Alliance Consulting, Inc.
Engineers • Constructors • Scientists

CONSERVATION PLAN

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

HEADGATE 4/5 VENTILATION SHAFTS SITE
MONTGOMERY COUNTY, ILLINOIS

Prepared for

HILLSBORO ENERGY, LLC
MONTGOMERY COUNTY, ILLINOIS

ALLIANCE PROJECT NO. B19-243-1413
OCTOBER 2019
REVISED JANUARY 2020
REVISED APRIL 2020

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Illinois Department of Natural Resources
CONSERVATION PLAN
(Application for an Incidental Take Authorization)
Per 520 ILCS 10/5.5 and 17 Ill. Adm. Code 1080

PROJECT APPLICANT:	Hillsboro Energy
PROJECT NAME:	Headgate 4/5 Ventilation Shafts Site
COUNTY:	Montgomery
AMOUNT OF IMPACT AREA:	6.18 acres total (Temporary Impacts)

1. Likely Impacts

A. Area to be Affected

Hillsboro Energy LLC (Hillsboro) is proposing to install a mine facility for two (2) ventilation shafts, turbine pumps, an access road, and waterline for Deer Run Mine in Montgomery County, Illinois. This project originates approximately 0.76 miles south of the junction N 9th Ave and the Union Pacific railroad located northwest of Coffeen (Drawing No. B19-243-A1). Specifically, the project is located in Township 8N, Range 3W, Sections 22 and 27 (Figures; Drawing No. B19-243-A1 and Attachment B; Land Tract Identification Map).

Land ownership for the proposed project is primarily owned by the Illinois DNR (IDNR). Hillsboro is working on a license agreement with IDNR that will allow for surface land use for the proposed project. A small portion of the proposed project area is owned by New River Realty, which Hillsboro energy has a surface land use agreement with (This can be found on the surface deed to New River Realty and the land ownership map in Attachment B.). Additionally, copies of land use agreements will be provided to the IDNR once finalized.

The action area for this conservation plan would include the entire project area, which consists of two pads, a waterline, two turbine pumps, and an access road serving two (2) locations. Access to this location will occur via a previously permitted area that has access from N 9th Ave.

B. Biological Data on Affected Species

This Conservation Plan has been prepared in accordance with the Illinois Endangered Species Protection Act (520 ILCS 10/5.5 and 17 Ill. Adm. Code 1080) in support of an Incidental Take Authorization (ITA) application to the IDNR. The purpose of this Conservation Plan is to review the proposed Project in sufficient detail to determine to what extent the proposed action may result in "incidental take" of the ornate box turtle (*Terrapene ornata*), a state-listed threatened species.

A desktop and field habitat assessment were performed for the project area. Prior to the field investigation, several data sources were consulted to identify areas of potential habitat for the ornate box turtle. These data sources included:

- USA Topographic Map (Figures; Drawing No. B19-243-A1)

- Recent aerial photography (Figures; Drawing No. B19-243-A2)
- Endangered and Threatened Species Occurrence information from IDNR (Figures; Drawing No. B19-243-A3)
- Natural Resources Conservation Service (NRCS) soils data for Montgomery County, Illinois (Figures; Drawing No. B19-243-A4)

Species Appearance

The ornate box turtle is a terrestrial turtle that is distributed statewide in Illinois (U.S. ACOE, 2018). The ornate box turtle has a high-domed, oval carapace that flattens at the top with a discontinued, yellow mid-dorsal stripe. The carapace is a dark brown with yellowish lines that radiate outward. A hinged plastron can be used to draw in its soft parts (USFS, 2006).

Species Behavior

Ornate box turtles spend a large amount of time underground in burrows, which are used for hibernation and resting. Ornate box turtles will emerge in the early morning, basking until a body temperature appropriate for foraging is reached, then the ornate box turtle will forage as an opportunistic feeder until temperatures become too high (Ernst and Lovich, 2009). Once temperatures become too high, the ornate box turtle will retreat to cooler, shadier areas until temperatures cool down enough for a second foraging period. The length of many ornate box turtle activities, which consist of basking, foraging, and resting, are affected by environmental temperatures (Ernst and Lovich, 2009). The range of an individual ornate box turtle was found to be approximately five acres (Legler, 1960).

Species Occurrence Within and Near Project Area

The state threatened ornate box turtle was last found within the proposed action area on 6-16-18 (Illinois Natural Heritage Database). This occurrence was centered in soil map unit 113B. The project area contains 0.473 acres of this soil map unit (113B). This unit is a low slope silt loam that is not eroded. There are two (2) other species occurrences near the project area. One (1) occurrence is approximately 350 feet away from the project area and is in Soil Map Unit 882B2, which is a silt loam that is eroded, and in Soil Map Unit 113B2, which is a silt loam that is also eroded. The other occurrence is approximately 1,700 feet away, and is mainly situated within Soil Unit 113B and 8D which is a silt loam.

Habitat Characteristics

Ornate box turtles have preference for “sand prairie or shrubby border to sand prairie habitats” (Bernstein et al, 2007). However, ornate box turtles can be found in southern till plain prairies and open fields that were former prairies (INHS). The project area does not contain sandy soils but is part of the southern till plain prairies.

Habitat Assessment for Project Area

Suitable habitat for the ornate box turtle can be found in the southern till plains of Illinois. The known occurrence of the ornate box turtle was in soil map unit 113B, which has a landform

setting of till plains. Similarly, soil map unit 7C2 has a landform setting of till plains though this unit is eroded. These soil types may be sufficient for ornate box turtle habitat since the unconsolidated material of a till plain would accommodate their burrows.

C. Description of Project Activities

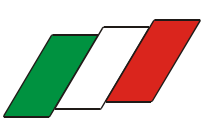
Project Description

This project will provide necessary ventilation for the Deer Run Mine. Ventilation is necessary to provide adequate levels of oxygen within the mine via fresh air flow in, while also providing a suitable path for depleted air, gases, and dust to vent. The location and dimensions of the ventilation shafts were determined by air flow calculations that consider specifications of the particular mine, as well as compliance with regulations put forth by the Mine Safety and Health Administration (MSHA) to ensure adequate air quality for the health and safety of mine workers.

Hillsboro is proposing the installation of two (2) ventilation sites within the Incidental Boundary Revision (IBR) area. Each site will consist of a bleeder shaft with concrete pad for a ventilation fan and a temporary drill pit/ subsoil stockpile, a borehole for a vertical turbine pump (VTP) with a concrete pad and a temporary drill pit/ subsoil stockpile, two (2) utility boreholes, a gravel work yard, and a topsoil stockpile. Additionally, a gravel access road connecting each site with the main road, a waterline, and temporary topsoil storage will be required. The proposed area of impact was determined to include the entire IBR area (Permit 399, IBR 14), which was permitted for. This was to include any potential for incidental take of the ornate box turtle throughout the entire project.

The bleeder shafts (a total of two for the project) will be 30 inches in diameter. The VTP boreholes (a total of two for the project) will be 16 inches in diameter. The utility boreholes (a total of four for the project – two at each site) will be 10 inches in diameter. Each borehole and shaft will be fully cased with steel pipe, will be installed to a depth of approximately 525 feet, and will be fully grouted in place. All openings will be protected to prevent entry to the mine workings by wildlife, livestock, people, and/or machinery. The surface casing will be high enough above ground to prevent drainage from entering the hole, groundwater, or surface water. Each borehole and shaft will be permanently sealed within 60 days of becoming inactive. Each borehole will be plugged during reclamation by filling it to the top with neat cement and cutting the steel casing to at least five feet below the natural soil level. Each shaft will be filled with MSHA approved material and have a minimum of 1-foot concrete cap five feet below the regrade surface contour. The concrete pads (a total of two for the project) for the bleeder shafts will each be 16′ x 48′ x 2′. The concrete pads (a total of two for the project) for the VTP boreholes will each be 10′ x 10′ x 1′.

The access road will consist of 3,080-foot-long gravel road that is 15 feet wide. There is an existing road on the property that will be upgraded where necessary. The gravel road will be left in place after reclamation, at the request of the landowner. The road will serve as an improvement to facilitate landowner′s access and will be considered a permanent impact. A 12-inch HDPE SDR-17 waterline that extends approximately 7,500 feet will also be installed and buried to a minimum depth of five (5) feet. There is potential in electrical and communication wires being buried in the same ditch. The waterline will be capped and left in place during reclamation.



