

# RED FLAG INVESTIGATION DOCUMENT

## Minnich Road and Tillman Road Intersection Intersection Improvement Project

Allen County, Indiana

DES #1382818

August 4, 2014

### NARRATIVE

This Red Flag Investigation (RFI) pertains to the Allen County Highway Department (ACHD) project to reconstruct the Minnich Road and Tillman Road intersection from a four-way stop intersection to a roundabout. The proposed roadway alignment of Minnich Road and Tillman Road will allow traffic movements that will result in fewer delays and improve safety.

The current alignment of this intersection has Tillman Road at a slight angle, with the west leg of the intersection being slightly north of the east leg. This current alignment causes sight distance issues and safety concerns. The improvements will correct these problems. Tillman Road and Minnich Road are classified as rural major collectors.

A Roadway Safety Audit was performed on October 9, 2012 with the long term recommendation of a roundabout type intersection to enhance the safety of the intersection. Also, a Minnich Road / Tillman Road Abbreviated Roundabout Feasibility Study was completed in March 2013 which provided a total project cost including preliminary engineering, right-of-way engineering, right-of-way services, acquisition costs and construction costs. The Safety Audit and Feasibility Study have been included in this document.

### SUMMARY

<b>Infrastructure</b>			
Indicate the number of items of concern found within ½ mile, including an explanation why each item within the ½ mile radius will/will not impact the project. If there are no items, please indicate N/A:			
Religious Facilities	N/A	Recreational Facilities	N/A
Airports	N/A	Pipelines	N/A
Cemeteries	N/A	Railroads	1
Hospitals	N/A	Trails	N/A
Schools	N/A	Managed Lands	N/A
Museums	N/A		

### Explanation:

- There is 1 railroad within the half mile radius. The CSX rail line runs through the northern and eastern half of the area determined by the half mile radius. It crosses Minnich Road approximately 1,600 ft. north of Tillman Road. It crosses Tillman Road approximately 3,200 feet east of Minnich Road. The railroad alignment is outside the limits of the project area and will not be affected by the project.

**Water Resources**

Indicate the number of items of concern found within ½ mile, including an explanation why each item within the ½ mile radius will/will not impact the project. If there are no items, please indicate N/A:

NWI - Points	N/A	NWI - Wetlands	<b>4</b>
Karst Springs	N/A	IDEM 303d Listed Lakes	N/A
Canal Structures – Historic	N/A	Lakes	N/A
NWI - Lines	N/A	Floodplain - DFIRM	<b>Yes</b>
IDEM 303d Listed Rivers and Streams (Impaired)	N/A	Cave Entrance Density	N/A
Rivers and Streams	<b>3</b>	Sinkhole Areas	N/A
Canal Routes - Historic	N/A	Sinking-Stream Basins	N/A
Outstanding Rivers (Special Interest Waterways)	N/A	Line of Protection	N/A
*High Capacity Wells (Wellhead Protection Areas)	N/A	National River Inventory (NRI)	N/A

**Explanation:**

- Rivers and Streams – three drains are within the half mile radius. The Scharpenberg Drain, Dauer Drain, and Schmidt Drain. The Dauer Drain is not near the project area and will not be affected by the project. The Schmidt Drain touches the western limits of the project and the Scharpenberg Drain touches the southern limits of the project area. Both of these may be affected by the project.
- There are four NWI-wetlands within the half mile radius. Since none of them are within the project area they will not be affected by the project.
- The Floodplain exists within the half mile radius and intersects the project area at the west end and the south end. This may affect the project.
- \*High Capacity Wells – To protect these features they are not identified in the water resource map due to their locational sensitivity. No high capacity wells were found within a half mile radius of the project area and therefore will not be affected by the project.

**Mining/Mineral Exploration**

Indicate the number of items of concern found within ½ mile, including an explanation why each item within the ½ mile radius will/will not impact the project. If there are no items, please indicate N/A:

Petroleum Wells	N/A	Petroleum Fields	N/A
Mines – Surface	N/A	Mines – Underground	N/A

**Explanation:**

- No Mining/Mineral Explorations were found within the half mile radius.

<b>Hazmat Concerns</b>			
Indicate the number of items of concern found within ½ mile, including an explanation why each item within the ½ mile radius will/will not impact the project. If there are no items, please indicate N/A:			
Brownfield Sites	N/A	Restricted Waste Sites	N/A
Corrective Action Sites (RCRA)	N/A	Septage Waste Sites	N/A
Confined Feeding Operations	N/A	Solid Waste Landfills	N/A
Construction Demolition Waste	N/A	State Cleanup Sites	N/A
Industrial Waste Sites (RCRA Generators)	N/A	Tire Waste Sites	N/A
*Infectious/Medical Waste Sites	N/A	Waste Transfer Stations	N/A
Lagoon/Surface Impoundments	N/A	RCRA Waste Treatment, Storage, and Disposal Sites (TSDs)	N/A
Leaking Underground Storage Tanks (LUSTs)	N/A	Underground Storage Tanks	N/A
Manufactured Gas Plant Sites	N/A	Voluntary Remediation Program	N/A
NPDES Facilities	N/A	Superfund	N/A
NPDES Pipe Locations	N/A	Institutional Control Sites	N/A
Open Dump Sites	N/A		

**Explanation:**

- \*Infectious/Medical Waste Sites were not able to be confirmed or denied in the project area. More research is needed to determine if there are any within the ½ mile radius of the project.

**Ecological Information**

The Allen County listing of the Indiana Natural Heritage Data Center information on endangered, threatened, or rare (ETR) species and high quality natural communities is attached with ETR species highlighted. Due to the sensitive nature of identifying locations of threatened and endangered species, maps of these specific habitats are not provided. In general, small stream corridors with well-developed riparian woods, upland forested areas, wetlands and portions of the St. Joseph River have been identified as potential habitat sites to threatened and endangered species.

**Cultural Resources**

The items below represent all properties or bridges in Fort Wayne and Allen County that have obtained any type of historic designation. The types of historic designation are: Indiana Historic Bridge Inventory, Fort Wayne Local Historic Districts, the Indiana State Register of Historic Places, the National Register of Historic Places, the Historic American Buildings Survey, and National Historic Landmark. The Items below labeled as “Potential” are items that have been identified by the Fort Wayne Historic Preservation Commission and/or Architecture and Community Heritage (ARCH) of Fort Wayne for their historical significance and potential for being listed in one of the above historical designations. Also, structures or properties from the latest County Interim Report have been identified.

<b>Historic Features</b> Indicate the number of items of concern found within ½ mile, including an explanation why each item within the ½ mile radius will/will not impact the project. If there are no items, please indicate N/A:			
Historic Sites or Districts	N/A	Select Bridges	N/A
Non-Select Bridges	N/A	Potential Historic Sites or Districts	N/A
Properties identified in the latest Interim Report	N/A		

**Explanation:**

- No Historic Features were found within the ½ mile radius of the project. Further discussion with the Fort Wayne Historic Preservation Commission and Architecture and Community Heritage (ARCH) of Fort Wayne confirmed that there were no historic sites or districts that were within the ½ mile area surrounding the project area.

**RECOMMENDATIONS**

Multiple Red Flag items are located within the RFI search radius.

**INFRASTRUCTURE:** Only 1 railroad is within the anticipated limits of construction. If the project limits change, additional coordination with CSX Railroad should be undertaken.

**WATER RESOURCES:** There are two drains (Schmidt and Scharpenberg) that are on the outer limits of the project area and may be impacted by the project. The project area west of the intersection along Tillman Road falls within a floodplain and will need further investigation during design and construction. Additional coordination should be conducted with the Allen County Surveyor’s Office and the Department of Planning Services.

**MINING/MINERAL EXPLORATION:** N/A

**HAZMAT CONCERNS:** More research is needed to determine if there are any Infectious/Medical Waste Sites within the ½ mile radius of the project.

**ECOLOGICAL INFORMATION:** Coordination with the Indiana Department of Natural Resources (IDNR) and the United States Fish and Wildlife Service may be required to determine if any endangered, threatened, or rare species are present within the project area.

**CULTURAL RESOURCES:** N/A

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**Prepared by:**

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**Graphics:**

A map for each report section with a ½ mile radius buffer around all project area(s) showing all items identified as possible items of concern is attached.

