marion

MARION

February 1, 2023

ARKANSAS INC

BURNS McDONNELL

TABLE OF CONTENTS

APPENDIX

SITE READINESS REPORT

MARION
SITE READINESS OVERVIEW

GENERAL SITE DATA

- GENERAL DATA/INFORMATION:
  - The subject property (hereafter referred to as "Site") is a 1,194-acre greenfield with a single owner. It is clear, generally flat, and currently used for agricultural operations.
  - The Site is located at 13 Military Road, Marion, Arkansas. It is near the intersection of Kuhn Road and Hino Boulevard and the following geocoordinates 35.18492 N, 90.27141 W.
  - Environmental studies have been completed over the past few years, including a Phase 1 ESA, a preliminary geotechnical report, and a wetland study.

- POPULATION/DEMOGRAPHIC DATA:
  - Crittenden County's 2020 population was 48,381 (source: US Census Bureau).
  - Population within 60-minute drive time ages 16+ is approximately 668,961 (source: 2022 ESRI).
  - The City of Marion's 2020 population was 13,789 (source: US Census Bureau).

- EXISTING NEARBY INDUSTRIES:
  - Consolidated Grain & Barge
  - Family Dollar Distribution
  - FedEx National
  - Hedger Brothers Concrete
  - Hino
  - Infinity Transport
  - Infinity Warehouse
  - SB Power Tools
  - Schneider National Carriers
  - Union Pacific Railroad Intermodal Facility

- DEVELOPMENT TARGETS:
  - Distribution & Logistics
  - Metals
  - Firearms & Ammunition
  - Transportation Equipment

LAND USE AND ZONING

- CURRENT LAND USE
  - Agriculture

- FUTURE LAND USE
  - Industrial

- ZONING
  - I-1 Light Industrial

SITE TOPOGRAPHY

- Per the USGS Contour database, site topography and drainage patterns are as follows:
  - The site is essentially flat with average slopes less than 1% from north to south, dropping about 7 feet in elevation over approximately ~7,500 feet horizontally.
  - There appears to be roadside ditches along the gravel roads that segment the Site into parcels/fields.
  - There are multiple treelined hedgerows that run north to south on the property that may function as a swale that drains the south of the site.

The flat nature of the site will help limit some of the overall earthwork associated with development. However, an end user may opt to bring in additional fill to help promote more positive drainage across the site given the limited amount of elevation change on Site.

SOILS & GEOLOGIC DATA

- A preliminary geotechnical investigation was performed on the site by Patriot Engineering and Environmental, Inc. on January 4th, 2007. See Appendix 1 for full report. The findings from the investigation are summarized below:
  - The soil stratigraphy varied by the location of the 5 borings, but Site soils generally consist of low to high plasticity silts and clays (see boring logs for more information) and bedrock was very deep.
  - Groundwater was encountered at depths ranging from 11' to 31'. The 5 borings caved to depths ranging from 3.5' to 36.5'. Seasonal fluctuations in the groundwater level should be expected to occur due to variations in rainfall, temperatures, and other environmental or physical factors.
  - The Site is located relatively close to the New Madrid fault zone, therefore the Site Classification will most likely be no better than "D".
  - Site Geotechnical Advantages:
    - Rock excavation is not anticipated. Bedrock is anticipated to be deeper than 75' throughout the Site.
    - Site topography is generally flat. Therefore, significant cut or fill should not be required for site development.
    - Although on-site soils will not likely be suitable for use as structural fill, the Site's proximity to the Mississippi River should make sand and gravel readily available within short haul distances.
    - Highly plastic soils were not encountered at shallow depths; therefore, over-excavation or high percentage lime stabilization should not be necessary.
  - Site Geotechnical Disadvantages:
    - Site subsoils, especially from 8' to 4', are considered soft/weak/compressible, therefore deep foundation systems will likely be required even for moderate foundation loads.
    - Shallow soils are silty in nature, therefore relatively small increases in moisture content (wet weather conditions) can result in soft, pumping subgrade conditions requiring aeration or other treatment.

- Although groundwater was encountered no shallower than 11', additional test borings indicated groundwater could be as shallow as 6' at any time.
- Because the Site is located relatively close to the New Madrid fault zone epicenter, the foundation and structural design will have to consider high seismic design factors.

The results are from the investigation are preliminary in nature. Therefore, a comprehensive geotechnical report is recommended during future design phases of development. A comprehensive geotechnical report will provide necessary comprehensive information about the depth to bedrock, soil bearing capacity, groundwater conditions, and final recommendations regarding foundation design and required pavement sections that are specific to a proposed development.

TRANSPORTATION INFRASTRUCTURE

- ROADWAYS
  - Arkansas State Highway 147 (AR-147) is the primary access to the Site. It runs in the north-south direction approximately 1/3 of a mile West of the Site.
  - The AR-147 and I-40 interchange is located approximately 2 miles southwest of the Site and the AR-147 and the AR-147 and US-64 intersection is approximately 1.3 miles northwest.
  - Kuhn Road runs north-south along the east property boundary and Hino Road ends at the southeast property corner – both are 2-lane, asphalt roads. Kuhn Road turns west at the north end of the site running between the Site and the Union Pacific Intermodal Terminal before bisecting the northwest corner of the Site and intersecting with AR-147 approximately 2/3 miles to the west.
  - Existing interior Site roads consist of Kuhn Road (2-lane, asphalt) and several gravel/dirt farm access roads.
  - Finally, US-64 and I-55 interchange is located approximately 5.5 miles east of the AR-147 and US-64 intersection. Also, the I-55 and I-40 interchange is located approximately 2.75 miles south of the I-55 and US-64 interchange.

- RAILROAD
  - There is a Union Pacific main line Intermodal Terminal abutting the Site's north property line, but the nearest spot of the to spur off the main line into the Site is approximately a mile northwest of the Site. Extending a spur into the site is most likely not feasible because it would require crossing privately owned properties.

The Site's proximity to the Interstate is a notable asset, but it is recommended that the Marion community perform a preliminary traffic study to evaluate the scope, cost, and schedule required to upgrade the interior access roads within the site to be able to handle future development. As for rail, due to the infeasibility of providing rail service to the site, it is recommended that Marion target end users that do not heavily rely on rail service.

AIR SERVICE

- COMMERCIAL AIRPORTS
  - Memphis International Airport (MEM)
    - 17.3 miles
  - General DeWitt Spain Airport (M01)
    - 11.4 miles

- MUNICIPAL AIR SERVICE
  - West Memphis Municipal Airport (AWM)
    - 3.3 miles

The Site's proximity to the West Memphis Municipal Airport may trigger the FAA Part 77 surface criteria. If triggered, future development will be limited to FAA-established height criteria which may impact the types of end users that could locate to this site. It is recommended to contact the West Memphis Municipal Airport to determine if they have an airport layout plan so potential end users can fully understand the restrictions that are placed on the subject property (runway obstacle free zone, building restriction lines, transitional/primary surface elevations, etc.).

FLOODPLAIN

- Based on FEMA's Flood Insurance Rate Map (FIRM), the Site is situated within the 500-year floodplain and therefore is at minimal risk of flooding. Since 100-year floodplain is not present, development should be able to commence without significant hydrologic studies.

WETLANDS

- Based on the U.S. Fish and Wildlife Service's (USFWS) National Wetland Inventory (NWI), there are no wetland areas on Site.
- A preliminary wetland investigation was performed on Site in 2006. The memorandum titled "Site Investigation of Marion Property" dated December 8, 2006. See Appendix 4 for the full report. The findings from the investigation are summarized below:
  - Several channels appear on the property that will be considered "waters of the United States" by the Army Corps of Engineers. These channels are divided into jurisdictional streams and jurisdictional wetlands. The jurisdictional wetlands are historical stream channels that now possess the characteristics of a jurisdictional wetland.
  - A site investigation was conducted on December 8, 2006, with the Army Corps of Engineers to obtain concurrence with the Memorandum findings. During the investigation, the Corps provided verbal concurrence with the jurisdictional determinations and conveyed no concerns regarding the impacts associated with the development or permitting of future projects on Site. The jurisdictional areas existing on Site primarily provide drainage for adjacent farm fields and exhibit minimal resource value or habitat. No pristine wetlands are located on the Site and the jurisdictional areas are minimal considering the size and location of the subject property.

A full wetland delineation is recommended prior to any development on the Site as well as getting a current Approved Jurisdictional Determination (AJD) from the Army Corps of

Engineers since the AJD is only valid for five years. Wetland rules typically change based on the federal political climate, so maintaining active, updated AJDs will be an essential component for site readiness for years to come.

If any of the streams/wetlands on the Site are determined to be jurisdictional, the permit mechanisms employed would vary dependent upon the nature and extent of impacts to Waters of the U.S. as follows:

- Impacts below 1/10 of an acre may be automatically covered under a Nationwide Permit (NWP) with no requirement to notify the USACE dependent upon the nature of impact.
- Impacts between 1/10 and ½ acre that qualify for coverage under an NWP would require a Pre-Construction Notification (PCN) and would typically be authorized in 90 days or less.
- Impact greater than ½ acre or impacts ineligible for coverage under a NWP would require an individual permit, with an anticipated review period of 12 months or more.
- Compensatory mitigation is typically required for impacts to Waters of the U.S. exceeding 1/10 acre.

UTILITIES OVERVIEW

- As part of the project RFI request, the site was assigned a series of representative, assumed site utility demands. These demands are summarized below and are intended to provide a baseline of typical industrial utility demands that could be anticipated for a site of this acreage. Inability to meet these demands does not automatically mean the utilities are deficient—instead, this information should be used to help guide the economic developer on the viability of an end user being able to develop on the property given the end user's specific demands. The baseline utility demands are as follows:

    - Power – 50 MW of 3-phase electric
    - Natural Gas – 35,000 mcf/month
    - Domestic Water – 750,000 GPD
    - Sewer – 600,000 GPD
    - Fiber – 100 MB/s

ELECTRIC POWER

- The Site is served by Entergy of Arkansas via a non-redundant 161kV transmission line located along the east edge of the Site. The nearest servicing substation is the Kuhn Substation located just east of the Site.

NATURAL GAS

- The Site is served by Summit Utilities via a non-redundant 6" (250 psi) line located adjacent to the Site.

WATER

- The Site is served by the City of Marion via a non-redundant 12" main located adjacent to the Site's eastern boundary. Additionally, there is a 1-million-gallon elevated tank located at the northeast corner of the Site.

SANITARY SEWER

- The Site is served by the City of Marion via a non-redundant 15" gravity sanitary sewer located adjacent to the site. Given the large size of the Site, on-site lift stations and sanitary sewer force mains will most likely be required to convey flows form private service points to the existing public connection point.

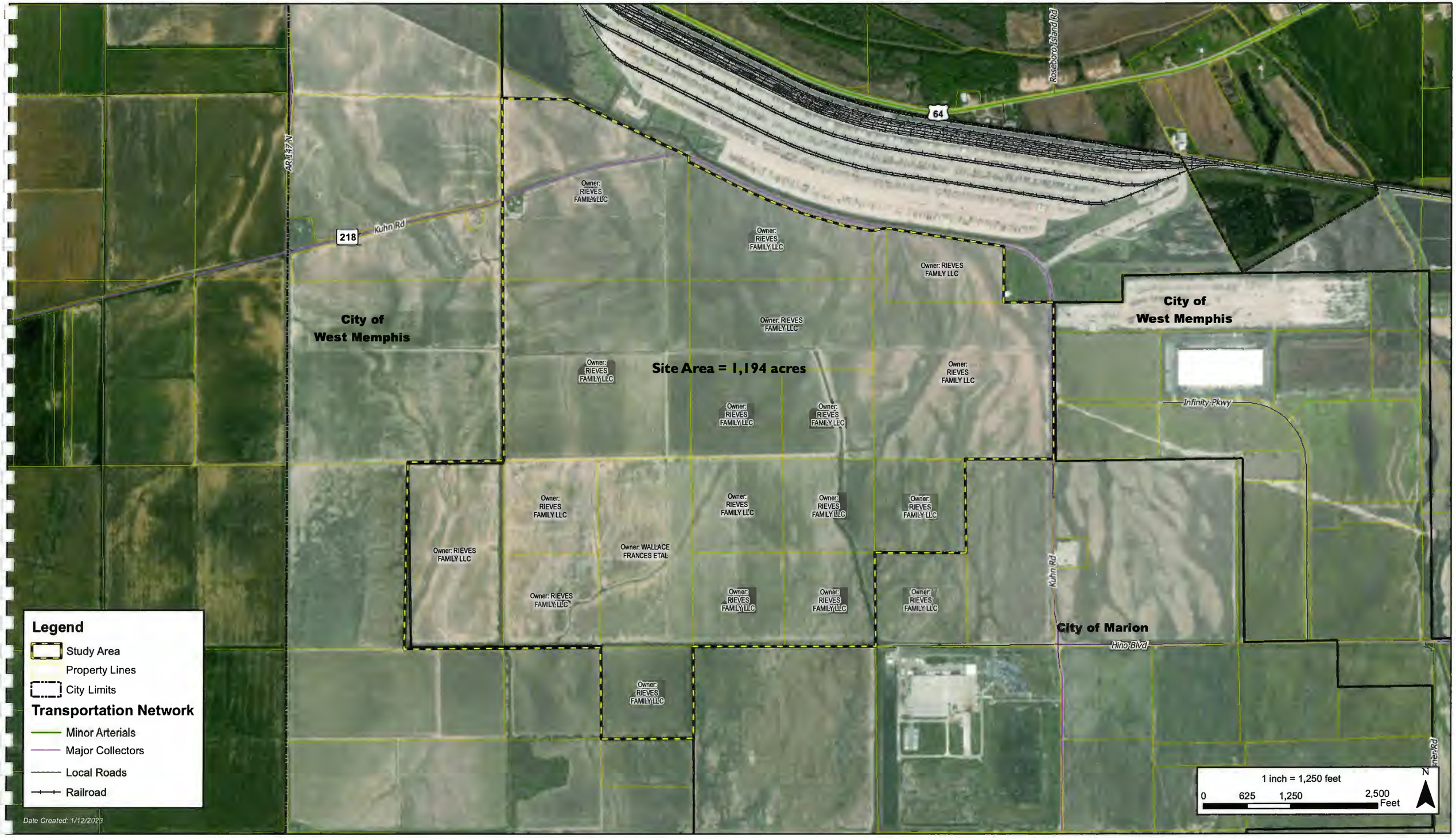
FIBER

- The Site is served by Xfinity via AT&T fiber optic lines located adjacent to the Site.

RECOMMENDATIONS

- In general, it is recommended to complete site due diligence studies to aid in the marketing effort. This includes, but is not limited to, a wetland delineation, comprehensive geotechnical report, threatened and endangered species study, an archaeological and cultural resources study, and a prelim traffic study.
- It is recommended to have preliminary discussions with adjacent landowners to see if it would be a possibility to get a right of way for a potential rail spur into the site from the northwest.
- It is recommended to have conversations with your utility providers to understand if the current utility infrastructure would meet the assumed demands of future development, and if it does not find out what the cost and timeline would be to upgrade those utilities.
- To attract end users to the site, it is recommended to have a proactive marketing approach by engaging with the nearby industries and businesses in the community to understand what potential industry could benefit them.

SITE MAPS



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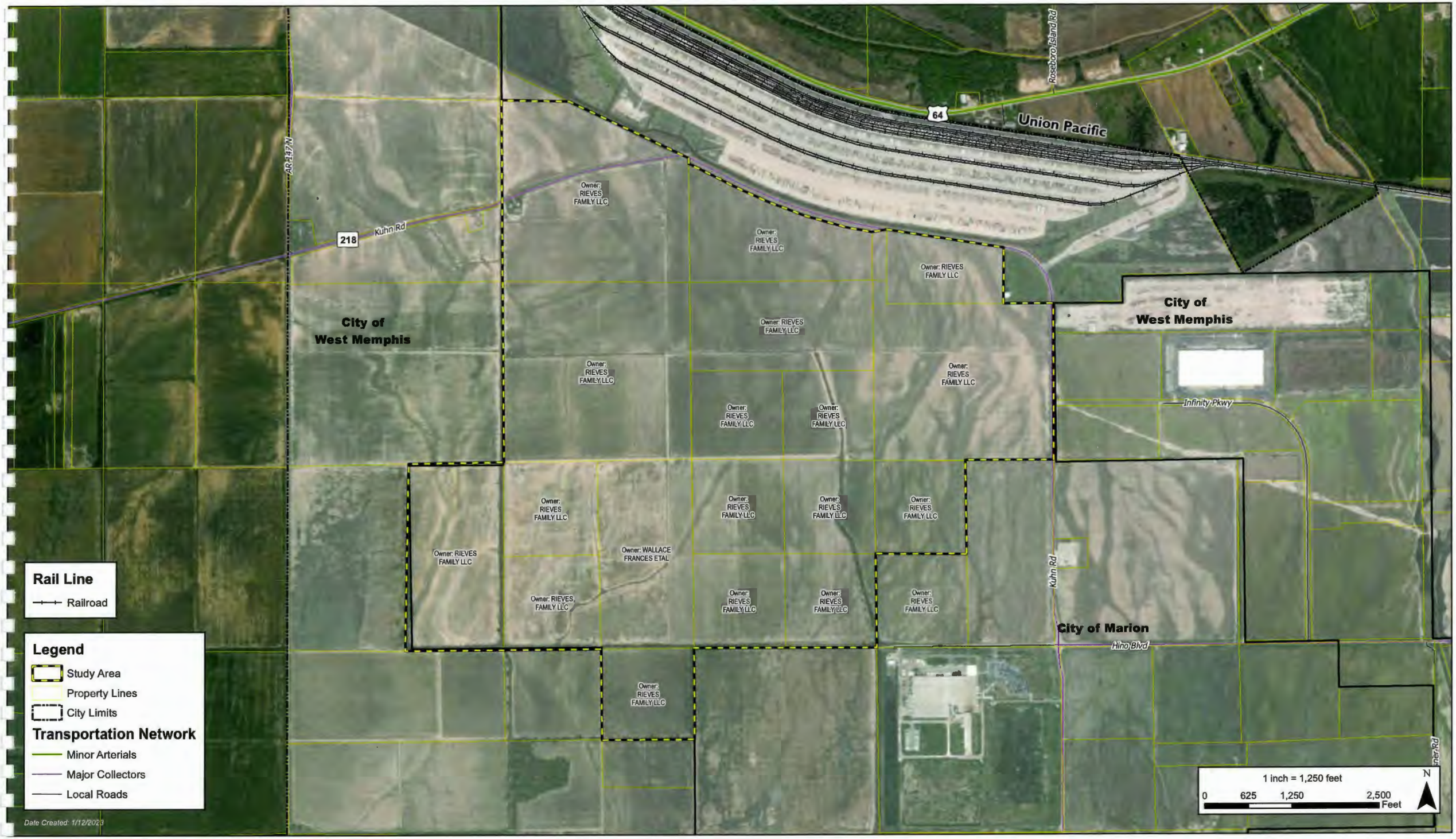
SITE MAP

