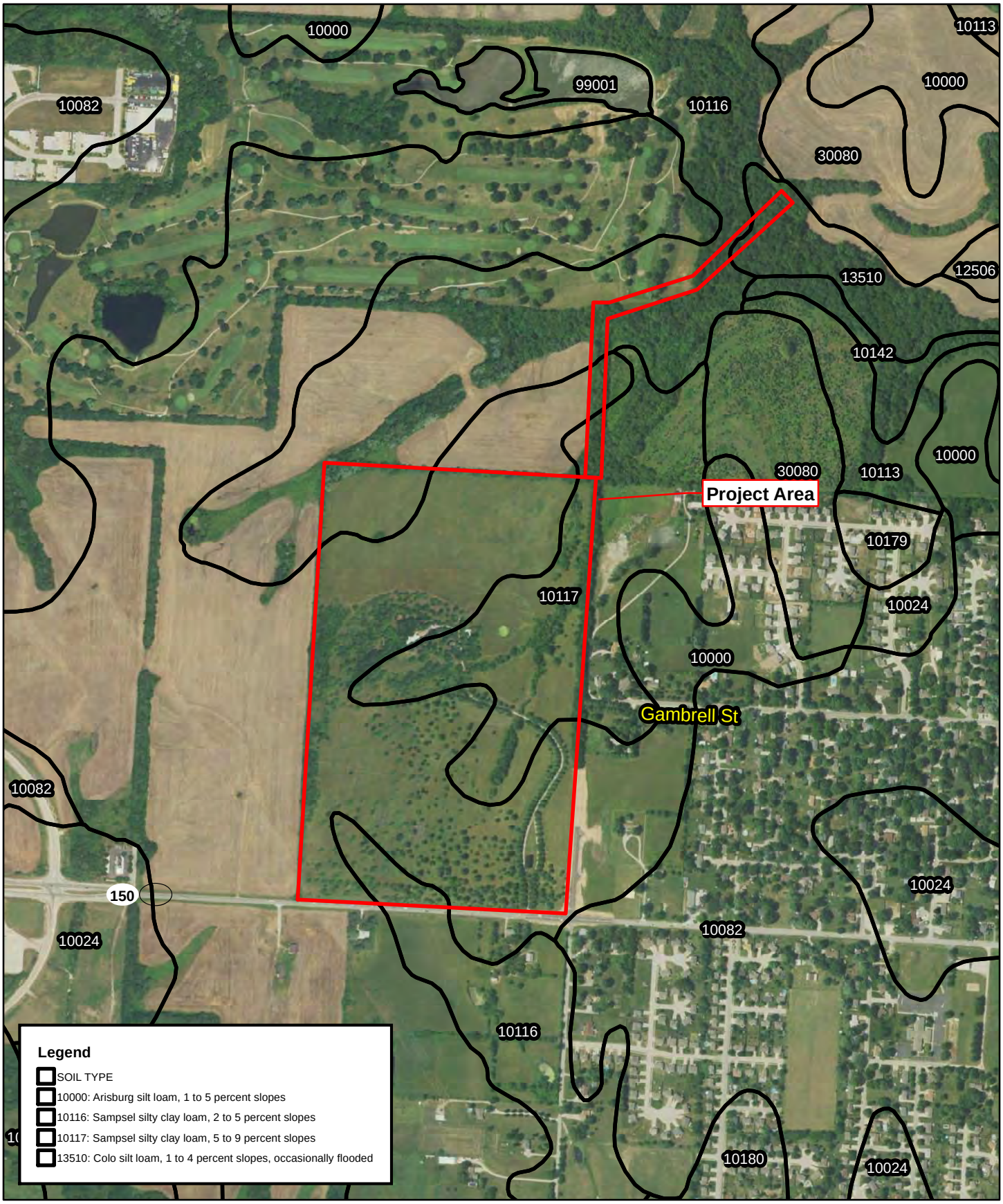
1 in. = 2,000 ft.