Two (2) gravel work yards are proposed. The northern gravel work yard is proposed to be 0.90 acres, while the southern gravel work yard is proposed to be 0.80 acres. There are two (2) proposed areas for topsoil storage. There is also proposed temporary topsoil storage alongside the access road. If excessive water or wind erosion is identified, then temporary seeding and mulching or erosion barriers may be utilized around the stockpiles. Once mining activity has finished at the site, equipment on the surface will be removed, as well as concrete pads, and the topsoil will be replaced. Regarding any heavy equipment use related to reclamation, the biological monitor will be present. The area will then be revegetated. Please refer to Map 3A, Map 3B, and Map entitled "Permanent Access Road" in the "Figures" section of this application for more information on the specification and locations of project features.

Actions to be taken in order to avoid compaction include completing seeding shortly after soil placement to eliminate the need for soil preparation. Should this not be achieved, mechanical preparation of the soil may be completed by using harrows, disks, or chisel plows to loosen the top 3-4 inches of soil. Should permanent seeding not be completed soon after topsoil placement, temporary seeding may be completed. Mulch is anticipated to be straw free of weeds that is placed or blown across the seeded area and mechanically or chemically anchored. Should temporary vegetation be implemented, prior to seeding of the area, the upper 3-4 inches of soil will be loosened utilizing mechanical equipment such as harrows, disks, or chisel plows, if needed. Final soil preparation and seeding will occur when weather conditions allow for the best germination of the permanent seeding. Please refer to the planting attached tables found in Attachment D of this application for more detail on cover crop and reclamation proposed seed species and seeding rates.

Timeline of Proposed Activities

The specific project timeline is to be determined. Construction would begin, tentatively, on August 1, 2020. A tentative timeline would require approximately 8-12 weeks of construction. The duration of this permit would be five (5) years, which would be sufficient time for construction, operation, maintenance, and reclamation for listed species. Another vent shaft will be installed; however, this location is unable to pinpointed at this time.

D. Adverse Effects on Listed Species

Habitat disturbance and mortality of the ornate box turtle are the main adverse effects that could occur due to this project. Mortality may occur from project-related activities or encounters with vehicles and/or equipment. Soil disturbing activities may disturb or alter habitats and/or burrows. The burrows would be difficult to identify since they occur underground. However, impacts caused by this project are temporary so habitat disturbance would be limited.

2. Minimization, Mitigation, and Funding

A. Number of Individuals Taken and Amount of Habitat Affected

Since the project will utilize vehicles/construction equipment and ornate box turtles are relatively small, it is difficult to quantify how many individuals would be at risk for taking. However, ornate box turtles are typically solitary, which may limit the number of individuals, if any, that are taken. Given that the range of the ornate box turtle has been documented to be approximately

five acres, it is possible that one to two individuals could be present during construction of the site.

B. Management

Once the project is completed the project area will be reseeded to reestablish suitable habitat. Post-mining land use will mimic pre-mining land use. The area will be returned to Fish and Wildlife Habitat-Herbaceous with an enhanced access road. Stockpile areas will be revegetated after the initial disturbance with a cover crop to minimize erosion.

The entire disturbed area will be graded for positive drainage. During the reclamation work, topsoil will be removed and stored during initial site construction, then redistributed and graded over the exposed subsoil. The topsoil will be limed, fertilized, and prepared and seeded in accordance with the following schedule: If the site is reclaimed in the spring season, but before normal planting season, the disturbed area will be straw mulched at 1.5 ton/acre and seeded with a cover crop of spring oats to protect the soil until the primary planting season is underway. If the site is reclaimed in the late fall season, the site will be seeded to a temporary cover crop of winter wheat (+/- 1.5 Bu./Ac.) and the site fertilized. The site would then be mulched at two tons/acre to protect the soil over the winter season.

Thereafter, the planting of managed Fish and Wildlife-Herbaceous activities will fall into the regular rotation and planting according to the management plan of the landowner. Please refer to the planting tables found in Attachment D of this application for more detail on cover crop (temporary) and reclamation (permanent) proposed seed species and seeding rates.

C. Measures to Avoid, Minimize, and Mitigate

A biologic monitor will be present while work is commencing in areas of potential habitat for the ornate box turtle. Additionally, informative materials will be provided to the work crews outlining identification, habitat requirements, active and inactive periods, and general information for the ornate box turtle.

Furthermore, a speed limit of 5 mph will be enforced of all workers on site to increase visibility and reduce potential for accidental injury or take caused by vehicles and work equipment. Exclusionary fencing will also be in placed around the entire facility to exclude the ornate box turtle from dangerous areas where work is commencing and be left in place during all construction activities. A biological monitor will also be inspecting the exclusion fencing for any necessary repairs. Any ornate box turtles found within the exclusion fencing will be relocated directly outside the fencing exclusively on the western side of the IBR; however, the survey protocol will be coordinated with the IDNR.

In order to mitigate for the ornate box turtle Hillsboro Energy is proposing to utilize a 64 acre property adjacent to the IBR that has been deemed potential ornate box turtle habitat by the IDNR. By utilizing this property Hillsboro exceeds the 5.5:1 ratio for endangered species habitat. This property was donated to the Illinois Department of Natural Resources with Hillsboro Energy reserving the mineral rights underneath the property. The mitigation area will provide protection to the ornate box turtle in perpetuity; therefore, no additional shafts, access roads, or other structures will be established within the mitigation area. It has been estimated that the property is worth approximately $4,500 per acre making the 64 acre property worth about $288,000.

D. Post Project Monitoring

Post-mining land use will mimic pre-mining land use. The project area will be monitored, which will include monitoring the vegetation and the reclamation of the project area, as well as presence/absence surveys and habitat assessment for the ornate box turtle. The presence/absence surveys will be conducted by Alliance biologists. This will be done by walking transects over the IBR area and removing all ornate box turtles from inside the IBR to directly outside the exclusionary fencing on the western side of the IBR. The area will be returned to Fish and Wildlife Habitat-Herbaceous with an enhanced access road. Thereafter, the planting of managed Fish and Wildlife-Herbaceous activities will fall into the regular rotation and planting according to the management plan of the landowner. Post construction surveys will be conducted in the project area and on adjacent IDNR lands to determine whether the species is still present.

E. Adaptive Management

Adaptive management will allow Hillsboro Energy to adjust its actions to reflect new information and/or changing conditions in order to minimize take of the ornate box turtle and conserve potential habitat.

A biologic monitor will be present to ensure Hillsboro Energy can react quickly and accommodate any unforeseen circumstances that may occur.

If any turtles are injured as a result of work done during this project, the Biologic Monitor will be contacted. In the event the listed species is injured during work, then work will cease and direct coordination with IDNR will ensue. Arrangements will be made to transport individual to a licensed wildlife rehabilitator, if feasible.

F. Funding

Funding for the implementation of the measures outlined in this conservation plan will be accounted for in Hillsboro Energy's overall budget for the Headgate 4/5 Ventilation Shafts Site project.

3. Alternative Actions

The proposed project is necessary for ventilation of the Deer Run Mine. The location of the project area is specific and determined by the underlying mine as well as necessary air flow calculations required for compliance with safety measures. Due to the nature of this project, the only alternative aside from the preferred alternative is no action alternative which would result in the potential abandonment of the mining plan in this location.

A. Preferred Alternative

The preferred alternative is outlined in the "Project Description" section of this conservation plan. The activities for this alternative are outlined in the "timeline of activities" section of this conservation plan.

B. No Action Alternative

The no action alternative would go against safety standards pertaining to the mine and would result in an inability to properly ventilate the mine which would result in the abandonment of mining at this location. The locations for the ventilation shafts were strategically determined to optimize ventilation and meet safety standards.

4. Survival of Species

Take of the ornate box turtle is estimated to be from 1 to 2 individuals, but is not anticipated to reduce the overall survival or recovery of the species, the community of which it is a part, or essential habitat for the following reasons:

- Estimated potential take of the ornate box turtle is low (1-2). The low number of individuals that may be affected is unlikely to impact the overall survival or recovery of the species.
- A biological Monitor will be onsite to implement and oversee conservation measures to avoid and/or minimize direct effects to the species during construction, particularly measures to locate and remove turtles from the construction work area with oversight by IDNR biologists.
- The project area is only 6.18 acres, and the duration of impacts is short and will be followed by restoration of habitat. This will make the area available to the ornate box turtle again.