Marion



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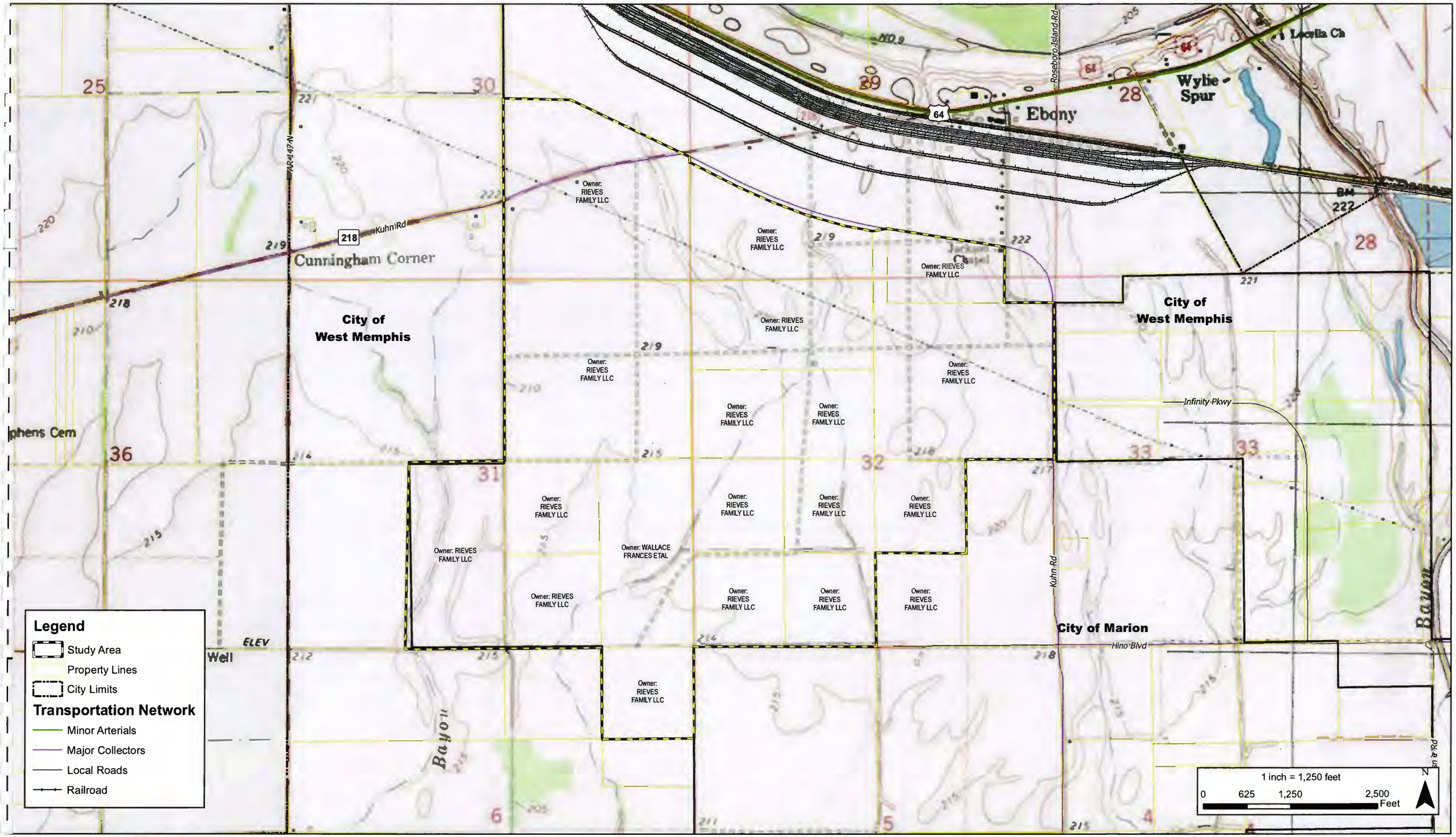
RAIL MAP

Marion



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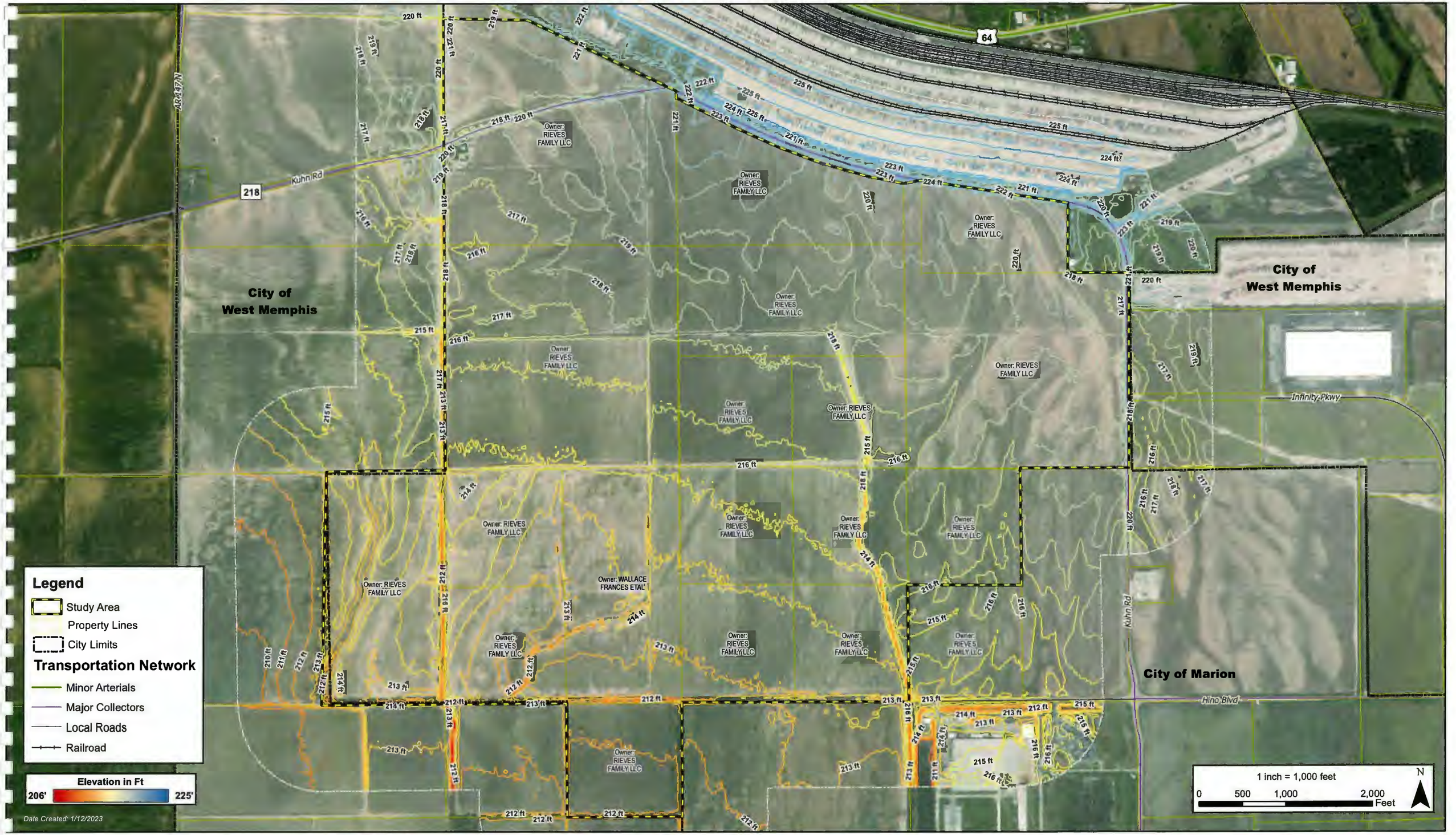
TOPOGRAPHY MAP

Marion



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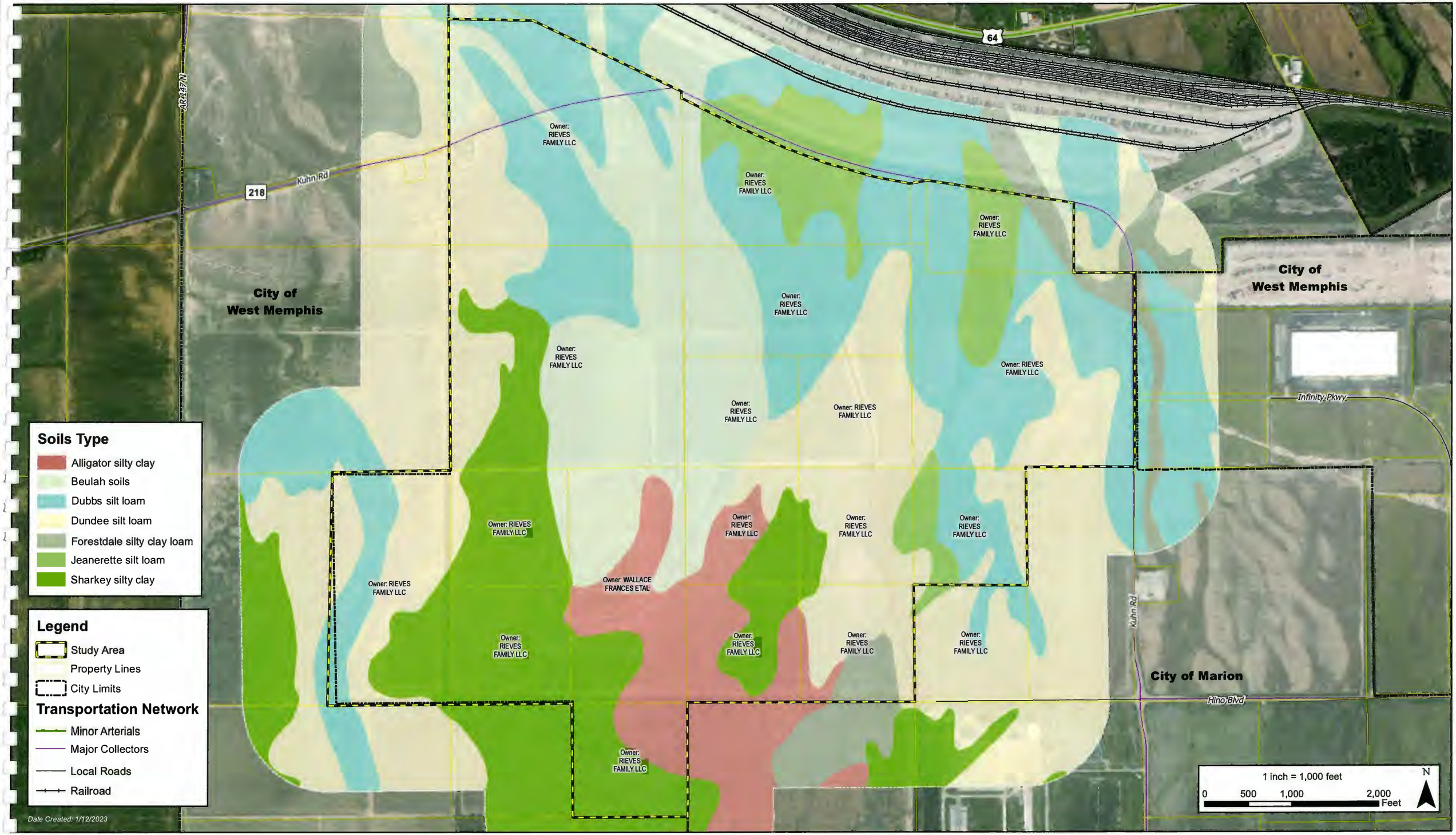
1-FT CONTOUR MAP

Marion



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SOIL MAP

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GEOLOGY MAP

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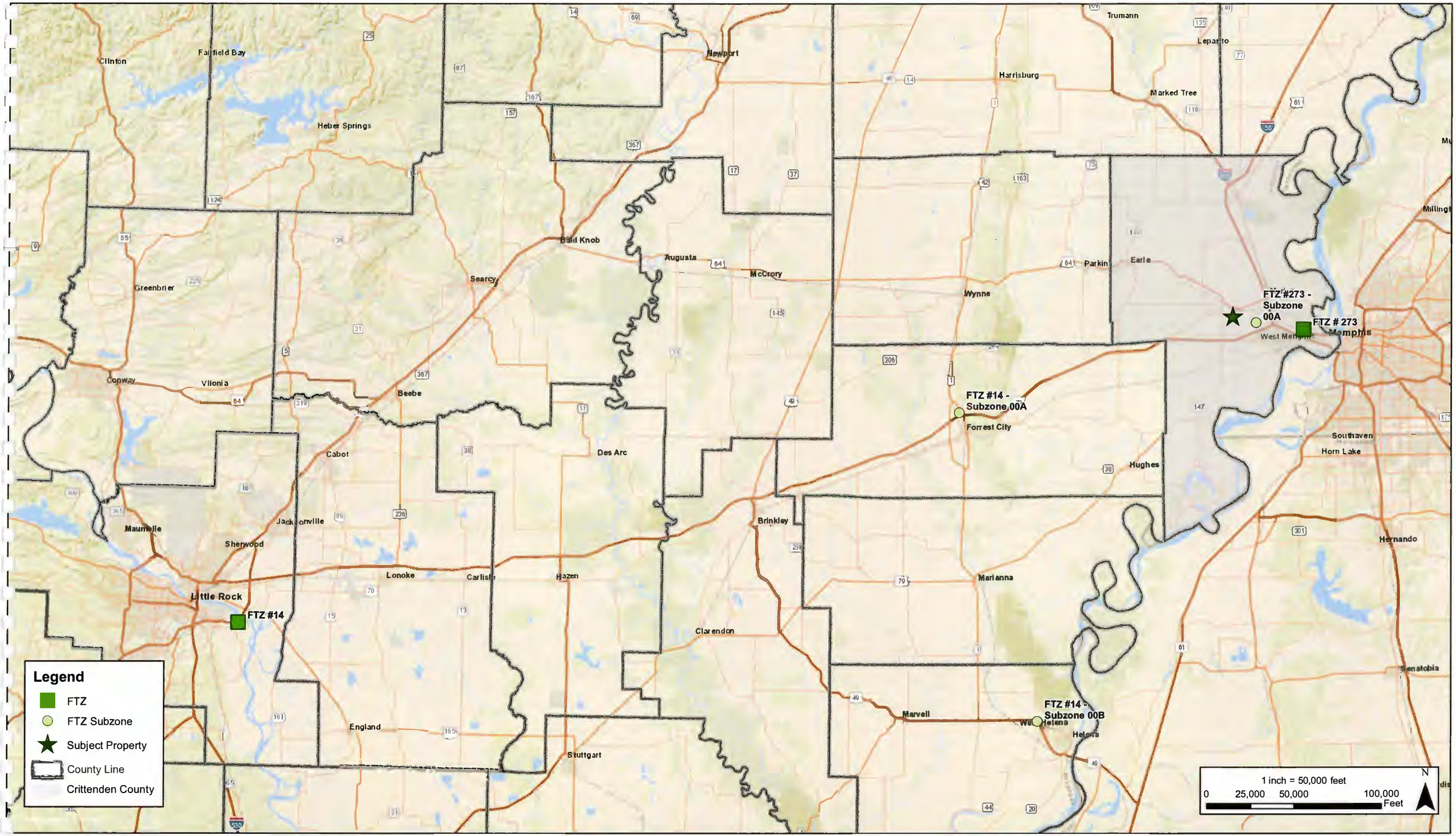

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FOREIGN-TRADE ZONE MAP

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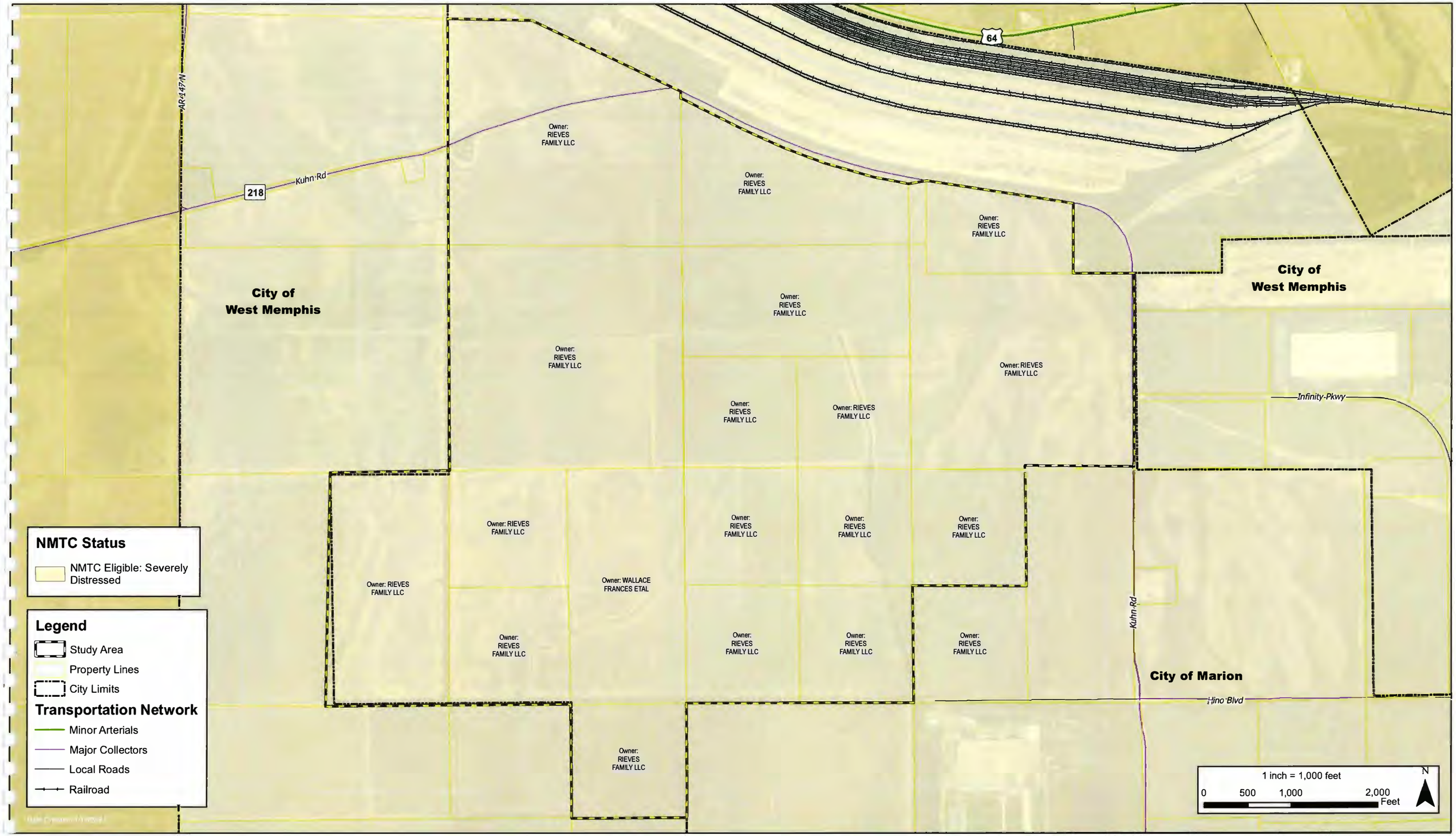

