jundud	Juncus dudleyi	Dudley's Rush	4	FACW	-1	Forb	Perennial	Native
juntor	Juncus torreyi	Torrey's Rush	4	FACW	-1	Forb	Perennial	Native
parqui	Parthenocissus quinquefolia	Virginia-Creeper	2	FACU	1	Vine	Perennial	Native
polpen	Persicaria pensylvanica	Pinkweed	0	FACU	1	Forb	Annual	Native
phaaru	Phalaris arundinacea	Reed Canary Grass	0	FACW	-1	Grass	Perennial	Adventive
popdel	Populus deltoides	Eastern Cottonwood	2	FAC	0	Tree	Perennial	Native
rhacat	Rhamnus cathartica	European Buckthorn	0	FAC	0	Shrub	Perennial	Adventive
rosmul	Rosa multiflora	Rambler Rose	0	FACU	1	Shrub	Perennial	Adventive
rubocc	Rubus occidentalis	Black Raspberry	2	UPL	2	Shrub	Perennial	Native
rumcri	Rumex crispus	Curly Dock	0	FAC	0	Forb	Perennial	Adventive
salint	Salix interior	Sandbar Willow	1	FACW	-1	Shrub	Perennial	Native
samcan	Sambucus nigra ssp. canadensis	Black Elder	1	FACW	-1	Shrub	Perennial	Native
sciflu	Schoenoplectus fluviatilis	River Club-Rush	4	OBL	-2	Sedge	Perennial	Native
sciatv	Scirpus atrovirens	Dark-Green Bulrush	4	OBL	-2	Sedge	Perennial	Native
solalt	Solidago altissima	Tall Goldenrod	1	FACU	1	Forb	Perennial	Native
solgig	Solidago gigantea	Late Goldenrod	4	FACW	-1	Forb	Perennial	Native
taroff	Taraxacum officinale	Common Dandelion	0	FACU	1	Forb	Perennial	Adventive
typlat	Typha latifolia	Broad-Leaf Cat-Tail	1	OBL	-2	Forb	Perennial	Native
vitrip	Vitis riparia	River-Bank Grape	2	FACW	-1	Vine	Perennial	Native

Wetland G Jurisdictional Determination Opinion: Wetland G appears to be a jurisdictional wetland area due to a connection to an unnamed tributary of the Kishwaukee River. A jurisdictional request to the Army Corps of Engineers should be submitted to identify the governing agency.

Wetland H: Wetland H is a wet prairie wetland that receives surface and subsurface flows from the upstream watershed and the surrounding property. Wetland H is characterized by data point 1H and is approximately **1.20 acres or 50,529.60 square foot.** The flagged wetland area was a historical farmed wetland. The dominant vegetation found was determined to be Sandbar Willow (*Salix interior*), Reed Canary Grass (*Phalaris arundinacea*) & Common Cattails (*Typha latifolia*).

During our investigation positive wetland hydrology is met with the primary indicators of Saturation (A3) & Surface Soil Cracks (B6). Mapped soil is identified as Pella silty clay loam (153A) which is a poorly drained hydric soil & Millbrook silt loam (219A) which is a somewhat poorly drained hydric soil.

Said vegetation soils and hydrology information noted above can be found in the datasheets section of this report. Please note data sheets 1H-3H reference wetland H.

Study Information

Site:	Windsor Trent
Locale:	Wetland H
By:	Robert Vanni

Conservatism-Based Metrics		Additional Metrics	
Mean C (native species)	1.13	Species Richness (all)	12.00
Mean C (all species)	0.75	Species Richness (native)	5.00



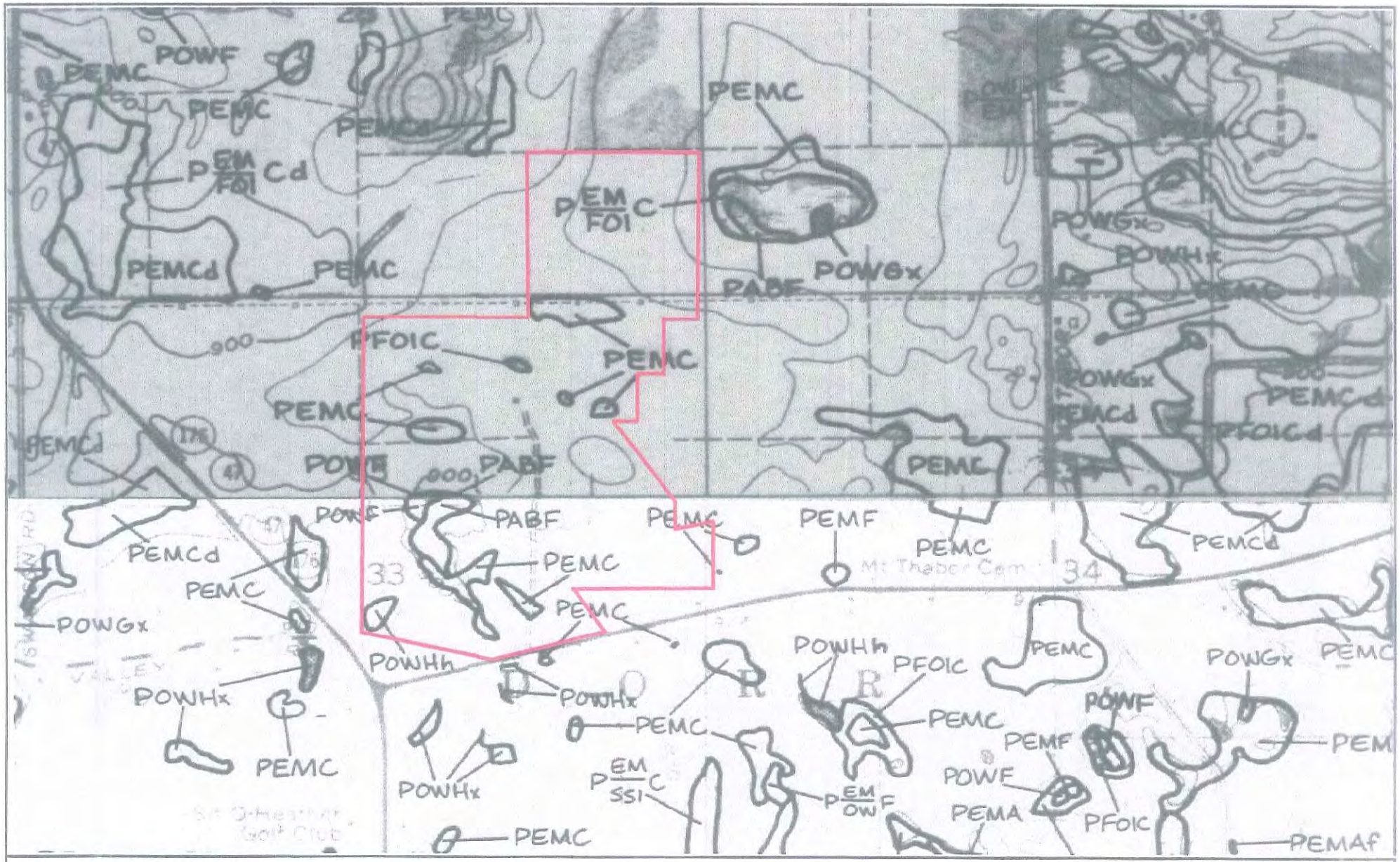
Source: Bing Street Maps

MIDWEST ECOLOGICAL

Location Map

Client: Kenneth A. Rawson, Windsor Trent, LLC.
540 Frontage Road, Ste 3175
Northfield, illinois 60093-1281

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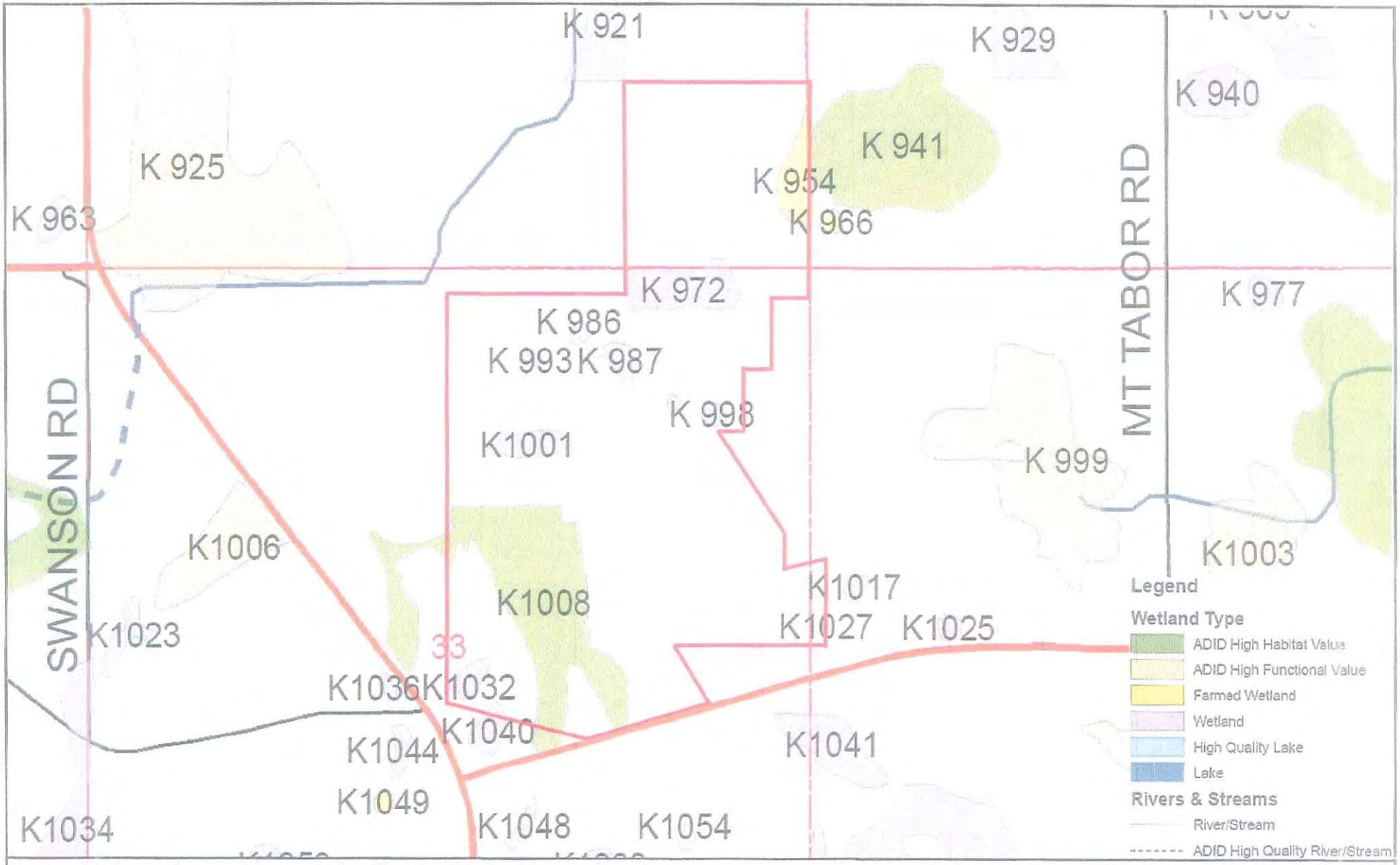
Source: National Wetland Inventory Map

MIDWEST ECOLOGICAL

N.W.I. Map

Client: Kenneth A. Rawson, Windsor Trent, LLC.
540 Frontage Road, Ste 3175
Northfield, illinois 60093-1281

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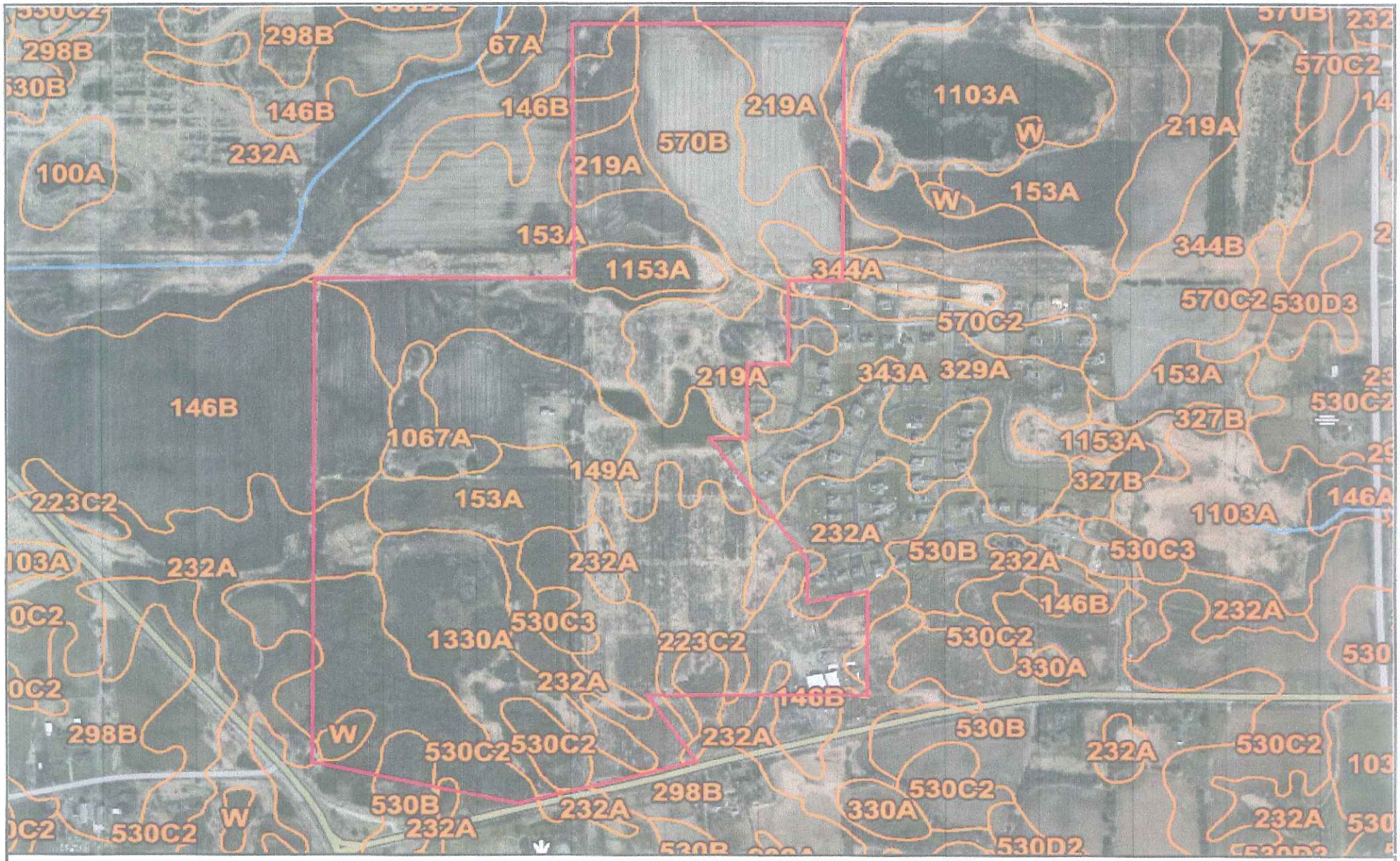
Source: McHenry County Advanced Identification Wetland Map