GENERAL SITE MAP SHOWING PROJECT AREA: YES

TOPOGRAPHIC MAP SHOWING THE PROJECT AREA: YES

INFRASTRUCTURE: YES

WATER RESOURCES: YES

MINING/MINERAL EXPLORATION: YES

HAZMAT CONCERNS: YES

CULTURAL RESOURCES: YES

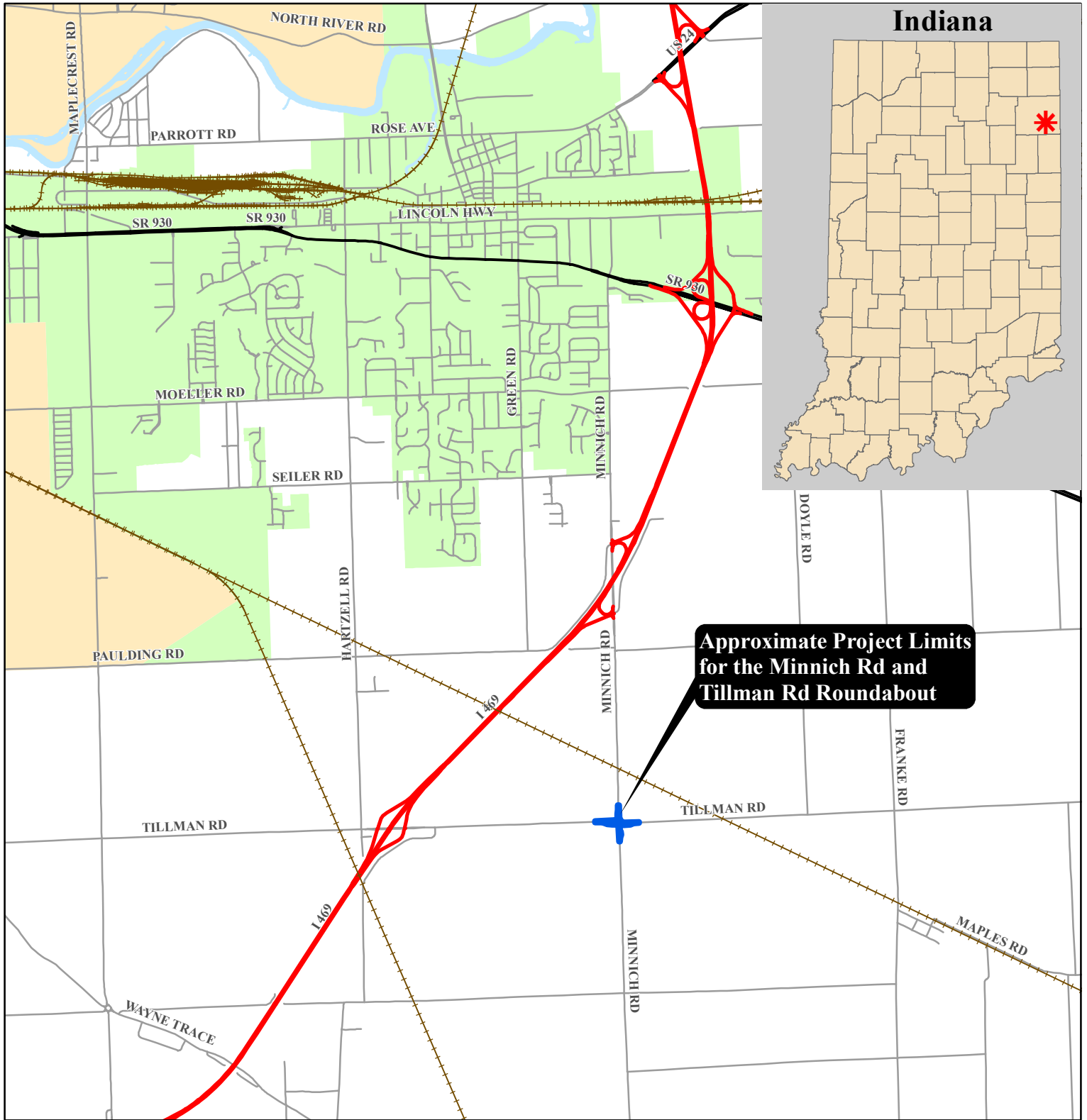
COUNTY LIST OF THREATENED AND ENDANGERED SPECIES: YES

**Additional Attachments:**

Roadway Safety Audit: YES

Abbreviated Roundabout Feasibility Study: YES

Red Flag Investigation - Project Location  
Minnich Road and Tillman Road Intersection  
Construction of a Roundabout  
Allen County, Indiana

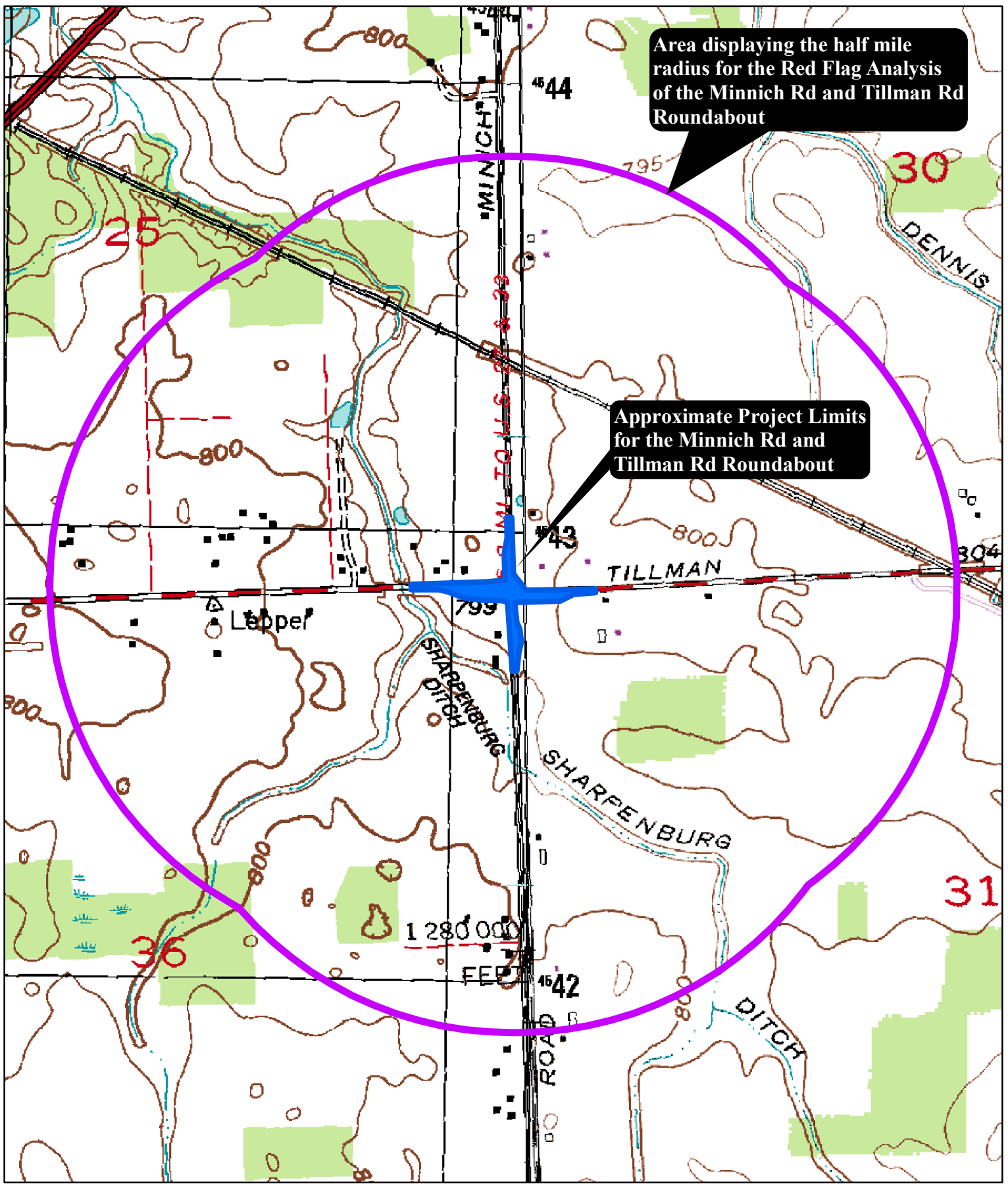


Approximate Project Limits  
for the Minnich Rd and  
Tillman Rd Roundabout

**Legend**

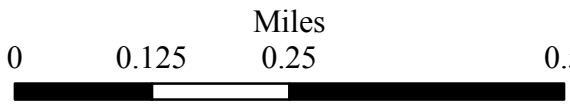
Interstates	Rivers
State Route	Railroad
US Route	City of Fort Wayne
Local Road	City of New Haven





Area displaying the half mile radius for the Red Flag Analysis of the Minnich Rd and Tillman Rd Roundabout

Approximate Project Limits for the Minnich Rd and Tillman Rd Roundabout



Red Flag Investigation - Topographic Map  
 Minnich Road and Tillman Road Intersection  
 Construction of a Roundabout  
 Allen County, Indiana





Red Flag Investigation - Water Resources Map  
 Minnich Road and Tillman Road Intersection  
 Construction of a Roundabout  
 Allen County, Indiana