5. Implementing Agreement

A. Names and Signatures

Hillsboro Energy LLC (Applicant)

Clayton Cross, P.E.
Manager of Engineering
Patton Mining, LLC

Clyton Cross, Authorized Person
Signature

Illinois Department of Natural Resources (Regulator)

B. Obligations and Responsibilities

The Illinois Department of Natural Resources is responsible for the review of this Conservation Plan and for the subsequent issuance of an Incidental Take Authorization. Hillsboro Energy, LLC is responsible for biological monitoring, coordination with IDNR, and funding related to the project.

C. Certification that Each Participant has Legal Authority

This project will be funded solely by Hillsboro Energy, LLC, and there is no state or federal funding for this project. However, the IDNR has ownership of the land on which the project is proposed to occur (see Attachment B for mapping).

D. Assurance of Compliance

Hillsboro will adhere to all federal and state environmental laws in association with the planning and execution of this project.

E. Copies of Federal Authorizations Already Obtained

No incidental take authorizations have been issued at this time. This project will be associated with Permit No. 399, IBR 14.

References

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ATTACHMENT A

SOIL REPORT

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Montgomery County, Illinois

July 15, 2019

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

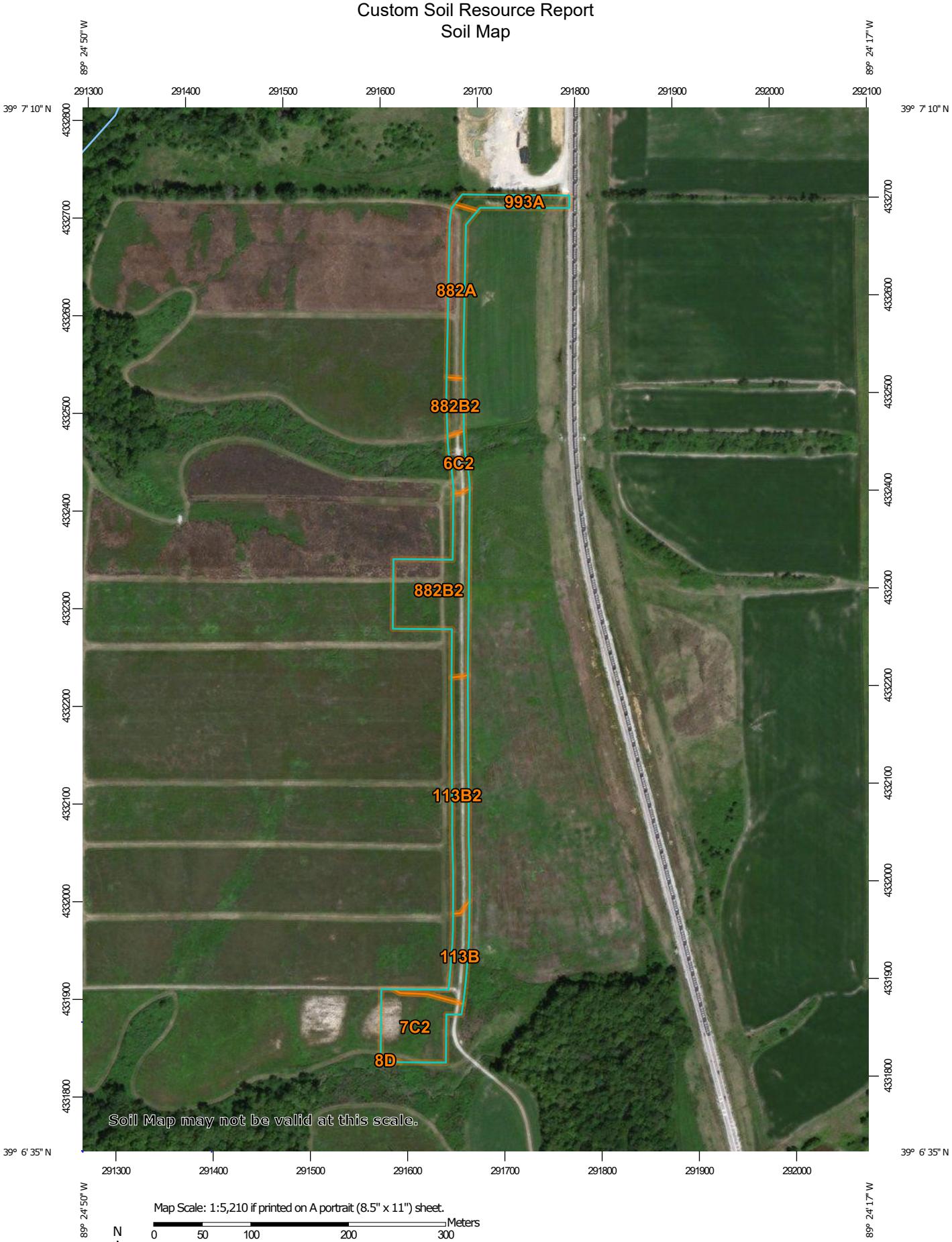
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:5,210 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 250 500 1000 1500

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Montgomery County, Illinois
Survey Area Data: Version 15, Sep 12, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 6, 2013—Sep 20, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
6C2	Fishhook silt loam, 5 to 10 percent slopes, eroded	0.3	4.1%
7C2	Atlas silt loam, 5 to 10 percent slopes, eroded	1.2	19.7%
8D	Hickory silt loam, 10 to 18 percent slopes	0.0	0.2%
113B	Oconee silt loam, 2 to 5 percent slopes	0.5	7.5%
113B2	Oconee silt loam, 2 to 5 percent slopes, eroded	1.0	16.1%
882A	Oconee-Darmstadt-Coulterville silt loams, 0 to 2 percent slopes	0.8	12.2%
882B2	Oconee-Darmstadt-Coulterville silt loams, 2 to 5 percent slopes, eroded	2.1	34.1%
993A	Cowden-Piasa silt loams, 0 to 2 percent slopes	0.4	6.1%
Totals for Area of Interest		**6.2**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the

scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Montgomery County, Illinois

6C2—Fishhook silt loam, 5 to 10 percent slopes, eroded

Map Unit Setting

National map unit symbol: y5bd
Elevation: 350 to 1,020 feet
Mean annual precipitation: 37 to 45 inches
Mean annual air temperature: 48 to 57 degrees F
Frost-free period: 180 to 200 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Fishhook and similar soils: 90 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fishhook

Setting

Landform: Hillslopes on ground moraines
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Head slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loess over paleosol formed in till

Typical profile

H1 - 0 to 6 inches: silt loam
H2 - 6 to 32 inches: silty clay loam
H3 - 32 to 51 inches: clay loam
H4 - 51 to 80 inches: clay loam

Properties and qualities

Slope: 5 to 10 percent
Depth to restrictive feature: 20 to 39 inches to densic material
Natural drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Available water storage in profile: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Hydric soil rating: No

7C2—Atlas silt loam, 5 to 10 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2tp1z
Elevation: 330 to 840 feet
Mean annual precipitation: 38 to 46 inches
Mean annual air temperature: 54 to 58 degrees F
Frost-free period: 180 to 195 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Atlas, eroded, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Atlas, Eroded

Setting

Landform: Till plains
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Head slope, side slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Loess over paleosol formed in till

Typical profile

Ap - 0 to 7 inches: silt loam
2Btg1 - 7 to 29 inches: silty clay loam
2Btg2 - 29 to 79 inches: silty clay loam

Properties and qualities

Slope: 5 to 10 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.01 to 0.06 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 2.0
Available water storage in profile: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Ava, eroded

Percent of map unit: 10 percent
Landform: Hillslopes, ridges
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: No

8D—Hickory silt loam, 10 to 18 percent slopes

Map Unit Setting

National map unit symbol: 2tjpr
Elevation: 50 to 820 feet
Mean annual precipitation: 36 to 48 inches
Mean annual air temperature: 50 to 57 degrees F
Frost-free period: 165 to 190 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Hickory and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hickory

Setting

Landform: Ground moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy till

Typical profile

A - 0 to 3 inches: silt loam
E - 3 to 10 inches: loam
Bt1 - 10 to 35 inches: clay loam
Bt2 - 35 to 42 inches: clay loam
Bt3 - 42 to 60 inches: clay loam

Properties and qualities

Slope: 10 to 18 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Marseilles

Percent of map unit: 3 percent
Landform: Ground moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Atlas