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NEW MARKET TAX CREDIT MAP

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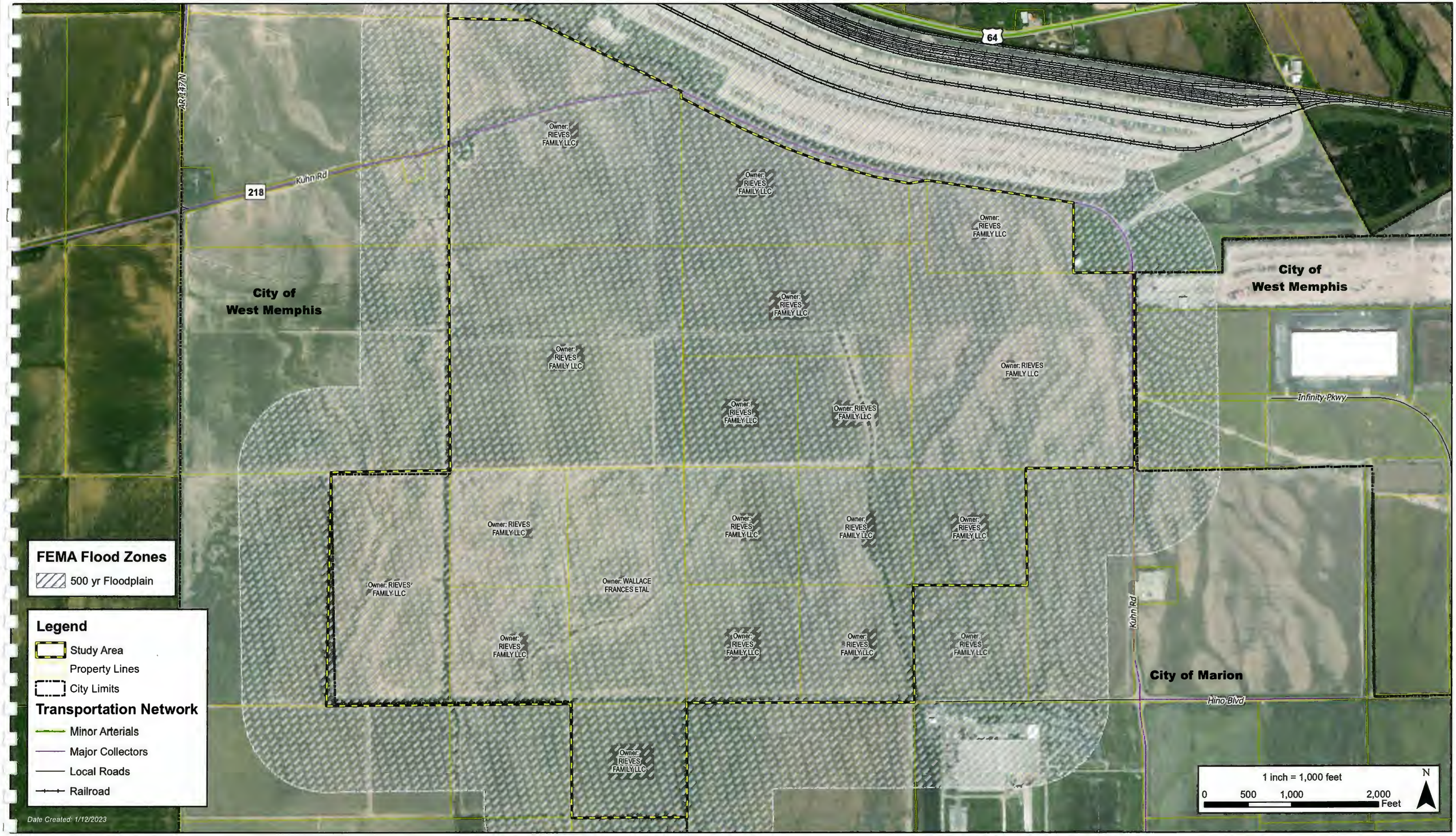
FLOODPLAIN AND WETLAND MAPS



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FEMA FLOODPLAIN MAP

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NWI WETLAND MAP

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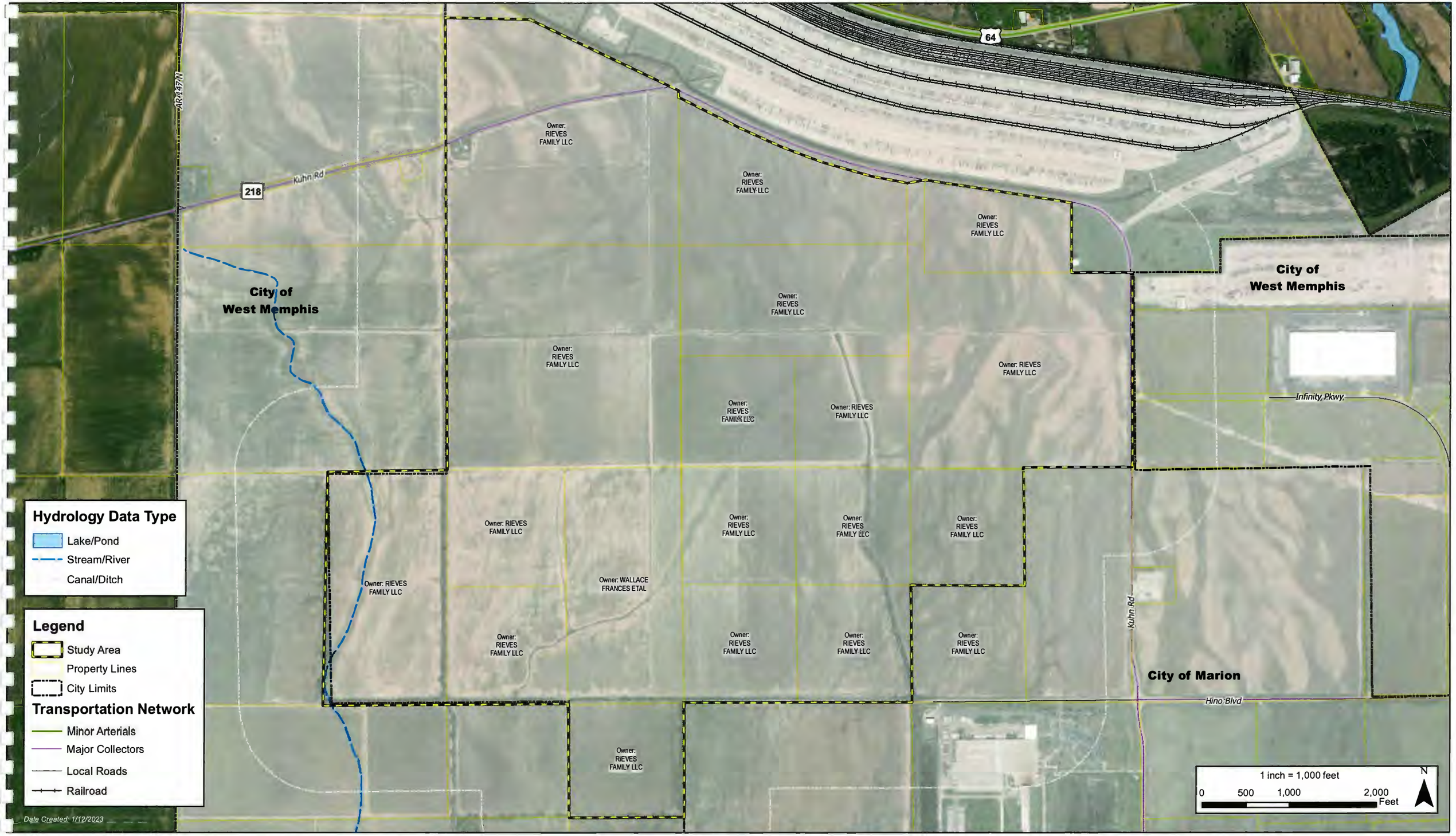

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NHD WATER BODIES MAP

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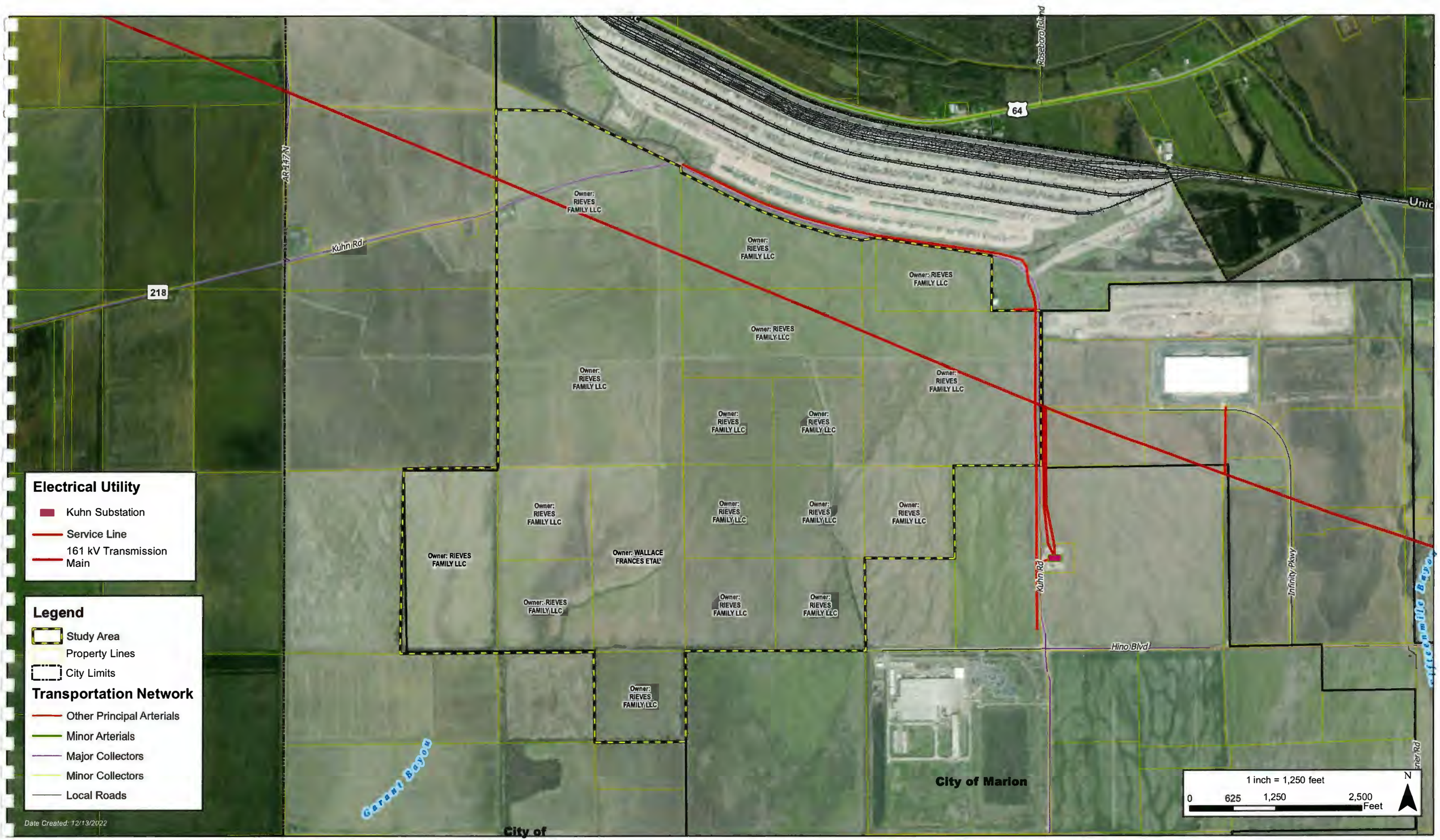
Utility Maps

UTILITY MAPS



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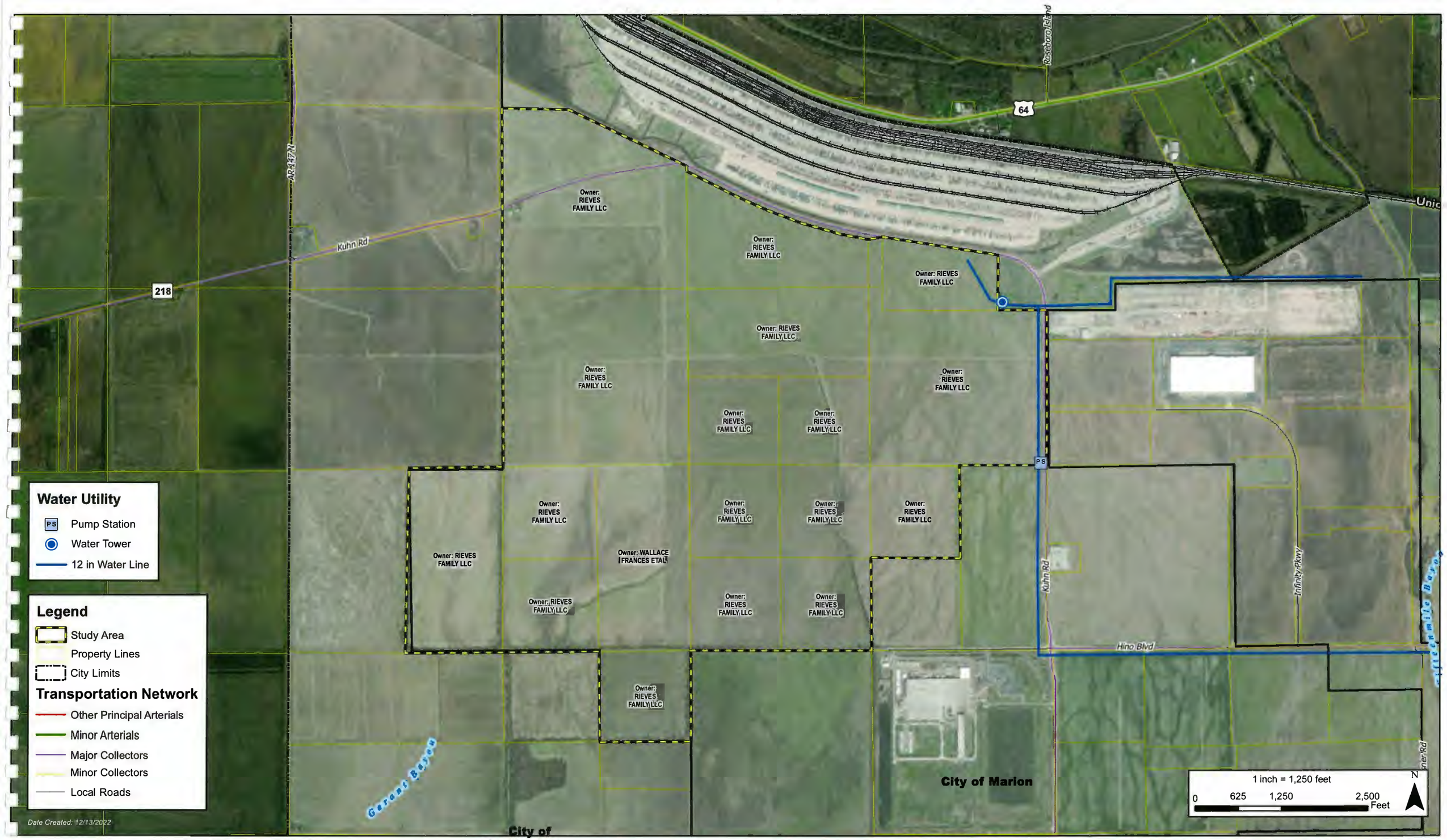
POWER MAP

Marion



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WATER MAP

Marion

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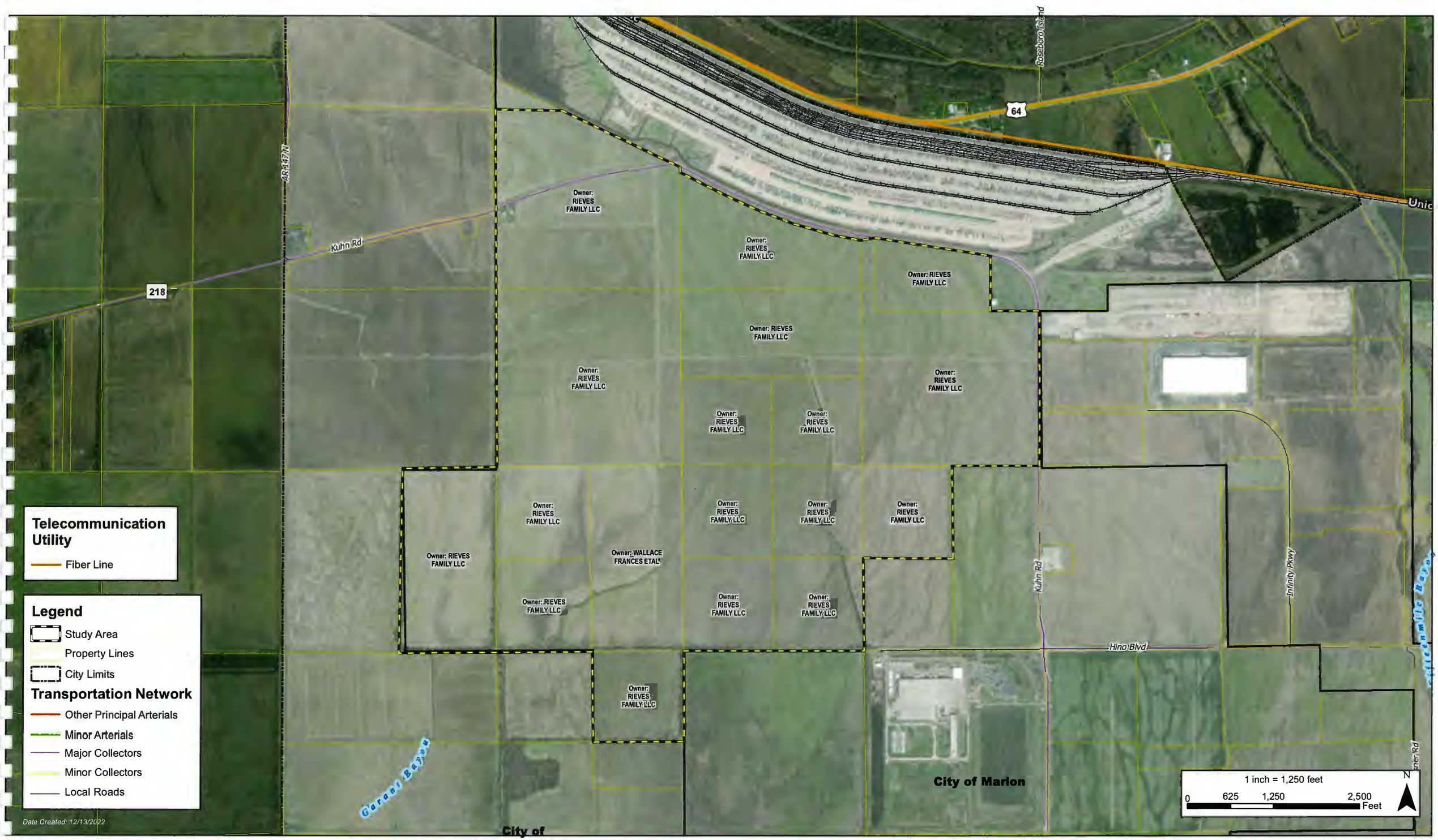
SANITARY SEWER MAP