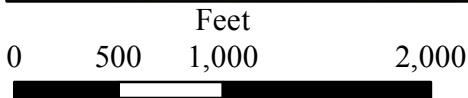
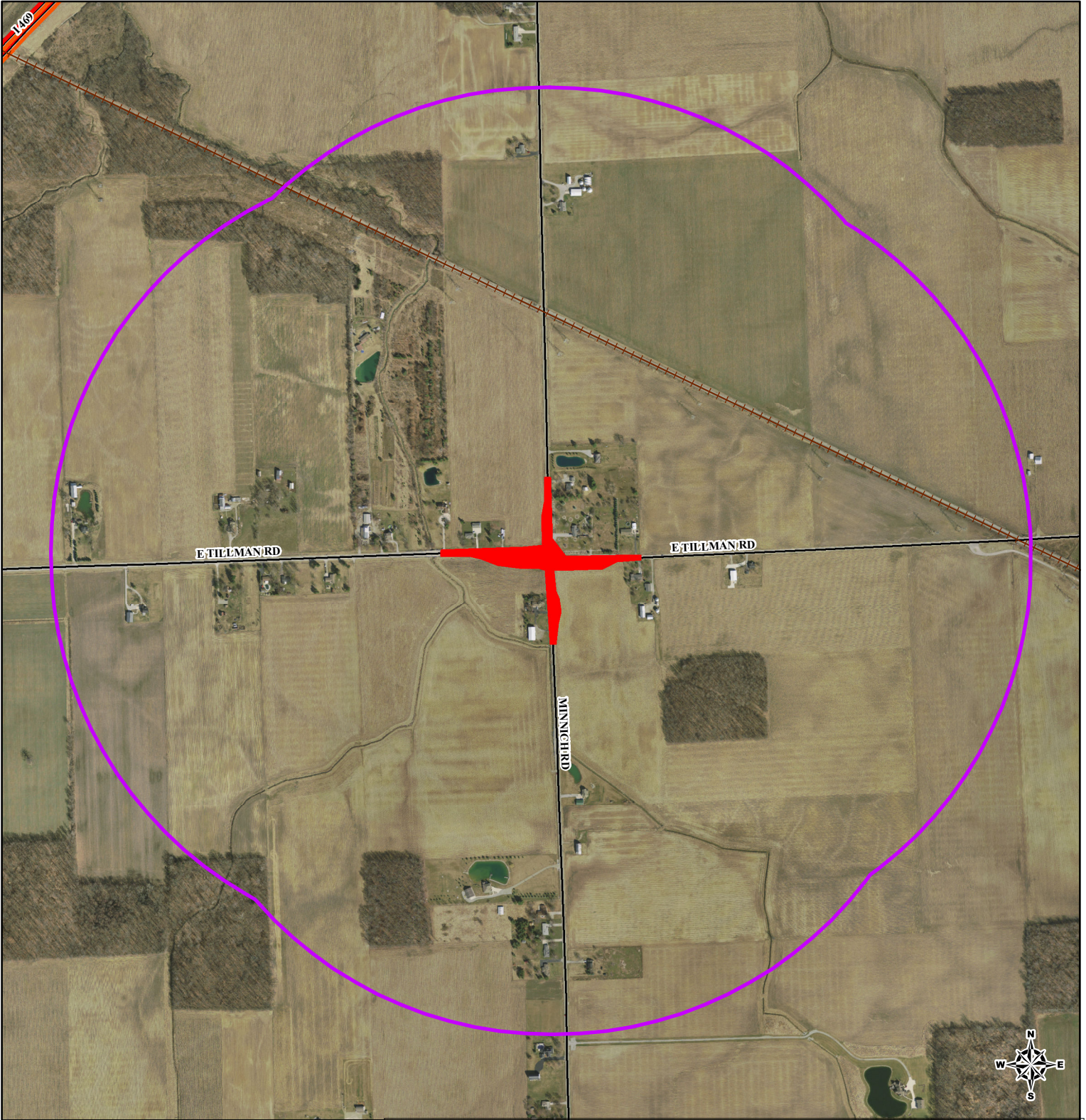
This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.



Wetland Points	Historic Canal Route	Line of Protection
Wetland Lines	Historic Canal Structure	Interstates
Wetlands	Lake - Impaired	State Route
Stream - Impaired	Floodplain	US Route
Outstanding Rivers	Karst Springs	Local Road
National River Inventory (NRI)	Cave Entrance Density	Half Mile Buffer
Linear Waterbody	Sinkhole Areas	Project Area
Waterbody Areas	Sinking-Stream Basins	



Red Flag Investigation - Infrastructure Map  
Minnich Road and Tillman Road Intersection  
Construction of a Roundabout  
Allen County, Indiana



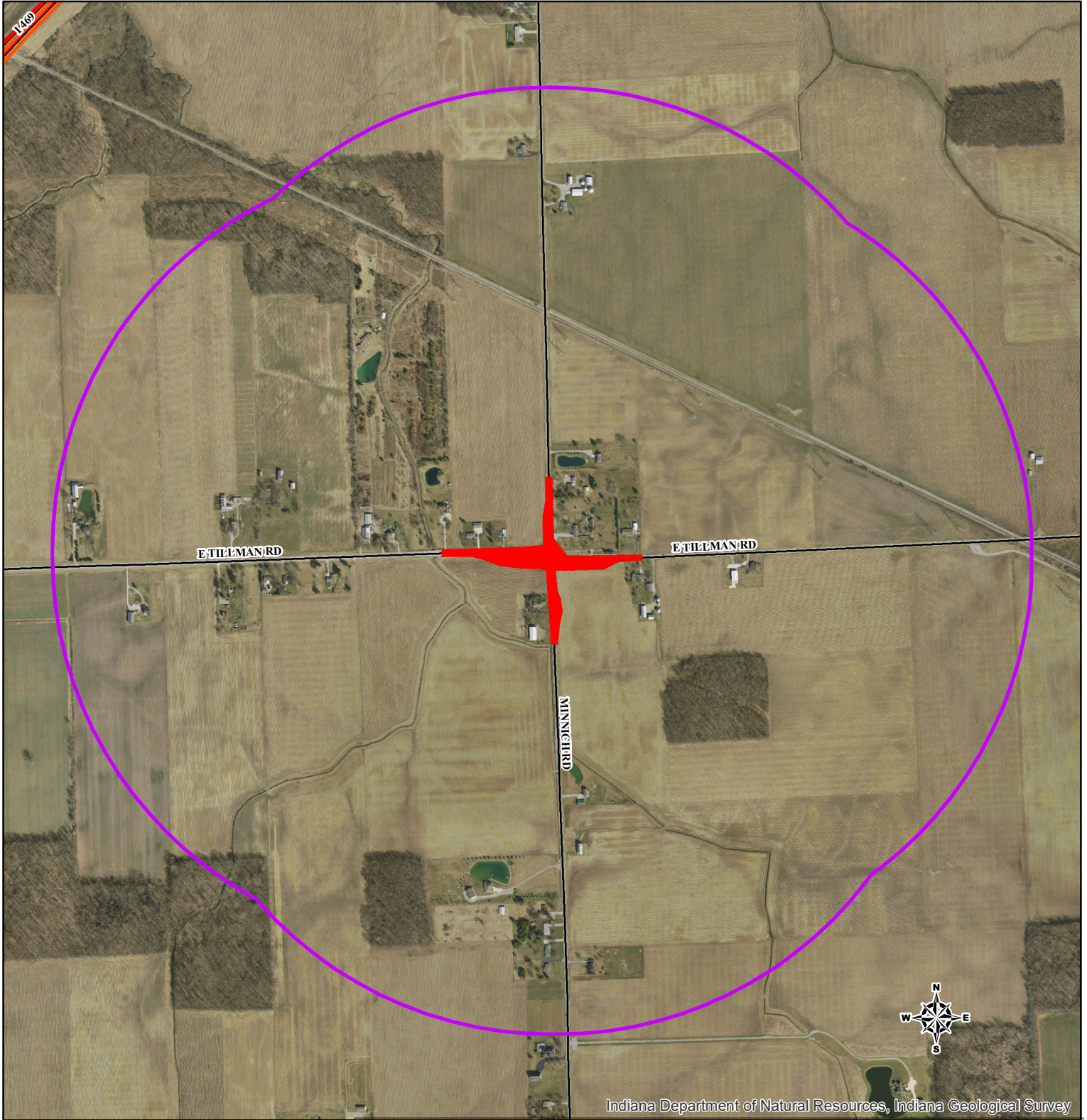
This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.