MIDWEST ECOLOGICAL

MCADID Map

Client: Kenneth A. Rawson, Windsor Trent, LLC.
540 Frontage Road, Ste 3175
Northfield, illinois 60093-1281

N W E S



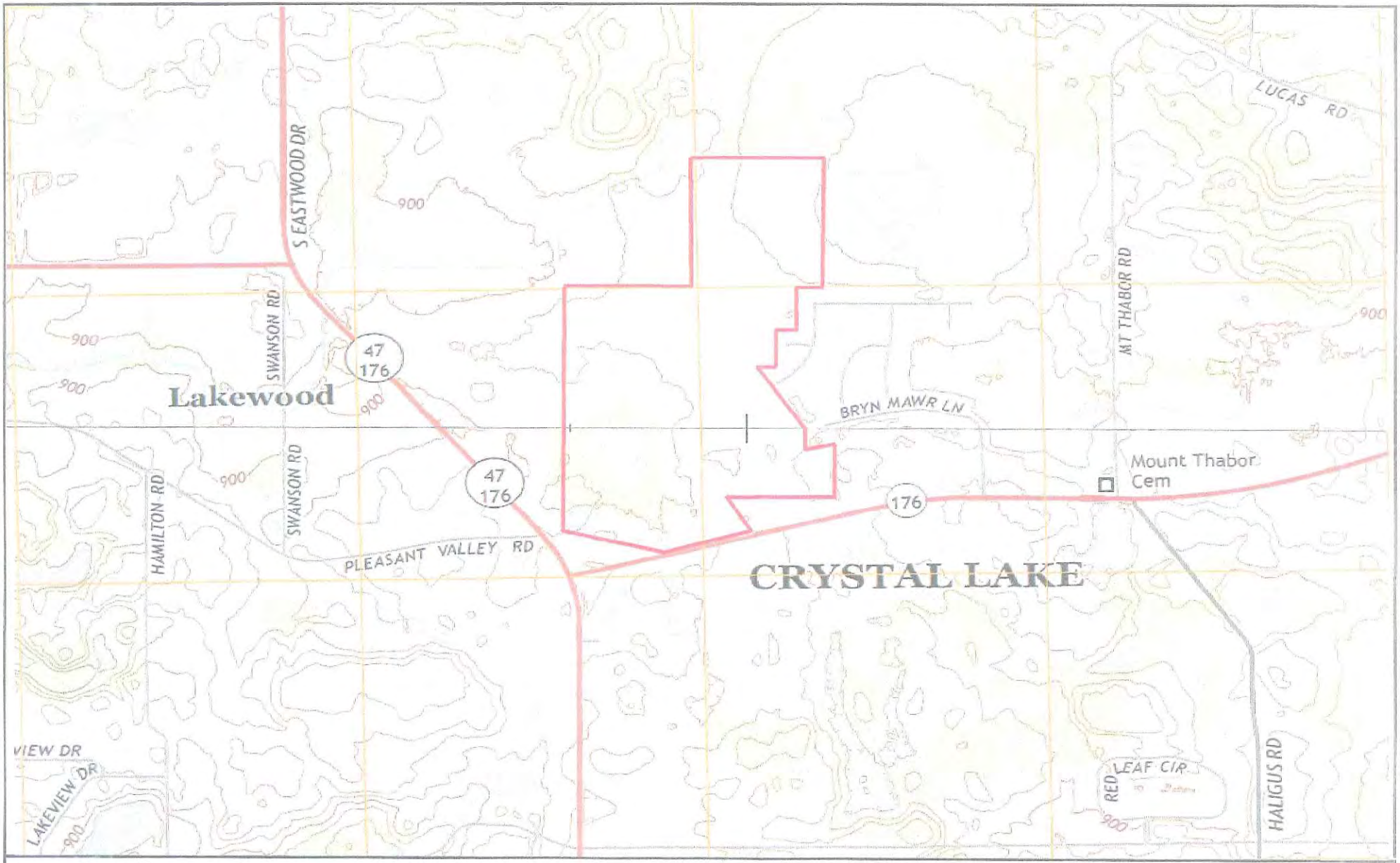
Source: NRCS Websoil Survey

MIDWEST ECOLOGICAL

Soils Map

Client: Kenneth A. Rawson, Windsor Trent, LLC.
540 Frontage Road, Ste 3175
Northfield, illinois 60093-1281

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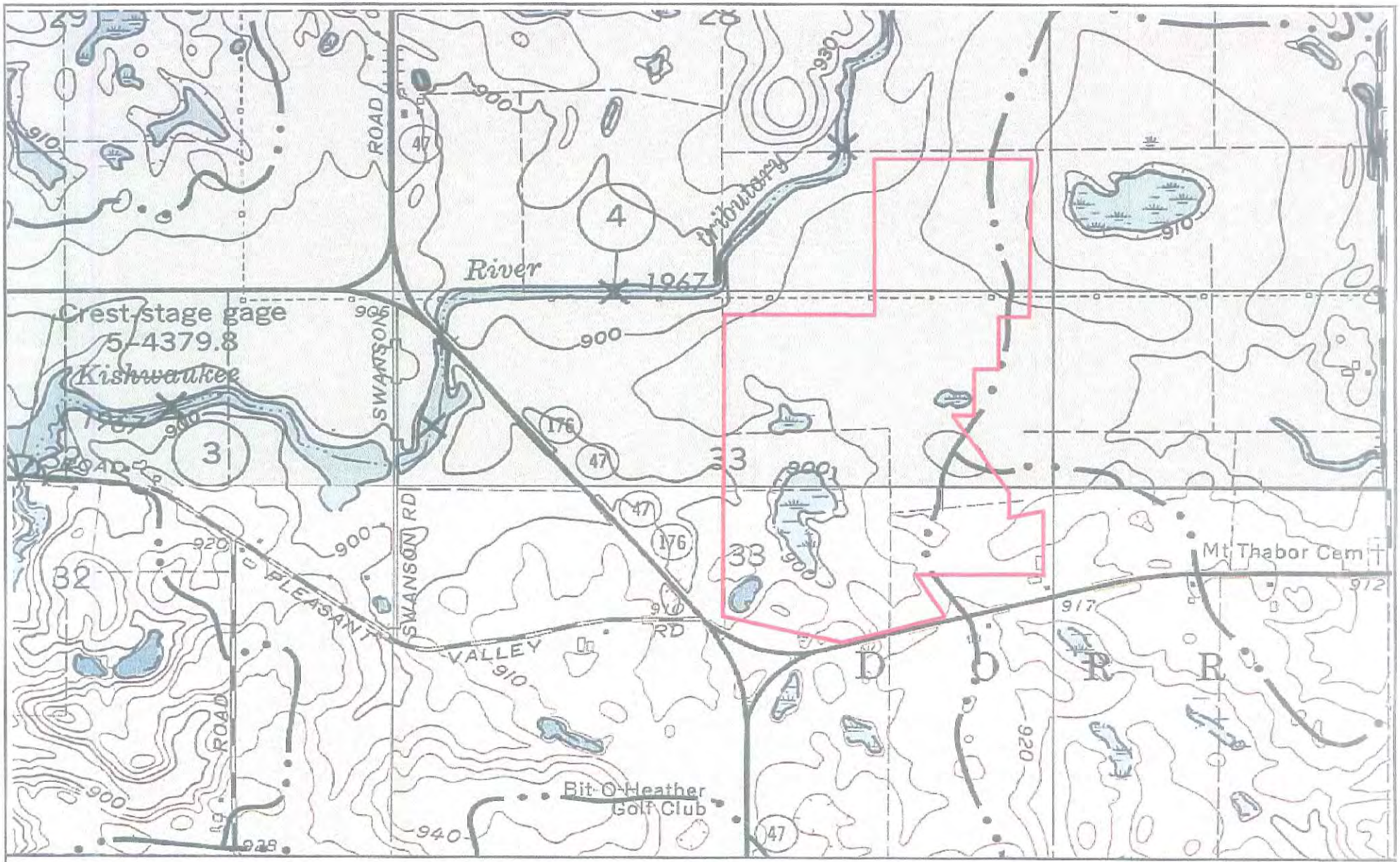
Source: United States Geological Survey Maps (2015)

MIDWEST ECOLOGICAL

U.S.G.S Maps

Client: Kenneth A. Rawson, Windsor Trent, LLC.
540 Frontage Road, Ste 3175
Northfield, illinois 60093-1281

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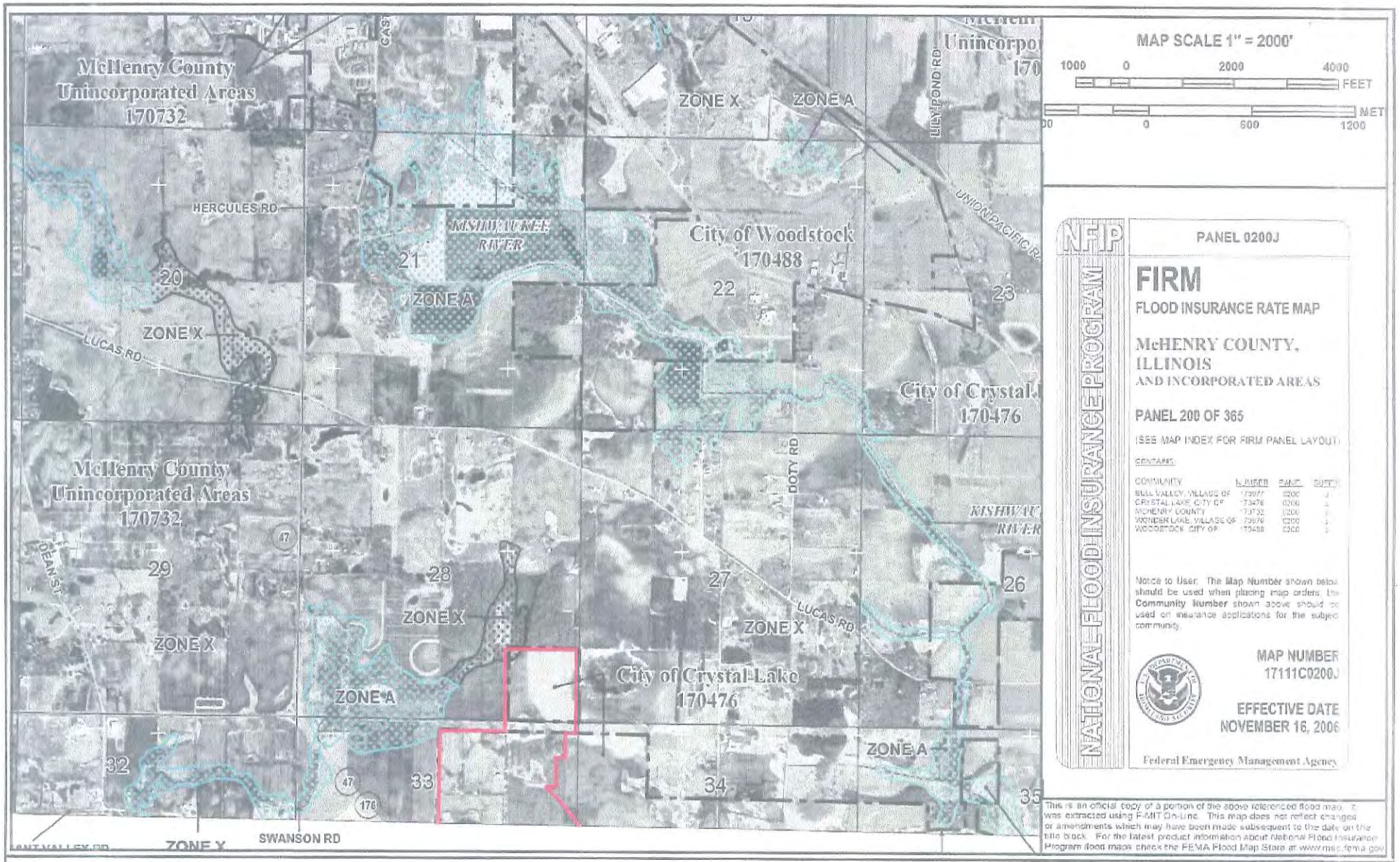
Source: United States Geological Survey, Hydrolgical Atlas, Maps (HA 256 & 361)

MIDWEST ECOLOGICAL

Hydrological Atlas Maps

Client: Kenneth A. Rawson, Windsor Trent, LLC.
540 Frontage Road, Ste 3175
Northfield, illinois 60093-1281

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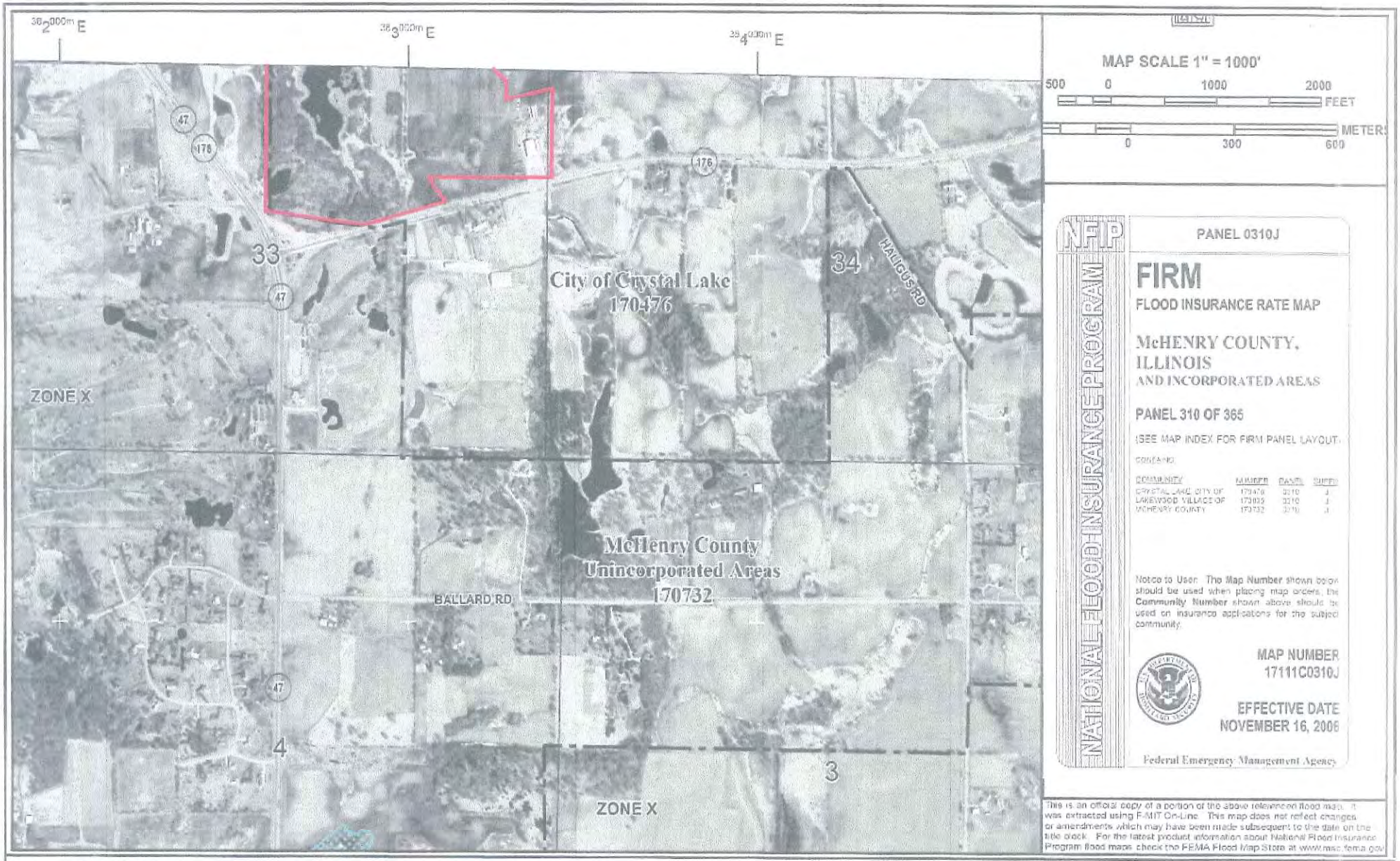
Source: Flood Insurance Rate Map