Source: US Gelogic Survey
Location: SE 1/4 of Sec 29 - T47N - R31W, Jackson County, MO
Pleasant Hill, MO 1:24K Quadrangle

FIGURE A-2
USGS TOPOGRAPHIC MAP

COBEY CREEK
LEE'S SUMMIT, MISSOURI

HABITAT ARCHITECTS



NORTH

0 400 800

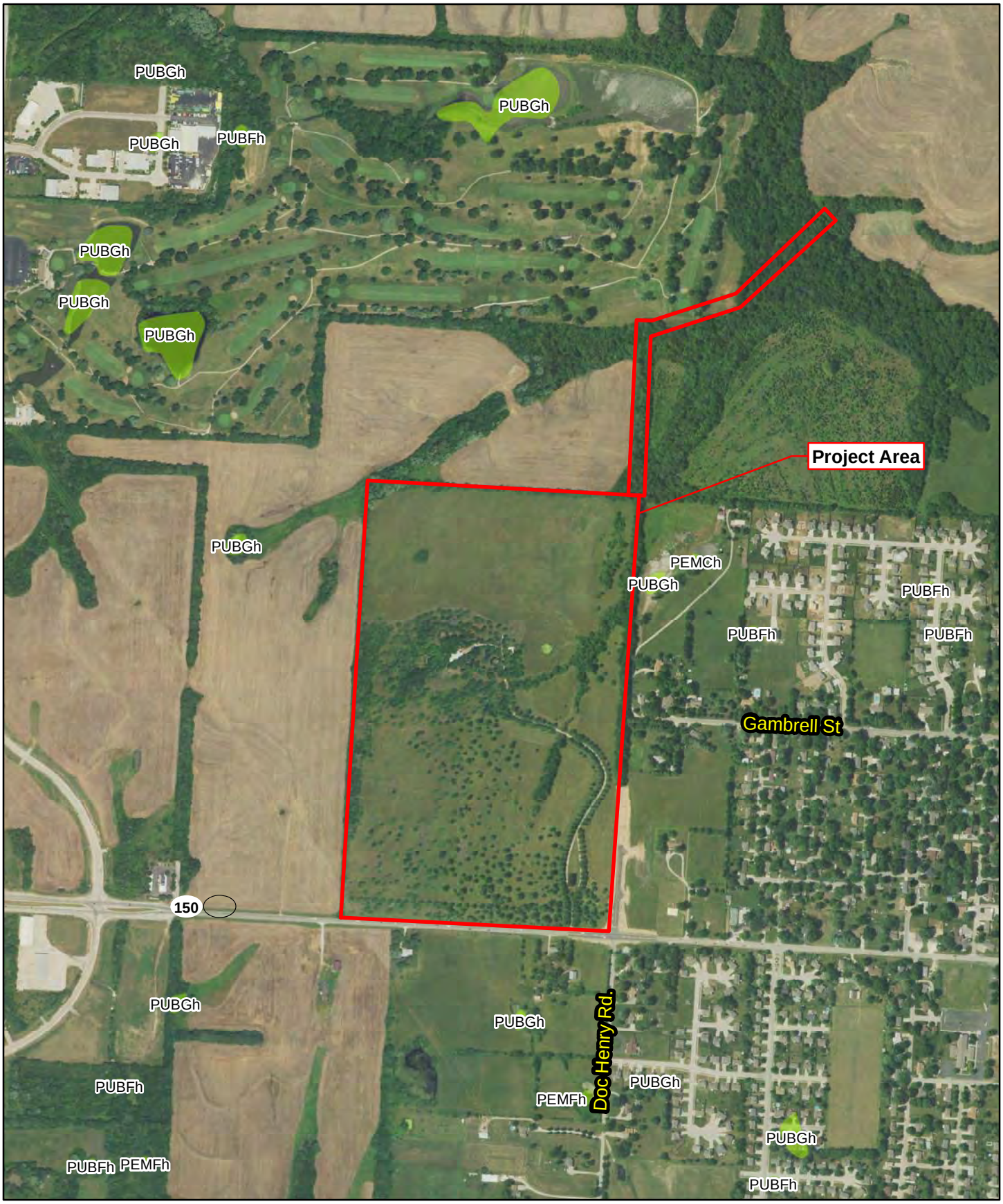
1 in. = 800 ft.