Percent of map unit: 3 percent
Landform: Ground moraines
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope, head slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Radford

Percent of map unit: 1 percent
Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Frondorf

Percent of map unit: 1 percent
Landform: Ground moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Ava

Percent of map unit: 1 percent
Landform: Ridges
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex

Across-slope shape: Convex
Hydric soil rating: No

Rozetta

Percent of map unit: 1 percent
Landform: Ground moraines
Landform position (two-dimensional): Backslope, summit, shoulder
Landform position (three-dimensional): Interfluve, side slope, head slope
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

113B—Oconee silt loam, 2 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2tp7z
Elevation: 360 to 840 feet
Mean annual precipitation: 37 to 46 inches
Mean annual air temperature: 50 to 57 degrees F
Frost-free period: 170 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Oconee and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Oconee

Setting

Landform: Till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess

Typical profile

Ap - 0 to 8 inches: silt loam
E - 8 to 16 inches: silt loam
Bt - 16 to 58 inches: silty clay loam
C - 58 to 79 inches: silty clay loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 24 inches

Frequency of flooding: None
Frequency of ponding: None
Sodium adsorption ratio, maximum in profile: 5.0
Available water storage in profile: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Cowden

Percent of map unit: 10 percent
Landform: Flats
Landform position (two-dimensional): Summit
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

113B2—Oconee silt loam, 2 to 5 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wk1k
Elevation: 330 to 820 feet
Mean annual precipitation: 38 to 46 inches
Mean annual air temperature: 54 to 58 degrees F
Frost-free period: 180 to 195 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Oconee, eroded, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Oconee, Eroded

Setting

Landform: Ground moraines
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loess

Typical profile

Ap - 0 to 8 inches: silt loam
Bt - 8 to 58 inches: silty clay loam
C - 58 to 79 inches: silty clay loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 5.0
Available water storage in profile: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Darmstadt, eroded

Percent of map unit: 10 percent
Landform: Ground moraines
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

882A—Oconee-Darmstadt-Coulterville silt loams, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 1vs7j
Elevation: 340 to 1,020 feet
Mean annual precipitation: 37 to 46 inches
Mean annual air temperature: 52 to 57 degrees F
Frost-free period: 170 to 200 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Oconee and similar soils: 40 percent
Darmstadt and similar soils: 29 percent
Coulterville and similar soils: 25 percent
Minor components: 6 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Oconee

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 16 inches: silt loam
H3 - 16 to 47 inches: silty clay loam
H4 - 47 to 65 inches: silty clay loam
H5 - 65 to 80 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Available water storage in profile: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Hydric soil rating: No

Description of Darmstadt

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 11 inches: silt loam
H3 - 11 to 27 inches: silty clay loam
H4 - 27 to 39 inches: silty clay loam
H5 - 39 to 62 inches: silt loam
H6 - 62 to 80 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 8 to 19 inches to natric

Natural drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.01 to 0.06 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 30 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 25.0
Available water storage in profile: Very low (about 2.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D
Hydric soil rating: No

Description of Coulterville

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 15 inches: silty clay loam
H3 - 15 to 23 inches: silty clay loam
H4 - 23 to 56 inches: silty clay loam
H5 - 56 to 80 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 20 percent
Sodium adsorption ratio, maximum in profile: 13.0
Available water storage in profile: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Cowden

Percent of map unit: 3 percent
Landform: Swales
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Piasa

Percent of map unit: 3 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

882B2—Oconee-Darmstadt-Coulterville silt loams, 2 to 5 percent slopes, eroded

Map Unit Setting

National map unit symbol: 1vsds
Elevation: 340 to 1,020 feet
Mean annual precipitation: 37 to 45 inches
Mean annual air temperature: 52 to 57 degrees F
Frost-free period: 170 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Oconee and similar soils: 40 percent
Darmstadt and similar soils: 29 percent
Coulterville and similar soils: 25 percent
Minor components: 6 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Oconee

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit, shoulder
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loess

Typical profile

Ap - 0 to 8 inches: silt loam
Bt1 - 8 to 47 inches: silty clay loam
Bt2 - 47 to 65 inches: silty clay loam
Bt3 - 65 to 80 inches: silt loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Available water storage in profile: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Hydric soil rating: No

Description of Darmstadt

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loess

Typical profile

Ap - 0 to 11 inches: silt loam
Btn1 - 11 to 21 inches: silty clay loam
Btn2 - 21 to 39 inches: silty clay loam
Cng - 39 to 62 inches: silt loam
Cg - 62 to 80 inches: silt loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: 8 to 19 inches to natric
Natural drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.01 to 0.06 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 30 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 25.0
Available water storage in profile: Very low (about 2.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Hydric soil rating: No

Description of Coulterville

Setting

Landform: Ground moraines
Landform position (two-dimensional): Shoulder, summit, backslope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loess

Typical profile

Ap - 0 to 7 inches: silt loam
Btng - 7 to 15 inches: silty clay loam
Btkn - 15 to 68 inches: silty clay loam
2C - 68 to 80 inches: silt loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 20 percent
Sodium adsorption ratio, maximum in profile: 13.0
Available water storage in profile: High (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Cowden

Percent of map unit: 3 percent
Landform: Flats
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Piasa

Percent of map unit: 3 percent
Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave

Hydric soil rating: Yes

993A—Cowden-Piasa silt loams, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2tbs0
Elevation: 330 to 840 feet
Mean annual precipitation: 38 to 46 inches
Mean annual air temperature: 52 to 58 degrees F
Frost-free period: 180 to 195 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Cowden and similar soils: 50 percent
Piasa and similar soils: 48 percent
Minor components: 2 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cowden

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess

Typical profile

Ap - 0 to 8 inches: silt loam
Eg - 8 to 19 inches: silt loam
Btg - 19 to 50 inches: silty clay loam
Cg - 50 to 79 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 17 to 21 inches to abrupt textural change
Natural drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 5.0
Available water storage in profile: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Hydric soil rating: Yes

Description of Piasa

Setting

Landform: Ground moraines, depressions
Landform position (two-dimensional): Summit, toeslope
Landform position (three-dimensional): Interfluve, talf, dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess over silty pedisediment

Typical profile

Ap - 0 to 8 inches: silt loam
Eng - 8 to 12 inches: silt loam
Btng - 12 to 48 inches: silty clay loam
2BCng - 48 to 79 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 11 to 14 inches to natric
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.01 to 0.06 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum in profile: 30 percent
Salinity, maximum in profile: Very slightly saline to slightly saline (2.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 20.0
Available water storage in profile: Very low (about 2.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D
Hydric soil rating: Yes

Minor Components

Darmstadt

Percent of map unit: 2 percent
Landform: Ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve, rise
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

References

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ATTACHMENT B

LAND OWNERSHIP

NEW RIVER ROYALTY
17-22-300-001

NEW RIVER
ROYALTY
17-22-200-007

IDNR
17-22-300-503

IDNR
17-22-300-002

IDNR
17-22-300-003

IDNR
17-22-300-502

IDNR
17-22-300-503

IDNR
17-27-100-503

NEELEY
STEVEN
17-27-100-504

IDNR
17-27-100-502

IDNR
17-27-
200-008

NEW RIVER ROYALTY
17-27-200-015

IDNR
17-27-
200-011

IDNR
17-27-100-004

IDNR
17-27-100-002

IDNR
17-27-
100-502

IDNR
17-27-
200-007

NEELEY
STEVEN
17-27-100-504

KENNETH
BLANKENSHIP
17-27-
400-001

MC CARIO
STEVEN D
17-27-200-507

Legend

- EXISTING DEER RUN PERMITTED AREAS
- PROPERTY LINES
- PROPOSED IBR AREA
- PROPOSED IBR LAND OWNERS
- PROPOSED IBR ADJACENT LAND OWNERS

Property Map

N
W E
S

0 400′ 800′

MAP 2

Hillsboro Energy, LLC
12051 9th Avenue
Hillsboro, IL 62049

Revisions

No	Date	By	No.	Date	By
1			6		
2			7		
3			8		
4			9		
5			10		

HG 4/5 Bleeder Shaft

Drawn By:	BM
Checked By:	JLP
Approved By:	JLP
Date:	11/4/19
Scale:	1"=400'