	Religious Facilities		Recreational Facilities		Interstates
	Museums		Trails		State Route
	Schools		Railroad		US Route
	Hospitals		Pipelines		Local Road
	Cemetaries		Managed Lands		Half Mile Buffer
	Airports		County Boundary		Project Area



Red Flag Investigation - Mining/Mineral Exploration Map  
 Minnich Road and Tillman Road Intersection  
 Construction of a Roundabout  
 Allen County, Indiana



Indiana Department of Natural Resources, Indiana Geological Survey



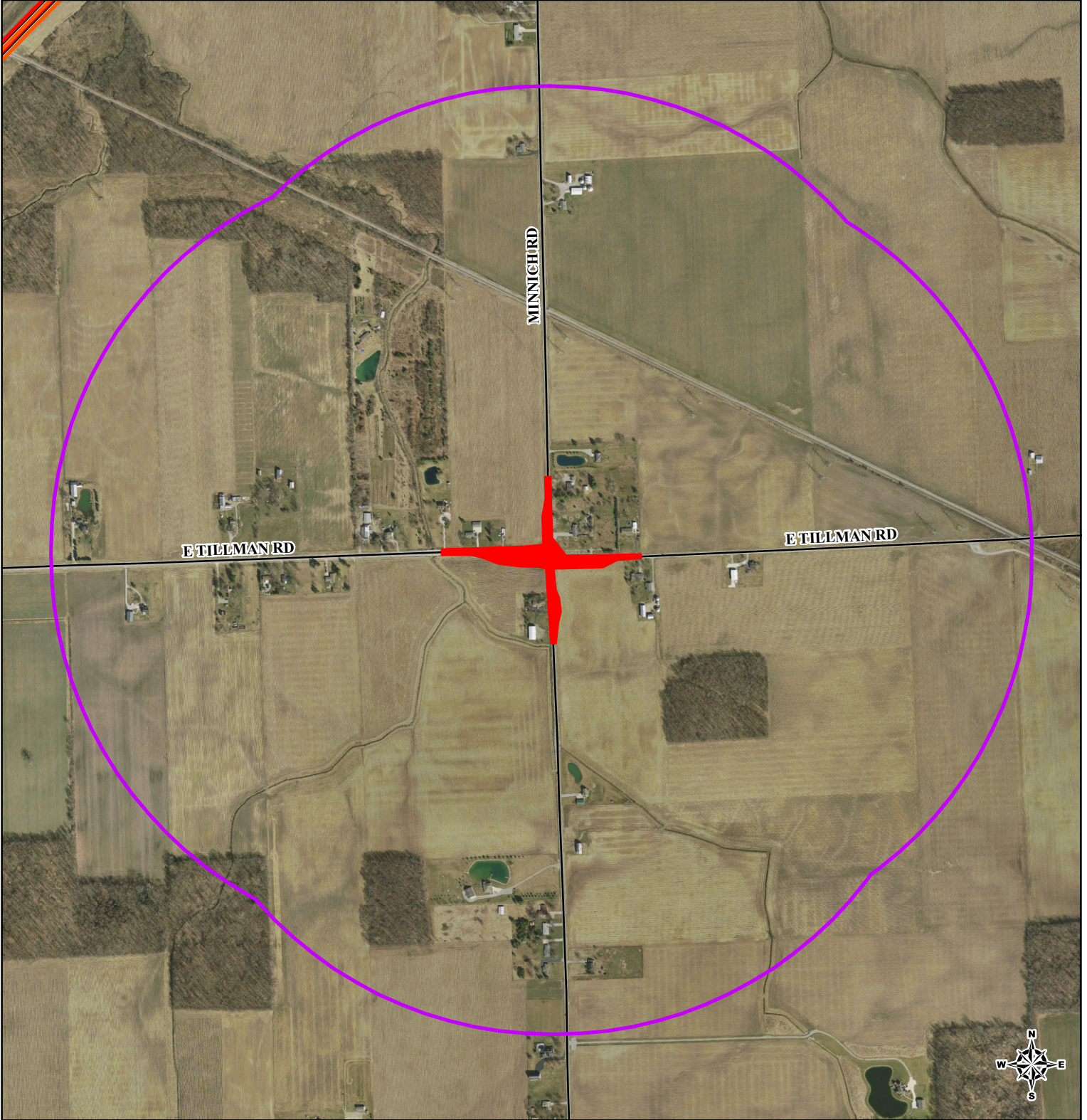
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Mines - Underground	Gas Wells	Interstates
Mines - Surface	Gas Storage Wells	State Route
Gas	Oil Wells	US Route
Oil	Service Wells	Local Road
Oil/gas	Stratigraphic Test Wells	Half Mile Buffer
	Dry Wells	Project Area
	Unknown Wells	



Red Flag Investigation - Hazmat Concerns Map  
Minnich Road and Tillman Road Intersection  
Construction of a Roundabout  
Allen County, Indiana



This map is intended to serve as an aid in graphic representation only. This Information is not warranted for accuracy or other purposes.

**\*See next page for Map Legend**

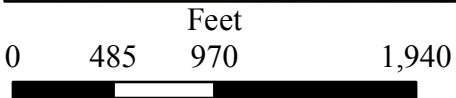
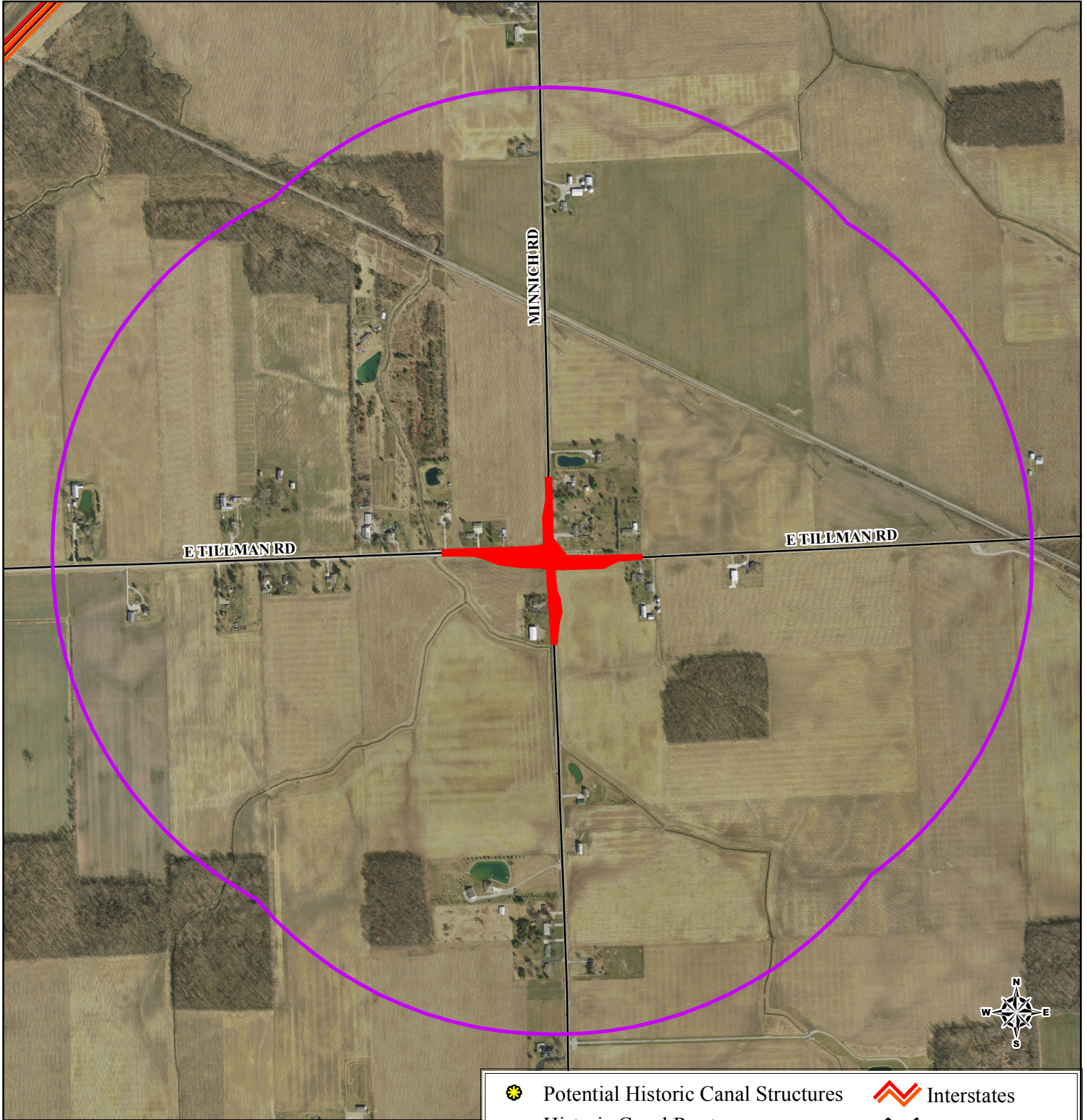


Red Flag Investigation - Hazmat Concerns Legend  
Minnich Road and Tillman Road Intersection  
Construction of a Roundabout  
Allen County, Indiana

	Confined Feeding Operations		Brownfields
	Industrial Waste Site		State Cleanup Sites
	Waste Treatment Storage Disposal		Voluntary Remediation Program Sites
	Waste Septage Sites		Institutional Controls
	Waste Tire Sites		Leaking Underground Storage Tank
	Construction Demolition Waste		Underground Storage Tank
	Waste Solid Active Permitted		Manufactured Gas Plants
	Composting Facilities		Waste Transfer Stations
	Open Dumps		Waste Restricted Sites
	Waste Old Landfills		Interstates
	Landfill Sites		State Route
	NPDES Facility		US Route
	NPDES Pipe		Local Road
	Corrective Action Sites		Half Mile Buffer
	Superfund		Project Area



Red Flag Investigation - Historical Features Map  
Minnich Road and Tillman Road Intersection  
Construction of a Roundabout  
Allen County, Indiana



This map is intended to serve as an aid in graphic representation only. This Information is not warranted for accuracy or other purposes.