Source: Jackson County Soil Survey
Location: SE 1/4 of Sec 29 - T47N - R31W, Jackson County, MO
Pleasant Hill, MO 1:24K Quadrangle

FIGURE A-3
SOILS MAP

COBEY CREEK
LEE'S SUMMIT, MISSOURI

HABITAT ARCHITECTS



NORTH

0 400 800

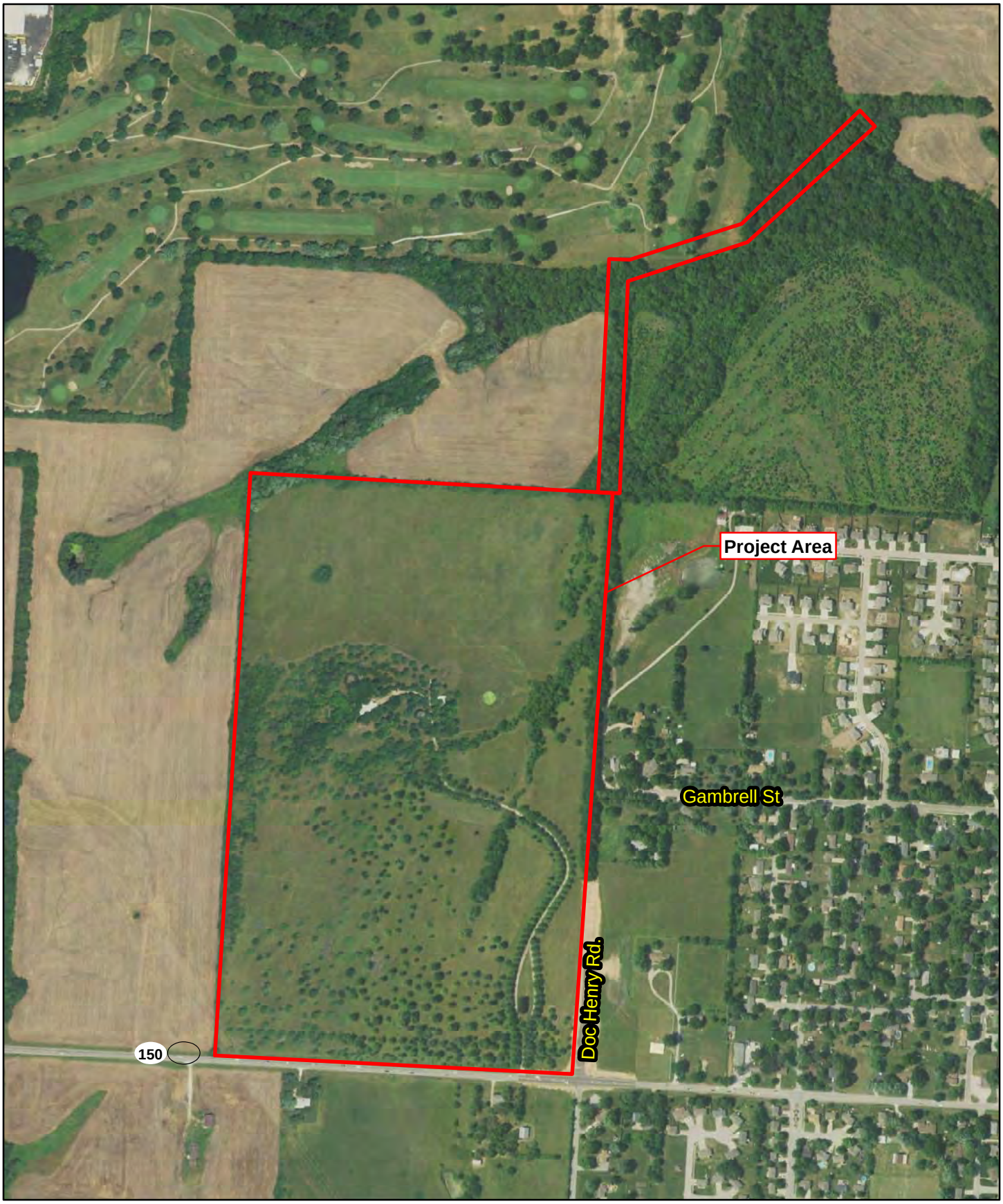
1 in. = 800 ft.

Source: U.S. Fish & Wildlife Service
Location: SE 1/4 of Sec 29 - T47N - R31W, Jackson County, MO
Pleasant Hill, MO 1:24K Quadrangle

FIGURE A-4
NATIONAL WETLAND INVENTORY MAP

COBEY CREEK
LEE'S SUMMIT, MISSOURI

HABITAT ARCHITECTS



NORTH

0 375 750

1 in. = 600 ft.