Marion



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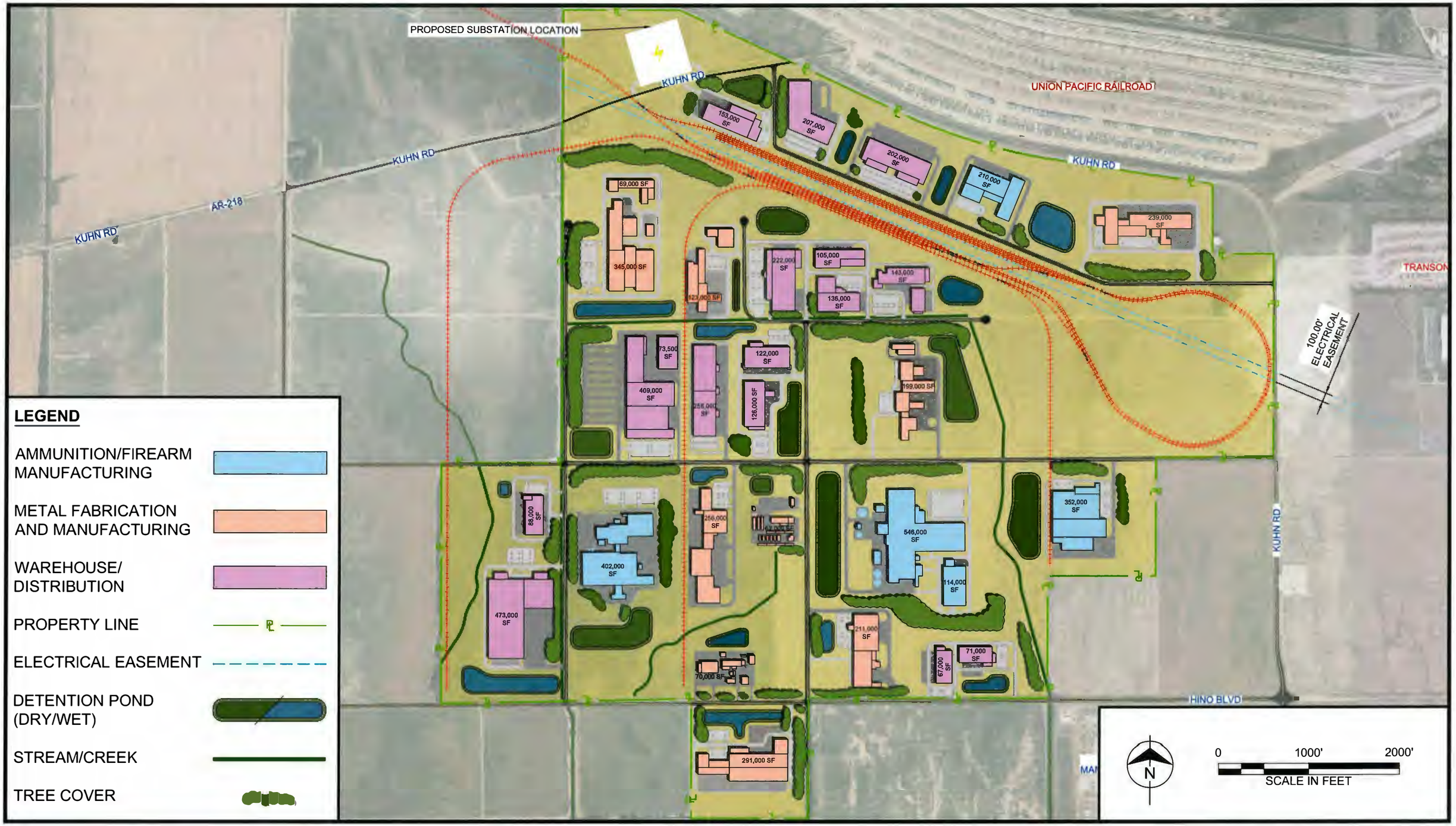
TELECOMMUNICATION MAP

Marion

CONCEPTUAL MASTER PLANS



LEGEND

- AMMUNITION/FIREARM MANUFACTURING
- METAL FABRICATION AND MANUFACTURING
- WAREHOUSE/ DISTRIBUTION
- PROPERTY LINE
- ELECTRICAL EASEMENT
- DETENTION POND (DRY/WET)
- STREAM/CREEK
- TREE COVER

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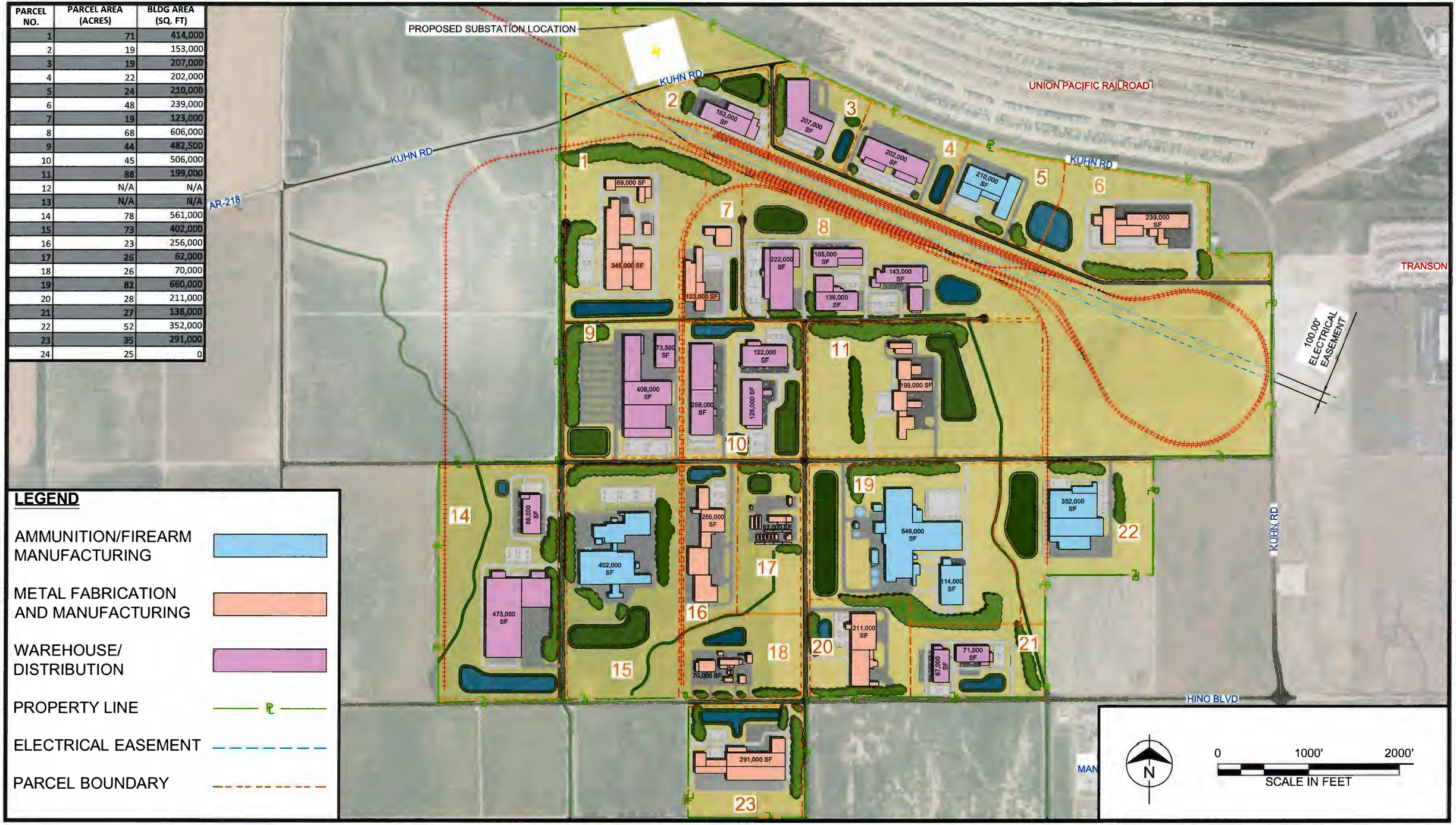
MASTERPLAN WITH RAIL: OVERALL SITE PLAN

Marion

PARCEL NO.	PARCEL AREA (ACRES)	BLDG AREA (SQ. FT)
1	71	414,000
2	19	153,000
3	19	207,000
4	22	202,000
5	24	210,000
6	48	239,000
7	19	123,000
8	68	606,000
9	44	482,500
10	45	506,000
11	88	199,000
12	N/A	N/A
13	N/A	N/A
14	78	561,000
15	73	402,000
16	23	256,000
17	26	62,000
18	26	70,000
19	82	660,000
20	28	211,000
21	27	138,000
22	52	352,000
23	35	291,000
24	25	0



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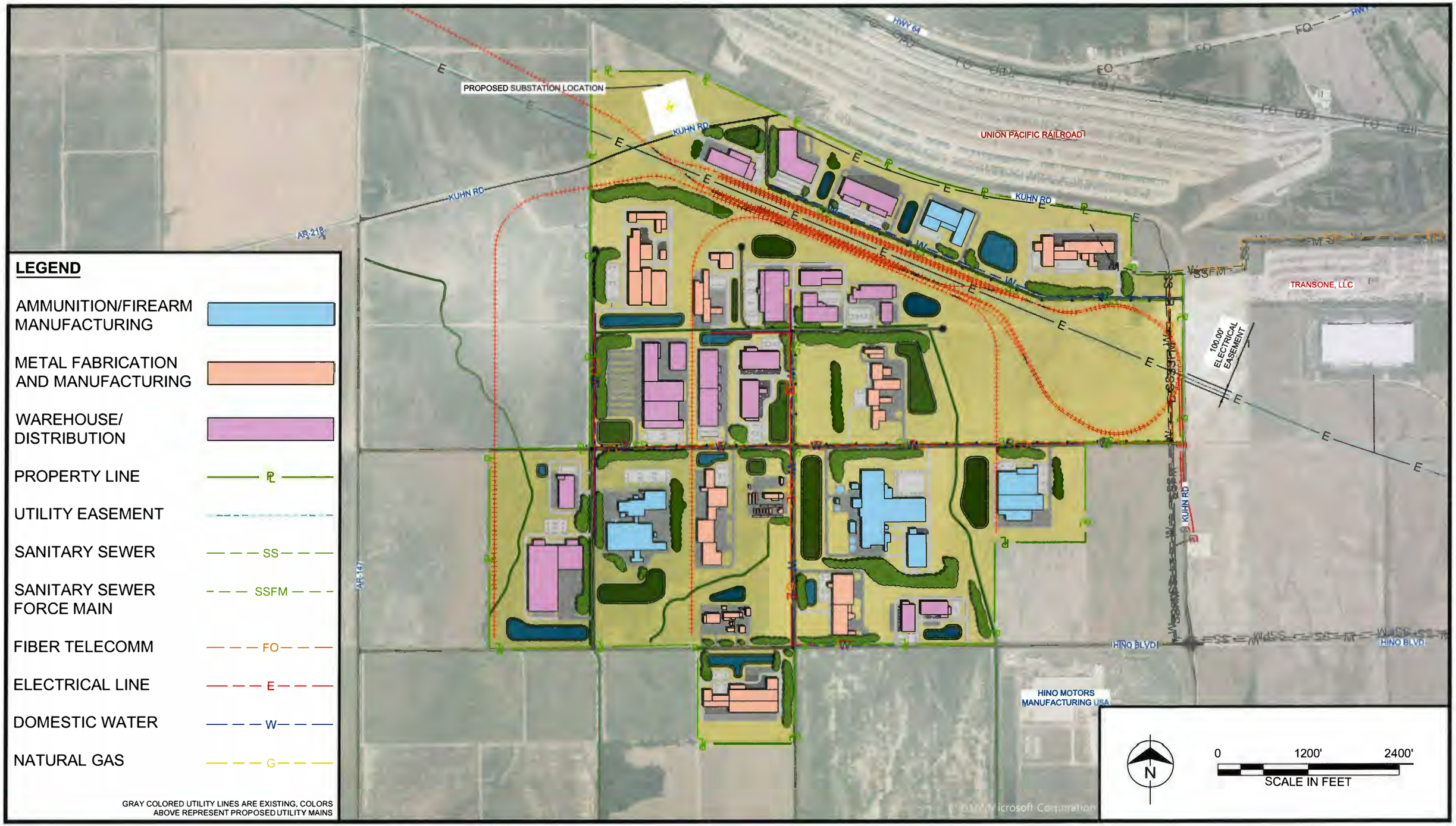
MASTERPLAN WITH RAIL: PARCEL LABELS

Marion



LEGEND

- AMMUNITION/FIREARM MANUFACTURING
- METAL FABRICATION AND MANUFACTURING
- WAREHOUSE/ DISTRIBUTION
- PROPERTY LINE — PL —
- UTILITY EASEMENT
- SANITARY SEWER — SS —
- SANITARY SEWER FORCE MAIN — SSFM —
- FIBER TELECOMM — FO —
- ELECTRICAL LINE — E —
- DOMESTIC WATER — W —
- NATURAL GAS — G —

GRAY COLORED UTILITY LINES ARE EXISTING, COLORS ABOVE REPRESENT PROPOSED UTILITY MAINS

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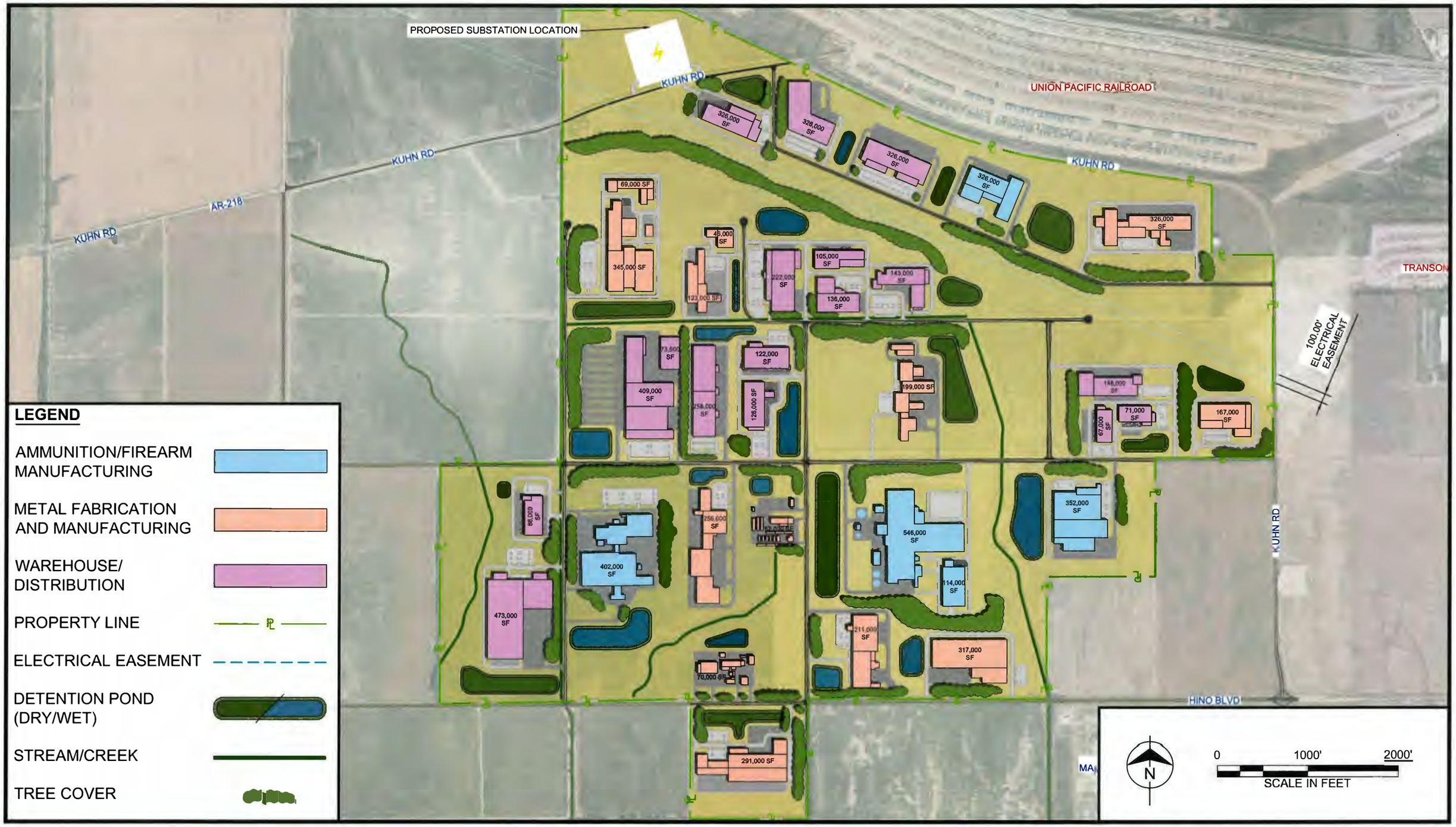
MASTERPLAN WITH RAIL: UTILITY PLAN