	Potential Historic Canal Structures		Interstates
	Historic Canal Routes		State Route
	Non-Select Bridge		US Route
	Select Bridge		Local Road
	Historical Sites		Half Mile Buffer
	Potential Historical Sites		Project Area
	Historical Areas or Districts		
	Potential Historical Areas or Districts		



## Indiana County Endangered, Threatened and Rare Species List

County: **Allen**

Species Name	Common Name	FED	STATE	GRANK	SRANK
<b>Mollusk: Bivalvia (Mussels)</b>					
<b>Epioblasma obliquata perobliqua</b>	<b>White Cat's Paw Pearlymussel</b>	<b>LE</b>	<b>SE</b>	<b>G1T1</b>	<b>SX</b>
<b>Epioblasma torulosa rangiana</b>	<b>Northern Riffleshell</b>	<b>LE</b>	<b>SE</b>	<b>G2T2</b>	<b>SX</b>
Lampsilis fasciola	Wavyrayed Lampmussel		SSC	G5	S3
Obovaria subrotunda	Round Hickorynut		SSC	G4	S1
<b>Pleurobema clava</b>	<b>Clubshell</b>	<b>LE</b>	<b>SE</b>	<b>G2</b>	<b>S1</b>
Ptychobranthus fasciolaris	Kidneyshell		SSC	G4G5	S2
<b>Quadrula cylindrica cylindrica</b>	<b>Rabbitsfoot</b>	<b>C</b>	<b>SE</b>	<b>G3G4T3</b>	<b>S1</b>
Toxolasma lividus	Purple Lilliput		SSC	G3	S2
<b>Villosa fabalis</b>	<b>Rayed Bean</b>	<b>C</b>	<b>SSC</b>	<b>G2</b>	<b>S1</b>
<b>Insect: Odonata (Dragonflies &amp; Damselflies)</b>					
Tachopteryx thoreyi	Gray Petaltail		SR	G4	S2S3
<b>Fish</b>					
Moxostoma valenciennesi	Greater Redhorse		SE	G4	S2
Percina evides	Gilt Darter		SE	G4	S1
<b>Amphibian</b>					
Ambystoma laterale	Blue-spotted Salamander		SSC	G5	S2
Hemidactylium scutatum	Four-toed Salamander		SE	G5	S2
Rana pipiens	Northern Leopard Frog		SSC	G5	S2
<b>Reptile</b>					
Clemmys guttata	Spotted Turtle		SE	G5	S2
Clonophis kirtlandii	Kirtland's Snake		SE	G2	S2
Emydoidea blandingii	Blanding's Turtle		SE	G4	S2
<b>Sistrurus catenatus catenatus</b>	<b>Eastern Massasauga</b>	<b>C</b>	<b>SE</b>	<b>G3G4T3T4Q</b>	<b>S2</b>
<b>Bird</b>					
Asio flammeus	Short-eared Owl		SE	G5	S2
Bartramia longicauda	Upland Sandpiper		SE	G5	S3B
Buteo lineatus	Red-shouldered Hawk		SSC	G5	S3
Buteo platypterus	Broad-winged Hawk	No Status	SSC	G5	S3B
Circus cyaneus	Northern Harrier		SE	G5	S2
Dendroica cerulea	Cerulean Warbler		SE	G4	S3B
Falco peregrinus	Peregrine Falcon	No Status	SE	G4	S2B
<b>Haliaeetus leucocephalus</b>	<b>Bald Eagle</b>	<b>LT,PDL</b>	<b>SE</b>	<b>G5</b>	<b>S2</b>
Ixobrychus exilis	Least Bittern		SE	G5	S3B
Lanius ludovicianus	Loggerhead Shrike	No Status	SE	G4	S3B
Nyctanassa violacea	Yellow-crowned Night-heron		SE	G5	S2B
Nycticorax nycticorax	Black-crowned Night-heron		SE	G5	S1B
Phalaropus tricolor	Wilson's Phalarope		SSC	G5	SHB
Sturnella neglecta	Western Meadowlark		SSC	G5	S2B
Tyto alba	Barn Owl		SE	G5	S2

Indiana Natural Heritage Data Center  
Division of Nature Preserves  
Indiana Department of Natural Resources  
This data is not the result of comprehensive county surveys.

Fed: LE = Endangered; LT = Threatened; C = candidate; PDL = proposed for delisting  
State: SE = state endangered; ST = state threatened; SR = state rare; SSC = state species of special concern; SX = state extirpated; SG = state significant; WL = watch list  
GRANK: Global Heritage Rank: G1 = critically imperiled globally; G2 = imperiled globally; G3 = rare or uncommon globally; G4 = widespread and abundant globally but with long term concerns; G5 = widespread and abundant globally; G? = unranked; GX = extinct; Q = uncertain rank; T = taxonomic subunit rank  
SRANK: State Heritage Rank: S1 = critically imperiled in state; S2 = imperiled in state; S3 = rare or uncommon in state; G4 = widespread and abundant in state but with long term concern; SG = state significant; SH = historical in state; SX = state extirpated; B = breeding status; S? = unranked; SNR = unranked; SNA = nonbreeding status unranked

**Indiana County Endangered, Threatened and Rare Species List**

**County: Allen**

Species Name	Common Name	FED	STATE	GRANK	SRANK
Wilsonia citrina	Hooded Warbler		SSC	G5	S3B
<b>Mammal</b>					
Lynx rufus	Bobcat	No Status	SSC	G5	S1
Taxidea taxus	American Badger		SSC	G5	S2
<b>Vascular Plant</b>					
Andromeda glaucophylla	Bog Rosemary		SR	G5	S2
Armoracia aquatica	Lake Cress		SE	G4?	S1
Chelone obliqua var. speciosa	Rose Turtlehead		WL	G4T3	S3
Circaea alpina	Small Enchanter's Nightshade		SX	G5	SX
Coeloglossum viride var. virescens	Long-bract Green Orchis		ST	G5T5	S2
Crataegus succulenta	Fleshy Hawthorn		SR	G5	S2
Euphorbia obtusata	Bluntleaf Spurge		SE	G5	S1
Phlox ovata	Mountain Phlox		SE	G4	S1
Platanthera psycodes	Small Purple-fringe Orchis		SR	G5	S2
Poa alsodes	Grove Meadow Grass		SR	G4G5	S2
Scutellaria parvula var. parvula	Small Skullcap		SX	G4T4	SX
Spiranthes lucida	Shining Ladies'-tresses		SR	G5	S2
Spiranthes magnicamporum	Great Plains Ladies'-tresses		SE	G4	S1
<b>High Quality Natural Community</b>					
Forest - flatwoods central till plain	Central Till Plain Flatwoods		SG	G3	S2
Forest - floodplain mesic	Mesic Floodplain Forest		SG	G3?	S1
Forest - floodplain wet-mesic	Wet-mesic Floodplain Forest		SG	G3?	S3
Forest - upland dry	Dry Upland Forest		SG	G4	S4
Forest - upland dry-mesic	Dry-mesic Upland Forest		SG	G4	S4
Forest - upland mesic	Mesic Upland Forest		SG	G3?	S3
Lake - pond	Pond		SG	GNR	SNR
Prairie - dry-mesic	Dry-mesic Prairie		SG	G3	S2
Wetland - marsh	Marsh		SG	GU	S4
Wetland - swamp forest	Forested Swamp		SG	G2?	S2
Wetland - swamp shrub	Shrub Swamp		SG	GU	S2
<b>Other</b>					
Geomorphic - Nonglacial Erosional Feature - Water Fall and Cascade	Water Fall and Cascade			GNR	SNR

Indiana Natural Heritage Data Center  
Division of Nature Preserves  
Indiana Department of Natural Resources  
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Fed: LE = Endangered; LT = Threatened; C = candidate; PDL = proposed for delisting  
State: SE = state endangered; ST = state threatened; SR = state rare; SSC = state species of special concern; SX = state extirpated; SG = state significant; WL = watch list  
GRANK: Global Heritage Rank: G1 = critically imperiled globally; G2 = imperiled globally; G3 = rare or uncommon globally; G4 = widespread and abundant globally but with long term concerns; G5 = widespread and abundant globally; G? = unranked; GX = extinct; Q = uncertain rank; T = taxonomic subunit rank  
SRANK: State Heritage Rank: S1 = critically imperiled in state; S2 = imperiled in state; S3 = rare or uncommon in state; G4 = widespread and abundant in state but with long term concern; SG = state significant; SH = historical in state; SX = state extirpated; B = breeding status; S? = unranked; SNR = unranked; SNA = nonbreeding status unranked





**Northeastern Indiana Regional Coordinating Council**

# **Roadway Safety Audit: Summary Report**

## **Minnich Road and Tillman Road**

Date: October 9, 2012

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## **INTRODUCTION**

The Northeastern Indiana Regional Coordinating Council and City of Fort Wayne conducted a Roadway Safety Audit (RSA) on October 9, 2013 for the intersection of Minnich Road and Tillman Road. The RSA followed the guidelines provided by the Federal Highway Administration and the Indiana Department of Transportation. The RSA was organized and facilitated by Jerry Foust, a transportation planner for the Northeastern Indiana Regional Coordinating Council. The RSA was requested by William Hartman, Executive Director of the Allen County Highway Department.