Source: NAIP 2016
Location: SE 1/4 of Sec 29 - T47N - R31W
Pleasant Hill, MO 1:24K Quadrangle

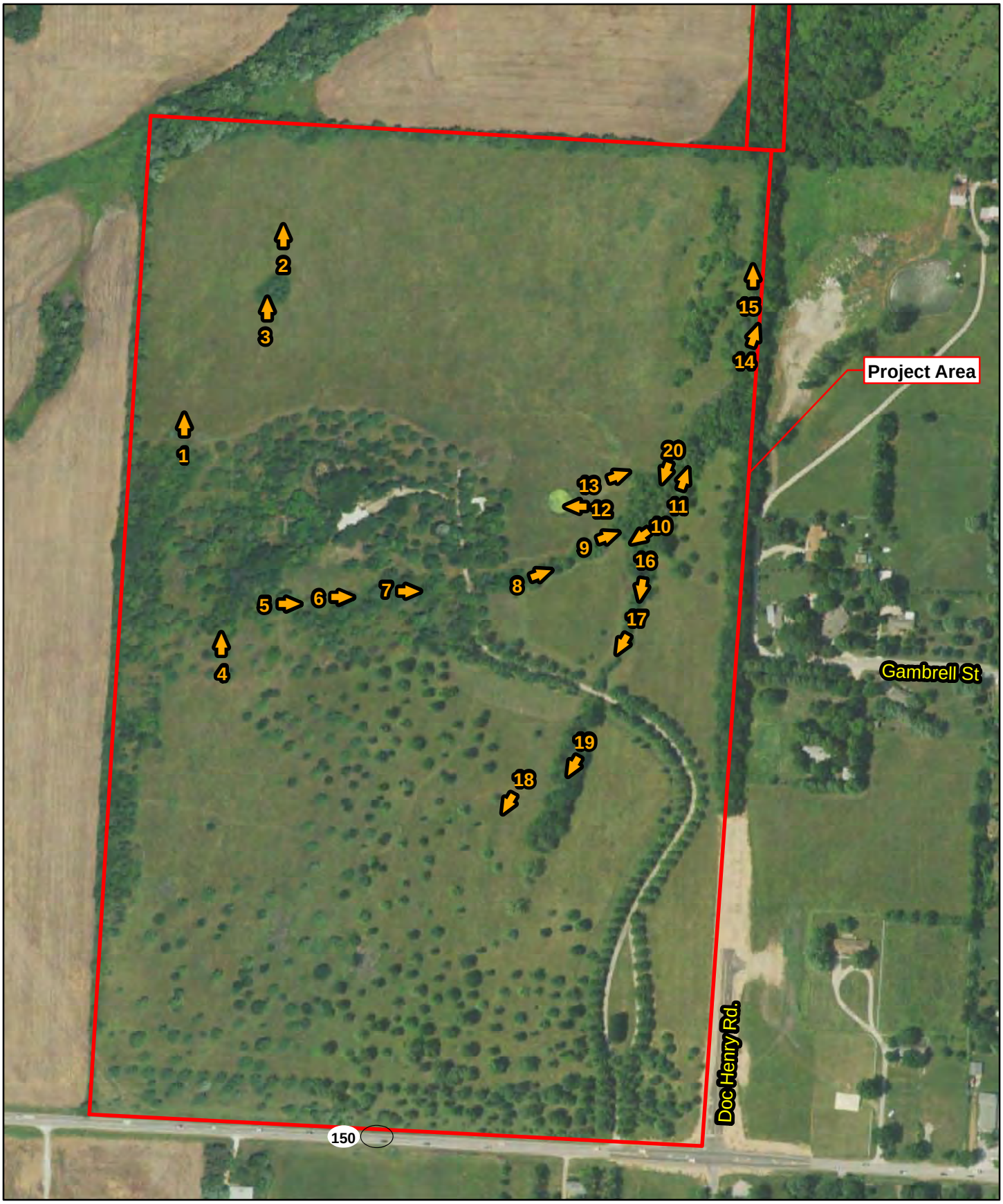
FIGURE A-5
AERIAL MAP

COBEY CREEK
LEE'S SUMMIT, MISSOURI

HABITAT ARCHITECTS

Appendix B – Photo Log

Figure B-1: Photo Locations Map
Photo Log



NORTH

0 175 350

1 in. = 350 ft.