File Location:
MAP_2_LAND_TRACT_ID_MAP_IBR_HG4-5 DEGAS

ATTACHMENT C

SITE PHOTOGRAPHS

1. Overview of Site - Prior to Disturbance

2. Overview of Site - Facing North

3. Overview of Site - Facing South

4. Vegetation at Site – Facing North

5. Vegetation at Site – Facing South

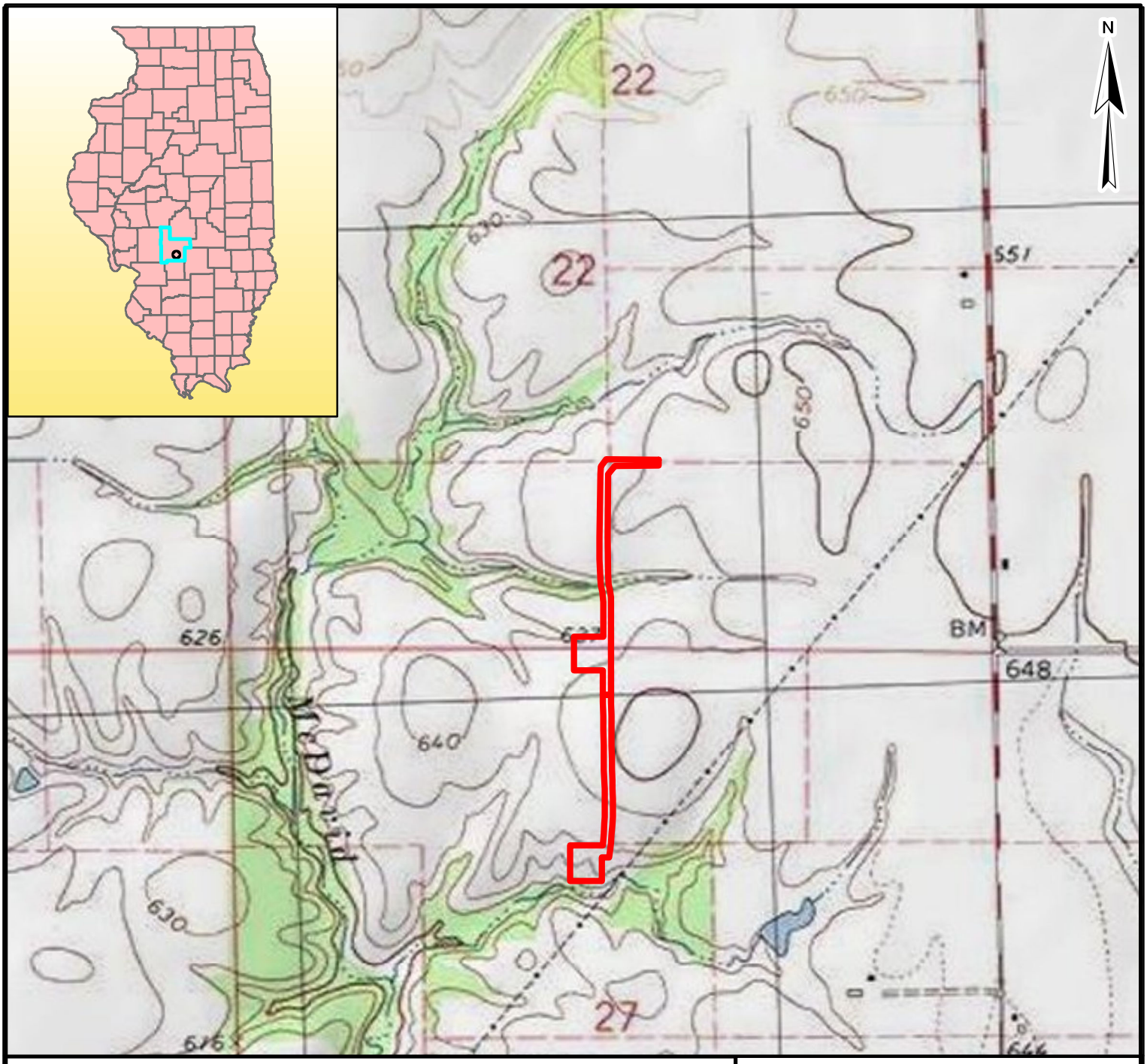
ATTACHMENT D

SEED LISTS

Temporary Vegetation		
Plant Species*	**Seeding Rate PLS**	**Method of Application**
Spring Oats	2.0 bu./acre	Drilled or Broadcast
Virginia Wild Rye	4 (Drilled) or 6 (Broadcast) lbs/acre	Drilled or Broadcast
Canada Wild Rye	4 (Drilled) or 6 (Broadcast) lbs/acre	Drilled or Broadcast
German Millet	20.0 lbs/acre	Drilled or Broadcast
Sorghum/Sudan/Sudex	32.0 lbs/acre	Drilled or Broadcast
* Grasses shown above are suggested grasses which may be planted for temporary cover. Any of the grasses may be planted at the recommended rate to achieve a temporary vegetative cover.		

Permanent Vegetation Mix		
Grasses		
Plant Species*	**Seeding Rate PLS**	**Method of Application**
Little Bluestem	0.35 lbs/acre	Broadcast
Sideoats Grama	0.35 lbs/acre	Broadcast
Praire Junegrass	0.21 lbs/acre	Broadcast
Wildflowers		
Plant Species*	**Seeding Rate PLS**	**Method of Application**
Foxglove Beardtongue	0.015 lbs/acre	Broadcast
Tickseed Lanceleaf Coreopsis	0.15 lbs/acre	Broadcast
Canadian Milkvetch	0.010 lbs/acre	Broadcast
Eastern Purple Coneflower	0.25 lbs/acre	Broadcast
Illinois Bundleflower	0.26 lbs/acre	Broadcast
Butterfly Milkweed	0.031 lbs/acre	Broadcast
Gray Goldenrod	0.0050 lbs/acre	Broadcast
Stiff Goldenrod	0.020 lbs/acre	Broadcast
Smooth Blue Aster	0.040 lbs/acre	Broadcast

FIGURES



REFERENCES

Topographic Quad was retrieved from ESRI Online Services on 7/16/19.

0 500 1,000 2,000 Feet

1 inch = 1,000 feet

B19-243-1413

Legend

Project Area

Alliance Consulting, Inc.
Engineers · Constructors · Scientists
124 PHILPOTT LANE
BEAVER, WV 25813
(304) 255-0491