This report provides a summary of the RSA including;

- listing of team members,
- process followed to perform the review,
- agenda,
- traffic data used for the review,
- crash data provided to team members,
- checklists completed by the team members,
- roadway features identified (acceptable and deficient),
- identified short term improvements,
- identified long term improvements,
- RSA conclusion,
- formal response from roadway owner

## **PROCESS**

The Northeastern Indiana Regional Coordinating Council contacted audit team members to request their participation. Each member was identified based on their profession, unbiased opinion of the project, and expressed interest in conducting an RSA. Each member was provided with guidelines of the process, data for preliminary review, and an agenda for the RSA. All identified team members were unaware of specific improvements being considered by the Allen County Highway Department prior to and during the review period.

Traffic data and crash data was sent to the 4 team members prior to the date of the RSA. The team members were asked to review the data to become familiar with the roadway's operation and crash patterns prior to the preliminary meeting. At the preliminary meeting staff addressed questions that team members had prior to proceeding to the field review. The process and agenda are provided in Appendix A.

### **Team Members**

Dana Plattner, P.E., Highway Engineer (INDOT, Fort Wayne District)  
Shan Gunawardena, P.E., City Engineer (City of Fort Wayne)  
Master Trooper Kurt Jack, (Indiana State Police)  
Aaron Ott, P.E., Senior Engineer (A&Z Engineering LLC)

### **Other Participants**

Jerry Foust, Senior Transportation Planner (NIRCC)

## **ROADWAY SAFETY AUDIT**

Audit checklists were utilized to complete the RSA and have been summarized below. The RSA team was comprised of three professional engineers and an Indiana State Trooper so a great deal of review was given to existing infrastructure. This information reflects the comments and proposals of the RSA team members that were completed during the audit.

### **Acceptable Features**

The review team identified the following acceptable features and roadway characteristics that should remain in place to ensure safety of the corridor. These features were identified in during the preliminary meeting and field review.

- Double stop signs on east and west approach
- Rumble strips on east and west approach
- Advanced warning signs on all four approaches

### **Deficient Features**

Features throughout the corridor identified by team members as “deficient” were identified in the listing below. Team members attempted to provide a short term and long term improvement for each deficiency identified during the review.

- Offset of Tillman Road approaches
- Misconception that Minnich Road traffic will stop
- Placement of stop signs and cross traffic does not stop signs are too far back from intersection
- Visibility of the intersection when approaching from the east approach (westbound)
- Edge of pavement on Minnich Road has abrupt drop off
- No edge line pavement markings exist on Minnich Road
- Shoulders are unimproved on Minnich Road
- Stop sign on west approach (south side) is leaning

### **Proposed Short Term Improvements**

The following improvements were identified by the audit team members to address the deficient features they felt were contributing to crashes on this corridor. One primary consideration in defining a short term improvements was cost. This factor limited improvements to those that could be performed within the existing right-of-way and would require a limited amount of preliminary engineering. Two different proposals were offered below.

#### Proposal One

- Leave existing flashers at this location and add stop signs on Minnich Road with all appropriate pre-warn signage and covert the intersection to all-way stop.
- All of the stop signs should be installed using 2 LED oversized signs on each approach.

#### Proposal Two

- Remove the flashing beacons from the intersection and install 2 LED oversized stop signs on both east and west approaches.

- Install a “Cross Traffic Does Not Stop” sign on the opposing stop sign post to ensure motorists can view the sign.
- Repair edge of pavement on Minnich Road and install edge line pavement markings
- Relocate the 45 MPS posting south of this intersection to ensure speeds through the intersection are 45 MPH rather than 55 MPH.
- OPTIONAL - If flashing beacons are left at the intersection; install box type flashers rather than a single strand diagonally to allow Tillman Road traffic to visually see the amber flashers for Minnich Road traffic when they are stopped.

### **Proposed Long Term Improvements**

The following long term improvements were identified by the audit team members to address the deficient features they felt were contributing to crashes on this corridor. The proposed improvements did not consider the cost as a factor.

- Construct a roundabout at this location to address safety of intersection and reduce travel speeds on Minnich Road
- Improve Minnich Road to include safety edge, edge line pavement markings and improved shoulders where possible.

### **RSA Conclusion**

The final step of the audit included a presentation of findings to the roadway owner. The acceptable features, deficient features, proposed short term improvements, and propose long term improvements were shared with the owner. Upon completion of these discussions the owner disclosed the proposed improvements the City of Fort Wayne had identified. This discussion offered team members the opportunity to provide input regarding specific improvement details that should be considered in the owner’s proposed project. The group then prepared the following conclusion;

*The RSA team members recommend that Allen County officials immediately make as many of the short term improvements as possible and monitor the crash data. If additional improvements are still needed to address crashes, a project to construct a roundabout should be initiated.*

### **Formal Response**

The roadway owner, Allen County Highway Department, will pursue the removal of the flashing beacons and install two 36” LED stop signs on each Tillman Road approach. An additional “Cross Traffic Does Not Stop” sign will be installed on the opposing stop sign post to increase the awareness to motorists.



## **APPENDIX A**

# ROADWAY SAFETY AUDIT

## Minnich Road & Tillman Road

---

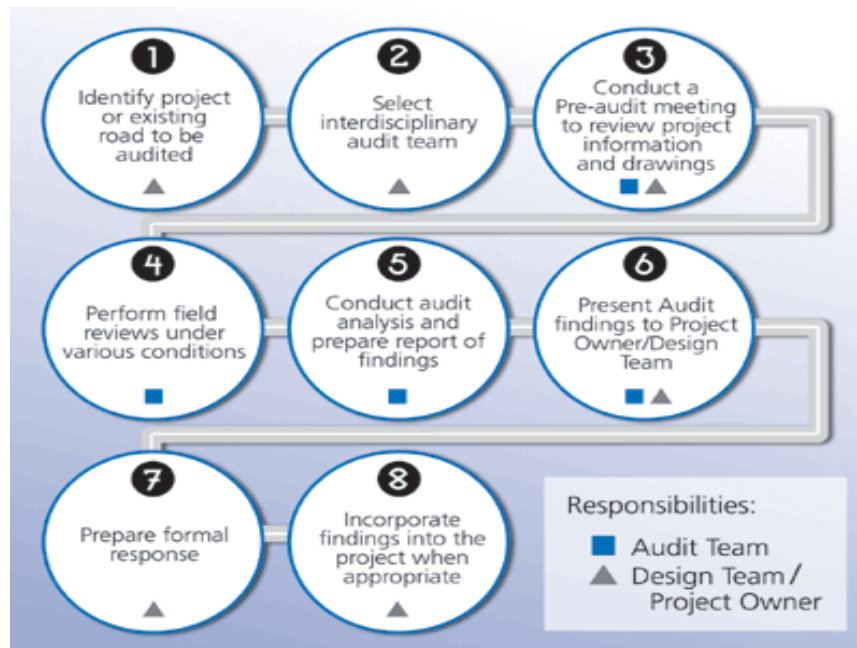
# ROADWAY SAFETY AUDIT

## Minnich Road & Tillman Road

---

### Overview

The goal of the Roadway Safety Audit (RSA) is to determine the safety deficiencies and potential solutions (both long term and short term) for this roadway segment. The RSA will include positive features, deficiencies, short term (low-cost) solutions and long-term solutions. The Northeastern Indiana Regional Coordinating Council will serve as the coordinating agency representing the project owner, City of Fort Wayne, for this RSA.



### Process

#### *Step One: Project Information and Data*

Audit team members will be provided detailed crash information for 2007, 2008, and 2009, traffic count data, and other relevant materials prior to the pre-audit meeting. This will give the audit team members a chance to review the data and get an idea of what issues are present on this roadway. This information will be provided by the NIRCC and the City of Fort Wayne.

#### *Step Two: Pre-Audit Meeting*

The City of Fort Wayne, Northeastern Indiana Regional Coordinating Council, and audit team members will meet to review the project information together. This meeting will

give auditors a chance to ask questions about the information previously reviewed or address other questions prior to the field review.

*Step Three: Field Review*

The audit team members will visit the site to collect information. The checklist and review sheets will be completed by the team. The team members will then return to the City County Building to finalize all the information.

*Step Four: Report of Findings*

The team members and the Northeastern Indiana Regional Coordinating Council will summarize their findings and prepare a short presentation for the City of Fort Wayne. This report will include comments provided by each auditor.

*Step Five: Presentation of Audit Findings*

The City of Fort Wayne, Northeastern Indiana Regional Coordinating Council and audit team will reconvene to discuss the findings. The RSA team will present their findings to the owner and the City of Fort Wayne will inform the team members of the proposed improvement. The group will discuss how this proposed improvement can be incorporated together in order to prepare an official conclusion. The final documentation of the RSA will be prepared by the Northeastern Indiana Regional Coordinating Council and forwarded to the City of Fort Wayne for a formal response.