Source: NAIP 2016
Location: SE 1/4 of Sec 29 - T47N - R31W
Pleasant Hill, MO 1:24K Quadrangle

FIGURE B-1
PHOTO LOCATION MAP

COBEY CREEK
LEE'S SUMMIT, MISSOURI

HABITAT ARCHITECTS

Photo No.	Photo Dir.	Date	Description:
1	N	4/11/17	Looking north across the property.

Photo No.	Photo Dir.	Date	Description:
2	N	4/11/17	Looking north below a small isolated patch of trees.

Photo No.	Photo Dir.	Date	Description:
3	N	4/11/17	Looking north at a patch of trees.

Photo No.	Photo Dir.	Date	Description:
4	E	4/11/17	Looking at the open water OW-1.

Photo No.	Photo Dir.	Date	Description:
5	E	4/11/17	Looking down the vegetated swale S-1.

Photo No.	Photo Dir.	Date	Description:
6	E	4/11/17	Looking down the vegetated swale S-1.

Photo No.	Photo Dir.	Date	Description:
7	E	4/11/17	Looking down the vegetated swale S-1.

Photo No.	Photo Dir.	Date	Description:
8	E	4/11/17	Looking down the vegetated swale S-1 just after it exits a culvert under a private drive.

Photo No.	Photo Dir.	Date	Description:
9	E	4/11/17	Looking down the vegetated swale S-1 at the point in which it becomes a tributary.

Photo No.	Photo Dir.	Date	Description:
10	E	4/11/17	This photo depicts the location where S-1 becomes a tributary and enters Non-RPW-1.

Photo No.	Photo Dir.	Date	Description:
11	N	4/11/17	Looking down Non-RPW-1.

Photo No.	Photo Dir.	Date	Description:
12	W	4/11/17	Looking across an open water sewage lagoon.

Photo No.	Photo Dir.	Date	Description:
13	NE	4/11/17	Looking northeast from the sewage lagoon.

Photo No.	Photo Dir.	Date	Description:
14	N	4/11/17	Debris in Non-RPW-1.

Photo No.	Photo Dir.	Date	Description:
15	NE	4/11/17	Depicts where Non-RPW-1 leaves the property.

Photo No.	Photo Dir.	Date	Description:
16	S	4/11/17	Looking S along Non-RPW-1.

Photo No.	Photo Dir.	Date	Description:
17	S	4/11/17	Looking south along the vegetated swale S-2.

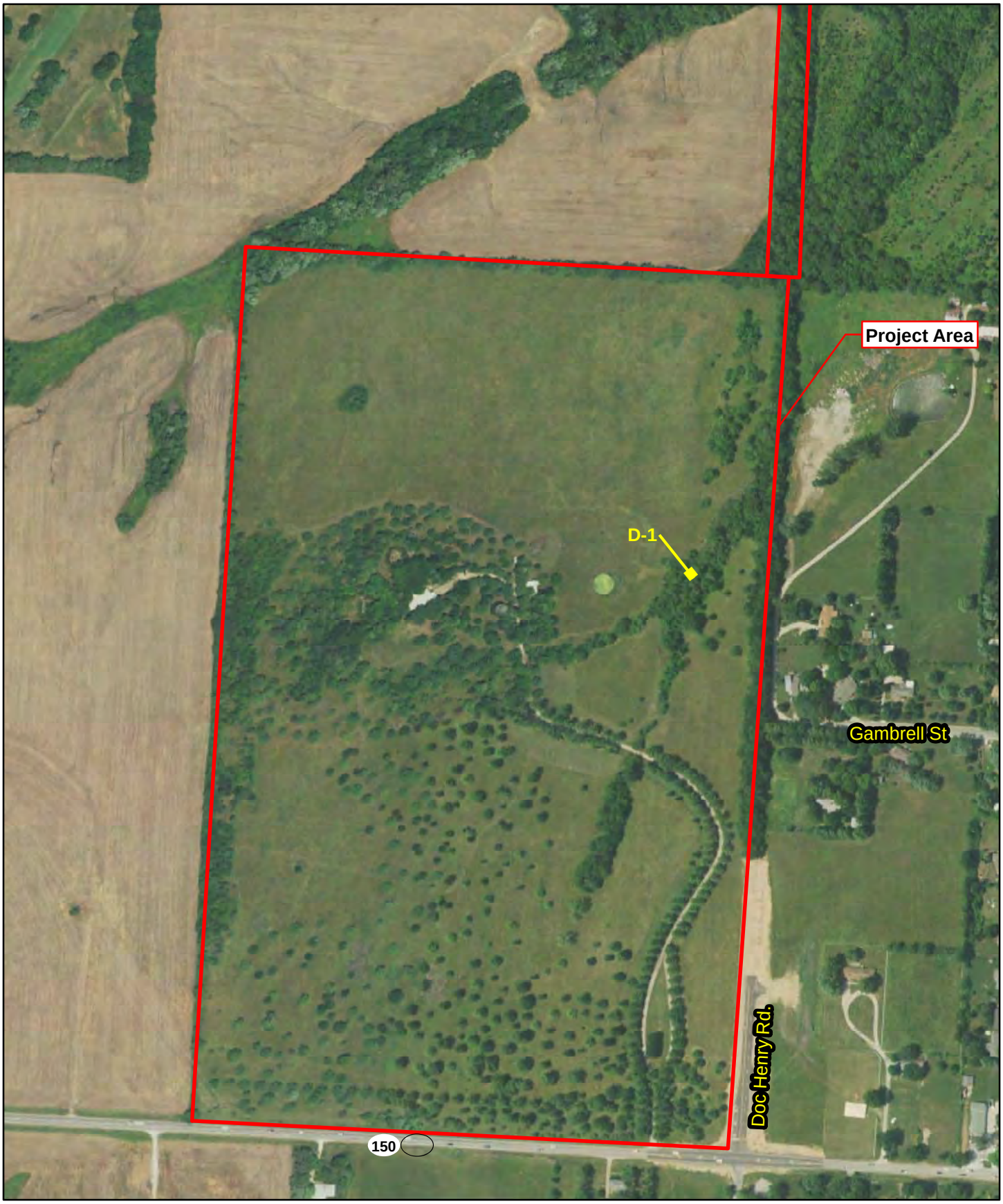
Photo No.	Photo Dir.	Date	Description:
18	SW	4/11/17	Looking SW up-gradient from Swale S-2.