MIDWEST ECOLOGICAL

F.I.R.M. Map (1 of 2)

Client: Kenneth A. Rawson, Windsor Trent, LLC.
540 Frontage Road, Ste 3175
Northfield, illinois 60093-1281

N W E S



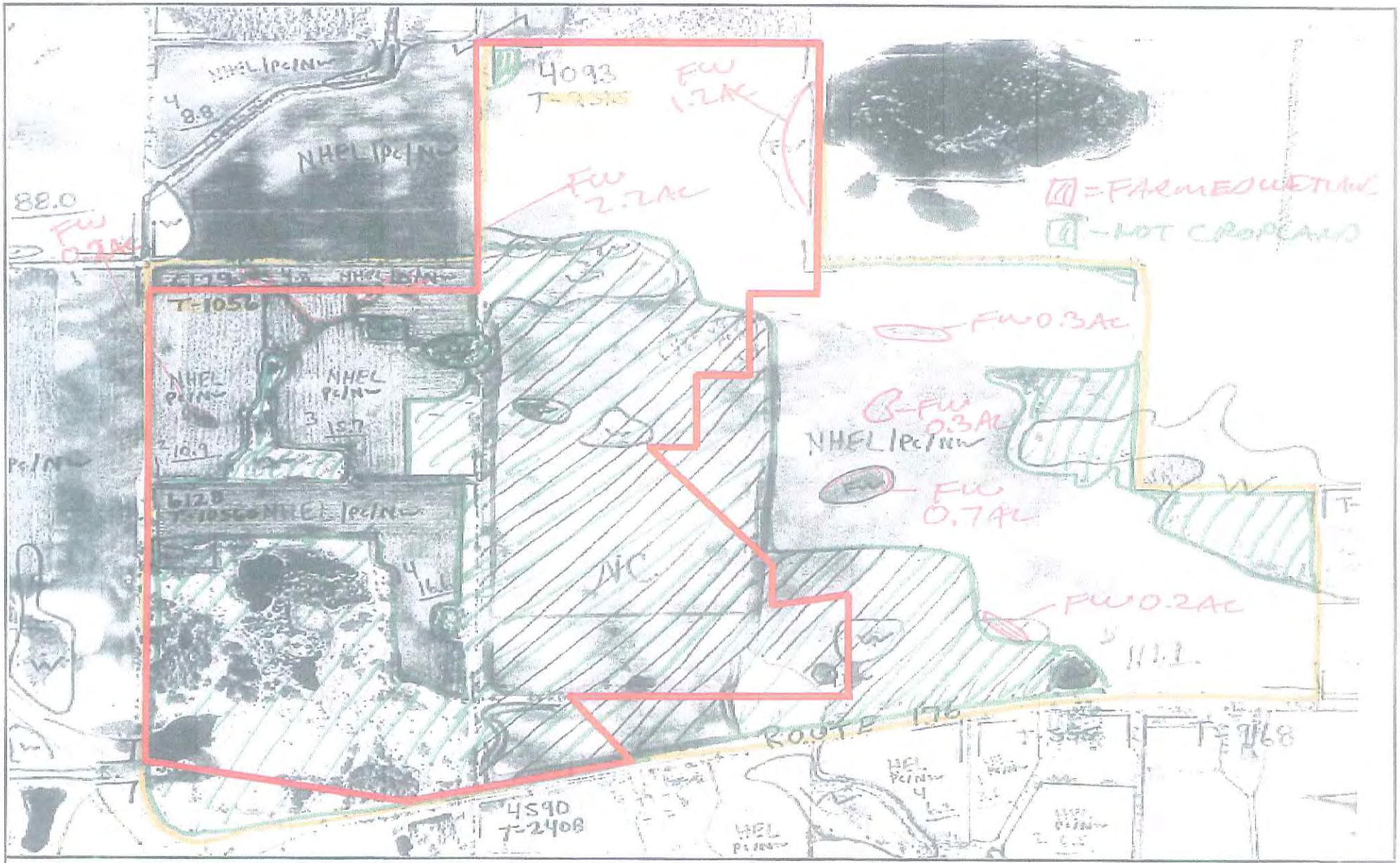
Source: Flood Insurance Rate Map

MIDWEST ECOLOGICAL

F.I.R.M. Map (2 of 2)

Client: Kenneth A. Rawson, Windsor Trent, LLC.
540 Frontage Road, Ste 3175
Northfield, illinois 60093-1281

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Source: NRCS Certified Farmed Wetland Determination

MIDWEST ECOLOGICAL

Certified Farmed Wetland Map

Client: Kenneth A. Rawson, Windsor Trent, LLC.
540 Frontage Road, Ste 3175
Northfield, Illinois 60093-1281

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APPENDIX B

Certified Farmed Wetland Determination

United States Department of Agriculture

NRCS Natural Resources Conservation Service

Woodstock Field Office
1143 North Seminary Ave
P.O. Box 168
Woodstock, IL 60098
Phone: (815) 338-0049 Fax: (815) 338-7731
dave.brandt@il.usda.gov

Friday, June 7, 2002

Bryn Mawr Corporation
C/o Kenneth Rawson
311 West Superior Avenue
Suite 525
Chicago, IL. 60610

Dear Mr. Rawson:

Enclosed is a Wetland Conservation Determination Form (CPA-026) for tract 1056, 2315 and 10560 (File 02013). The tracts are located northeast of the intersection of State Highways 47 and 176, Sections 28, 33 and 34 of Dorr Township, McHenry County, Illinois. Attached to the CPA-026 is a copy of the NRCS Wetland Inventory that highlights the tracts of land and wetlands for reference.

Please be aware that I make wetland determinations according to tracts of land and fields as defined by the USDA Farm Service Agency (FSA). Further, because you do not directly receive federal farm program benefits, NRCS determines wetlands on cropland only (identified in red on the attached map). All non cropland areas of the tracts (identified in green) need to have wetlands evaluated using the 1987 US Army Corps of Engineers Wetland Delineation Manual and submitted directly to them. The acreage identified on the CPA-026 represents only the NRCS agricultural wetlands.

According to our appeal policy, this preliminary technical determination will become final within 30 days unless you request, in writing, either or both of the following options:

1. A field visit be made by our office to review with you the basis for our preliminary technical determination, answer questions you have, and to gather additional information from you concerning this determination.

2. That mediation be used in an attempt to settle your concerns with the preliminary technical determination. If you choose mediation, you must contact the mediator directly and make arrangements for mediation by contacting one of the mediators on an approved list. If you choose mediation, please inform my

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, sexual orientation, or marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audio tape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whiten Building, 1400 Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

office and I will provide the necessary information.

A final technical determination will be issued within 30 days after a field visit, if you request it, or within 30 days following the completion of mediation. If you do not request a field visit or mediation, this preliminary technical determination will be considered final 30 days after receipt of this letter. The final technical determination may be appealed to the Farm Service Agency (FSA) County Committee at the address below:

McHenry-Lake County Committee
1143 N. Seminary, PO Box 168
Woodstock, IL. 60098

If other individuals are associated with the farm, we encourage you to discuss this letter with them. If you have any questions on this, please contact me.

Sincerely,

Dave Brandt

David J. Brandt
NRCS Team Leader/ District Conservationist

cc: Jon T. Turner, Phoenix & Associates, Inc.
Kara Hellige, USACOE
USDA-FSA

File: \dave\wetlands\02013.doc

U.S.D.A.
Soil Conservation Service

SCS-CPA-026
(June 91)

HIGHLY ERODIBLE LAND AND WETLAND CONSERVATION DETERMINATION

1. Name and Address of Person
BRYN MAWR CORPORATION
C/O KENNETH RAWSON
311 WEST SUPERIOR AVE.
CHICAGO, IL. 60610

2. Date of Request
5/15/02

3. County
McHENRY

4. Name of USDA Agency or Person Requesting Determination
ABOVE

5. Farm No. and Tract No.
TRACT 2315 FILE 0203

SECTION I - HIGHLY ERODIBLE LAND

	FIELD NO.(s)	TOTAL ACRES
6. Is soil survey now available for making a highly erodible land determination? Yes ☐ No ☐		
7. Are there highly erodible soil map units on this farm? Yes ☐ No ☐		
8. List highly erodible fields that, according to ASCS records, were used to produce an agricultural commodity in any crop year during 1981-1985.		
9. List highly erodible fields that have been or will be converted for the production of agricultural commodities and, according to ASCS records, were not used for this purpose in any crop year during 1981-1985; and were not enrolled in a USDA set-aside or diversion program.		
10. This Highly Erodible Land determination was completed in the: Office ☐ Field ☐		

SECTION II - WETLAND

	FIELD NO.(s)	TOTAL ACRES
11. Are there hydric soils on this farm? Yes ☑ No ☐		
12. Wetlands (W), including abandoned wetlands, or Farmed Wetlands (FW) or Farmed Wetlands Pasture (FWP). Wetlands may be farmed under natural conditions. Farmed Wetlands and Farmed Wetlands Pasture may be farmed and maintained in the same manner as they were prior to December 23, 1985, as long as they are not abandoned.	5	2.7Ac
13. Prior Converted Cropland (PC). Wetlands that were converted prior to December 23, 1985. The use, management, drainage, and alteration of prior converted cropland (PC) are not subject to the wetland conservation provisions unless the area reverts to wetland as a result of abandonment.		
14. Artificial Wetlands (AW). Artificial wetlands includes irrigation-induced wetlands. These wetlands are not subject to the wetland conservation provisions.		
15. Minimal Effect Wetlands (MW). These wetlands are to be farmed according to the minimal-effect agreement signed at the time the minimal-effect determination was made.		
16. Mitigation Wetlands (MW). Wetlands on which a person is actively mitigating a frequently cropped area or a wetland converted between December 23, 1985 and November 28, 1990.		
17. Restoration with Violation (RVW-year). A restored wetland that was in violation as a result of conversion after November 28, 1990, or the planting of an agricultural commodity or forage crop.		
18. Restoration without Violation (RSW). A restored wetland converted between December 23, 1985 and November 28, 1990, on which an agricultural commodity has not been planted.		
19. Replacement Wetlands (RPW). Wetlands which are converted for purposes other than to increase production, where the wetland values are being replaced at a second site.		
20. Good Faith Wetlands (GFW+year). Wetlands on which ASCS has determined a violation to be in good faith and the wetland has been restored.		
21. Converted Wetlands (CW). Wetlands converted after December 23, 1985 and prior to November 28, 1990. In any year that an agricultural commodity is planted on these Converted Wetlands, you will be ineligible for USDA benefits.		
22. Converted Wetland (CW+year). Wetlands converted after November 28, 1990. You will be ineligible for USDA program benefits until this wetland is restored.		
23. Converted Wetland Non-Agricultural use (CWNA). Wetlands that are converted for trees, fish production, shrubs, cranberries, vineyards or building and road construction.		
24. Converted Wetland Technical Error (CWTE). Wetlands that were converted as a result of incorrect determination by SCS.		

25. The planned alteration measures on wetlands in fields _____ are considered maintenance and are in compliance with FSA.

26. The planned alteration measures on wetlands in fields _____ are not considered to be maintenance and if installed will cause the area to become a Converted Wetland (CW). See item 22 for information on CW+year.

27. The wetland determination was completed in the office ☑ field ☑ and was delivered ☐ mailed ☑ to the person on 5/15/02.