Marion



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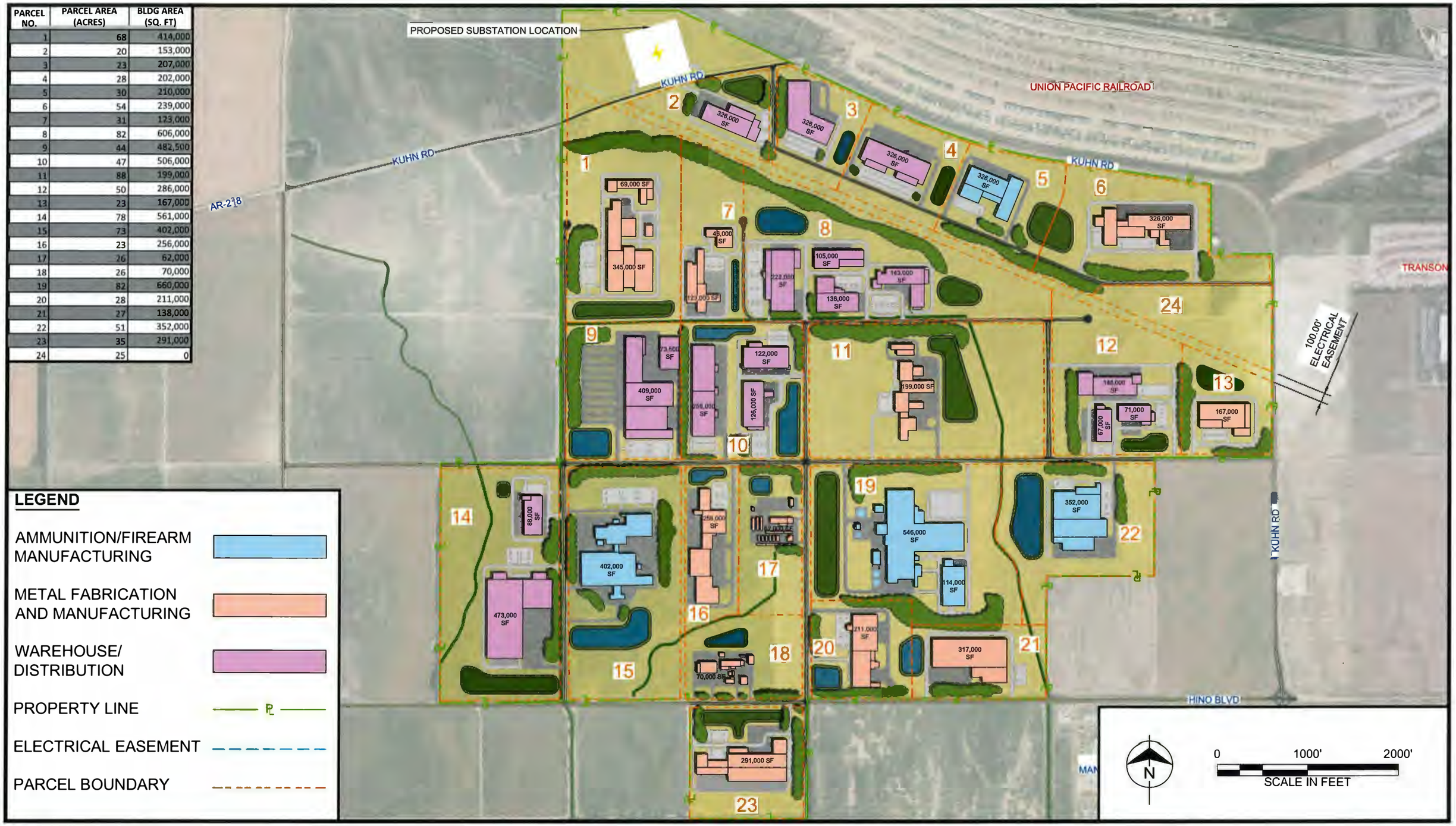
- PROPERTY LINE
- ELECTRICAL EASEMENT
- DETENTION POND (DRY/WET)
- STREAM/CREEK
- TREE COVER

marion

MASTERPLAN WITHOUT RAIL: OVERALL SITE PLAN

Marion

PARCEL NO.	PARCEL AREA (ACRES)	BLDG AREA (SQ. FT)
1	68	414,000
2	20	153,000
3	23	207,000
4	28	202,000
5	30	210,000
6	54	239,000
7	31	123,000
8	82	606,000
9	44	482,500
10	47	506,000
11	88	199,000
12	50	286,000
13	23	167,000
14	78	561,000
15	73	402,000
16	23	256,000
17	26	62,000
18	26	70,000
19	82	660,000
20	28	211,000
21	27	138,000
22	51	352,000
23	35	291,000
24	25	0



LEGEND

- AMMUNITION/FIREARM MANUFACTURING
- METAL FABRICATION AND MANUFACTURING
- WAREHOUSE/ DISTRIBUTION
- PROPERTY LINE (PL)
- ELECTRICAL EASEMENT
- PARCEL BOUNDARY

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MASTERPLAN WITHOUT RAIL: PARCEL LABELS

Marion

LEGEND

- AMMUNITION/FIREARM MANUFACTURING
- METAL FABRICATION AND MANUFACTURING
- WAREHOUSE/ DISTRIBUTION
- PROPERTY LINE — PL —
- UTILITY EASEMENT
- SANITARY SEWER — SS —
- SANITARY SEWER FORCE MAIN — SSFM —
- FIBER TELECOMM — FO —
- ELECTRICAL LINE — E —
- DOMESTIC WATER — W —
- NATURAL GAS — G —

GRAY COLORED UTILITY LINES ARE EXISTING, COLORS ABOVE REPRESENT PROPOSED UTILITY MAINS

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MASTERPLAN WITHOUT RAIL
UTILITY PLAN

Marion

APPENDIX 1

Report of Site Reconnaissance Study
and Preliminary Geotechnical Engineering
Investigation
Proposed Industrial Site Development
Marion, Arkansas
Patriot Project No. 5-06-1500

Prepared For:

Client

Prepared By:

Patriot Engineering and
Environmental, Inc.
400 Production Court
Louisville, Kentucky 40299

January 4, 2007

PATRIOT ENGINEERING and Environmental, Inc.
Engineering Value for Project Success
Consulting Environmental, Geotechnical and Materials Engineers

January 4, 2007

To Whom It May Concern:

RE: Report of Site Reconnaissance Study and Preliminary Geotechnical Engineering Investigation
Proposed Industrial Site Development
Marion, Arkansas
Patriot Project Number 5-06-1500

Dear Sir:

Submitted herewith is the report of our subsurface investigation for the above-referenced site. This investigation was completed in general accordance with our telephone discussions, with the email correspondence received between November 21 and December 8, 2006, and with your conversations with Mike Vaught of Patriot.

This report includes detailed and graphic logs of a total of five (5) soil test borings drilled at the proposed site. Also included in the report are the results of laboratory tests performed on samples obtained from the site, and preliminary geotechnical conclusions and recommendations pertinent to the site.

We appreciate the opportunity to have performed this site reconnaissance study and preliminary geotechnical engineering investigation and are looking forward to working with you during any future phases of development. If you have any questions regarding this report or if we may be of any additional assistance regarding any geotechnical aspect of the project, please do not hesitate to contact our office.

Respectfully submitted,
Patriot Engineering and Environmental, Inc.

Richard L. Johnson, P.E.
Manager, Louisville Geotechnical Services

Ronald W. Spivey, P.E.
Senior Project Engineer

Attachment: Report of Geotechnical Investigation

400 Production Court, Louisville, Kentucky 40299
(502) 961-5652 • (502) 961-9256 FAX • www.patrioteng.com
Offices in Indianapolis, Evansville, Fort Wayne, Lafayette, South Bend, Terre Haute, Dayton, and Robinson.

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REPORT OF SITE RECONNAISSANCE STUDY AND PRELIMINARY GEOTECHNICAL ENGINEERING INVESTIGATION

Proposed Industrial Site Development
Marion, Arkansas
Patriot Project No. 5-06-1500

1.0 INTRODUCTION

1.1 General

The proposed project consists of the selection of a site for future development of a new industrial plant. The results of this site reconnaissance study and preliminary geotechnical engineering investigation are presented in this report. This investigation was carried out in general accordance with telephone discussions with the Client, with the email correspondence received from the Client between November 21 and December 8, 2006, and with the Client's conversations with Mike Vaught of *Patriot*.

1.2 Purpose and Scope

The purpose of this study was to determine the general near surface and subsurface conditions within the proposed project area and to develop the preliminary geotechnical engineering conclusions and recommendations necessary for the site selection process. This was achieved by drilling soil test borings at several locations at the proposed site (5 total borings), and by conducting laboratory tests on samples taken from the borings. The number of test borings performed for this study was limited to approximately one full day of drilling and sampling at the request of the Client.

This report contains the results of our findings, an engineering interpretation of these results with respect to the available project information, and conclusions and preliminary recommendations to aid in site selection process for the proposed facility.

2.0 PROJECT INFORMATION

The proposed project involves the development of a large-scale industrial complex.

At the time of preparation of this report, this site is on the order of 1,600 acres in size and is located near the City of Marion, Arkansas. The site lies between I-40 and US 64, east of SR 147, west of Kuhn Road and north of Red Cross Road extended just west of Marion. The proposed project will include manufacturing and warehouse structures, roadways, parking lots, proposed future expansion areas and other related facilities. No structural design information for the proposed plant is available, but we have assumed a plant design similar to other plant facilities of the Client. Some heavily loaded column foundations and floor slabs are expected along with some deep pits.

3.0 SITE AND SUBSURFACE CONDITIONS

3.1 Site Conditions

The Marion site lies in the Mississippi River valley and is very flat. The site had previously been planted in cotton, although the cotton had been picked by the time of this investigation. (One parcel had recently been planted in cotton.) There are dirt farm roads throughout the property along with drainage ditches. A power line traverses the property from northwest toward the southeast.

3.2 Subsurface Conditions

Our interpretation of the subsurface conditions is based upon soil borings drilled at the approximate locations shown on the Boring Location Maps in Appendix A. The following discussion is general; for more specific information, please refer to the boring logs presented in Appendix A. It should be noted that the dashed stratification lines shown on the soil boring logs indicate approximate transitions between soil types. In situ stratification changes could occur gradually or at different depths. All depths discussed below refer to depths below the existing ground surface.

Brown and gray medium stiff to stiff clayey silt to sandy silt (ML) was noted beneath about 12 inches of topsoil in B-1 and from the ground surface in B-2 through B-5. Beneath the silty surface layer brown and gray to gray soft to very stiff silty clay (CL) was encountered to depths ranging from 8.5 to 16 feet. An exception was noted in B-3, where medium stiff, highly plastic clay (CH) was found from 8.5 to 13.5 feet. Gray, soft clayey silt (ML) was penetrated to a depth of 28.5 feet in B-1 and B-2 and

from 8.5 to 16 feet in B-3. Gray, medium stiff, highly plastic silty clay was found from 8.5 to 21 feet in B-5. Gray, soft silty clay (CL) was encountered from 28.5 to 33.5 feet in B-1, from 16 to 20 feet (bottom of test boring) in B-3 and from 12 to 25 feet (bottom of test boring) in B-4. Bluish gray to gray, soft to medium stiff, highly plastic silty clay (CH) with occasional traces of marl was observed from 33.5 to 48.5 feet in B-1 and from 28.5 to 42 feet in B-2. Gray, medium dense silty sand to fine to medium sand with some silt (SM) was noted from 21 to 34.5 feet in B-5, underlain by gray, medium stiff silty clay (CL) to 38.5 feet. Gray, medium dense fine to medium sand was noted below 48.5 feet in B-1, below 42 feet in B-2 and below 38.5 feet in B-5 extending to the bottom of test boring in each case (58.5, 45 and 40 feet, respectively.

3.3 Groundwater Conditions

Groundwater was encountered at depths ranging from 11 to 29 feet in four (4) of the five borings at this site, and at completion of drilling water levels were recorded at depths of 17 to 31.5 feet in three (3) borings. The five (5) borings caved to depths ranging from 3.5 to 36.5 feet after removal of the augers.

The term groundwater, for the purpose of this report, pertains to any water that percolates through the naturally occurring soil materials found on site. This includes any overland flow that permeates through a given depth of soil, perched water, and water that occurs below the "water table", a zone that remains saturated and water bearing year round.

It should be recognized that fluctuations in the groundwater level should be expected to occur due to variations in rainfall and other environmental or physical factors at the time measurements are made. The true static groundwater level can only be determined through observations made in cased holes over a long period of time, the construction of which was beyond the scope of this investigation.

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 Basis

Our recommendations are based on data presented in this report, which include soil borings, laboratory testing and our experience with similar projects. Subsurface

variations that may not be indicated by an exploratory boring program can exist on any site. If such variations or unexpected conditions are encountered during construction, or if the project information is incorrect or changed, we should be informed immediately since the validity of our recommendations may be affected. Refer to Appendix B for additional qualifications and contractual considerations.

4.2 Primary Geotechnical Considerations

Patriot has considered the following geotechnical-related factors in drawing conclusions and preparing recommendations for this site reconnaissance study. (Obviously, others are considering many other non-geotechnical factors as a part of the process.)

- The presence of rock/bedrock within potential grading or excavation depths.
- The strength and compressibility of the supporting subsoils.
- Possible foundation systems
- Cut and fill requirements
- The ability to work with existing shallow soils during construction.
- The depth to groundwater.
- Seismic factors
- Unusual soil or rock conditions requiring possible specialty techniques.
- Storm water/melt water drainage issues.
- Availability of acceptable soil and rock borrow materials.
- Special geologic issues, such as faults.

These factors have been considered for the site and rating values have been assigned to each factor. (The rating values have been arbitrarily selected by Patriot for the purposes of this report only and are based on this very limited geotechnical investigation and very limited map and resource material review.) No significant consideration has been given to possible environmental factors, assuming that others are addressing the environmental concerns. During future preliminary and final geotechnical engineering investigations for the site, other geotechnical factors may arise that are not addressed in this report.

4.3 Site Rating and Commentary

This site has a rating of 33 points based on Patriot's arbitrary rating system using the above factors. The primary geotechnical advantages of this site are: (1) there will be

no rock excavation, and (2) the site is flat. However, the soil conditions are fair to poor. The shallow soils are silty and will probably pump and rut with relatively small increases in moisture content. The soils become soft to very soft below about 8 to 10 feet and do not improve until below 35 to 40 feet. There is a strong likelihood that pile foundations will be needed even for moderate foundation loads. Furthermore, the gray clay soils are highly plastic, and could present problems with shrinkage and swelling if the pits extend down into these soils. (It should be noted that the fat clays are sufficiently deep that they should not present a problem for shallow footings, floor slab support or pavement support.)

Although groundwater was encountered no shallower than 11 feet at this site, test borings for the nearby elevated water tank indicated that groundwater could be as shallow as 6 feet at time. Because the site is flat, drainage of storm water will be a significant issue. Borrow material will have to come from off site, but it is likely that sand and gravel and lean clay will be locally available for grade-raise fill.

This site is relatively close to the New Madrid fault zone, and the seismic map indicates very high accelerations (0.2-second spectral acceleration of 1.82 g and 1-second spectral acceleration of .538 g). Furthermore, the Site Classification will probably be no better than **D** without extensive cross-hole sonic testing to verify otherwise. Bedrock is expected to be quite deep, and no information was found to indicate the presence of rock faults directly beneath this site.

4.4 Summary

In summary, the Marion, Arkansas site, has some positive aspects from a geotechnical standpoint. First of all, bedrock or rock removal should not be an issue within this site. It is likely that bedrock is deeper than 75 feet throughout this site. Secondly, the site is relatively flat, so that no significant cut or fill should be required, except for pit and underground utility excavations. Thirdly, although little borrow material will be available within the proposed 1,600-acre site, it is likely that river sand and gravel is readily available within reasonable haul distances.

Neutral issues relative to this site are as follows: Highly plastic (fat) clays were not encountered at shallow depths, so that over-excavation or high percentage lime treatment should not be necessary. On the other hand, the shallow soils generally

have a relatively high silt content, and silty soils can be difficult to work with in wet weather conditions. Relatively small increases in moisture content can lead to soft, pumping subgrade conditions requiring aeration or other treatment. Secondly, based upon this limited investigation, it does not appear that specialty techniques will be required for foundation installation, for grading operations or for infrastructure construction. From a geotechnical standpoint, deep foundations (driven piles, augered, cast-in-place piles, drilled shafts), over-excavation followed by replacement with structural fill, normal groundwater control (pumping from sumps) or pavement subgrade soil having a California Bearing Ratio (CBR) value of 2.5 percent or higher are not considered conditions requiring specialty construction or installation techniques.

Lower ratings were applied to the following conditions or situations: The subsoils, especially from 8 to 40 feet, are considered weak and compressible. As a result, it is not likely that shallow foundations can be utilized except for lightly loaded, one or two story structures. Low design bearing pressures and potential settlement issues are expected for this site, and deep foundation systems will be needed to support moderate to heavily loaded structures – probably extending to depths of 60 feet or greater. Highly plastic (fat) clays could be encountered in some areas in excavations extending deeper than 8 or 10 feet. Fat clays are generally not acceptable for direct support of foundations, slabs or pavement, and some over-excavation and replacement is generally recommended. Groundwater inflow should be expected in any excavations extending deeper than 6 to 10 feet, requiring groundwater control. Because the site is located in relatively close proximity to the New Madrid fault zone epicenter, the foundation and structural design will have to take into account high seismic design factors. Surface drainage design will have to take into account the relatively flat nature of the site. The cotton fields have been drained by a series of ditches within the site. The shallow subgrade soils are considered frost susceptible and subject to deterioration upon thawing conditions, due to the high silt content and some clay content.

5.0 INVESTIGATIONAL PROCEDURES

5.1 Field Work

A total of 5 borings were drilled at the Marion site on December 6 and 7. These

borings were drilled at the approximate locations shown on the Boring Location Maps in Appendix A. The latitude and longitude of each boring location were determined using a hand held GPS device and are shown on the Boring Location Maps.

The borings were advanced using 2¼" I.D. (inside diameter) hollow-stem augers. Samples were recovered in the undisturbed material below the bottom of the augers using the standard drive sample technique in accordance with ASTM D 1586-99. A 2" O.D. by $1^3/_8$" I.D. split-spoon sampler was driven a total of 18 inches with the number of blows of a 140-pound hammer falling 30 inches of penetration is the Standard Penetration Test result commonly referred to as the N-value (or blow-count). Split-spoon samples were recovered at 2.5-foot intervals, beginning at a depth of 1 foot below the existing surface grade, extending to the termination depths. Water levels were monitored at each borehole location during drilling and upon completion of the boring. The boreholes were backfilled with auger cuttings prior to demobilization for safety considerations.

Upon completion of the boring program, all of the samples retrieved during drilling in this sampling program were returned to *Patriot*'s soils testing laboratory where they were visually examined and classified. A laboratory generated log of each boring was prepared based upon the driller's field log, laboratory test results, and our visual classification. Test boring logs and a description of the classification system are included in Appendix A in this report. Indicated on each log are the primary strata encountered, the approximate depth of each stratum change, depth of sample, the Standard Penetration Test results, groundwater conditions, and select laboratory test data. The laboratory logs were prepared for each boring giving the appropriate sample data and the textural description and classification.