Photo No.	Photo Dir.	Date	Description:
19	SW	4/11/17	Considerable debris in S-2.

Photo No.	Photo Dir.	Date	Description:
20	S	4/11/17	Emergent wetland W-1.

Appendix C – Data Sheets

Figure C-1: Data Points Map
Data Sheets



NORTH

0 200 400

1 in. = 400 ft.

Source: NAIP 2016
Location: SE 1/4 of Sec 29 - T47N - R31W
Pleasant Hill, MO 1:24K Quadrangle

FIGURE C-1
DATA POINTS MAP

COBEY CREEK
LEE'S SUMMIT, MISSOURI

HABITAT ARCHITECTS

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Cohey Creek City/County: Jackson Sampling Date: 4/11/17

Applicant/Owner: JCM Development State: MO Sampling Point: D-1

Investigator(s): SWT Section, Township, Range: S29, T47N, R31W

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

Slope (%): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Sampsel silty clay loam NWI classification: N/A

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are 'Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ 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 _____	Is the Sampled Area within a Wetland? Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30x30)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix nigra	20	Y	OBL
2. Ulmus rubra	5	Y	FAC
3.			
4.			
5.			
	25	= Total Cover	
Sapling/Shrub Stratum (Plot size: 30x30)			
1. Cornus drummondii	20	Y	FAC
2.			
3.			
4.			
5.			
	20	= Total Cover	
Herb Stratum (Plot size: 10x10)			
1. Poa pratensis	80	Y	FAC
2. Elymus virginicus	5	N	
3. Carex spp.	20	Y	FACW
4. Solidago	5	N	
5. Lamium amplexicaule	2	N	
6.			
7.			
8.			
9.			
10.			
	112	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2. N/A			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species _____	x 1 =	_____
FACW species _____	x 2 =	_____
FAC species _____	x 3 =	_____
FACU species _____	x 4 =	_____
UPL species _____	x 5 =	_____
Column Totals: _____ (A)		_____ (B)

Prevalence Index = B/A = _____

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 _____

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

Woody veg. only at edge with wet/upland

SOIL

Sampling Point: D-1

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	7.5YR 2.5/1	100						Silty Clay Loam
12-16	5YR 3/2	95	5YR 4/6	5	D	M		Silty Clay Loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ 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)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

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 ✓ Depth (inches): _____

Water Table Present? Yes ___ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 6