28. Remarks. ALL NON-CROPLAND AREAS OF THE TRACT NEED WETLANDS EVALUATED USING THE USACOE 87 WETLAND DELINEATION MANUAL.

29. *I certify that the above determination is correct and adequate for use in determining eligibility for USDA program benefits, and that wetland hydrology, hydric soils, and hydrophytic vegetation under normal circumstances exist on all areas outlined as Wetlands, Farmed Wetlands, and Farmed Wetlands Pasture.*

30. Signature of SCS District Conservationist
Dave Burnett

31. Date
6/7/02

U.S.D.A.
Soil Conservation Service

SCS-CPA-026
(June 91)

HIGHLY ERODIBLE LAND AND WETLAND CONSERVATION DETERMINATION

1. Name and Address of Person
BRYN MAWR CORPORATION
C/O KENNETH RAWSON
311 WEST SUPERIOR AVE.
CHICAGO, IL. 60610

2. Date of Request
5/15/02

3. County
McHENRY

4. Name of USDA Agency or Person Requesting Determination
ABOVE

5. Farm No. and Tract No.
TRACT 1056 FILE 02013

SECTION I - HIGHLY ERODIBLE LAND

	FIELD NO.(s)	TOTAL ACRES
6. Is soil survey now available for making a highly erodible land determination? Yes ☐ No ☐		
7. Are there highly erodible soil map units on this farm? Yes ☐ No ☐		
8. List highly erodible fields that, according to ASCS records, were used to produce an agricultural commodity in any crop year during 1981-1985.		
9. List highly erodible fields that have been or will be converted for the production of agricultural commodities and, according to ASCS records, were not used for this purpose in any crop year during 1981-1985; and were not enrolled in a USDA set-aside or diversion program.		
10. This Highly Erodible Land determination was completed in the: Office ☐ Field ☐		

SECTION II - WETLAND

	FIELD NO.(s)	TOTAL ACRES
11. Are there hydric soils on this farm? Yes ☑ No ☐		
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13. Prior Converted Cropland (PC). Wetlands that were converted prior to December 23, 1985. The use, management, drainage, and alteration of prior converted cropland (PC) are not subject to the wetland conservation provisions unless the area reverts to wetland as a result of abandonment.		
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29. *I certify that the above determination is correct and adequate for use in determining eligibility for USDA program benefits, and that wetland hydrology, hydric soils, and hydrophytic vegetation under normal circumstances exist on all areas outlined as Wetlands, Farmed Wetlands, and Farmed Wetlands Pasture.*

30. Signature of SCS District Conservationist
Dave Brandt

31. Date
6/7/02

U.S.D.A.
Soil Conservation Service

SCS-CPA-026
(June 91)

HIGHLY ERODIBLE LAND AND WETLAND CONSERVATION DETERMINATION

1. Name and Address of Person: BRYN MAWR CORPORATION c/o KENNETH RAWSON 311 WEST SUPERIOR AVE. CHICAGO, IL. 60610

2. Date of Request: 5/15/02

3. County: McHENRY

4. Name of USDA Agency or Person Requesting Determination: ABOVE

5. Farm No. and Tract No.: TRACT 10560 FILE 02013

SECTION I - HIGHLY ERODIBLE LAND

	FIELD NO.(s)	TOTAL ACRES
6. Is soil survey now available for making a highly erodible land determination? Yes ☐ No ☐		
7. Are there highly erodible soil map units on this farm? Yes ☐ No ☐		
8. List highly erodible fields that, according to ASCS records, were used to produce an agricultural commodity in any crop year during 1981-1985.		
9. List highly erodible fields that have been or will be converted for the production of agricultural commodities and, according to ASCS records, were not used for this purpose in any crop year during 1981-1985; and were not enrolled in a USDA set-aside or diversion program.		
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SECTION II - WETLAND

	FIELD NO.(s)	TOTAL ACRES
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13. Prior Converted Cropland (PC). Wetlands that were converted prior to December 23, 1985. The use, management, drainage, and alteration of prior converted cropland (PC) are not subject to the wetland conservation provisions unless the area reverts to wetland as a result of abandonment.		
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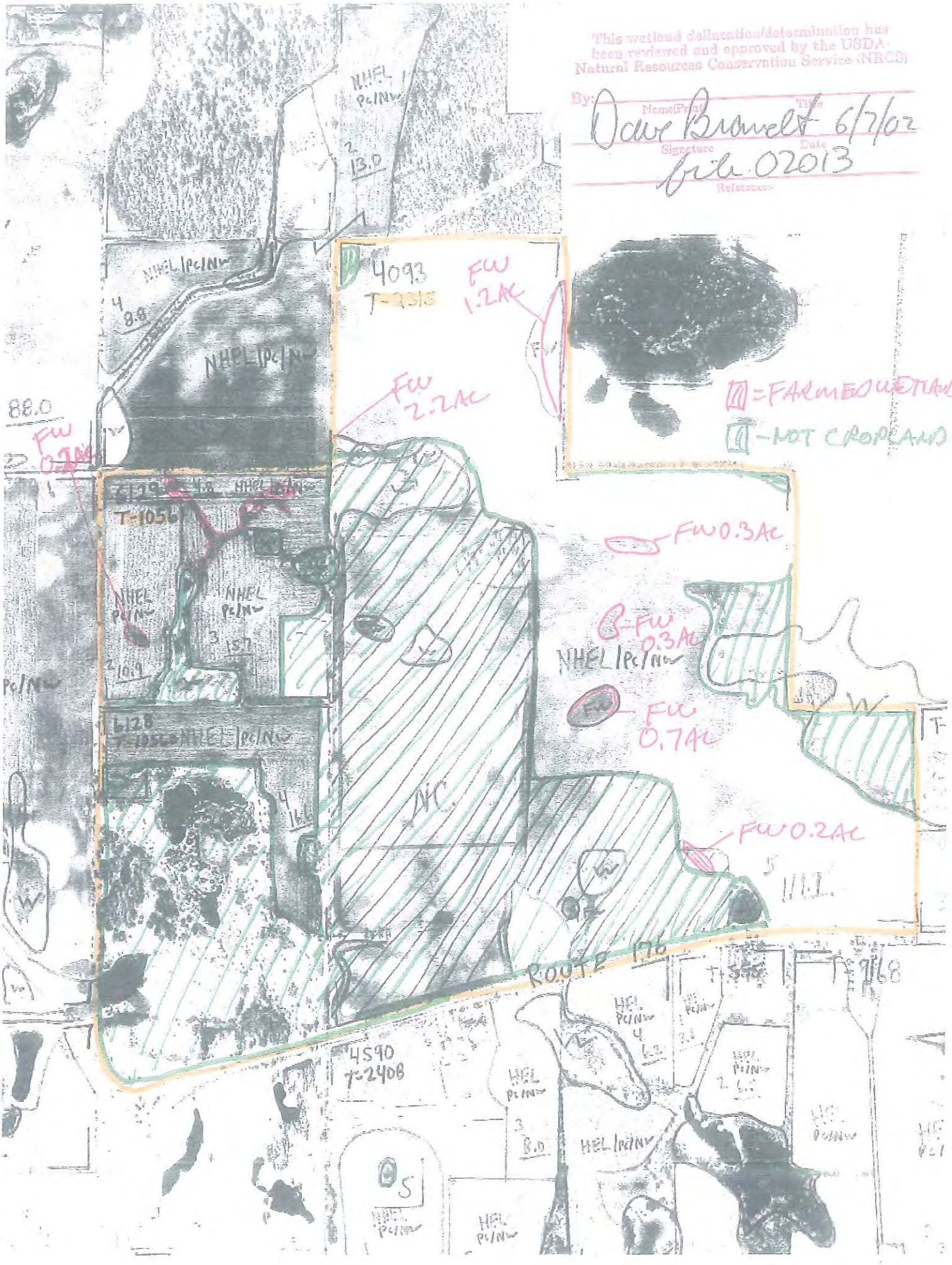
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29. *I certify that the above determination is correct and adequate for use in determining eligibility for USDA program benefits, and that wetland hydrology, hydric soils, and hydrophytic vegetation under normal circumstances exist on all areas outlined as Wetlands, Farmed Wetlands, and Farmed Wetlands Pasture.*	30. Signature of SCS District Conservationist: Dave Blanchett	31. Date: 6/7/02


This wetland delineation/determination has been reviewed and approved by the USDA-Natural Resources Conservation Service (NRCS)
By: Name(Print) Title
Dave Brovelt 6/7/02
Signature Date
fds 02013
References
4093
T-2315
FW 1.2AC
FW 2.2AC
FW 0.2AC
FW 0.3AC
B-FW 0.3AC
FW 0.7AC
FW 0.2AC
=FARMED WETLAND
=NOT CROPLAND
NHEL IPc/IN
T-1056
L12B
T-1056
4590
T-2408
ROUTE 176
HEL Pc/IN
88.0

Bryn Mawr Subdivision, Phase II – Traffic Impact Study

City of Crystal Lake
McHenry County, Illinois



Prepared for: The City of Crystal Lake,

On Behalf Of Windsor Trent

Prepared by:

TranSystems

February 2016

TranSystems
EXPERIENCE | Transportation

TranSystems
222 South Riverside Plaza
Suite 610
Chicago, IL 60606
Tel 312 669 9601
Fax 312 276 4805
www.transystems.com

February 5, 2016

Ms. Abigail L. Wilgreen, PE
City Engineer
City of Crystal Lake
100 W. Woodstock Street
Crystal Lake, Illinois 60014

RE: Bryn Mawr Subdivision Phase II Traffic Impact Study
Crystal Lake, Illinois

Dear Ms. Wilgreen:

In response to your request and authorization, TranSystems has completed a traffic impact study for the proposed Phase II of the Bryn Mawr Subdivision to be located generally on the north side of Illinois Route 176, approximately 0.4 miles east of the IL Route 176/IL Route 47 intersection, in Crystal Lake, Illinois. The purpose of this study was to assess the impact of the proposed development on the surrounding transportation system.

Included in this study is a discussion of the anticipated impacts of the proposed development on the adjacent street network for the following analysis scenarios:

- Existing Conditions
- Future Traffic plus Proposed Development

We trust that the enclosed information proves beneficial to Windsor Trent on behalf of Bryn Mawr Phase II and to the City of Crystal Lake in this phase of the development process. We appreciate the opportunity to be of service to you and will be available to review this study at your convenience.

Sincerely,
TRANSYSTEMS

By: _____

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Introduction

TranSystems has completed this traffic impact study for the proposed Phase II of the Bryn Mawr Subdivision to be located generally in Crystal Lake, Illinois, on the north side of Illinois Route 176 and approximately 0.4 miles east of the intersection of Illinois Route 176 and Illinois Route 47. The purpose of this study was to assess the impact of the proposed development on the surrounding transportation system. The location of the project relative to the major streets in the area is shown on ***Exhibit A-1(Regional Map)*** and ***Exhibit A-2 (Local Map)*** in ***Appendix A***.

In addition to a description of the proposed development and the surrounding transportation infrastructure, this study includes trip generation estimates, trip distribution estimates, capacity analyses, and a summary of findings.

Land Use

The proposed site is nearly 5 miles west of downtown Crystal Lake and is located immediately west of Phase I of the Bryn Mawr Subdivision, which consists of 91 existing single family homes. The area immediately surrounding the subdivision is largely rural and predominantly consists of undeveloped fields and prairie land, small forested areas, golf courses, and residential subdivisions.

Proposed Development Plan

The proposed development plan includes Phase II of the Bryn Mawr Subdivision, which is slated to consist of 204 townhomes and 305 single family homes. There will be two access points to the new subdivision. A new access point will be constructed on Illinois Route 176 at Helen Street as a new roadway with Phase II of the subdivision. Another access point currently exists as the sole access point to Phase I of the subdivision, at the intersection of Illinois Route 176 and Bryn Mawr Lane. Since Phase II will be connected to and added onto Phase I of the subdivision, either access point out to Illinois Route 176 will serve either phase of the subdivision.

Exhibit A-3 provides an aerial with the superimposed concept plan for Phase II of the subdivision as provided by the developer. While a parcel of land on the northwest quadrant of the IL Route 176/Bryn Mawr Lane intersection is indicated as a retail property, this is a potential future property without a development timetable and is not considered in this study.

Study Area

To assess the impacts of the proposed development, the study area intersections were analyzed during the A.M. peak hour and P.M. peak hour of a typical weekday.

The following existing intersections were analyzed as part of the study area:

- Illinois Route 176 at Illinois Route 47
- Illinois Route 176 at Bryn Mawr Lane
- Illinois Route 176 at Mt. Thabor Road/Haligus Road

The proposed intersection of Illinois Route 176 at Helen Street was also analyzed in future traffic conditions, since it will be constructed as part of the Phase II Bryn Mawr Subdivision.

Surrounding Street Network

Within the study area, Illinois Route 176 is a two-lane undivided east/west Strategic Regional Arterial (SRA) roadway with a rural cross section and a posted speed limit of 55 miles per hour (mph). Illinois Route 47 is a two-lane north/south SRA roadway with a posted speed limit of with a posted speed limit of 55 mph. It is a divided roadway with barrier median at its intersection with IL Route 176 but is generally an undivided roadway with a rural cross section. Bryn Mawr Lane is a two-lane undivided north/south residential local roadway with a posted speed limit of 30 mph. Mt. Thabor Road is a two-lane undivided north/south local road with a posted speed of 40 mph. It is approximately 1.05 miles in length and extends from IL Route 176 on the south up to its northern terminus at Lucas Road. Haligus Road is a two-lane undivided north/south local road with a posted speed of 40 mph. It extends from IL Route 176 on the north down to its southern terminus within the Village of Huntley, over 6 miles south of IL Route 176.

The intersection of Illinois Route 176 and Illinois Route 47 is a signalized intersection. At IL Route 47, IL Route 176 turns and heads north and becomes the same roadway as IL Route 47 for approximately 0.85 miles. At this point, Illinois Route 47 continues north while Illinois Route 176 turns and continues west at a second signalized intersection. These two intersections are owned and maintained by the Illinois Department of Transportation (IDOT) and are interconnected to each other. Both intersections currently run free and do not operate on specific traffic signal cycle lengths.

The existing intersection of IL Route 176 and Bryn Mawr Lane is an unsignalized intersection with stop control on Bryn Mawr Lane and free-flowing traffic on IL Route 176. The intersection has one exclusive eastbound left-turn lane and one exclusive westbound right-turn lane.

The existing intersection of IL Route 176 and Mt. Thabor and Haligus Roads is an offset intersection, with Mt. Thabor's north leg offset from Haligus Road's south leg by approximately 135 feet. It is currently an unsignalized two-way stop-controlled intersection with stop control on Mt. Thabor and Haligus and free-flowing traffic on IL Route 176.

Traffic Counts and Intersection Design Studies

Fully classified turning-movement traffic volume counts were collected at the intersection of Illinois Route 176 at Bryn Mawr Lane on Wednesday, January 13, 2016 for a 24-hour period. From the data, the A.M. peak hour of traffic was determined to be 7:00 A.M. to 8:00 A.M., and the P.M. peak hour was determined to be 5:00 P.M. to 6:00 P.M. The existing weekday A.M. and P.M. peak hour traffic volumes are provided in ***Exhibit A-4***.

The intersection of IL Route 176 and IL Route 47 is currently being studied for intersection improvements. As part of the analysis, an Intersection Design Study (IDS) for this intersection was recently developed. A draft copy of the IDS can be found in **Appendix B**. The improvements at the

intersection include additional turn lanes, including southbound and westbound dual left-turn lanes and a free-flow westbound right-turn lane. Additionally, Pleasant Valley Road, an east/west two-lane roadway which currently intersects IL Route 47 approximately 550 feet north of the IL Route 176/IL Route 47 intersection, is shown realigned so that it becomes the west leg of the intersection. The IDS traffic includes 2013 traffic volumes which were considered in this study as suitable volumes for the existing traffic for this intersection and are included in **Exhibit A-4**. Since this IDS represents a geometric study and improvements that are not currently programmed by IDOT for design and construction, the future geometric improvements at this intersection were not considered in this analysis. Instead, the existing geometric conditions at the intersection were analyzed. Additionally, it is likely that if this improvement project does not occur for several years that the design analysis would need to be updated to reflect a more accurate design horizon. The IDS in Appendix B indicates a 2020 design horizon. Current projects that are State or Federally funded consider a 2040 design horizon. At the time such a project moves forward, traffic growth rates for the roadways will be coordinated through the Chicago Metropolitan Agency for Planning (CMAP), who continually develops meaningful traffic forecasting models. It is likely that the Bryn Mawr Phase II development would be considered in the socio-economic factors that CMAP utilizes when projecting traffic to the year 2040.