5.2 Laboratory Testing

Representative samples recovered in the borings were selected for testing in the laboratory to evaluate their physical properties and engineering characteristics. Laboratory analyses included natural moisture content determinations (ASTM D 2216), and an estimate of the unconfined compressive strength (q_u) of the cohesive soil samples utilizing a calibrated hand penetrometer, and Atterberg Limits. The results of all laboratory tests are shown on the boring logs.

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APPENDIX A

Site Vicinity Map

Boring Location Map

Boring Logs

Boring Log Key

Unified Soils Classification (USCS)

APPENDIX A

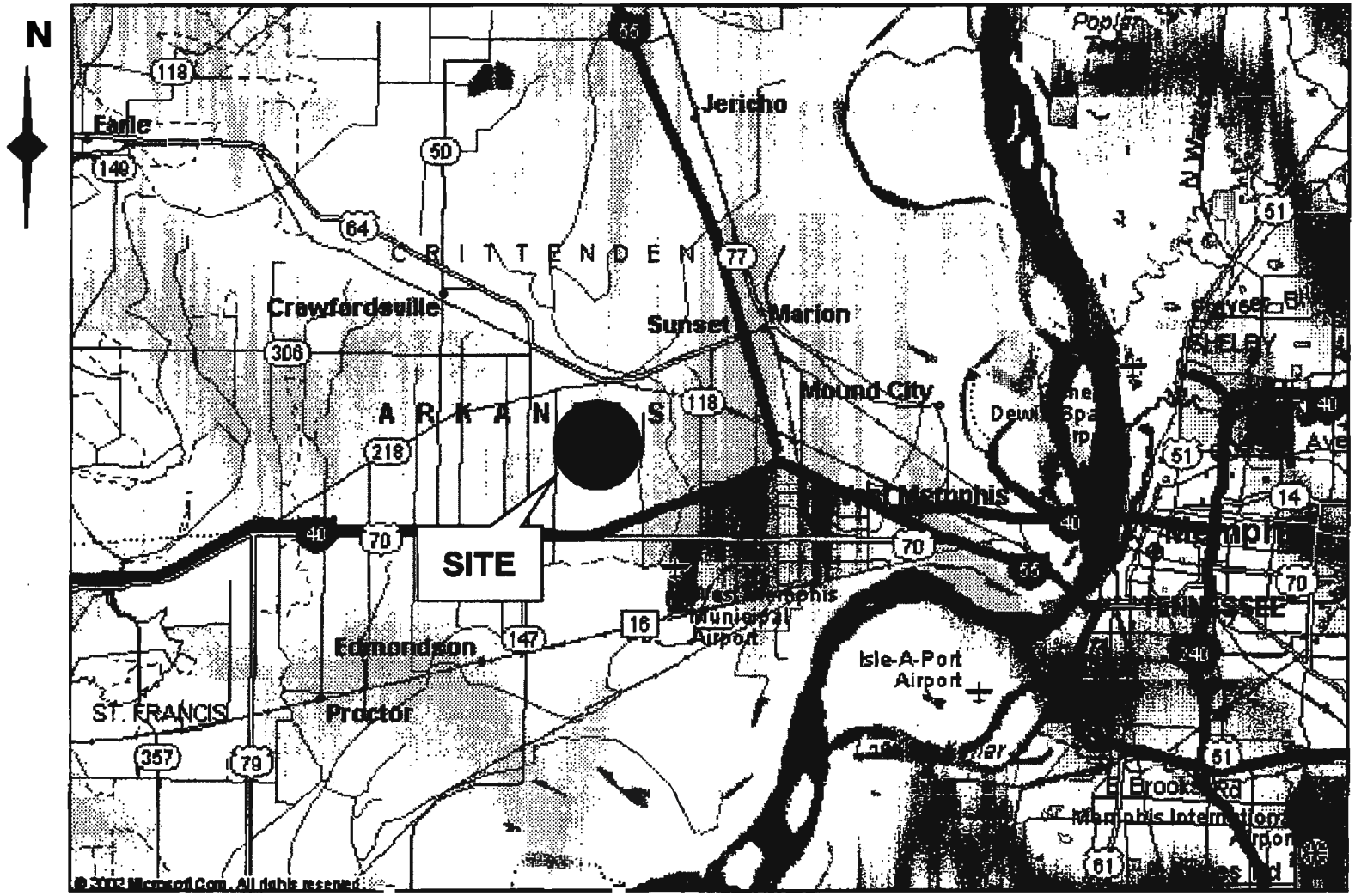
Site Vicinity Map

Boring Location Map

Boring Logs

Boring Log Key

Unified Soils Classification (USCS)



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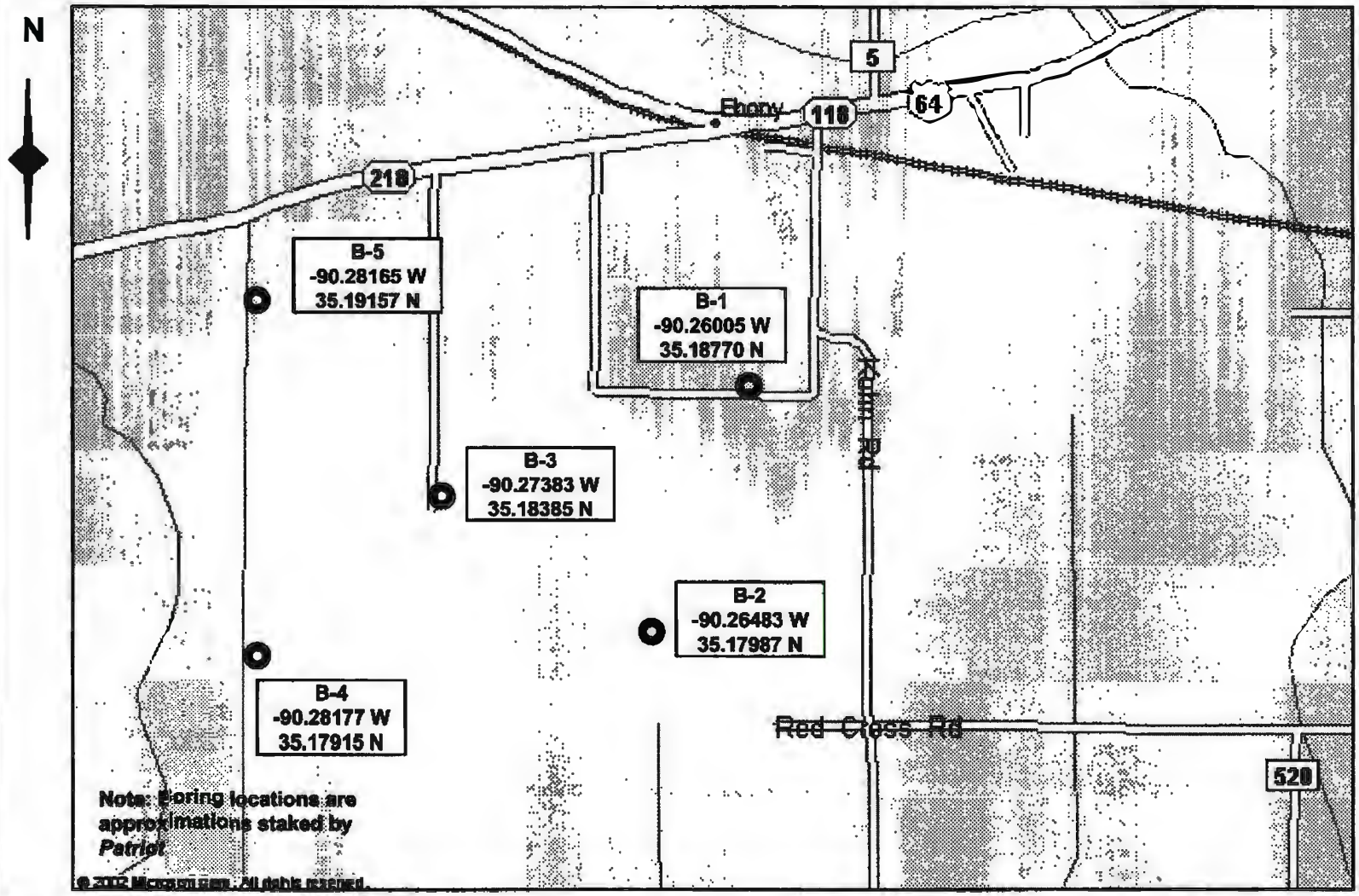
Louisville, Kentucky 40299

Site Vicinity Map
Proposed Industrial Site – Site "B"
Marion, AR

Job No. 5-06-1500	**Figure** 1



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and Environmental, Inc.
Louisville, Kentucky 40299

BORING LOCATION MAP
Proposed Industrial Site – Site "B"
Marion, AR

Job No. 5-06-1500	**Figure** 2

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LOG OF BORING B-1

Proposed Industrial Site - Site "B"
Marion, Arkansas

Client Name	: TMMNA	Driller	: TS / RL
Project Number	: 5-06-1500	Sampling	: Splitspoon
Logged By	: D. Johnson	Approximate Elevation	:
Start Date	: 12/6/2006	Drill Rig	: CME ATV Track Rig
Drilling Method	: HSA		

Water Levels
▼ During Drilling
▽ After Completion
◆ After 24 hours

Depth in Feet	Water Level	USCS	GRAPHIC	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	RQD %	REMARKS
0				Topsoil (12")							
		ML		Grayish brown, moist, medium stiff, SANDY SILT	☒	67	2/3/4	-	20		
5		ML		Grayish brown, moist, medium stiff, CLAYEY SANDY SILT	☒	83	4/3/3	0.75	28		Boring caved to 3.5' upon auger removal.
		ML		Gray, very moist, very soft, SILT w/ trace of clay	☒	100	1/2/1	-	36		
10	▼	CL		Gray, moist, very soft, SILTY CLAY	☒	100	1/2/1	0.75	38		
15		ML		Bluish gray, very moist, CLAYEY SILT	☒	94	1/2/1	-	31		
20					☒	100	2/1/2	0.25	34		
25					☒	100	2/1/2	-	31		
30		CL		Gray, moist, soft, SILTY CLAY	☒	100	1/2/2	0.75	39		
35		CH		Bluish gray to gray, moist, medium stiff, SILTY CLAY w/ trace marl	☒	100	3/3/3	1.5	48		
40				* soft below 43.5'	☒	100	2/4/4	0.25	34		
45					☒	100	3/2/3	1.75	34		
50		SP		Gray, wet, medium dense, fine to medium grained, SAND w/ trace silt	☒	100	1/5/8	-	28		
55					☒	100	4/4/10	-	18		
60				Boring terminated at 58.5'							

12-20-2006 C:\Borings\KY2006\5-06-1500\AR site\B-1.bor

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Indianapolis, Terre Haute, Evansville, Fort Wayne, South Bend, Lafayette, Louisville KY, Dayton OH, Charleston IL, Paducah KY

LOG OF BORING B-2

Proposed Industrial Site - Site "B"
Marion, Arkansas

Client Name	: TMMNA	Driller	: TS / RL
Project Number	: 5-06-1500	Sampling	: Splitspoon
Logged By	: D. Johnson	Approximate Elevation	:
Start Date	: 12/6/2006	Drill Rig	: CME ATV Track Rig
Drilling Method	: HSA		

Water Levels
▼ During Drilling
▽ After Completion
◆ After 24 hours

Depth in Feet	Water level	USCS	GRAPHIC	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	RQD %	REMARKS
0		ML		Dark brown and gray, moist, stiff to very stiff, SANDY SILT	☒	56	3/5/5	3.75	17		
					☒	78	5/7/9	3.0	29		
5		ML		Brown and gray, moist, stiff, SANDY SILT w/ trace clay	☒	89	3/5/5	1.75	23		
10		CH		Gray, moist, medium stiff, CLAY	☒	89	4/4/4	1.5	45		
15		CL		Gray and brown, moist, stiff, SILTY CLAY	☒	89	3/5/5	0.25	28		
20	▼	ML		Gray, very moist, very soft, CLAYEY SILT	☒	56	2/1/2	1.0	32		
25					☒	100	0/1/1	-	35		
30	▽	CH		Gray, moist, soft, SILTY CLAY	☒	100	1/2/2	0.5	47		
35					☒	100	2/2/2	0.25	53		Boring caved to 36.5' upon auger removal.
40					☒	100	2/3/2	-	31		
45		SP		Gray, wet, medium dense, fine to medium grained, SAND	☒	100	9/8/8	-	21		
50				Boring terminated at 45.0'							
55											
60											

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LOG OF BORING B-3

Proposed Industrial Site - Site "B"
Marion, Arkansas

Client Name	: TMMNA	Driller	: TS / RL
Project Number	: 5-06-1500	Sampling	: Splitspoon
Logged By	: D. Johnson	Approximate Elevation	:
Start Date	: 12/6/2006	Drill Rig	: CME ATV Track Rig
Drilling Method	: HSA		

Water Levels
▼ During Drilling
▽ After Completion
◆ After 24 hours

Depth in Feet	Water Level	USCS	GRAPHIC	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	RQD %	REMARKS
0		ML		Gray and brown, moist, stiff, SANDY SILT	☒	67	7/7/7	-	13		
5		CL		Mottled gray and brown, moist, stiff, SILTY CLAY	☒	78	7/8/9	3.5	27		
					☒	89	4/5/7	2.25	25		
10		ML		Grayish brown, very moist, soft, CLAYEY SILT	☒	100	2/3/2	0.25	26		
15	▼				☒	100	2/1/2	0.5	29		
	▽	CL		Gray, very moist, very soft, SILTY CLAY	☒	100	0/1/1	-	37		Boring caved to 17.5' upon auger removal.
20				Boring terminated at 20.0'							
25											
30											
35											
40											
45											
50											
55											
60											

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LOG OF BORING B-4

Proposed Industrial Site - Site "B"
Marion, Arkansas

Client Name	: TMMNA	Driller	: TS / RL
Project Number	: 5-06-1500	Sampling	: Splitspoon
Logged By	: D. Johnson	Approximate Elevation	:
Start Date	: 12/6/2006	Drill Rig	: CME ATV Track Rig
Drilling Method	: HSA		

Water Levels
▼ During Drilling
▽ After Completion
◆ After 24 hours

Depth in Feet	Water Level	USCS	GRAPHIC	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	RQD %	REMARKS
0		ML		Brown and gray, moist, stiff, CLAYEY SILT w/ trace organics	☒	67	3/4/7	3.75	21		
5		ML		Dark gray, dry, stiff, CLAYEY SILT w/ trace fine sand	☒	78	7/8/7	4.5	20		
		CL		Brown and gray, moist, stiff, SILTY CLAY w/ trace fine sand	☒	89	7/5/7	4.5	20		
10		CL			☒	94	4/4/6	2.0	31		
15		CL		Brown and gray, very moist, medium stiff to very soft, SILTY CLAY	☒	78	2/3/2	0.5	32		
20		CL		* gray below 21.0'	☒	100	1/2/1	0.25	32		
25					☒	94	1/2/1	0.5	54		Boring caved to 22.5' upon auger removal.
30				Boring terminated at 25.0'							
35											
40											
45											
50											
55											
60											

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LOG OF BORING B-5

Proposed Industrial Site - Site "B"
Marion, Arkansas

Client Name	: TMMNA	Driller	: TS / RL
Project Number	: 5-06-1500	Sampling	: Splitspoon
Logged By	: D. Johnson	Approximate Elevation	:
Start Date	: 12/7/2006	Drill Rig	: CME ATV Track Rig
Drilling Method	: HSA		

Water Levels
▼ During Drilling
▽ After Completion
◆ After 24 hours

Depth in Feet	Water Level	USCS	GRAPHIC	DESCRIPTION	Samples	Rec %	SPT Results	qp tsf	w %	RQD %	REMARKS
0		ML		Light brown and gray, dry, stif, CLAYEY SILT	☒	67	4/5/5	-	14		
5		CL		Brown and gray, moist, stiff, SILTY CLAY	☒	78	5/6/5	4.5	17		
					☒	98	5/6/7	2.75	26		
10		CH		Brown and gray, moist, medium stiff, SILTY CLAY	☒	100	4/4/4	2.0	36		
15					☒	100	3/2/4	1.0	51		
20					☒	100	3/3/3	-	28		
25	▽	SM		Gray, moist, medium dense, SILTY SAND	☒	83	5/6/7	-	15		
30		SM		Dark gray, very moist, medium dense, fine to medium grained, SAND w/ some silt	☒	89	9/8/9	-	26		Boring caved to 28.5' upon auger removal.
35		CL		Gray, very moist, medium stiff, SILTY CLAY w/ trace sand	☒	100	4/3/3	-	35		
40		SP		Gray, wet, medium dense, fine to medium grained, SAND w/ trace silt	☒	100	7/8/9	-	16		
45				Boring terminated at 40.0'							
50											
55											
60											

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BORING LOG KEY

UNIFIED SOIL CLASSIFICATION SYSTEM
FIELD CLASSIFICATION SYSTEM
FOR SOIL EXPLORATION

NON COHESIVE SOILS
(Silt, Sand, Gravel and Combinations)

Density	
Very Loose	-5 blows/ft. or less
Loose	-6 to 10 blows/ft.
Medium Dense	-11 to 30 blows/ft.
Dense	-31 to 50 blows/ft.
Very Dense	-51 blows/ft. or more

Grain Size Terminology			
Soil Fraction		**Particle Size**	**US Standard Sieve Size**
Boulders		Larger than 12"	Larger than 12"
Cobbles		3" to12"	3" to 12"
Gravel:	Coarse	¾" to 3"	¾" to 3"
	Small	4.76mm to ¾"	#4 to ¾"
Sand:	Coarse	2.00mm to 4.76mm	#10 to #4
	Medium	0.42mm to 2.00mm	#40 to #10
	Fine	0.074mm to 0.42mm	#200 to #40
Silt		0.005mm to 0.074 mm	Smaller than #200
Clay		Smaller than 0.005mm	Smaller than #200

RELATIVE PROPORTIONS FOR SOILS

Descriptive Term	Percent
Trace	1 - 10
Little	11 - 20
Some	21 - 35
And	36 - 50

COHESIVE SOILS
(Clay, Silt and Combinations)

Consistency	Field Identification	Unconfined Compressive Strength (tons/sq. ft.)
Very Soft	Thumb will penetrate soil more than 1 inch	Less than 0.25
Soft	Thumb will penetrate soil about 1 inch	0.25 – < 0.5
Medium Stiff	Thumb will penetrate soil about ½ inch	0.5 - < 1.0
Stiff	Thumb will indent soil about ¼ inch	1.0 - < 2.0
Very Stiff	Readily indented by thumbnail	2.0 - < 4.0
Hard	Indented with difficulty by thumbnail	Over 4.0

Classification on logs are made by visual inspection.