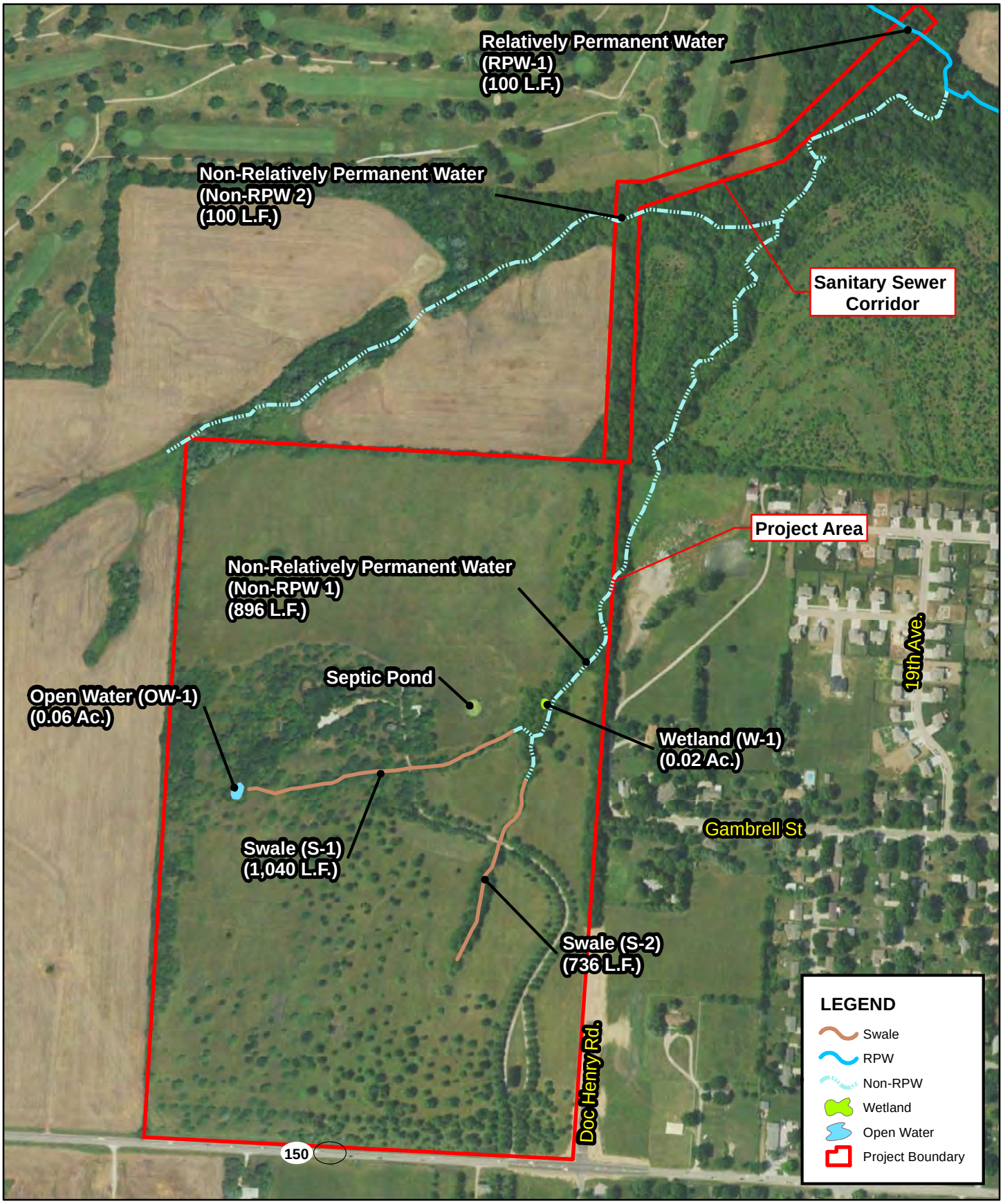
Wetland Hydrology Present? Yes ✓ No ___

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

Remarks:

Appendix D – Jurisdictional Resources

Figure D-1: Water Resources Map
Figure D-2: Waters of the U.S. and Wetland Delineation Map