The offset intersection of IL Route 176 and Mt. Thabor/Haligus is also currently being studied for intersection improvements. See **Appendix C** for the approved IDS. The primary improvements at the intersection involves removing the offset between the two north/south roadways, improving the skew of the intersection with respect to IL Route 176, adding an exclusive left-turn lane in both directions of IL Route 176 at the intersection, and signalization of the new intersection. Similar to the IL Route 176/IL Route 47 IDS, the IDS traffic for this intersection includes 2013 traffic volumes which were considered in this study as suitable volumes for the existing traffic for this intersection and are included in **Exhibit A-4**. The construction of this intersection is scheduled by IDOT to occur within the next two years, with Highway Safety Improvement Program (HSIP) funding being used to assist in the project's funding. Since this project is being programmed at or near the time Phase II of the Bryn Mawr Subdivision will be starting construction, the existing geometric conditions at this intersection that are considered in this study are the improved conditions from the IDS.

Analysis

The scope of analysis for the assessment of the proposed development's impact on the surrounding transportation system is based in large part on the recommended practices of the Institute of Transportation Engineers (ITE), as outlined in their Traffic Engineering Handbook. ITE is a nationally-recognized organization of transportation professionals with members from both private and public sectors. The analysis of the proposed development's impact included development of trip generation and trip distribution estimates as well as a traffic operations assessment. Each of the analysis methodologies and findings are described below in the subsequent sections.

Trip Generation

Trip generation estimates were prepared for the proposed development using the ITE Trip Generation Manual, 9th Edition. **Table 1** provides land use, average trip rate, and percent entering/exiting analyzed site for two land use types: *Land Use 210 (Single-Family Detached Housing)* and *Land Use 230 (Residential Condominium/Townhouse)*.

Table 1 - Trip Generation Land Uses

Description	ITE LUC	Variable	Weekday AM Peak Hour			Weekday PM Peak Hour		
			ITE Average Rate	% Enter	% Exit	ITE Average Rate	% Enter	% Exit
Single-Family Detached Housing	210	Dwelling Units	0.75	25%	75%	1.00	63%	37%
Residential Condominium/Townhouse	230	Dwelling Units	0.44	17%	83%	0.52	67%	33%

While the values in Table 1 are provided in the *Trip Generation Manual* and represent sound engineering judgment and an industry standard in the way of projecting traffic generated by a variety of land uses, these values are estimates that are based on data that was collected across the country, for a variety of similar but different subdivisions, and over several decades. To better tailor the data to the specific geographic location and current day application, the data should be refined and calibrated whenever possible. To do this, the *Trip Generation Manual* was used to estimate the number of trips generated by Bryn Mawr Phase I's 91 existing single-family homes. The results were then compared for the A.M. Peak and P.M. Peak Periods against the traffic count data collected at the IL Route 176/Bryn Mawr Lane intersection, which represents all entering and exiting subdivision traffic generated by the Phase I development. See **Table 2** for a comparison of the results.

Table 2 - Phase I Subdivision: Counted Traffic Compared to ITE Trip Generation Estimate

		Counted Traffic			ITE Trip Gen Manual Traffic			% Counted/ITE Trip Gen
		Entering	Exiting	Total	Entering	Exiting	Total	Total
AM	#	15	31	46	27	41	68	68%
	% of Total	33%	67%	100%	40%	60%	100%	
PM	#	41	16	57	57	34	91	63%
	% of Total	72%	28%	100%	63%	37%	100%	

As shown in the table, the *Trip Generation Manual* overestimates trips generated by Phase I by approximately 35%, since the counted traffic represents 63% to 68% of the traffic generated by the manual. Additionally, the percent of traffic entering versus exiting the neighborhood is very similar when comparing the counted data to the data from the manual, confirming the accuracy of the manual in that

regard. Due to the results of the comparison indicating that the single-family detached housing trips are overvalued, a 35% reduction was placed on these trips for Phase II of the Bryn Mawr Subdivision. ***Table 3*** shows the expected trips to be generated by the development for the two land use types and adjusted by calibrating the single-family values based on the existing Bryn Mawr Phase I Subdivision traffic. The residential condominium/townhouse land use trips were not calibrated, since the Phase I comparison only considered single-family detached houses and may not be perfectly relatable to all residential land uses.

Table 3
Final Trip Generation

Land Use	Intensity	ITE Code	A.M. Peak Hour			P.M. Peak Hour		
			Total	In	Out	Total	In	Out
Single-Family Detached Housing	Dwelling Units	210	229	57	172	305	192	113
Residential Condo/Townhouse	Dwelling Units	230	90	15	75	106	71	35
Pass-By Trips (0% of Trips)			0	0	0	0	0	0
Total Non Pass-By Proposed Development Trips			***319***	***72***	***246***	***411***	***263***	***148***

Pass-by traffic occurs when drivers stop at a destination while en route to their final destination. The pass-by drivers are already traveling on the adjacent streets to another destination; therefore, they are not making a specific trip to the site and should not be considered a new car on the roadway generated by the proposed development. In terms of residential land uses, pass-by traffic is unlikely. It is true that some trips may involve stopping by a residence on the way to somewhere else during the morning and evening peak periods. To remain conservative in our analysis, however, no pass-by trips were discounted from the trip generation numbers.

Trip Distribution

The estimated trips generated by the proposed development were distributed onto the street system. These distributions are based on existing travel patterns in the area and engineering judgment. The trip distribution breakdown is provided in **Exhibit A-5**. See **Exhibit A-6** and **Exhibit A-7** for the traffic volumes associated with the single-family detached housing and the residential condominium/townhouse land uses, respectively, based on the directional distribution of traffic. **Exhibit A-8** combines the volumes from the two previous exhibits, resulting in a total site-generated traffic volume exhibit for the Bryn Mawr Phase II Subdivision.

Traffic Operation Assessment

An assessment of the weekday A.M. and P.M. peak hour traffic operations was made for the scenarios listed below.

- Existing Conditions
- Future Traffic plus Proposed Development Conditions

The study intersections were evaluated using the HCS 2010 software package on the basis of the methodologies outlined in the Highway Capacity Manual (HCM), 2010 Edition, which is published by the Transportation Research Board. The operating conditions at an intersection are graded by the "level of service" experienced by drivers. Level of service (LOS) describes the quality of traffic operating conditions and is rated from "A" to "F". LOS A represents the most desirable condition with free-flow movement of traffic with minimal delays. LOS F generally indicates severely congested conditions with excessive delays to motorists. Intermediate grades of B, C, D, and E reflect incremental increases in the average delay per stopped vehicle. Average delay is measured in seconds per vehicle. ***Table 4*** shows the upper limit of delay associated with each level of service for signalized and unsignalized intersections.

Table 4
Intersection Level of Service Delay Thresholds

Level of Service (LOS)	Signalized	Unsignalized
A	≤ 10 Seconds	≤ 10 Seconds
B	≤ 20 Seconds	≤ 15 Seconds
C	≤ 35 Seconds	≤ 25 Seconds
D	≤ 55 Seconds	≤ 35 Seconds
E	≤ 80 Seconds	≤ 50 Seconds
F	> 80 Seconds	> 50 Seconds

While one of the primary measurements of traffic operations, LOS, applies to both signalized and unsignalized intersections, there are significant differences between how these intersections operate and how they are evaluated. LOS for signalized intersections reflects the operation of the intersection as a whole. Unsignalized intersections, in contrast, are evaluated based on the movement or movement groupings which are required to yield to other traffic. Typically, these are the left turns off of the major street and the side-street approaches for two-way stop-controlled intersections. Lower LOS ratings (D, E and F) do not, in themselves, indicate significant difficulties or the need for additional improvements. Many times there are convenient alternative paths to avoid the longer delays. Other times, the volumes on the unsignalized approaches are relatively minor when compared to the major street traffic.

The decision to install a traffic signal, which is often considered when lower LOS ratings are projected, should be based on engineering studies and the warrants for traffic signal installation as outlined in the Federal Highway Administration's Manual on Uniform Traffic Control Devices (MUTCD). Signals are typically not recommended in locations where there are convenient alternative paths, or the installation of a traffic signal would have negative impacts on the surrounding transportation system. For instance, if

the new signalized intersection is located too close to existing traffic signals it may not be recommended despite meeting the minimum warrants.

The LOS rating deemed acceptable varies by community, facility type and traffic control device. It is typical to consider LOS D to be the minimum desirable standard for signalized intersections. However, worse levels of service of E and F may be considered acceptable for some situations. For instance at locations where the installation of a traffic signal is not warranted by the conditions at the intersection or the location has been deemed undesirable for signalization for other reasons, e.g. the close proximity of an existing traffic signal or the presence of a convenient alternative path.

Existing Conditions

Illinois Route 176 at Illinois Route 47

The results of the Existing Conditions intersection analyses for the IL Route 176/IL Route 47 intersection are summarized in ***Table 5***. The intersection was evaluated with existing lane configurations and traffic control devices and using the existing peak hour traffic count volumes shown on ***Exhibit A-4***. The HCS 2010 reports are included in ***Appendix D***.

Table 5
Intersection Operational Analysis
Existing Conditions, Existing Traffic

Intersection / Movement	A.M. Peak Hour			P.M. Peak Hour		
	LOS[1]	Delay[2]	95th % Queue[3]	LOS[1]	Delay[2]	95th % Queue[3]
IL RTE 176 at IL RTE 47						
Westbound Left	*D*	*35.1*	*95*	*C*	*31.2*	*153*
Westbound Right	*D*	*54.2*	*278*	*E*	*65.2*	*470*
Northbound Through	*C*	*21.9*	*345*	*D*	*39.8*	*628*
Northbound Right	*A*	*5.3*	*38*	*A*	*4.0*	*28*
Southbound Left	*B*	*19.7*	*158*	*E*	*75.9*	*310*
Southbound Through	*A*	*9.4*	*220*	*B*	*16.0*	*350*
Overall Intersection	*C*	*21.1*		*D*	*39.3*	

1 – Level of Service
2 – Delay in average seconds per vehicle
3 – 95th Percentile Queue in Feet

As shown in ***Table 5***, Level of Service (LOS), average delay in seconds per vehicle per movement group, and 95th percentile queues in feet are provided for the intersections and for both the Weekday A.M. and P.M. peak periods.

Under existing geometric conditions, the IL Route 176/IL Route 47 intersection operates under favorable conditions for the A.M. peak period, with Levels of Service of D or better and 95th percentile queues fully contained within the available storage lengths of the turn lanes. During the P.M. peak period, however, the westbound right-turn and southbound left-turn movements operate at LOS E, with 95th percentile queues exceeding the existing storage lengths. It is important to realize that 95th percentile

queues statistically occur no more than 5% of the time, so during a peak hour, that would mean no more than 3 minutes. Additionally, the HCS 2010 analysis does not take right turn movements made on red.

At the existing IL Route 176/IL Route 47 intersection, there is an exclusive westbound right-turn lane that is unopposed, meaning there currently is no eastbound permissive left-turn movement that could potentially come in conflict with a vehicle turning from the opposing direction. Therefore, a right-turn overlap phase and 5-section traffic signal head may be installed to help move more westbound right-turning vehicles while the southbound left-turning vehicles have their green arrow. Even without the right-turn overlap phase in place, since there is no restriction on westbound right turns on red, several vehicles are making westbound right turns while they have a red indication on the traffic signal designated for their lane. HCS 2010 is not typically used to model right turns on red. This provides conservative results for right-turn movements.

The intersection's operation is vastly improved if the westbound right-turn overlap is modeled. **Table 6** provides capacity analysis results for the IL Route 176/IL Route 47 intersection for both the A.M. and P.M. peak periods, if a right-turn overlap phase was implemented at the intersection. Queues are often greatly reduced, and all Levels of Service are LOS D or better.

Table 6
Intersection Operational Analysis
Existing Geometry – Right-Turn Overlap Phase Implemented

Intersection / *Movement*	A.M. Peak Hour			P.M. Peak Hour		
	LOS[1]	Delay[2]	95th % Queue[3]	LOS[1]	Delay[2]	95th % Queue[3]
IL RTE 176 at IL RTE 47						
Westbound Left	*D*	*42.8*	*108*	*D*	*40.9*	*165*
Westbound Right	*C*	*33.2*	*220*	*D*	*47.3*	*373*
Northbound Through	*B*	*17.5*	*305*	*C*	*24.7*	*443*
Northbound Right	*A*	*5.7*	*40*	*A*	*5.0*	*30*
Southbound Left	*B*	*13.8*	*23*	*C*	*24.8*	*170*
Southbound Through	*A*	*6.5*	*160*	*A*	*8.4*	*200*
Overall Intersection	*B*	*15.8*		*C*	*24.0*	

1 – Level of Service
2 – Delay in average seconds per vehicle
3 – 95th Percentile Queue in Feet

Illinois Route 176 at Bryn Mawr and Illinois Route 176 at Mt. Thabor/Haligus

The results of the Existing Conditions intersection analyses for the IL Route 176/Bryn Mawr and Illinois Route 176/Mt. Thabor/Haligus intersections are summarized in ***Table 7***. As previously specified, the Bryn Mawr intersection was evaluated with existing lane configurations and traffic control devices, and the Mt. Thabor/Haligus intersection was evaluated with the lane configuration and signalized condition specified in the Intersection Design Study provided in **Appendix C**. The existing peak hour traffic count volumes shown on ***Exhibit A-4*** *were used in the analyses*. The HCS 2010 reports are included in ***Appendix D***.

Table 7
Intersection Operational Analysis
Existing Conditions, Existing Traffic

Intersection / *Movement*	A.M. Peak Hour			P.M. Peak Hour		
	LOS[1]	Delay[2]	95th % Queue[3]	LOS[1]	Delay[2]	95th % Queue[3]
IL RTE 176 at Bryn Mawr Lane						
Eastbound Left	A	8.4	0	A	8.2	1
Southbound Left	C	15.7	6	C	16.5	3
Southbound Right	A	9.9	1	B	10.7	1
Southbound Approach	B	14.6		B	14.7	
IL RTE 176 at Mt. Thabor/Haligus						
Eastbound Left	A	6.1	3	A	6.0	3
Eastbound Shared Through-Right	B	10.1	165	A	8.6	125
Westbound Left	A	6.9	10	A	5.7	18
Westbound Shared Through-Right	A	8.7	95	A	8.9	145
Northbound Left	C	33.4	20	D	35.9	18
Northbound Shared Through-Right	D	45.9	165	D	43.4	80
Southbound Left	C	34.1	0	D	35.1	3
Southbound Shared Through-Right	D	36.5	10	D	42.8	83
Overall Intersection	B	16.5		B	14.1	

1 – Level of Service
2 – Delay in average seconds per vehicle
3 – 95th Percentile Queue in Feet

Both intersections operate with favorable levels of service of LOS D or better, and all 95th percentile queues are adequately accommodated by the analyzed intersection geometry including the provided turn lane storage lengths.