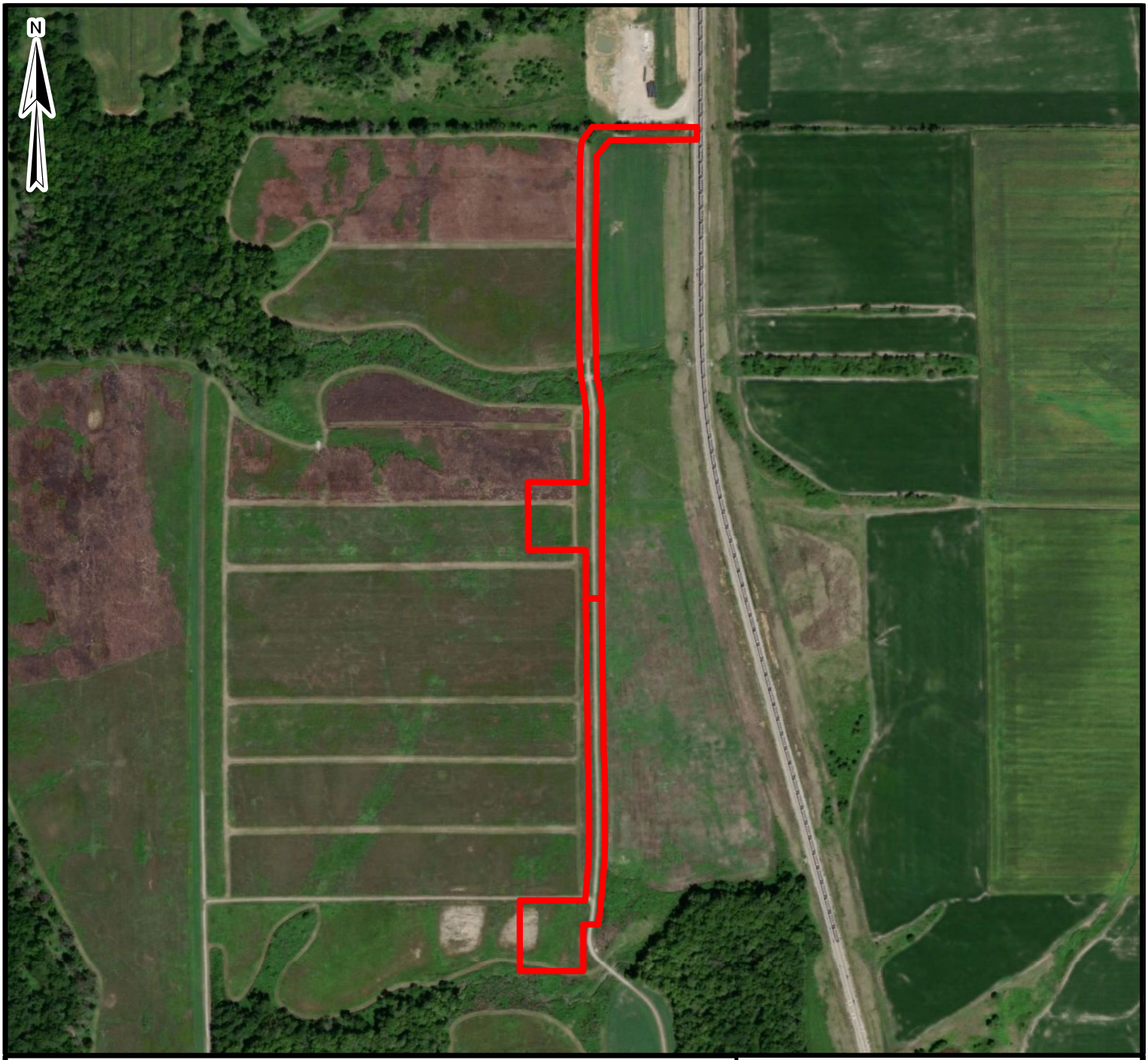
PROJECT LOCATION MAP

HEADGATE 4/5 VENTILATION SHAFT SITE
MONTGOMERY COUNTY, ILLINOIS

PREPARED FOR

HILLSBORO ENERGY, LLC
HILLSBORO, ILLINOIS

DRAWN BY	RG	7/16/2019
CHECKED BY		
APPROVED BY		
DRAWING NUMBER		
B19-243-A1		



REFERENCES

Aerial Imagery was retrieved from ESRI Online Services/Google Earth on 7/16/19.

0 250 500 1,000 Feet

1 inch = 500 feet

B19-243-1413

Legend

Project Area

Alliance Consulting, Inc.
Engineers · Constructors · Scientists
124 PHILPOTT LANE
BEAVER, WV 25813
(304) 255-0491

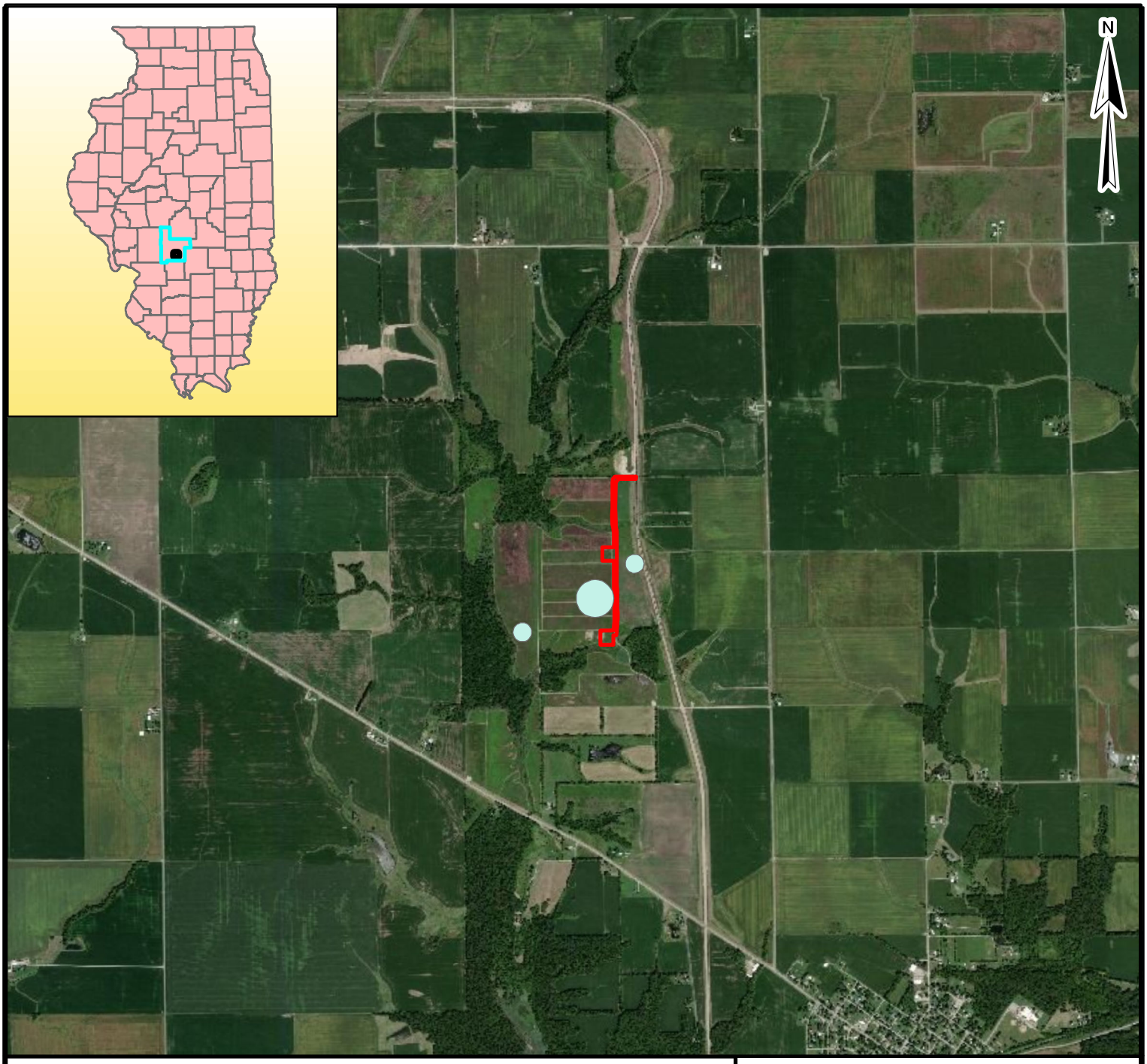
PROJECT AERIAL MAP

HEADGATE 4/5 VENTILATION SHAFT SITE
MONTGOMERY COUNTY, ILLINOIS

PREPARED FOR

HILLSBORO ENERGY, LLC
HILLSBORO, ILLINOIS

DRAWN BY	RG	7/16/2019
CHECKED BY		
APPROVED BY		
DRAWING NUMBER		
B19-243-A2		



REFERENCES

Aerial Imagery was retrieved from ESRI Online Services/Google Earth on 7/16/19.

Ornate box turtle occurence information was retrieved from an IDNR shapefile for endangered and threatened species location on 3/23/2020.

0 1,250 2,500 5,000 Feet

1 inch = 2,506 feet

B19-243-1413

Legend

ORNATE BOX TURTLE OCCURENCES

Project Area

Alliance Consulting, Inc.
Engineers · Constructors · Scientists
124 PHILPOTT LANE
BEAVER, WV 25813
(304) 255-0491