Standard Penetration Test - Driving a 2.0" O.D., $1^{3/8}$" I.D., sampler a distance of 1.0 foot into undisturbed soil with a 140 pound hammer free falling a distance of 30.0 inches. It is customary for **Patriot** to drive the spoon 6.0 inches to seat into undisturbed soil, then perform the test. The number of hammer blows for seating the spoon and making the tests are recorded for each 6.0 inches of penetration on the drill log (Example - 6/8/9). The standard penetration test results can be obtained by adding the last two figures (i.e. 8 + 9 = 17 blows/ft.).

Strata Changes - In the column "Soil Descriptions" on the drill log the horizontal lines represent strata changes. A solid line (———) represents an actually observed change, a dashed line (- - - - - -) represents an estimated change.

Groundwater observations were made at the times indicated. Porosity of soil strata, weather conditions, site topography, etc., may cause changes in the water levels indicated on the logs.

Groundwater symbols: ▼-observed groundwater elevation, encountered during drilling; ∇-observed groundwater elevation upon completion of boring.

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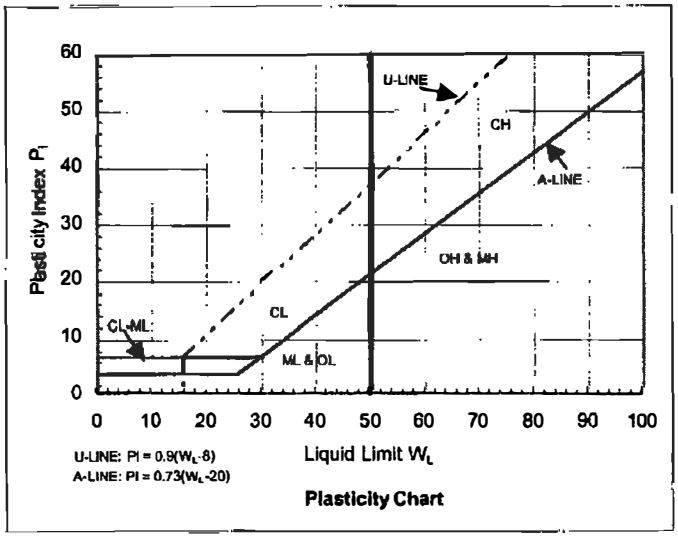
Unified Soil Classification

Major Divisions			Group Symbol	Typical Names	Classification Criteria for Coarse-Grained Soils		
Coarse-grained soils (more than half of material is larger than No. 200)	Gravels (more than half of coarse fraction is larger than No. 4 sieve size)	Clean gravels (little or no fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines	$C_U \geq 4$ $1 \leq C_C \leq 3$	$C_U = \frac{D_{60}}{D_{10}}$	$C_C = \frac{D^2_{30}}{D_{10} D_{60}}$
			GP	Poorly graded gravels, gravel-sand mixtures, little or no fines	Not meeting all gradation requirements for GW ($C_U < 4$ or $1 > C_C > 3$)		
		Gravels with fines (appreciable amount of fines)	GM (d/u)	Silty gravels, gravel-sand-silt mixtures	Atterberg limits below A line or $P_I < 4$	Above A line with $4 < P_I < 7$ are borderline cases requiring use of dual symbols	
			GC	Clayey gravels, gravel-sand-clay mixtures	Atterberg limits above A line or $P_I > 7$		
	Sands (more than half of coarse fraction is smaller than No. 4 sieve size)	Clean sands (little or no fines)	SW	Well-graded sands, gravelly sands, little or no fines	$C_U \geq 6$ $1 \leq C_C \leq 3$	$C_U = \frac{D_{60}}{D_{10}}$	$C_C = \frac{(D_{30})^2}{D_{10} D_{60}}$
			SP	Poorly graded sands, gravelly sands, little or no fines	Not meeting all gradation requirements for SW ($C_U < 6$ or $1 > C_C > 3$)		
		Sands with fines (appreciable amount of fines)	SM (d/u)	Silty sands, sand-silt mixtures	Atterberg limits below A line or $P_I < 4$	Limits plotting in hatched zone with $4 \leq P_I \leq 7$ are borderline cases requiring use of dual symbols	
			SC	Clayey sands, sand-clay mixtures	Atterberg limits above A line with $P_I > 7$		
Fine-grained soils (more than half of material is smaller than No. 200)	Silt and clays (liquid limit <50)		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity	1. Determine percentages of sand and gravel from grain size curve. 2. Depending on percentages of fines (fraction smaller than 200 sieve size), coarse-grained soils are classified as follows: Less than 5% - GW, GP, SW, SP More than 12% - GM, GC, SM, SC 5-12% - Borderline cases requiring dual symbols		
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays			
			OL	Organic silts and organic silty clays of low plasticity			
	Silts and clays (liquid limit >50)		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts			
			CH	Inorganic clays or high plasticity, fat clays			
			OH	Organic clays of medium to high plasticity, organic silts			
	Highly organic soils		PT	Peat and other highly organic soils			



Plasticity Chart

APPENDIX B

General Qualifications

and

Standard Clause for Unanticipated Subsurface Conditions

GENERAL QUALIFICATIONS
of Patriot Engineering's Geotechnical Engineering Investigation

This report has been prepared at the request of our client for his use on this project. The work, including the field work, laboratory testing, and engineering analysis, was performed in accordance with generally accepted soil and foundation engineering practices. This warranty is in lieu of all other warranties either expressed or implied.

This report may not contain sufficient information for purposes of other parties or other uses. Should there be any sufficient differences in structural arrangement, loading or location of the structure, our analysis should be reviewed.

The analysis, conclusions, and recommendations contained in our report are based on site conditions as they existed at the time of our exploration and further assume that the borings are representative of the subsurface conditions throughout the site.

If during construction, different subsurface conditions from those encountered during our explorations are observed or appear to be present beneath excavations, we must be advised promptly so that we can review these conditions and reconsider our recommendations where necessary.

If there is a substantial lapse of time between the submission of our report and the start of work at the site, or if conditions have changed due to natural causes or construction operations at or adjacent to the site, we urge that our report be reviewed to determine the applicability of the conclusions and recommendations considering the changed conditions and time lapse.

We urge that we be retained to review those portions of the plans and specifications that pertain to earthwork and foundations to determine whether they are consistent with our recommendations. In addition, we are available to observe construction, particularly the compaction of structural backfill and preparation of the foundations, and such other field observations as may be necessary.

In order to fairly consider changed or unexpected conditions that might arise during construction, we recommend the following verbiage (Standard Clause for Unanticipated Subsurface Conditions) be included in the project contract.

STANDARD CLAUSE FOR UNANTICIPATED SUBSURFACE CONDITIONS

"The owner has had a subsurface exploration performed by a soils consultant, the results of which are contained in the consultant's report. The consultant's report presents his conclusions on the subsurface conditions based on his interpretation of the data obtained in the exploration. The contractor acknowledges that he has reviewed the consultant's report and any addenda thereto, and that his bid for earthwork operations is based on the subsurface conditions as described in that report. It is recognized that a subsurface exploration may not disclose all conditions as they actually exist and further, conditions may change, particularly groundwater conditions, between the time of a subsurface exploration and the time of earthwork operations. In recognition of these facts, this clause is entered in the contract to provide a means of equitable additional compensation for the contractor if adverse unanticipated conditions are encountered and to provide a means of rebate to the owner if the conditions are more favorable than anticipated.

At any time during construction operations that the contractor encounters conditions that are different than those anticipated by the soils consultant's report, he shall immediately (within 24 hours) bring this fact to the owner's attention. If the owner's representative on the construction site observes subsurface conditions which are different than those anticipated by the consultant's report, he shall immediately (within 24 hours) bring this fact to the contractor's attention. Once a fact of unanticipated conditions has been brought to the attention of either the owner or the contractor, and the consultant has concurred, immediate negotiations will be undertaken between the owner and the contractor to arrive at a change in contract price for additional work or reduction in work because of the unanticipated conditions. The contract agrees that the following unit prices would apply for additional or reduced work under the contract. For changed conditions for which unit prices are not provided, the additional work shall be paid for on a time and materials basis."

Another example of a changed conditions clause can be found in paper No. 4035 by Robert F. Borg, published in ASCE Construction Division Journal, No. CO2, September 1964, page 37.

Wetlands Investigation
Site [illegible]ation Pit Derry
of P[illegible]

APPENDIX 2

BROPHY - HEINEKE & ASSOCIATES, INC.

Wetland/Environmental Consultants

December 8, 2006

Ms. Kay Brockwell
Economic Development Director
City of Marion
14 Military Road
Marion, Arkansas 72364

RE: Site Investigation of Marion Property

Dear Ms. Brockwell:

This is in reference to our site investigation conducted on December 7, 2006, of a parcel of property located south of Highway 64, east of Highway 147 and west of Kuhn Road in Marion, Crittenden County, Arkansas. The purpose of our investigation was to determine if any wetlands or other "waters of the United States" (as regulated by the U.S. Army Corps of Engineers - Corps) or "waters of the State of Arkansas" (as regulated by the Arkansas Department of Environmental Quality - ADEQ) are present on this site. The site is shown on the attached location map based on the Crawfordsville, Arkansas-Tennessee 1:24,000 U.S.G.S. topographic quadrangle.

During the field investigation, all watercourses and wetlands were identified within project boundaries. Several channels appear on the site and many have been historically altered due to farming activities on the subject property. Each of the potentially jurisdictional areas are indicated on the attached aerial photograph. Numerous field drains are located on the property and do not possess the characteristics associated with "waters of the United States." These areas are located in red on the attached aerial and will not be considered jurisdictional by the Corps.

Several other channels appear on the property and will be considered jurisdictional "waters of the United States" by the Corps. These areas can be located on the attached map highlighted in green and blue. The jurisdictional areas are divided into jurisdictional streams and jurisdictional wetlands. The jurisdictional wetlands on the property are historical stream channels which now possess the characteristics of a jurisdictional wetland. Jurisdictional streams are subject to regulation per linear foot of impacts and jurisdictional wetlands by acreage. The acreage of wetland impacts is calculated by multiplying the average width of the wetland by the total length.

In order to obtain concurrence for our findings, a site investigation was conducted on December 8, 2006, with Timothy Davis, Arkansas Section Chief with the Memphis District of the Army Corps of Engineers. During our investigation, the Corps provided verbal concurrence with our jurisdictional determinations of the channels on the property. Mr. Davis conveyed no concerns with the impacts associated with the development or the permitting of the proposed project. The jurisdictional areas located on the site primarily provide drainage from adjacent farm fields and exhibit minimal resource value or habitat. No pristine wetlands are located on the site and the jurisdictional areas are minimal considering the size and location of the subject property.

2978 Shelby Street • Bartlett, Tennessee 38134-4538 • (901) 373-3289 • Fax (901) 382-6380

It was stated that any major impacts to the jurisdictional areas will require an individual §404 Permit from the Corps and associated §401 Water Quality Certification from ADEQ. The permit application will require a Mitigation Proposal to restore resources values impacted by the development. In addition, a Practicable Alternatives Analysis will be conducted to examine alternatives which could decrease impacts to the jurisdictional areas. The permitting process will entail a 30 day public notice and will likely take from three to six months to obtain the necessary permits.

Depending on impacts to the jurisdictional areas, stream mitigation will likely entail the planting of bottomland hardwood seedlings on any segment of relocated channel. It may be beneficial to also plant the seedlings along the southern stream channel in order to enhance the existing riparian corridor. Wetland mitigation also will entail the restoration of wetland areas either on or off the project site. This mitigation is usually conducted at a 3:1 or 4:1 ratio (mitigated:impacted wetlands). Once mitigation measures are established, monitoring of these areas will be conducted semi-annually for the following five year period.

Mitigation was also discussed with Mr. Davis and no concerns were addressed. Projects similar to this have been permitted in the past and this project should be no exception. It was brought to our attention that the endangered fat pocketbook (*Potamilus capax*) may potentially be located within Ditch No. 11. However, after investigation of the property and the subject channel, it was determined the presence of this species is highly unlikely.

Ditch No. 11 contained only pockets of standing turbid water. Additionally, runoff from the adjacent railroad infrastructure and chemical runoff from the adjacent farm fields would likely prohibit the influx of this mussel.

Overall, the subject site contains non-jurisdictional areas, jurisdictional wetlands and jurisdictional intermittent streams. Considering the size of the property and the degraded quality of the wetlands and streams, the impacts associated with the proposed facility should be easily permitted. The impacts will entail a §404 Permit from the Corps and associated §401 Water Quality Certification from ADEQ. Mitigation will be requirement of permit issuance and should be easily established. Please call me at (901) 373-3289 if you have any questions. Thank you very much.

Sincerely,

Timothy E. Brophy
Certified Professional
Wetland Scientist #000522 (SWS)

copy:

Jerome Alford

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Image URL	http://www.terraserver.com/imagery/image_gx.asp?cpx=-90.2755076574113&cpy=35.1885678199256&res=8&provider_id=305&OL=Off
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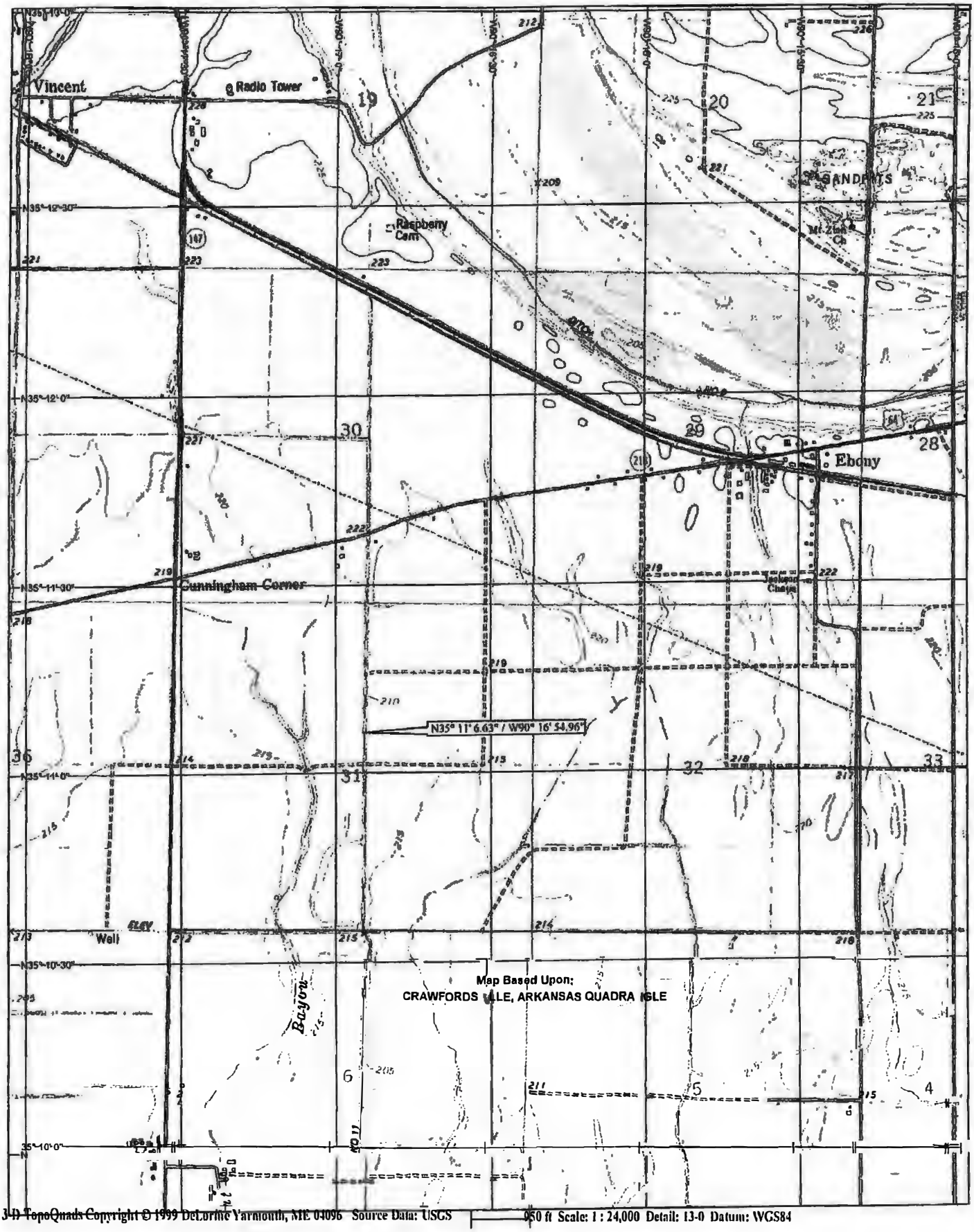

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetland delineation Manual)

Project/Site: Arkansas Megasite
Applicant/Owner: Bond Consulting Engineers East, Inc.
Investigator: Mitch Elcan and Brian Yates

Date: December 8, 2006
County: Crittenden
State: Arkansas

Do Normal Circumstances exist on the site? X Yes ___ No
Is the site significantly disturbed (Atypical Situation)? ___ Yes X No
Is the area a potential Problem Area? ___ Yes X No
(If needed, explain on reverse.)

Community ID: Wetland
Transect ID: ___
Plot ID: A

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Leptochloa uninervia*	Ground	FACW	9.		
2. *Panicum dichotomiflorum*	Ground	FACW	10.		
3. *Ranunculus sardous*	Ground	FAC+	11.		
4. *Sesbania exaltata*	Ground	FACW	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW OR FAC (excluding FAC-). 100%

Remarks: Hydrophytic vegetation parameter is met.

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
X No Recorded Data Available

Field Observations:

Depth of Surface Water: 0-2 (in.)
Depth to Free Water in Pit: N/A (in.)
Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
X Inundated
X Saturated in Upper 12 inches
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in wetlands
Secondary Indicators (2 or more required):
___ Oxidization Root Channels in Upper 12 inches
___ Water-Stained Leaves
___ Local Soil survey Data
___ FAC-Neutral Test
___ Other (Explain in Remark)

Remarks: Wetland Hydrology parameter is met.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetland delineation Manual)

Project/Site: Arkansas Megasite
Applicant/Owner: Bond Consulting Engineers East, Inc.
Investigator: Mitch Elcan and Brian Yates

Date: December 8, 2006
County: Crittenden
State: Arkansas

Do Normal Circumstances exist on the site?	X Yes	__ No	Community ID: Upland
Is the site significantly disturbed (Atypical Situation)?	__ Yes	X No	Transect ID:
Is the area a potential Problem Area? (If needed, explain on reverse.)	__ Yes	X No	Plot ID: A

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Rumex crispus*	Ground	FAC	9.		
2. *Quercus nigra*	Tree	FAC	10.		
3. *Geranium carolinianum*	Ground	NI	11.		
4. *Sorghum halepense*	Ground	FACU	12.		
5. *Smilax rotundifolia*	Vine	FAC	13.		
6. *Rubus argutus*	Ground	FACU+	14.		
7. *Allium vineale*	Ground	FACU	15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW OR FAC (excluding FAC-). 29%

Remarks: Hydrophytic vegetation parameter is not met.