Total Future Traffic

Future traffic is defined as the growth of the existing traffic at the study area intersections to a specified design horizon. It is also referred to as future background traffic. A typical design horizon for a project such as this would be to estimate and consider traffic at a point five years beyond completion of the Phase II Subdivision. Current estimates from the developer indicate that construction of all units should be complete within 9 years, or 2025. Therefore, the suitable design horizon is five years beyond that, resulting in the year 2030.

A suitable annual traffic growth rate should then be applied to the existing traffic volumes presented in ***Exhibit A-4***. Comparison of 2016 and 2013 traffic volumes used for the existing traffic, in addition to the use of engineering judgment, a 0.5% annual growth in traffic is a suitable estimate value. Therefore, background traffic in 2030 can be developed using this annual growth rate. The resulting future background traffic volumes are presented in ***Exhibit A-9***. Total future traffic can now be established and represents the total future background traffic plus the proposed development traffic. The total future traffic values are provided in ***Exhibit A-10***. These values were then input into HCS 2010 under the same geometric conditions used for the existing conditions analysis. For the new intersection constructed as part of the Phase II Subdivision, Illinois Route 176 at Helen Street, the same geometry and lane configuration that is present at the Bryn Mawr Lane intersection was assumed. Additionally, just as the Bryn Mawr intersection is unsignalized, the Helen Street intersection is also assumed to be unsignalized. The results are provided in ***Table 8***, with the HCS 2010 reports provided in ***Appendix E***.

Table 8
Intersection Operational Analysis
Existing Conditions, Total Future Traffic

Intersection / Movement	A.M. Peak Hour			P.M. Peak Hour		
	LOS[1]	Delay[2]	95th % Queue[3]	LOS[1]	Delay[2]	95th % Queue[3]
IL RTE 176 at IL RTE 47						
Westbound Left	*D*	*36.3*	*120*	*D*	*41.1*	*208*
Westbound Right	*E*	*73.6*	*370*	***F***	*160.0*	*848*
Northbound Through	*B*	*18.5*	*335*	*C*	*26.7*	*590*
Northbound Right	*A*	*3.8*	*30*	*A*	*2.8*	*25*
Southbound Left	*C*	*32.3*	*230*	***F***	*149.1*	*585*
Southbound Through	*A*	*9.9*	*238*	*B*	*14.2*	*373*
Overall Intersection	*C*	*25.6*		*E*	*62.0*	
IL RTE 176 at Helen Street						
Eastbound Left	*A*	*8.0*	*1*	*A*	*8.5*	*5*
Southbound Left	*D*	*25.5*	*56*	*D*	*26.7*	*30*
Southbound Right	*B*	*10.4*	*5*	*B*	*11.2*	*3*
Southbound Approach	*C*	*21.7*		*C*	*22.9*	
IL RTE 176 at Bryn Mawr Lane						
Eastbound Left	*A*	*8.0*	*1*	*A*	*8.7*	*1*
Southbound Left	*C*	*20.5*	*9*	*C*	*22.4*	*4*
Southbound Right	*B*	*10.4*	*1*	*B*	*12.3*	*1*
Southbound Approach	*C*	*18.5*		*C*	*19.0*	
IL RTE 176 at Mt. Thabor/Haligus						
Eastbound Left	*A*	*6.8*	*5*	*A*	*7.3*	*5*
Eastbound Shared Through-Right	*B*	*13.0*	*255*	*A*	*9.8*	*173*
Westbound Left	*A*	*8.2*	*10*	*A*	*6.3*	*20*
Westbound Shared Through-Right	*A*	*9.8*	*128*	*B*	*11.1*	*228*
Northbound Left	*C*	*32.8*	*23*	*D*	*35.6*	*28*
Northbound Shared Through-Right	*D*	*45.3*	*175*	*D*	*43.3*	*88*
Southbound Left	*C*	*33.4*	*0*	*D*	*35.2*	*5*
Southbound Shared Through-Right	*D*	*36.0*	*30*	*D*	*44.8*	*100*
Overall Intersection	*B*	*17.2*		*B*	*15.2*	

1 – Level of Service; 2 – Delay in average seconds per vehicle; 3 – 95th Percentile Queue in Feet

For the most part, the Levels of Service are acceptable at LOS D or better and 95th percentile queues are successfully accommodated by the existing storage length geometry. The main exception are the critical movements at the intersection of Illinois Route 176 at Illinois Route 47. In particular, the westbound right-turn and southbound left-turn movements are at LOS F during the future condition's P.M. peak period. As was done with the existing conditions analysis, the IL Route 176/IL Route 47 intersection was also run with a westbound right-turn overlap phase, since this phase could be installed on the existing geometry. The results of the analysis are shown in **Table 9**.

Table 9
Intersection Operational Analysis
Total Future Traffic, Right-Turn Overlap Phase Implemented

Intersection / Movement	A.M. Peak Hour			P.M. Peak Hour		
	LOS[1]	Delay[2]	95th % Queue[3]	LOS[1]	Delay[2]	95th % Queue[3]
IL RTE 176 at IL RTE 47						
Westbound Left	*D*	*45.5*	*140*	*E*	*57.9*	*233*
Westbound Right	*C*	*34.2*	*258*	*D*	*52.2*	*465*
Northbound Through	*B*	*19.8*	*350*	*C*	*31.8*	*595*
Northbound Right	*A*	*6.4*	*50*	*A*	*7.1*	*55*
Southbound Left	*B*	*18.3*	*158*	*D*	*35.4*	*245*
Southbound Through	*A*	*6.8*	*175*	*A*	*7.6*	*218*
Overall Intersection	*B*	*18.1*		*C*	*29.5*	

1 – Level of Service
2 – Delay in average seconds per vehicle
3 – 95th Percentile Queue in Feet

By implementing a westbound right-turn overlap at the intersection, delay is dramatically improved for several movements. The reason for this is because once the overlap phase is in action, the timings for other phases can be re-allotted and balanced across the intersection to better accommodate all movements. Therefore, implementing a right-turn overlap and optimizing the signal's cycle length and timing splits for each phase allows more time to be allotted to other critical movements such as the southbound left-turn movement. While the westbound left-turn movement remains at LOS E, but almost a LOS D, all 95th percentile queues are successfully accommodated by the existing storage length geometry at the intersection. In addition, it is important to recall that the HCS 2010 analysis does not consider right-turn overlap movements, which would drastically improve the westbound right-turn movement and would likely free up even more time to be allotted to other movements at the intersection.

Traffic Signal Warrant Analysis

Although delay at both the existing intersection of Illinois Route 176/Bryn Mawr and proposed intersection of Illinois Route 176/Helen operate with acceptable Levels of Service and delay, even under future traffic conditions, a traffic signal warrant analysis was completed both for existing conditions at IL 176/Bryn Mawr and proposed conditions at both intersections. See **Appendix F** for the warrant analysis reports. No warrants were met for either intersection under existing and future traffic conditions. It is likely that any increases in traffic delay at the two intersections will balance over time,

once traffic on Illinois Route 176 increases some point in the future to a level where safe turns into and out of both Bryn Mawr and Helen become difficult or impossible without considerable delay. According to our analysis, this will likely occur sometime after the completion of the Bryn Mawr Phase II Subdivision. Since both Bryn Mawr and Helen will provide access from Illinois Route 176 to the same subdivision, the balancing will occur such that if one of the two intersections becomes too busy, motorists will start to use the other intersection. Some traffic at the busier of the two intersections will leave it to use the other less busy one. Once traffic increases to a certain level on IL Route 176, however, turns will become difficult into and out of the subdivision at either intersection, and a peak hour traffic signal warrant may likely be met.

Future land development near the intersections outside of the property being developed and considered in this study may also promote the need for a future traffic signal. For instance, the northwest quadrant of the IL Route 176/Bryn Mawr intersection is currently zoned as a retail property. Should that property be developed, the traffic attracted to it may be such that a traffic signal at the intersection would then be required and properly warranted. A separate future traffic analysis would be required for any such development at or near the study area intersections.

Summary

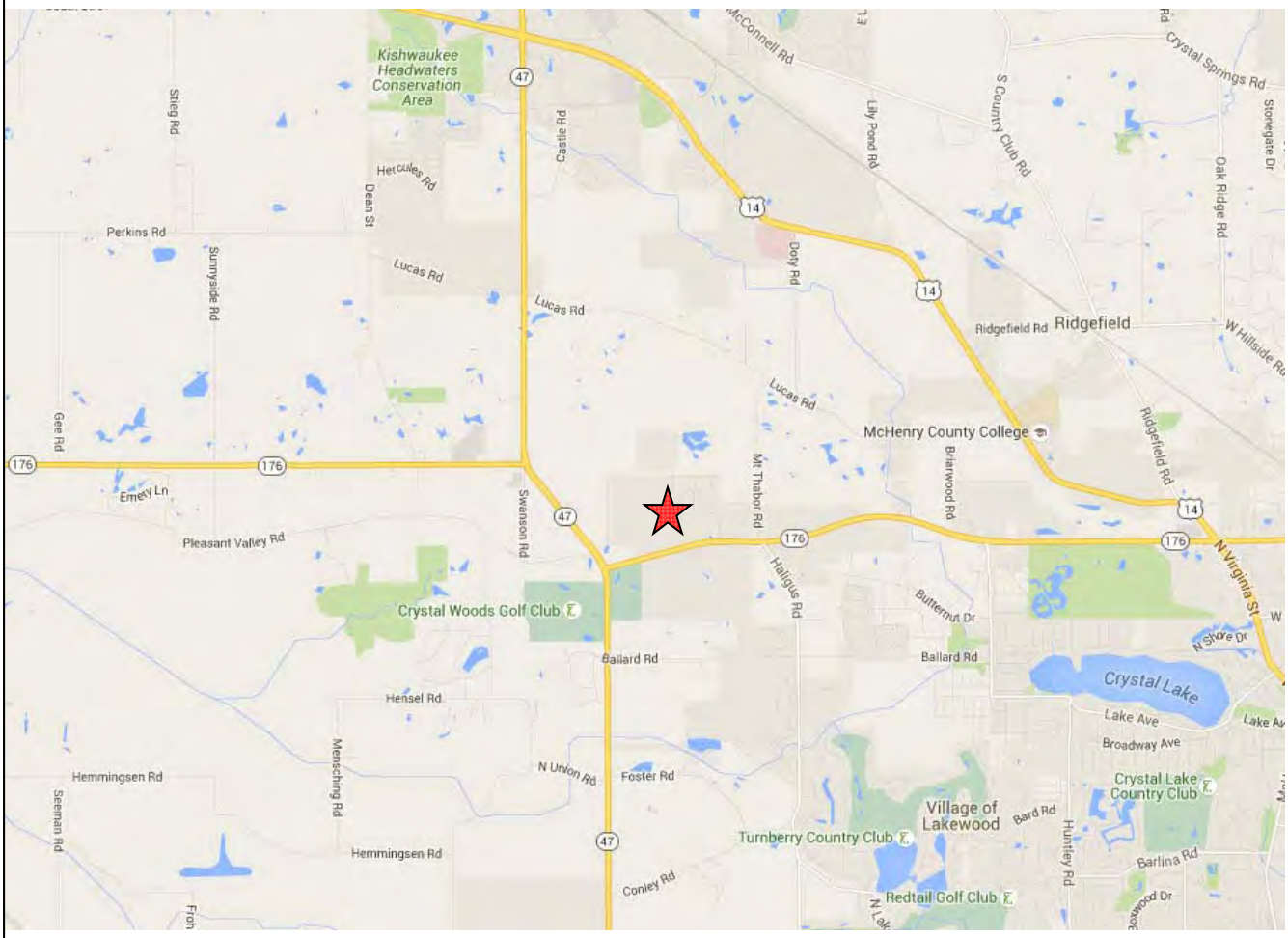
Based on the capacity analysis of both the existing and future traffic conditions, recommended proposed improvements consist of the following:

- Construct a new access point to the Bryn Mawr Phase II Subdivision at Helen Street. The lane geometry should be identical to the existing IL Route 176/Bryn Mawr intersection, with one eastbound through lane, one eastbound left-turn lane, one westbound through lane, one westbound right-turn lane, one southbound left-turn lane, and one southbound right-turn lane. The storage lengths and lane tapers required should follow IDOT's Bureau of Design and Environment (BDE) Manual, Chapter 36, Figure 36-3J. The intersection should be unsignalized with stop control on the Helen Street leg of the intersection and free-flow conditions on IL Route 176.
- At the intersection of IL Route 176/IL Route 47, install a westbound right-turn overlap phase that runs concurrently with the southbound left-turn phase. Re-optimize the traffic signal timings as necessary once the phase is active. Since the intersection currently runs free, along with its interconnect signal to the north at the west leg of IL Route 176, consider implementing a timing plan that better matches the travel needs of the area as necessary. The timing of this improvement would need to be determined by IDOT when they deem it necessary, depending on the schedule for the ultimate improvements at the IL Route 176/IL Route 47 intersection.