NORTH

0 250 500

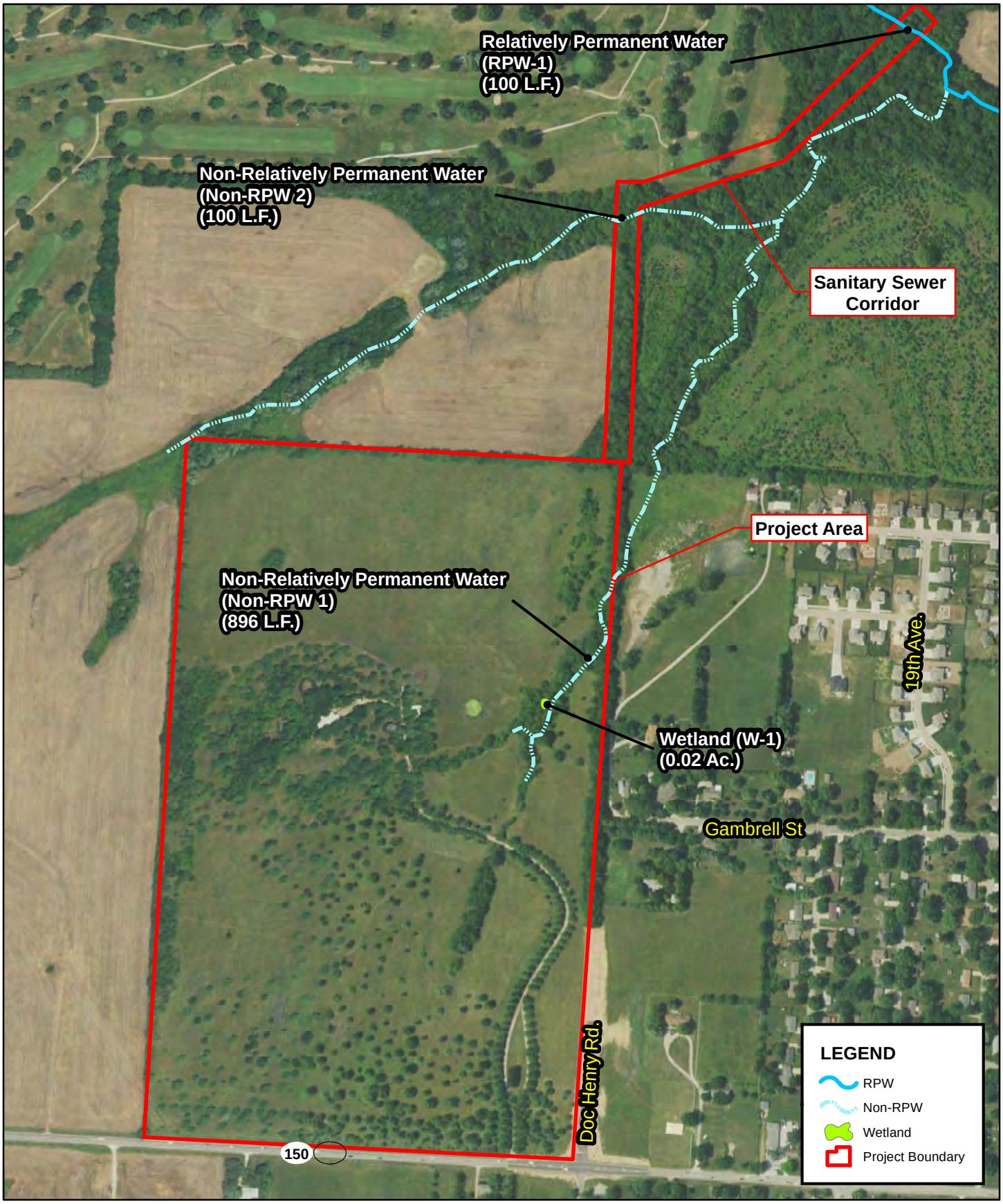
1 in. = 500 ft.

Source: NAIP 2016
Location: SE 1/4 of Sec 29 - T47N - R31W
Pleasant Hill, MO 1:24K Quadrangle

FIGURE D-1
WATER RESOURCES MAP

COBEY CREEK
LEE'S SUMMIT, MISSOURI

HABITAT ARCHITECTS



NORTH

0 250 500

1 in. = 500 ft.

Source: NAIP 2016
Location: SE 1/4 of Sec 29 - T47N - R31W
Pleasant Hill, MO 1:24K Quadrangle

FIGURE D-2
WATERS OF THE U.S. and WETLAND DELINEATION MAP

COBEY CREEK
LEE'S SUMMIT, MISSOURI

HABITAT ARCHITECTS