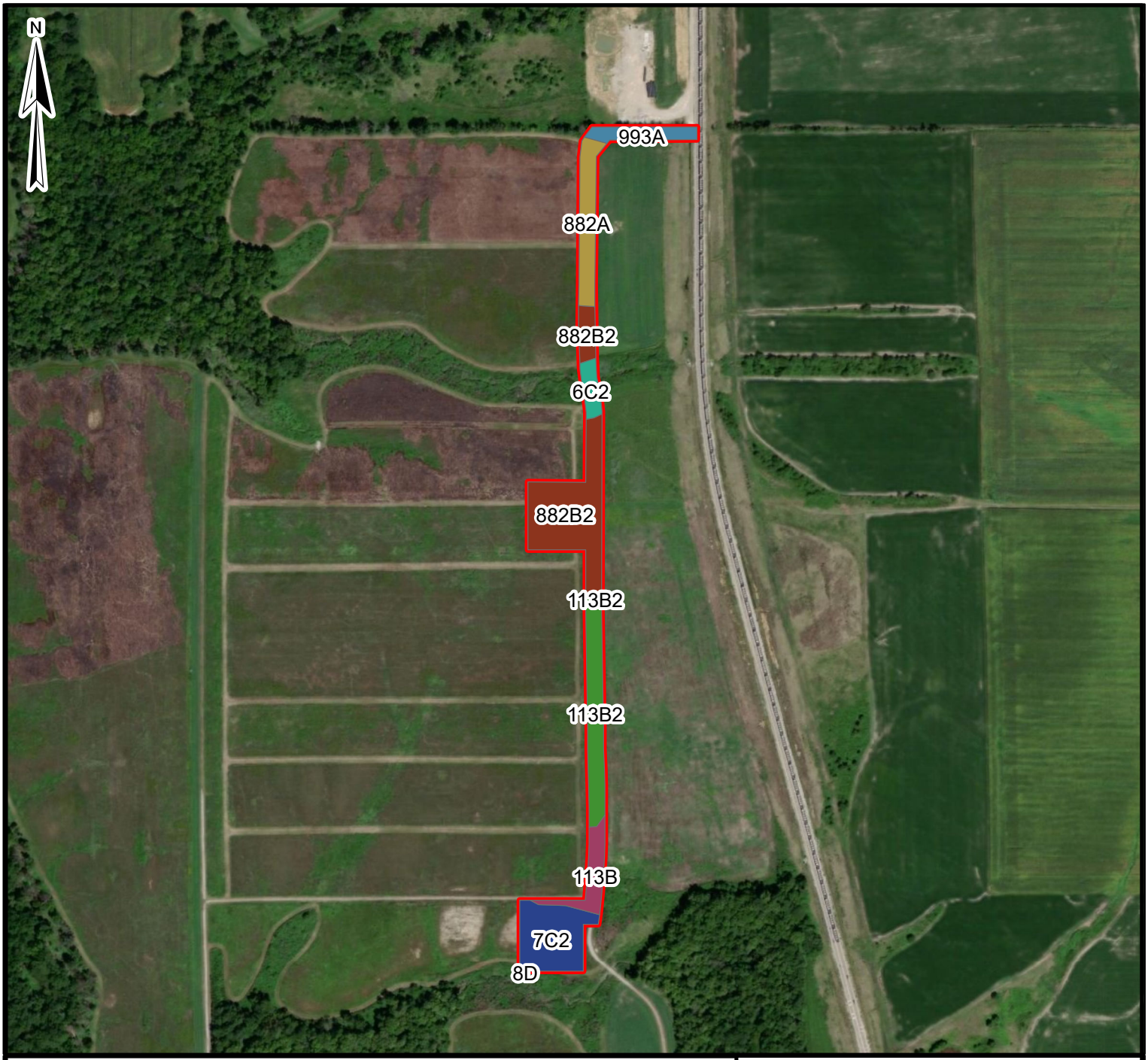
SPECIES OCCURRENCE MAP

HEADGATE 4/5 VENTILATION SHAFT SITE
MONTGOMERY COUNTY, ILLINOIS

PREPARED FOR

HILLSBORO ENERGY, LLC
HILLSBORO, ILLINOIS

DRAWN BY	RG	3/23/2020
CHECKED BY		
APPROVED BY		
DRAWING NUMBER		
B19-243-A3		



REFERENCES

Aerial Imagery was retrieved from ESRI Online Services/Google Earth on 7/16/19.

Soils data were retrieved from Web Soil Survey, U.S. Department of Agriculture, Natural Resources Conservation Service on 7/16/19.

0 250 500 1,000 Feet

1 inch = 500 feet

B19-243-1413

Legend

Project Area

Soil Units

- 113B
- 882A
- 113B2
- 882B2
- 6C2
- 8D
- 7C2
- 993A

Alliance Consulting, Inc.

Engineers · Constructors · Scientists

124 PHILPOTT LANE
BEAVER, WV 25813
(304) 255-0491

NRCS WEB SOIL SURVEY MAP

HEADGATE 4/5 VENTILATION SHAFT SITE
MONTGOMERY COUNTY, ILLINOIS

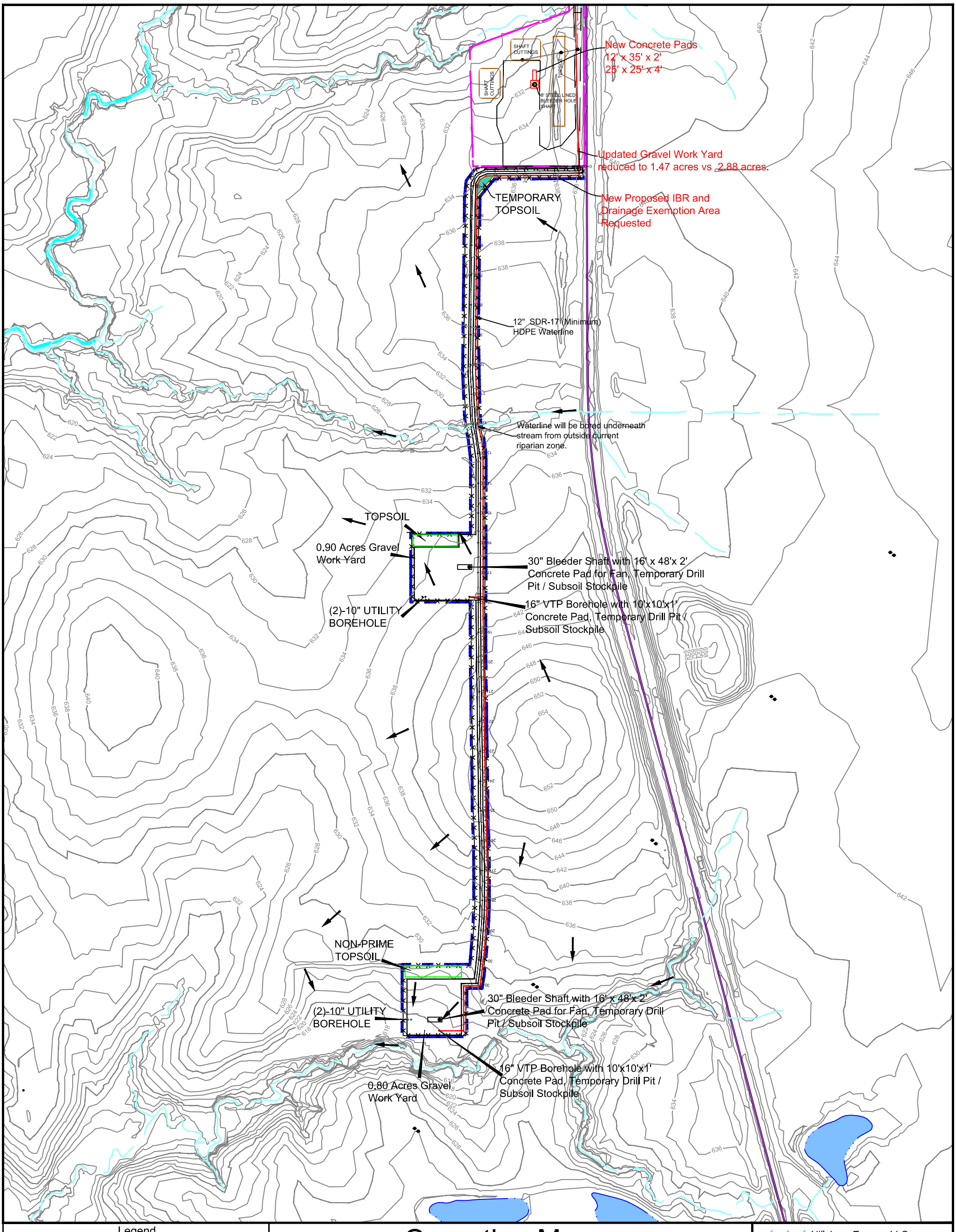
PREPARED FOR

HILLSBORO ENERGY, LLC
HILLSBORO, ILLINOIS

DRAWN BY	RG	7/16/2019
CHECKED BY		
APPROVED BY		

DRAWING NUMBER

B19-243-A4



Legend

- EXISTING DEER RUN PERMITTED AREAS
- PROPOSED IBR PERMIT LINE
- PROPOSED IBR ROAD
- FLOW ARROW
- EXCLUSIONARY FENCING

Operation Map

N W E S

0 300′ 600′

MAP 3A

Hillsboro Energy, LLC
12051 9th Avenue
Hillsboro, IL 62049

Revisions

No.	Date	By	No.	Date	By
1	11/2/20	JLP	6		
2			7		
3			8		
4			9		
5			10		

File Location: MAP_3_SURFACE_OPERATIONS_IBR_HG4-5 DEGAS

HG 4/5 Bleeder Shaft

Drawn By:	BM
Checked By:	JLP
Approved By:	JLP
Date:	11/4/19
Scale:	1"=300'

N 9th Ave

IBR #12

Waterline will be bored underneath stream from outside current riparian zone and outside of 9th Avenue Road ROW.