Appendix A - Exhibits

Exhibit A-1 Regional Location Map
Exhibit A-2 Local Location Map
Exhibit A-3 Site Plan
Exhibit A-4 Existing Peak Hour Traffic
Exhibit A-5 Directional Distribution
Exhibit A-6 Proposed Peak Hour Facility Traffic – Single-Family Detached Housing
Exhibit A-7 Proposed Peak Hour Facility Traffic – Residential Condominium/Townhouse
Exhibit A-8 Total Site Traffic
Exhibit A-9 2030 Background Traffic
Exhibit A-10 2030 Total Traffic

N



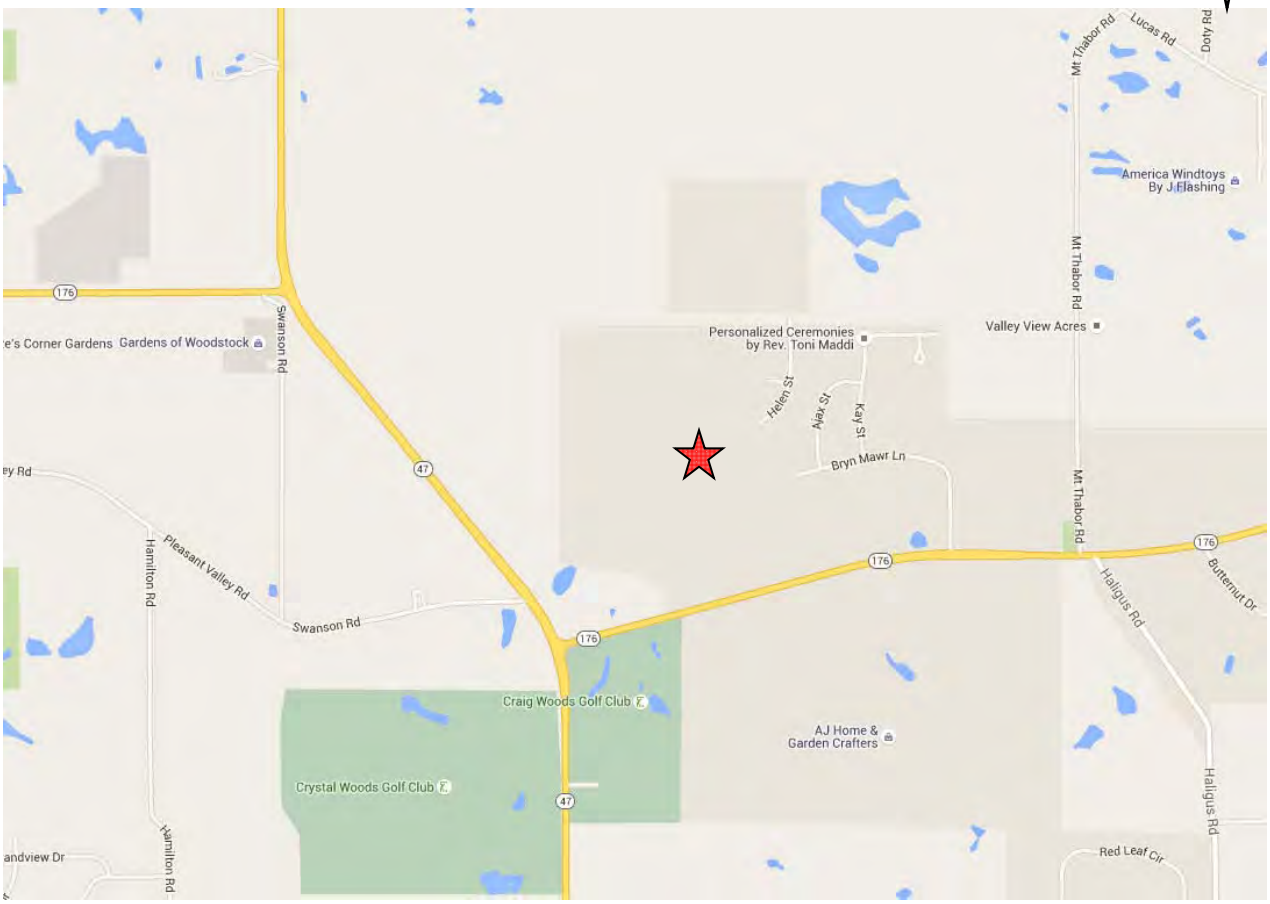
PROJECT LOCATION

Bryn Mawr Phase II Subdivision
CITY OF CRYSTAL LAKE, ILLINOIS
TRAFFIC IMPACT STUDY

EXHIBIT A-1
REGIONAL PROJECT LOCATION MAP

NOT TO SCALE DATE: 2/3/2016

N



PROJECT LOCATION

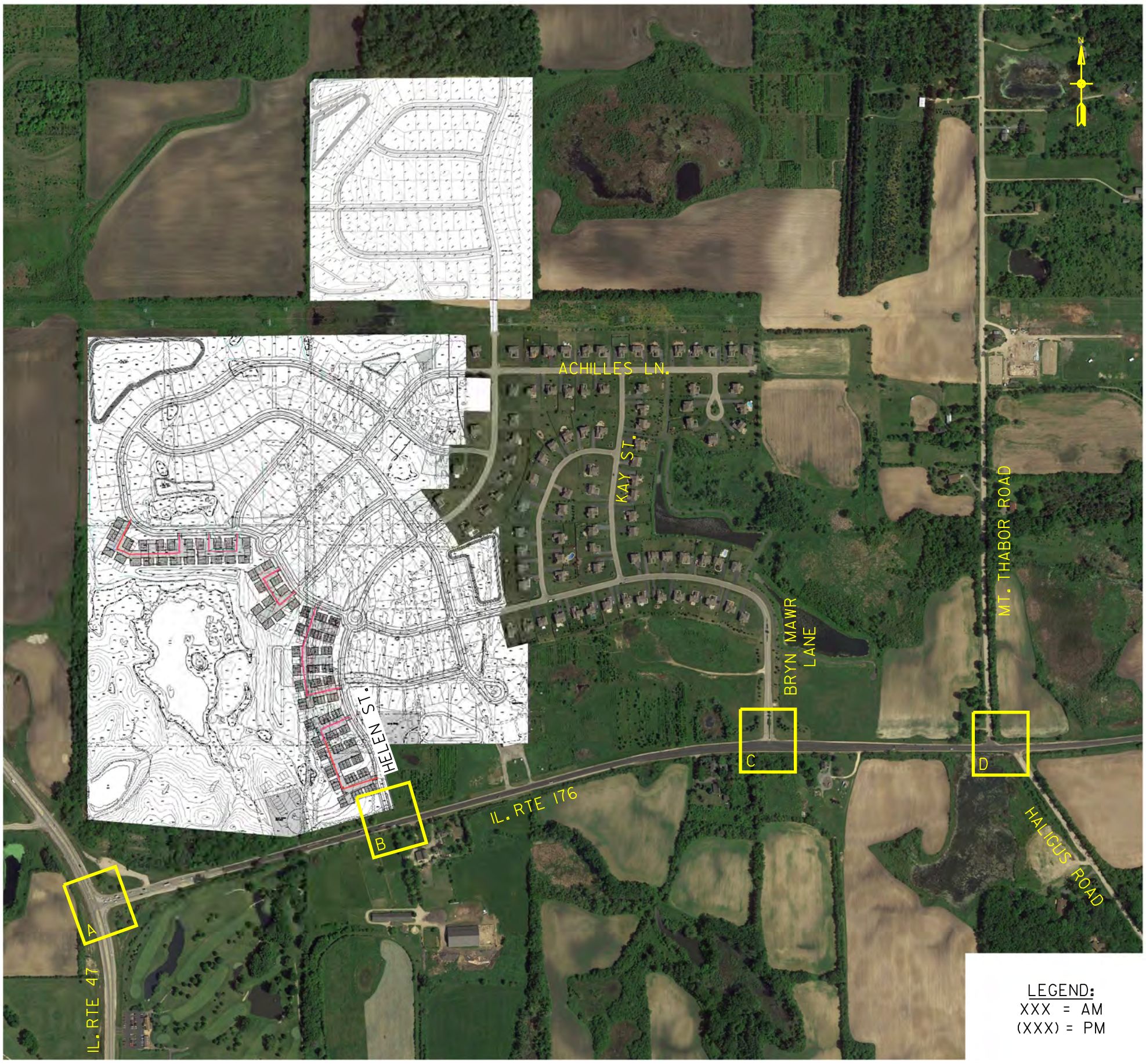
Bryn Mawr Subdivision Phase II
CITY OF CRYSTAL LAKE, ILLINOIS
TRAFFIC IMPACT STUDY

EXHIBIT A-2
LOCAL PROJECT LOCATION MAP

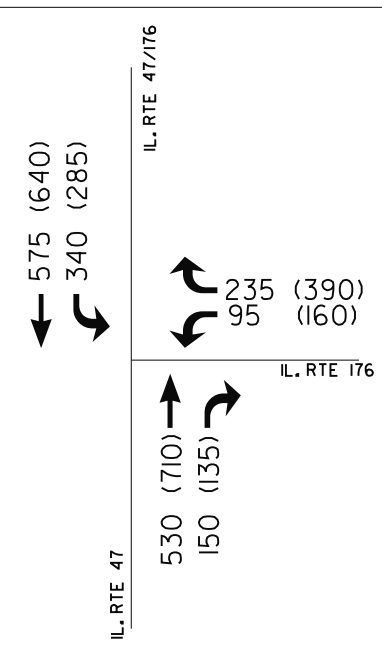
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EXHIBIT A-3 SITE PLAN

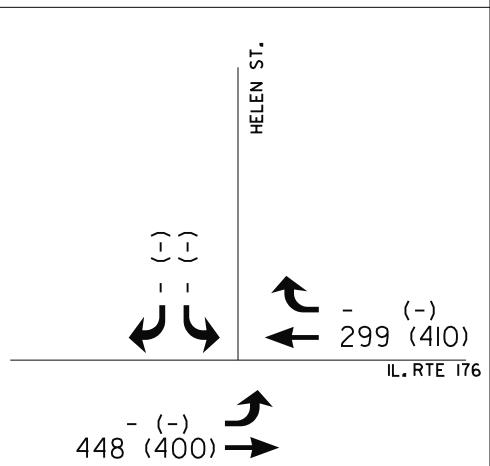


A — IL. RTE 176 AND IL. RTE 47

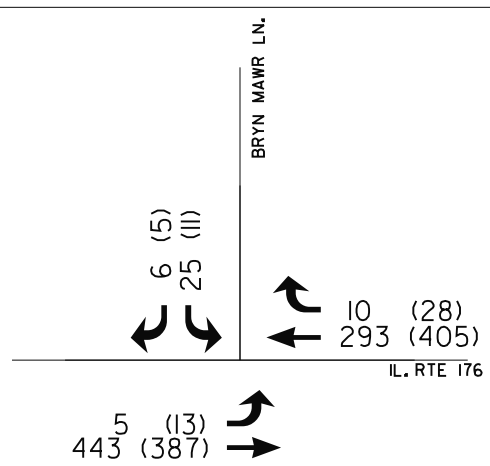


•TRAFFIC INFORMATION TAKEN FROM PREVIOUSLY COMPLETED INTERSECTION DESIGN STUDY. REFER TO APPENDIX B.

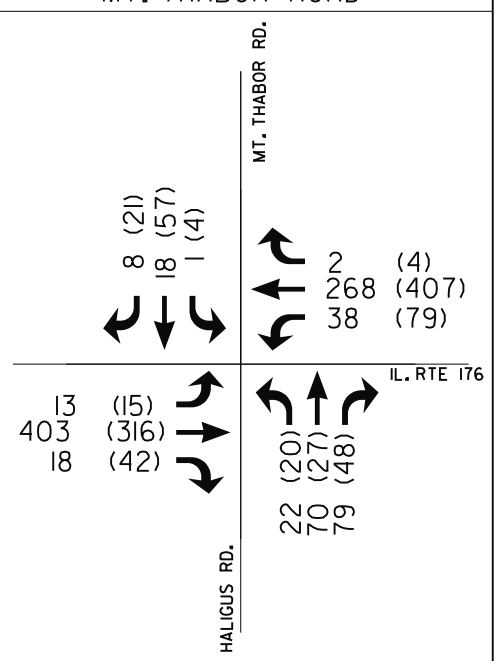
B — IL. RTE 176 AND HELEN ST.



C — IL. RTE 176 AND BRYN MAWR LANE



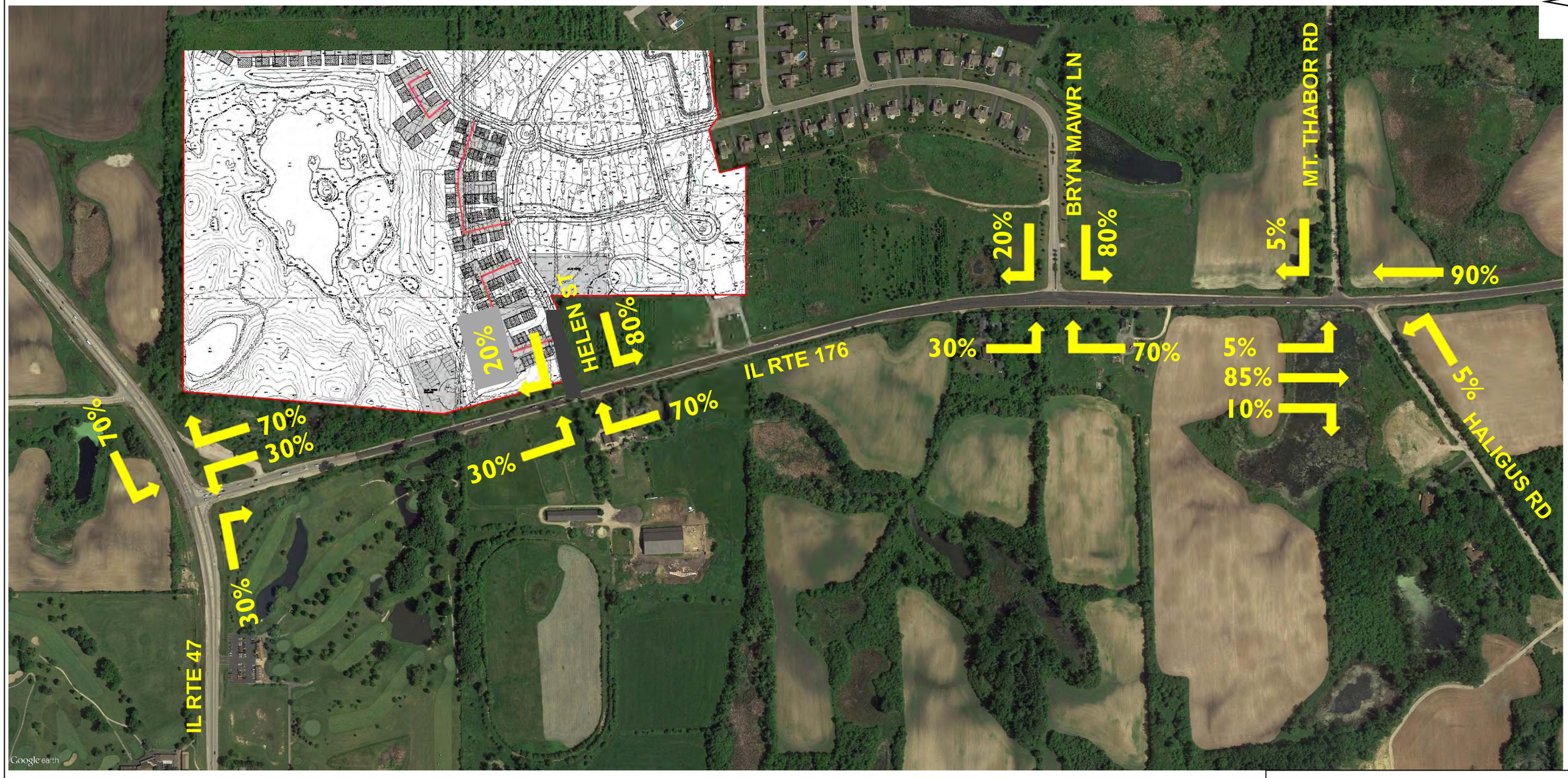
D — IL. RTE 176 AND HALIGUS ROAD/ MT. THABOR ROAD



•TRAFFIC INFORMATION TAKEN FROM PREVIOUSLY COMPLETED INTERSECTION DESIGN STUDY. REFER TO APPENDIX C.