*Step Six: Formal Response*

The City of Fort Wayne will provide a formal response to address suggested improvement strategies. This response will identify all the strategies that will be incorporated into the improvement project as well as improvement strategies that will not be pursued. All strategies not incorporated into the project will be accompanied by an explanation by the City of Fort Wayne.

## **APPENDIX B**

# Allen County Highway Department

200 E. Berry Street, Suite 280

Fort Wayne, IN 46802

260-449-7369

Fax: 260-449-7594

North Division: 2234 Carroll Rd Fort Wayne, IN 46818 260-449-4781 Fax: 260-449-4786

South Division: 8317 E. Tillman Rd Fort Wayne, IN 46816 260-449-4791 Fax: 260-449-4793

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March 25, 2013

Dan Avery, Executive Director  
Northeastern Indiana Regional Coordinating Council  
200 East Berry, Suite 230  
Fort Wayne, IN 46802

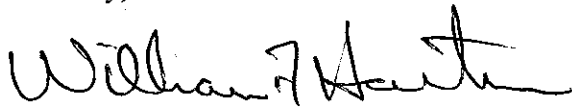
RE: Tillman Road/Minnich Road Intersection  
Request for Highway Safety Improvement Program Funding

Dear Mr. Avery,

The Allen County Commissioner's Office and the Allen County Highway Department are requesting a roadway safety audit for the intersection of Minnich Road and Tillman Road. This intersection has experienced a number of serious injury collisions and fatal crashes in recent years. Despite efforts to improve safety at this intersection through various applications, crashes are still occurring at a similar rate.

The Allen County Highway Department has developed a number of proposed projects to address issues at this location but would like to have an independent evaluation completed to ensure the correct project is selected. The Allen County Highway Department will request Highway Safety Improvement Program funds to complete the selected improvement. We would like to have a project type selected and initiated by the end of the 2013 calendar year.

Sincerely,



William F. Hartman  
Executive Director



# MINNICH ROAD & TILLMAN ROAD ABBREVIATED ROUNDABOUT FEASIBILITY STUDY



ALLEN COUNTY, INDIANA  
*March 2013*



ALLEN COUNTY HIGHWAY DEPARTMENT



A&Z ENGINEERING, LLC

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**2. Minnich Road and Tillman Road Intersection Evaluation .....4**

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    2.2 *Horizontal* .....5

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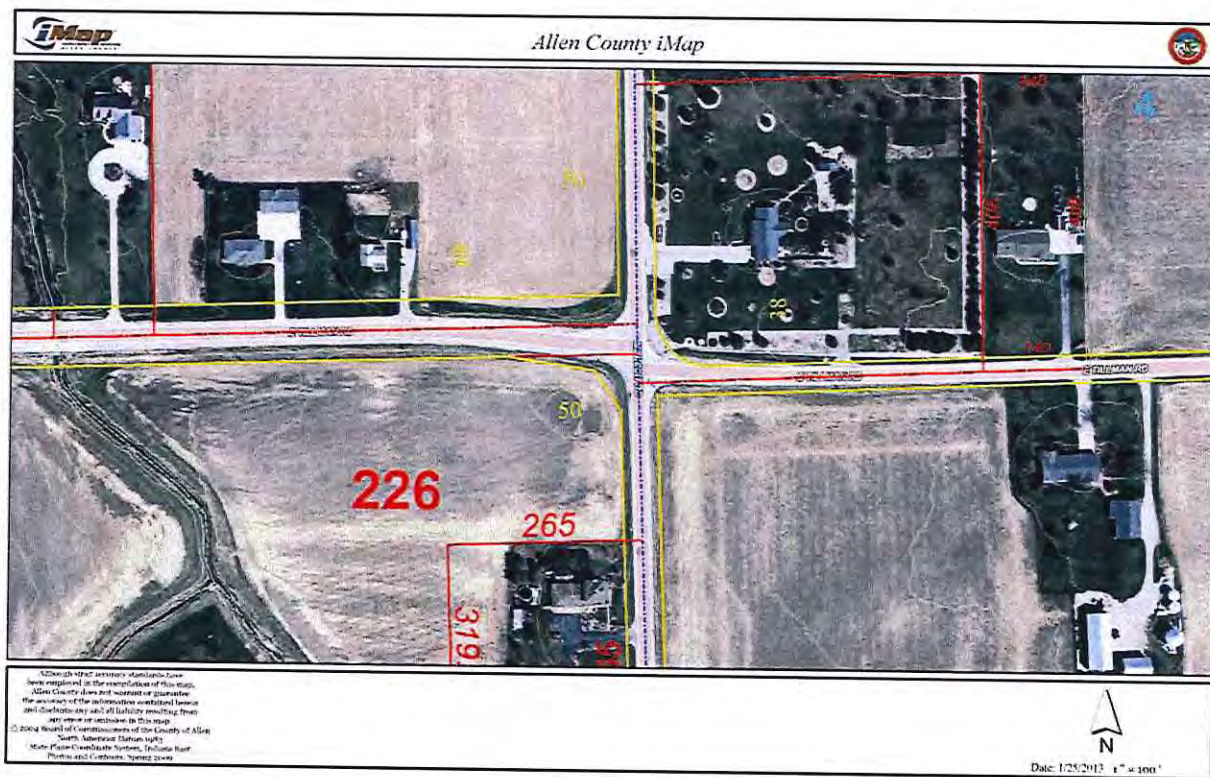
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- Appendix B   Proposed Geometrics & Typical Sections**
- Appendix C   Right-of-Way Impact Figure**
- Appendix D   Environmental Impact Review Maps**
- Appendix E   Project Costs**



## 1. Introduction

The Allen County Highway Department (ACHD) and Northeastern Indiana Regional Coordinating Council (NIRCC) are preparing for their transportation plan to provide an abbreviated feasibility study and estimated total project costs for the construction of a roundabout at Minnich Rd & Tillman Rd intersection utilizing federal funds. A Roadway Safety Audit was performed on October 9, 2012 with the long term recommendation of a roundabout type intersection to enhance the safety of this intersection. The goal of this study is to provide total project costs including preliminary engineering, right-of-way engineering, right-of-way services (including appraising, buying, row management), land costs and construction.



Minnich Road is a north-south roadway and Tillman Road is an east-west roadway. Both roads are classified as rural major collector roads. Appendix A provides photos of existing conditions with Appendix B illustrating existing conditions and features such as parcels, right-of-way, roadways and pavements, topography (contours), land uses, drives and accesses and drains or ditches.





Intersection of Minnich & Tillman Roads  
(Looking east on Tillman)

Intersection of Minnich & Tillman Roads  
(Looking north on Minnich)



## 2. Minnich Road and Tillman Road Intersection Evaluation

The proposed layout of the Minnich Road and Tillman Road intersection improvements are shown in Appendix B. These proposed improvements involve the removal of stop conditions along Tillman Road and the installation of a roundabout intersection. Currently, the majority of vehicular traffic on these roads is along Minnich Road and east Tillman Road. This is shown by the traffic volumes in Table 2.6. The roads are proposed to align in such a way that predominate traffic movements from Minnich Road and east Tillman Road will be more concise and will cause much fewer delays while the roundabout is operating within the designed capacity.

## Geometric Design Criteria

The applicable design standards used for the roundabout design are taken from the INDOT Indiana Design Manual and the Federal Highway Roundabout Design Guide. Key design criteria applied to the project are summarized below.

### Rural Single Lane Roundabout

- Entry Design Speed = 25 mph
- Inscribed Circular Diameter = 140 ft – 200 ft
- Flare Length = 130 ft
- Truck Apron = 3 ft – 13 ft with 3-4% cross slope away from center island
- Exit Radii = no less than 50 ft
- Splitter Islands = 200 ft length
- Approach Speed = 35 mph
- Incremental Speed Decrease = 12 mph per approach curve

### Rural Major Collector Roadway

- Travel Lane = 11 ft – 12 ft
- Paved Shoulder = 2 ft – 8 ft
- Cross Slope = 2%
- Side Slopes = 3:1 or flatter

## 2.1 Pavement

All roadways within the project study area consist of asphalt pavements. The existing pavement appears to be in fair condition with some distressed areas. The existing pavement markings are still visible on all roads.

The proposed pavement will be in accordance with INDOT pavement design standards and criteria, as shown in Table 2.1. The pavement sections utilized are the same as a recently INDOT approved roundabout improvement project with similar traffic volumes. Refer to Appendix B for typical cross sections.

<b>Description</b>	<b>HMA Mainline</b>	<b>HMA Roundabout</b>	<b>HMA Truck Apron</b>
<b>Layer</b>	<b>(in.)</b>	<b>(in.)</b>	<b>(in.)</b>
<b>QC/QA-HMA Surface</b>	1.5	1.5	1.5
<b>QC/QA-HMA Intermediate</b>	2.5	2.5	2.5
<b>QC/QA-HMA Base</b>	-	3	-
<b>Compacted Aggregate No. 53</b>	6	3	10
<b>Total Pavement (in)</b>	10	10	14
<b>Subgrade Treatment No. 53</b>	12	12	12

## 2.2 Horizontal

Tillman Road is an east-west alignment that consists of two 10 to 11 foot lanes with 1 to 2 foot aggregate and earth shoulders, with a posted speed limit of 50 mph on the eastbound approach and 55 mph westbound. Minnich Road is a north-south alignment that consists of two 11 foot lanes with 1 to 2 foot aggregate and earth shoulders, with a posted speed limit of 55 mph.