IBR #7

New Concrete Pads
12' x 35' x 2'
25' x 25' x 4'

Updated Gravel Work Yard
reduced to 1.47 acres vs 2.88 acres.

New Proposed IBR

TEMPORARY TOPSOIL

12" SDR-17 (Minimum) HDPE Waterline

Waterline will be bored underneath stream from outside current riparian zone.

100' BUFFER FROM STATE OWNED LANDS

SHAFT CUTTINGS

SHAFT CUTTINGS

TOPSOIL

6" STEEL LINED BLEEDER HOLE SHAFT

Coffeen Rd

Legend

- EXISTING DEER RUN PERMITTED AREAS
- PROPOSED IBR PERMIT LINE
- PROPOSED IBR ROAD
- FLOW ARROW

Operation Map

N W E S

0 400′ 800′

MAP 3B

Hillsboro Energy, LLC
12051 9th Avenue
Hillsboro, IL 62049

Revisions

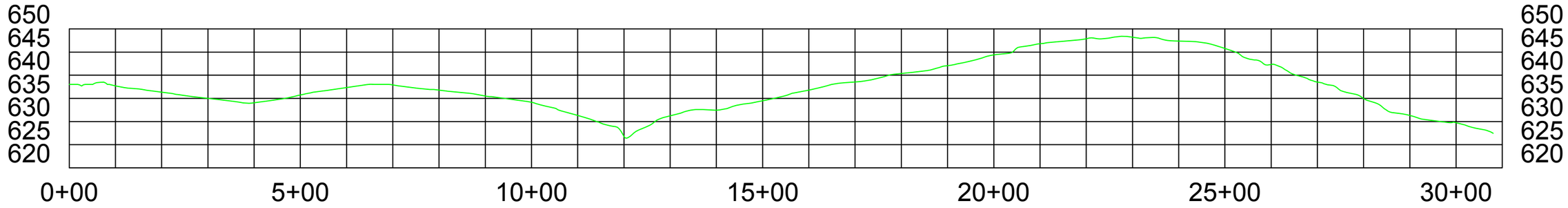
No	Date	By	No.	Date	By
1			6		
2			7		
3			8		
4			9		
5			10		

HG 4/5 Bleeder Shaft

Drawn By:	BM
Checked By:	JLP
Approved By:	JLP
Date:	11/4/19
Scale:	1"=400'

File Location:
MAP_3_SURFACE_OPERATIONS_IBR_NO_7_11-4-19

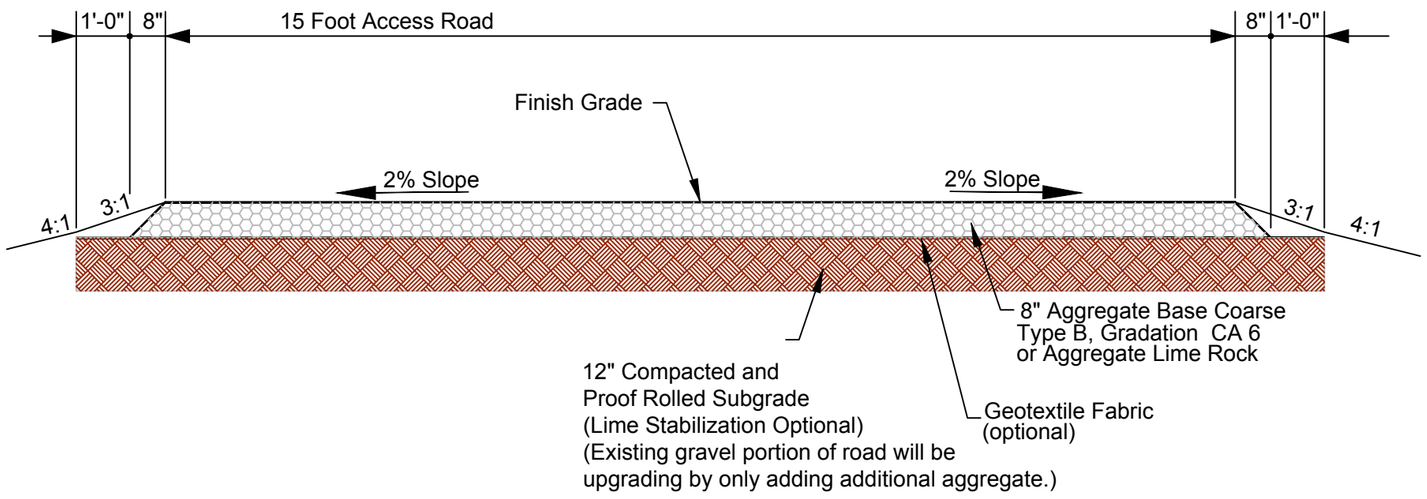
Permanent Access Road Profile Drawn: Horizontal 10:1 Vertical 1:1 (NTS)



IBR is using existing culvert at 12+00.

NTS

Typical Gravel Road Section



NTS

Hillsboro Energy, LLC
12051 N. 9th Avenue
Hillsobro, IL 62049

Revisions

No	Date	By	No	Date	By
1			6		
2			7		
3			8		
4			9		
5			10		

Permanent Access Road

Drawn By:	JLP
Checked By:	JLP
Approved By:	JLP
Date:	11/5/19
Scale:	NTS

File Location:
Drawing #:DEER RUN HG 4-5 BLEEDER SHAFT ROAD CROSS SECTION

PUBLIC NOTICE

The proposed project area is located in Montgomery County:
The Incidental Boundary Revision (IBR) is located off Co. Rd 1600 E approximately 1.8 miles northwest of Coffeen, in Montgomery County, Illinois. The exact township, range, and section for the location of this project is Township 8 North, Range 3 West, southern half of Section 22 and the northern half of Section 27.

Proposed activities include the installation of two concrete pads, each containing a bleeder shaft and a vertical turbine hole, as well as a ventilation fan (for each pad) located above the surface. Associated activities will include excavating of topsoil, lengthening and widening an existing access road, and trenching in a waterline. These impacts are temporary as the ventilation fans/shafts will be in use for approximately three (3) years.

During final reclamation, the access road will be left in place as an upgrade for the landowner. The incidental take authorization was requested since proposed activities have potential to result in the taking of one (1) or two (2) individual ornate box turtles, which is not anticipated to reduce the overall survival of the species in the wild in Illinois:

In order to minimize adverse impacts to the ornate box turtle, exclusionary fencing will be installed along area where work is commencing and a biological monitor will be on site to inspect exclusionary fencing and identify and potentially relocate any ornate box turtles located in the project area. Additionally, a speed limit of 5 mph will be in place for the work site to increase visibility and reduce potential of injury or take. Compensatory mitigation will be provided to the Illinois Wildlife Preservation Fund to bring conservation benefit to the ornate box turtle.

Copies of the application for this permit request are available for inspection at the Hillsboro Public Library, 214 School Street, Hillsboro, IL 62049. The Conservation Plan will also be available for review on the Department's website at the following address: https://www.dnr.illinois.gov/conservation/NaturalHeritage/Pages/Incidental-Take-Authorizations.aspx (reference ITA #215).

Comments from the public may be directed to the Illinois Department of Natural Resources, Department of Natural Heritage, Attn. Incidental Take Authorization Coordinator, One Natural Resources Way, Springfield, IL 62702-1271, or emailed to DNR.ITAcoordinator@illinois.gov. Any comments made by the public must be received by the Illinois Department of Natural Resources, in Springfield, Illinois on or before August 1, 2020.

Note: The above public notice is to be published in the Hillsboro Journal-News, this posting will appear three (3) times in the Hillsboro Journal-News for three (3) consecutive weeks with no less than 14 days between the first and last posting. The posting in The Breeze Courier will also appear one (1) time on the same date as the first posting in the Hillsboro Journal-News. This notice will be published starting Monday, May 11, 2020.