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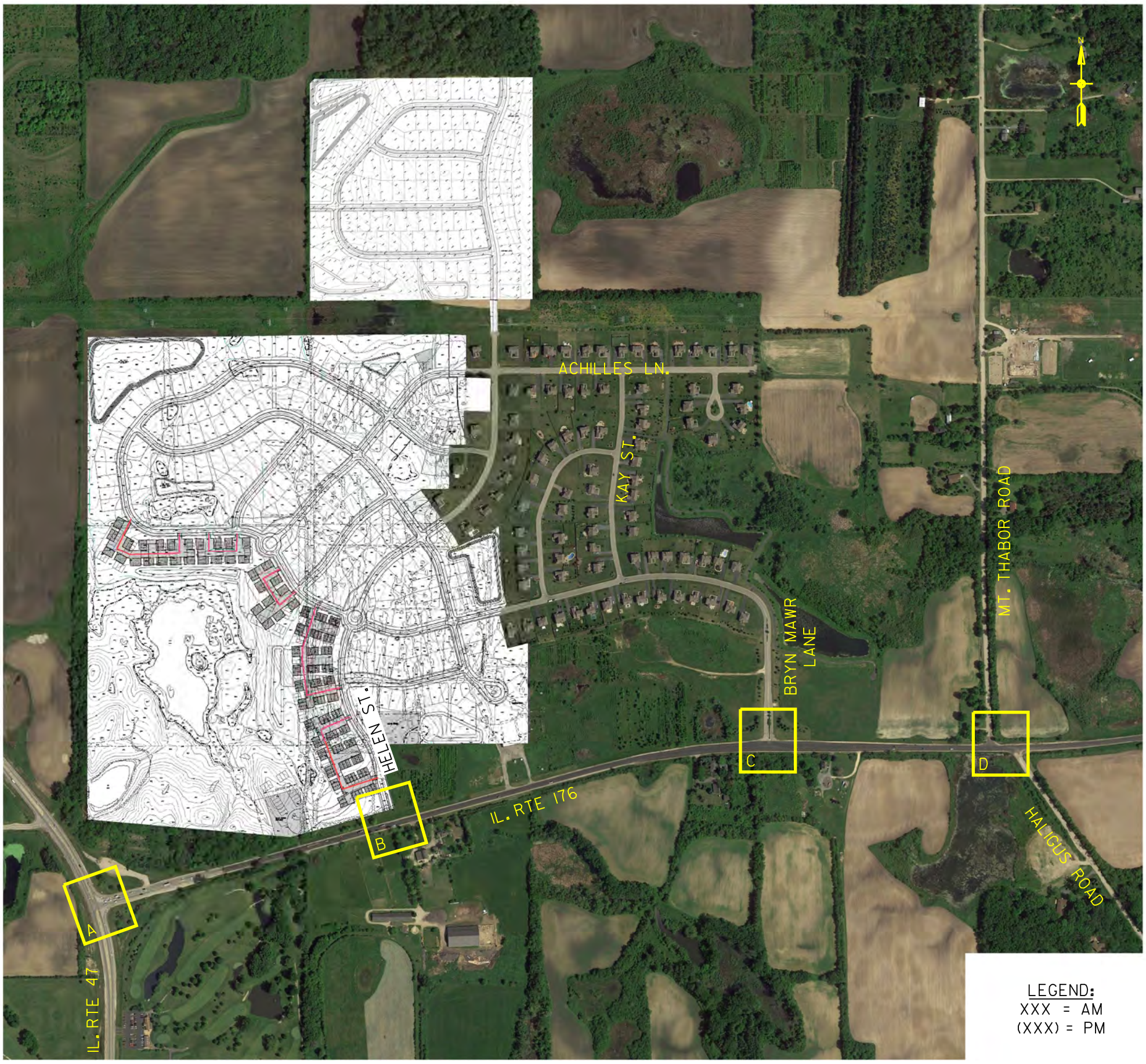
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FED. ROAD DIST. NO. 1	ILLINOIS	FED. AID PROJECT		



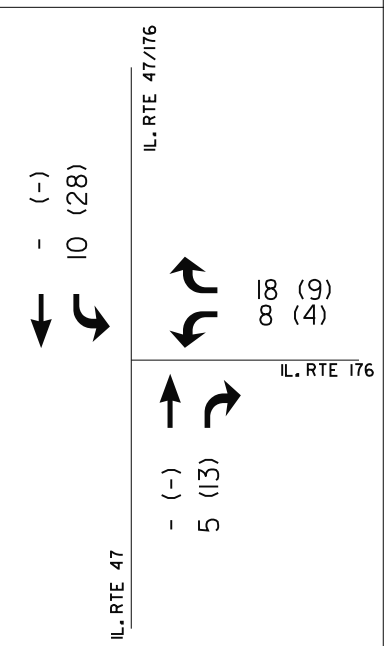
Bryn Mawr Phase II Subdivision
CITY OF CRYSTAL LAKE, ILLINOIS
TRAFFIC IMPACT STUDY

EXHIBIT A-5
Directional Distribution

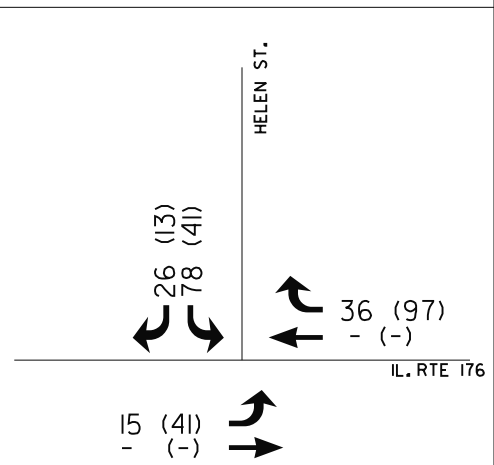
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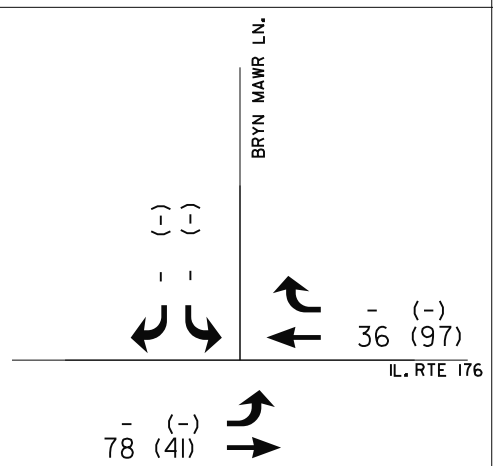
A — IL. RTE 176 AND IL. RTE 47



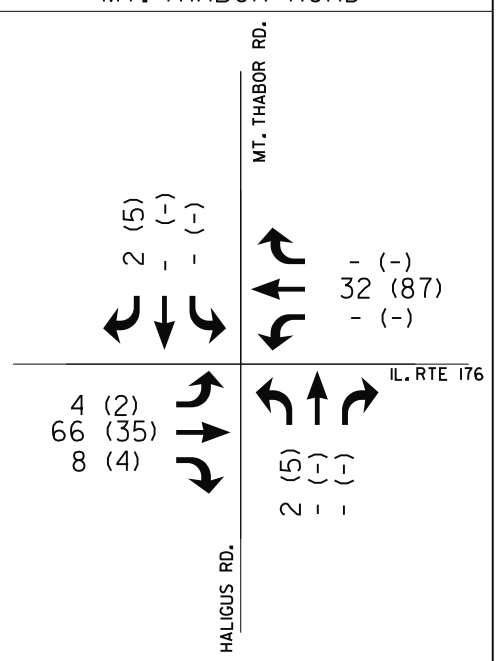
B — IL. RTE 176 AND HELEN ST.



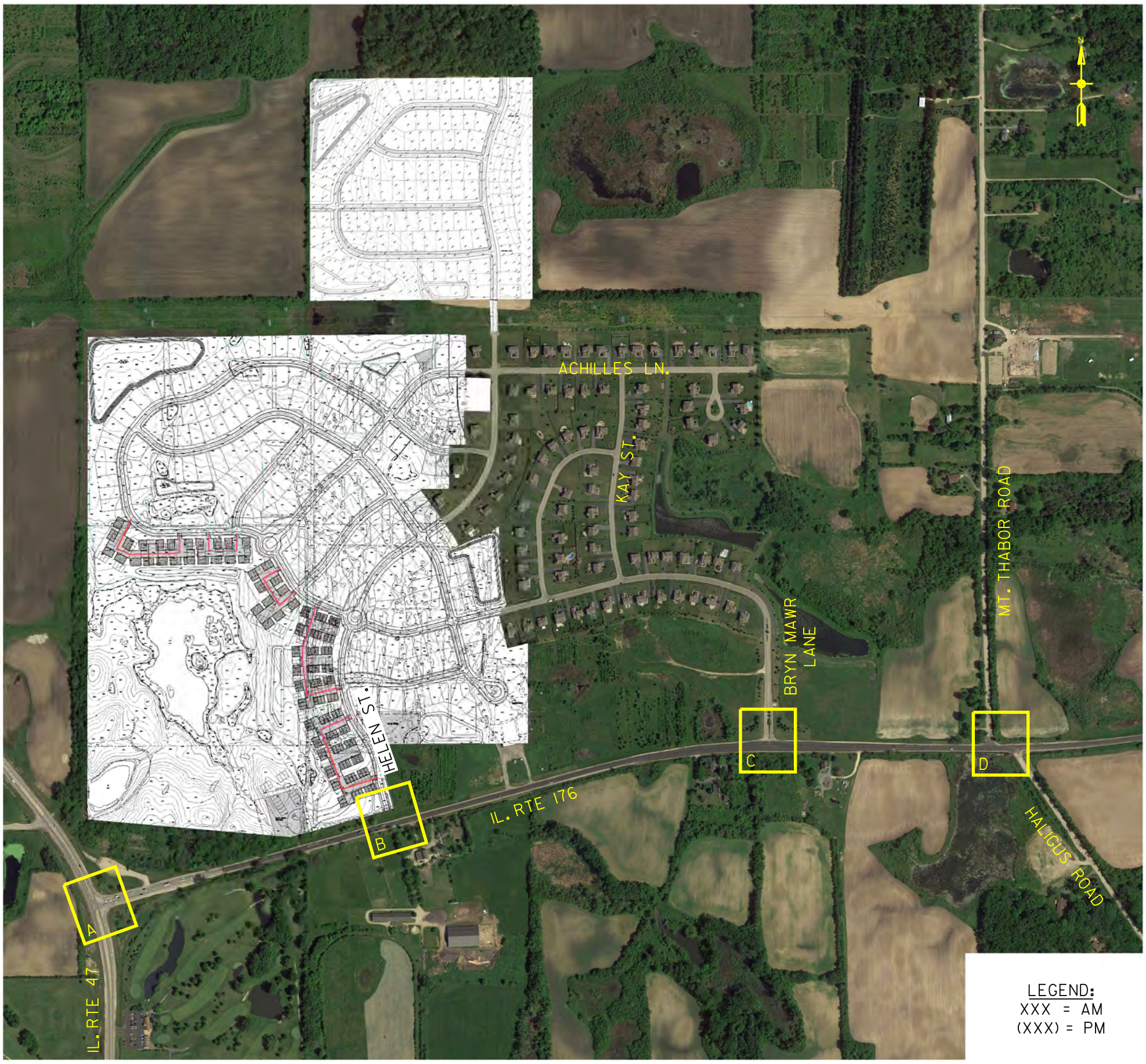
C — IL. RTE 176 AND BRYN MAWR LANE



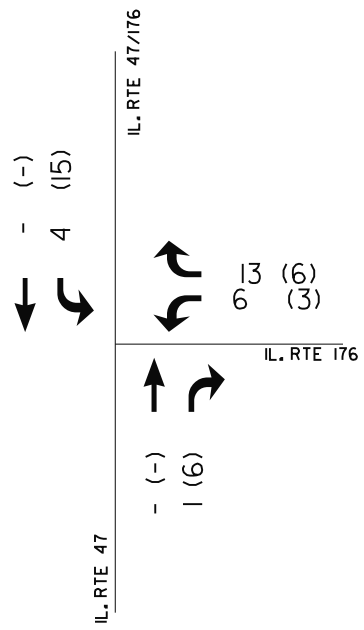
D — IL. RTE 176 AND HALIGUS ROAD/ MT. THABOR ROAD



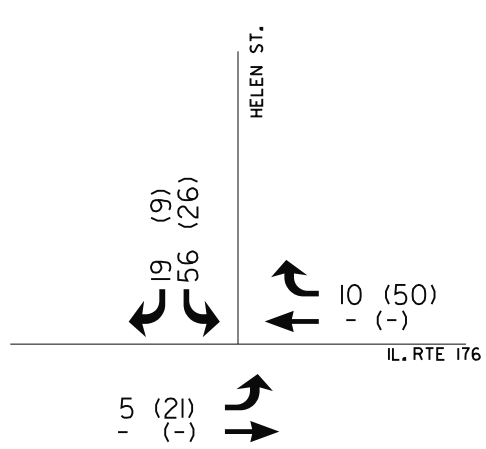
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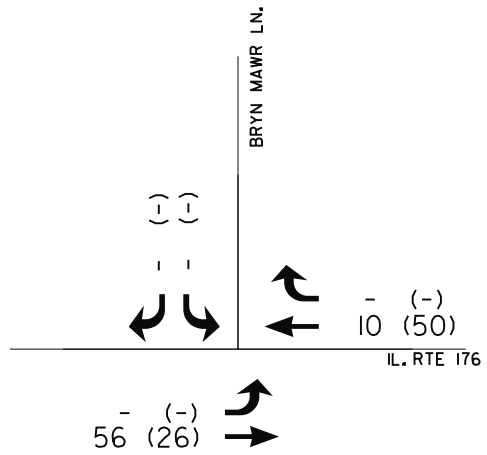
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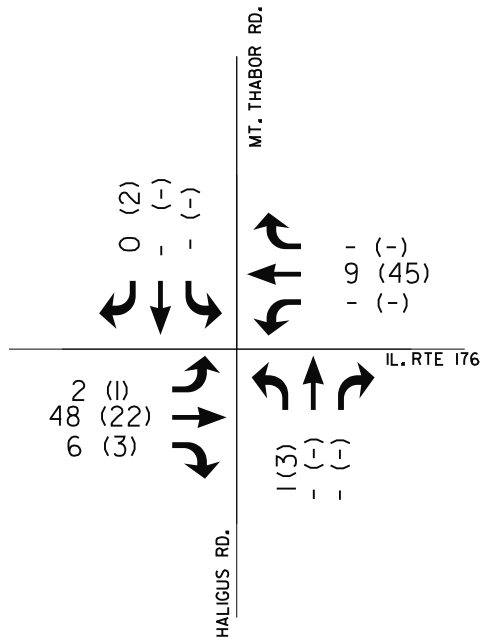
B — IL. RTE 176 AND HELEN ST.



C — IL. RTE 176 AND BRYN MAWR LANE



D — IL. RTE 176 AND HALIGUS ROAD/ MT. THABOR ROAD



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