HYDROLOGY

__ Recorded Data (Describe in Remarks):
- ____ Stream, Lake, or Tide Gauge
- ____ Aerial Photographs
- ____ Other

X No Recorded Data Available

Field Observations:

Depth of Surface Water:	0	(in.)
Depth of Free Water Pit:	> 16	(in.)
Depth of Saturated Soils:	> 16	(in.)

Wetland Hydrology Indicators:
Primary Indicators:
- __ Inundated
- __ Saturated in Upper 12 Inches
- __ Water Marks
- __ Drift Lines
- __ Sediment Deposits
- __ Drainage Patterns in wetlands

Secondary Indicators (2 or more required):
- __ Oxidization Root Channels in Upper 12 inches
- __ Water-Stained Leaves
- __ Local Soil survey Data
- __ FAC-Neutral Test
- __ Other (Explain in Remark)

Remarks: Wetland hydrology parameter is not met.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetland delineation Manual)

Project/Site: Arkansas Megasite
Applicant/Owner: Bond Consulting Engineers East, Inc.
Investigator: Mitch Elcan and Brian Yates

Date: December 8, 2006
County: Crittenden
State: Arkansas

Do Normal Circumstances exist on the site?	X Yes	___ No	Community ID: Upland
Is the site significantly disturbed (Atypical Situation)?	___ Yes	X No	Transect ID:
Is the area a potential Problem Area?	___ Yes	X No	Plot ID: C
(If needed, explain on reverse.)			

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Rubus trivialis*	Vine	FAC	9.		
2. *Sorghum halepense*	Ground	FACU	10.		
3. *Conyza canadensis*	Ground	FACU	11.		
4. *Lamium purpureum*	Ground	NI	12.		
5. *Rumex crispus*	Ground	FAC	13.		
6. *Geranium carolinianum*	Ground	NI	14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW OR FAC (excluding FAC-). 33%

Remarks: Hydrophytic vegetation parameter is not met.

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

X No Recorded Data Available

Field Observations:

Depth of Surface Water:	0	(in.)
Depth of Free Water Pit:	> 16	(in.)
Depth of Saturated Soils:	> 16	(in.)

Wetland Hydrology Indicators:
Primary Indicators:
- ___ Inundated
- ___ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in wetlands

Secondary Indicators (2 or more required):
- ___ Oxidization Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ___ Local Soil survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remark)

Remarks: Wetland hydrology parameter is not met.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetland delineation Manual)

Project/Site: Arkansas Megasite
Applicant/Owner: Bond Consulting Engineers East, Inc.
Investigator: Mitch Elcan and Brian Yates

Date: December 8, 2006
County: Crittenden
State: Arkansas

Do Normal Circumstances exist on the site?	X Yes	__ No	Community ID:	Wetland
Is the site significantly disturbed (Atypical Situation)?	__ Yes	X No	Transect ID:	
Is the area a potential Problem Area?	__ Yes	X No	Plot ID:	C
(If needed, explain on reverse.)				

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. ~~*Panicum dichotomiflorum*~~	Ground	FACW	9.		
2. *Leptochloa uninervia*	Ground	FACW	10.		
3. *Polygonum pennsylvanicum*	Ground	FACW	11.		
4. *Ranunculus sardous*	Ground	FAC+	12.		
5. *Sesbania exaltata*	Ground	FACW-	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW OR FAC (excluding FAC-). 100%

Remarks: Hydrophytic vegetation parameter is met.

HYDROLOGY

__ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

X No Recorded Data Available

Field Observations:

Depth of Surface Water:	2-4	(in.)
Depth to Free Water in Pit:	N/A	(in.)
Depth to Saturated Soils:	0	(in.)

Wetland Hydrology Indicators:
Primary Indicators:
- X Inundated
- X Saturated in Upper 12 inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in wetlands

Secondary Indicators (2 or more required):
- ___ Oxidization Root Channels in Upper 12 inches
- ___ Water-Stained Leaves
- ___ Local Soil survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remark)

Remarks: Wetland Hydrology parameter is met.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetland delineation Manual)

Project/Site: Arkansas Megasite
Applicant/Owner: Bond Consulting Engineers East, Inc.
Investigator: Mitch Elcan and Brian Yates

Date: December 8, 2006
County: Crittenden
State: Arkansas

Do Normal Circumstances exist on the site? X Yes ___ No
Is the site significantly disturbed (Atypical Situation)? ___ Yes X No
Is the area a potential Problem Area? ___ Yes X No
(If needed, explain on reverse.)

Community ID: Wetland
Transect ID: ___
Plot ID: G

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Panicum dichotomiflorum*	Ground	FACW	9.		
2. *Sesbania exaltata*	Ground	FACW-	10.		
3. *Polygonum pennsylvanicum*	Ground	FACW	11.		
4. *Amaranthus rudis*	Ground	FAC	12.		
5. *Rubus trivialis*	Vine	FAC	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW OR FAC (excluding FAC-). 100%

Remarks: Hydrophytic vegetation parameter is met.

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
X No Recorded Data Available

Field Observations:

Depth of Surface Water: 0-2 (in.)
Depth to Free Water in Pit: N/A (in.)
Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
X Inundated
X Saturated in Upper 12 inches
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in wetlands
Secondary Indicators (2 or more required):
___ Oxidization Root Channels in Upper 12 inches
___ Water-Stained Leaves
___ Local Soil survey Data
___ FAC-Neutral Test
___ Other (Explain in Remark)

Remarks: Wetland Hydrology parameter is met.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetland delineation Manual)

Project/Site: Arkansas Megasite
Applicant/Owner: Bond Consulting Engineers East, Inc.
Investigator: Mitch Elcan and Brian Yates

Date: December 8, 2006
County: Crittenden
State: Arkansas

Do Normal Circumstances exist on the site? X Yes __ No
Is the site significantly disturbed (Atypical Situation)? __ Yes X No
Is the area a potential Problem Area? __ Yes X No
(If needed, explain on reverse.)

Community ID: Wetland
Transect ID:
Plot ID: J

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Leptochloa uninervia*	Ground	FACW	9.		
2. *Panicum dichotomiflorum*	Ground	FACW	10.		
3. *Ranunculus sardous*	Ground	FAC+	11.		
4. *Sesbania exaltata*	Ground	FACW	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW OR FAC (excluding FAC-). 100%

Remarks: Hydrophytic vegetation parameter is met.

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
X No Recorded Data Available

Field Observations:

Depth of Surface Water: 0-2 (in.)
Depth to Free Water in Pit: N/A (in.)
Depth to Saturated Soils: 0 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
X Inundated
X Saturated in Upper 12 Inches
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in wetlands
Secondary Indicators (2 or more required):
___ Oxidization Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil survey Data
___ FAC-Neutral Test
___ Other (Explain in Remark)

Remarks: Wetland Hydrology parameter is met.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetland delineation Manual)

Project/Site: Arkansas Megasite
Applicant/Owner: Bond Consulting Engineers East, Inc.
Investigator: Mitch Elcan and Brian Yates

Date: December 8, 2006
County: Crittenden
State: Arkansas

Do Normal Circumstances exist on the site?	X Yes	___ No	Community ID: Upland
Is the site significantly disturbed (Atypical Situation)?	___ Yes	X No	Transect ID:
Is the area a potential Problem Area?	___ Yes	X No	Plot ID: G
(If needed, explain on reverse.)			

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Conyza canadensis*	Ground	FACU	9. *Capsella bursa-pastoris*	Ground	FACU+
2. *Sorghum halepense*	Ground	FACU	10.		
3. *Conyza canadensis*	Ground	FACU	11.		
4. *Amaranthus rudis*	Ground	FAC	12.		
5. *Lamium purpureum*	Ground	NI	13.		
6. *Geranium carolinianum*	Ground	NI	14.		
7. *Allium vineale*	Ground	FACU	15.		
8. *Leptochloa uninervia*	Ground	FACW	16.		

Percent of Dominant Species that are OBL, FACW OR FAC (excluding FAC-). 22%

Remarks: Hydrophytic vegetation parameter is not met.

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ____ Stream, Lake, or Tide Gauge
- ____ Aerial Photographs
- ____ Other

X No Recorded Data Available

Field Observations:

Depth of Surface Water:	0	(In.)
Depth of Free Water Pit:	> 16	(In.)
Depth of Saturated Soils:	> 16	(In.)

Wetland Hydrology Indicators:
Primary Indicators:
- ___ Inundated
- ___ Saturated In Upper 12 inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in wetlands

Secondary Indicators (2 or more required):
- ___ Oxidization Root Channels in Upper 12 inches
- ___ Water-Stained Leaves
- ___ Local Soil survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remark)

Remarks: Wetland hydrology parameter is not met.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetland delineation Manual)

Project/Site: Arkansas Megasite
Applicant/Owner: Bond Consulting Engineers East, Inc.
Investigator: Mitch Elcan and Brian Yates

Date: December 8, 2006
County: Crittenden
State: Arkansas

Do Normal Circumstances exist on the site?	X Yes	___ No	Community ID: Upland
Is the site significantly disturbed (Atypical Situation)?	___ Yes	X No	Transect ID:
Is the area a potential Problem Area? (If needed, explain on reverse.)	___ Yes	X No	Plot ID: J

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Rumex crispus*	Ground	FAC	9.		
2. *Amaranthus rudis*	Ground	FAC	10.		
3. *Geranium carolinianum*	Ground	NI	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW OR FAC (excluding FAC-). 67%

Remarks: Hydrophytic vegetation parameter is met. Much of the surrounding upland area is cultivated cotton field and is mostly bare dirt with few plants present.

HYDROLOGY

___ Recorded Data (Describe In Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
X No Recorded Data Available

Field Observations:

Depth of Surface Water: 0 (in.)
Depth of Free Water Pit: > 16 (in.)
Depth of Saturated Soils: > 16 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
___ Saturated In Upper 12 inches
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in wetlands
Secondary Indicators (2 or more required):
___ Oxidization Root Channels in Upper 12 inches
___ Water-Stained Leaves
___ Local Soil survey Data
___ FAC-Neutral Test
___ Other (Explain in Remark)

Remarks: Wetland hydrology parameter is not met.

SOILS

Map Unit Name
(Series and Phase): Dundee silt loam (DuA) Drainage Class: Somewhat poorly drained
Field Observations
Taxonomy (Subgroup): N/A Confirm Mapped Type? X Yes ___ No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-16	A/B	10YR 5/4	7.5YR 5/6	Few, Indistinct	Silt loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks: Hydric soils parameter is not met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? ___ Yes X No
Wetland Hydrology Present? ___ Yes X No
Hydric Soils Present? ___ Yes X No

Is this Sampling Point Within a Wetland? ___ Yes X No

Remarks: None of the three wetland parameters were met. The area is not a wetland.

Approved by HQUSACE 3/92
Computer Version by Heineke & Associates, Inc. 2/04

SOILS

Map Unit Name
(Series and Phase): Dundee Silt loam (DuA) Drainage Class: Somewhat poorly drained
Field Observations
Taxonomy (Subgroup): N/A Confirm Mapped Type? X Yes __ No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-4	A/B	10YR 4/2	None	None	Silt loam
4-12	B	10YR 4/3	Few, indistinct	10YR 4/4	Silt loam
12-16	B	10YR 4/3	Few, distinct	7.5YR 5/6	Silt loam

Hydric Soil Indicators:

____ Histosol
____ Histic Epipedon
____ Sulfidic Odor
____ Aquic Moisture Regime
____ Reducing Conditions
____ Gleyed or Low-Chroma Colors
____ Concretions
____ High Organic Content in Surface Layer in Sandy Soils
____ Organic Streaking in Sandy soils
____ Listed on Local Hydric Soils List
____ Listed on National Hydric Soils List
____ Other (Explain in Remarks)

Remarks: Hydric soils parameter is not met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? __Yes _X__ No
Wetland Hydrology Present? ___ Yes _X__ No
Hydric Soils Present? ___ Yes _X__ No

Is this Sampling Point Within a Wetland? __ Yes _X__ No

Remarks: None of the three wetland parameters were met. The area is not a wetland.

Approved by HQUSACE 3/92
Computer Version by Heineke & Associates, Inc. 2/04

SOILS

Map Unit Name
(Series and Phase): Dundee Silt Loam (DuA) Drainage Class: Somewhat poorly drained
Field Observations
Taxonomy (Subgroup): N/A Confirm Mapped Type? X Yes __ No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-8	A/B	10YR 4/2	10YR 5/6	Few, Distinct	Silty clay loam
8-16	B	10YR 4/2	2.5YR 4/6	Common, Distinct	Silty clay loam

Hydric Soil Indicators:

____ Histosol
____ Histic Epipedon
____ Sulfidic Odor
____ Aquic Moisture Regime
____ Reducing Conditions
_X_ Gleyed or Low-Chroma Colors
____ Concretions
____ High Organic Content in Surface Layer in Sandy Soils
____ Organic Streaking in Sandy soils
____ Listed on Local Hydric Soils List
____ Listed on National Hydric Soils List
____ Other (Explain in Remarks)

Remarks: Hydric soils parameter is met. Dundee (DuA) soil series contains hydric inclusions of Forestdale (Fo) silty clay loam which is consistent with observations above.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? _X_ Yes ___ No
Wetland Hydrology Present? _X_ Yes ___ No
Hydric Soils Present? _X_ Yes ___ No

Is this Sampling Point Within a Wetland? _X_ Yes ___ No

Remarks: All three wetland parameters were met. The area is a wetland.

Approved by HQUSACE 3/92
Computer Version by Heineke & Associates, Inc. 2/04

SOILS

Map Unit Name
(Series and Phase): Dundee silt loam (DuA) Drainage Class: Somewhat poorly drained
Field Observations
Taxonomy (Subgroup): N/A Confirm Mapped Type? X Yes __ No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-8	A/B	10YR 4/2	7.5YR 6/8	Few, Distinct	Silty clay loam
8-16	B	10YR 4/2	10YR 5/6	Common, Distinct	Silty clay loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
X Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks: Hydric soils parameter is met. Dundee (DuA) soil series contains hydric inclusions of Forestdale (Fo) silty clay loam which is consistent with observations above.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? X Yes ___ No
Wetland Hydrology Present? X Yes ___ No
Hydric Soils Present? X Yes ___ No
Is this Sampling Point Within a Wetland? X Yes ___ No

Remarks: All three wetland parameters were met. The area is a wetland.

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SOILS

Map Unit Name
(Series and Phase): Alligator silty clay (A1A)

Drainage Class: Poorly drained

Field Observations

Taxonomy (Subgroup): Vertic haplaquepts

Confirm Mapped Type? __ Yes X No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-4	A/B	10YR 4/2	None	None	Silt loam
4-12	B	10YR 4/3	Few, indistinct	10YR 4/4	Silt loam
12-16	B	10YR 4/3	Few, distinct	7.5YR 5/6	Silt loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks: Hydric soils parameter is not met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? X Yes __ No
Wetland Hydrology Present? __ Yes X No
Hydric Soils Present? __ Yes X No

Is this Sampling Point Within a Wetland? __ Yes X No

Remarks: Only one of the three wetland parameters was met. The area is not a wetland.

Approved by HQUSACE 3/92
Computer Version by Heineke & Associates, Inc. 2/04

SOILS

Map Unit Name
(Series and Phase): Alligator silty clay (A1A) Drainage Class: Poorly drained

Field Observations

Taxonomy (Subgroup): Vertic haplaquepts Confirm Mapped Type? X Yes __ No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-8	A/B	10YR 4/2	10YR 5/6	Few, Distinct	Silty clay loam
8-16	B	10YR 4/2	2.5YR 4/6	Common, Distinct	Silty clay loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
X Gleyed or Low-Chroma Colors

___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy soils
X Listed on Local Hydric Soils List
X Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks: Hydric soils parameter is met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? X Yes ___ No
Wetland Hydrology Present? X Yes ___ No
Hydric Soils Present? X Yes ___ No

Is this Sampling Point Within a Wetland? X Yes ___ No

Remarks: All three wetland parameters were met. The area is a wetland.

Approved by HQUSACE 3/92
Computer Version by Heineke & Associates, Inc. 2/04

SOILS

Map Unit Name
(Series and Phase): Sharkey silty clay (ShA)

Drainage Class: Poorly drained

Field Observations

Taxonomy (Subgroup): Vertic haplaquepts

Confirm Mapped Type? X Yes ___ No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-8	A/B	10YR 4/2	10YR 5/6	Few, Distinct	Silty clay loam
8-16	B	10YR 4/2	2.5YR 4/6	Common, Distinct	Silty clay loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
X Gleyed or Low-Chroma Colors

___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy soils
X Listed on Local Hydric Soils List
X Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks: Hydric soils parameter is met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? X Yes ___ No
Wetland Hydrology Present? X Yes ___ No
Hydric Soils Present? X Yes ___ No

Is this Sampling Point Within a Wetland? X Yes ___ No

Remarks: All three wetland parameters were met. The area is a wetland.

Approved by HQUSACE 3/92
Computer Version by Heineke & Associates, Inc. 2/04

SOILS

Map Unit Name
(Series and Phase): Sharkey silty clay (ShA)

Drainage Class: Poorly drained

Field Observations

Taxonomy (Subgroup): Vertic haplaquepts

Confirm Mapped Type? __ Yes _X_ No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-5	A/B	10YR 4/2	None	None	Silt loam
5-8	B	10YR 4/4	Few, indistinct	10YR 6/4	Silt loam
8-16	B	10YR 4/4	Few, distinct	2.5YR 5/6	Silt loam

Hydric Soil Indicators:

____ Histosol
____ Histic Epipedon
____ Sulfidic Odor
____ Aquic Moisture Regime
____ Reducing Conditions
____ Gleyed or Low-Chroma Colors
____ Concretions
____ High Organic Content in Surface Layer in Sandy Soils
____ Organic Streaking in Sandy soils
____ Listed on Local Hydric Soils List
____ Listed on National Hydric Soils List
____ Other (Explain in Remarks)

Remarks: Hydric soils parameter is not met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? __Yes _X_ No
Wetland Hydrology Present? __Yes _X_ No
Hydric Soils Present? __Yes _X_ No

Is this Sampling Point Within a Wetland? __ Yes _X_ No

Remarks: None of the three wetland parameters were met. The area is not a wetland.

Approved by HQUSACE 3/92
Computer Version by Heineke & Associates, Inc. 2/04