To minimize impact to the northeast and southwest residential properties, it is proposed to shift the intersection southwest of its current placement and utilize a roundabout type intersection design with an inscribed circular diameter of 140 feet (minimum value for a rural roundabout). Using INDOT design standards for minimum horizontal radius at various speeds and FHWA roundabout design guidelines for entry speed (25 mph) several curves along the approaches are introduced prior to the roundabout intersection to successively slow traffic to the appropriate entry speed. On an open rural highway reducing shoulder widths and introducing curbs is intended to assist in giving drivers a sense or context of an urban environment with lower speeds. Federal Highway suggests an incremental drop in speed of 12 mph per curve as desirable along with adding curbing. Refer to Appendix B for the Proposed Geometric Figure. The preliminary roundabout geometrics only provides the general design elements and features anticipated to be incorporated in a final proposed design.

### 2.3 Vertical

The terrain for all existing roadways and the intersection is mostly level. The general project roadway profile generally slopes towards the south and west within about 4' to 6' elevation drop.

### 2.4 Drives

There are eight drives that will be affected by this project; five on Tillman Road and three on Minnich Road. Proposed driveways and field entrances will be replaced or extended as needed. New field entrances may need to be constructed to provide access to non-residential properties.

### 2.5 Drainage

The project area terrain slopes towards the south and west overland sheet flow and conveyed with open side ditches to the Scharpenberg Drain or the Schmidt Drain. The Scharpenberg Drain crosses under Minnich Road at the south end approach and drains northwesterly into the Schmidt Drain which crosses under Tillman Rd at the west end approach. The proposed drainage will generally follow similar drainage patterns within a combination of side ditches and storm drains. It is anticipated to mitigate the additional storm runoff with some detention areas adjacent to the project prior to outlet into the Schmidt Drain.

### 2.6 Traffic

Traffic counts for the area roadways were obtained from Northeastern Indiana Regional Coordinating Council (NIRCC) for the year 2012 and are shown below in Table 2.6. Projected AADT's are calculated at an assumed 1% annual growth and utilized for the verification of a single lane roundabout.

<b>Roadway Segment</b>	<b>AADT 2012</b>	<b>AADT 2016 (1%)</b>	<b>AADT 2036 (1%)</b>
Tillman Road (East of Intersection)	713	740	900
Tillman Road (West of Intersection)	1069	1100	1340
Minnich Road (North of Intersection)	3463	3600	4400
Minnich Road (South of Intersection)	3518	3650	4450



## 2.7 Maintenance of Traffic

Maintaining traffic through the project during construction will be difficult due to the proposed total reconstruction of the intersection and approaches. Road closures with proper detouring of all through traffic will likely be required.

## 2.8 Utilities

Known existing utilities identified by IUPPS servicing the area include electric, cable, and communication. In table 2.8 below, a list of these utilities and contact numbers is given. This list is only a preliminary identification of utilities within the project area at the time of study.

<b>TABLE 2.8 UTILITIES</b>		
<b>Utility</b>	<b>Company</b>	<b>Contact</b>
Electric	Paulding Putnam Electric Co-op. Inc.	419-399-5015 (Doug Johanns)
Phone	Frontier	260-461-3646 (Lauren Biedak)
Cable	Comcast	260-458-5107 (John Gayday)

Relocation of most utilities within the new roadway corridor will be required. There should not be any significant challenges to relocating utilities due to the openness of the project area and anticipated right-of-way acquisition.

## 2.9 Right of Way

A review of Allen County GIS data indicates existing rights of way of various widths for each roadway section, however all properties in the project area appear to have been “metes and bounds” parcels which the property deed is described to the section line. The section lines, as well as township line, coincide with the apparent center of roadway for Minnich Road through the project limits. Along Tillman Road, the section line follows the apparent center of roadway; however there is an 80 foot offset in the section line where it intersects with Minnich Road at the Section/Township line. For the purpose of this cost study, it was assumed that any presently existing right-of-way should be re-acquired in fee simple in conjunction with the acquisition of any new fee simple and temporary right-of-way.

Because of the desired placement of the proposed roundabout to minimize impacts to the developed residential property on the northeast quadrant of the intersection (shown as Parcel 5 on the figure in Appendix C), each approach to the roundabout will be realigned and require non uniform acquisition of permanent r/w. The majority of the land needed for the improvements is currently utilized as crop land. The 2 residential properties in close proximity to the intersection which are the most sensitive in regard to right-of-way impacts are identified at parcels 3 and 5. Considerations need to be made with the roundabout placement and design of the approach alignments to minimize impacts to these parcels and avoid costly right-of-way acquisition. Both parcels have extensive improvements along the frontage of their properties and the residential structure on parcel 3 is currently located only 40 feet from the existing edge of pavement.

The assumed locations and areas of proposed r/w necessary for the intersection improvements are shown on the figure in Appendix C. The preliminary proposed right-of-way assumptions were conservative in consideration of the possibilities to include



storm water run-off controls (i.e. detention facilities) and the possibility to need some temporary right-of-way for construction of the improvements if permanent right-of-way can be further minimized for the improvements. The intent of the current assumptions was to provide a logical, but conservative analysis, and try to reduce the impacts and costs during the engineering of the project. A summary of the quantities is below in Table 2.9. Additional details of the breakdown of R/W costs is included in Appendix E.

<b>TABLE 2.9 RIGHT-OF-WAY SUMMARY</b>	
<b>Number of Parcels Affected</b>	7 Parcels
<b>Area of Land Acquisition</b>	Approx. 7 Acres

### 2.10 Environmental

The area included in this study is mostly rural farmland with scattered residential parcels adjacent to the proposed roads. There are two apparent wetlands in the vicinity of the study area per the National Wetland Inventory Map, however each appear to be residential ponds and are not anticipated to affect the project. There are no historical properties or districts listed on the Indiana Register of Historic Sites and Structures (State Register) or the National Register of Historic Places within the study area. The project area west of the intersection along Tillman Road falls within a floodplain and would need further consideration during design and construction. A full Environmental Study, likely to be a Categorical Exclusion (CE) Level 2 or 3, will be required if Federal Funds are utilized for this project. Refer to Appendix D for environmental review maps.

A Stormwater Pollution Prevention Plan (SWPPP), including provisions for permanent and temporary erosion and sediment controls, will be required to be developed and submitted for obtaining IDEM Rule 5 permit, because disturbances will exceed 1 acre. Coordination with the Indiana Department of Natural Resources (IDNR) and the United States Fish and Wildlife Service may be required to determine if any endangered, threatened, or rare species are present within the project area.

<b>TABLE 2.10 ENVIRONMENTAL PERMITS</b>	
<b>Agency</b>	<b>Permit</b>
Allen County Drainage Board	Required
IDEM Rule 5	Required
IDNR (Construction in Floodway)	Possible
Dept. of the Army, Corps of Engineers (Sect 404)	Not anticipated
IDEM (401 WQC)	Not anticipated

### 3. Estimated Project Costs

A summary of the opinion of construction cost estimate, preliminary engineering and right-of-way engineering and acquisition are presented in Table 3.1. The construction cost estimate includes a 25% contingency based on 2013 dollars. Refer to the detailed opinion of total project costs in Appendix E.

<b>PROJECT COST ESTIMATE</b>	
<b>TABLE 3.1</b>	
<b>Preliminary Engineering</b>	<b>\$265,000</b>
<b>Right-of-Way Engineering</b>	<b>\$65,000</b>
<b>Right-of-Way Acquisition</b>	<b>\$170,000</b>
<b>Construction</b>	<b>\$1,335,000</b>
<b>Construction Inspection (15%)</b>	<b>\$200,000</b>
<b>Total (2013)</b>	<b>\$2,035,000</b>

#### 4. Conclusions

The feasibility of a rural roundabout at the intersection of Minnich Road and Tillman Road was concurred with a preliminary geometric layout following INDOT and FHWA standards and guidelines. Anticipated impacts were then reviewed and quantified with estimated total project costs prepared for use in the planning and development of this project.

# **Appendix A**

## **Photos of Project Area**



**PHOTOS OF PROPOSED PROJECT LOCATION – Intersection of Minnich Road & Tillman Road**



Figure 1: Looking west along Tillman Road



Figure 4: Looking east along Tillman Road



Figure 2: Looking west along Tillman Road



Figure 5: Looking east along Tillman Road



Figure 3: Looking west along Tillman Road



Figure 6: Looking east along Tillman Road





Figure 7: Looking east along Tillman Road



Figure 10: Looking north along Minnich Road



Figure 8: Looking north along Minnich Road



Figure 11: Looking north along Minnich Road



Figure 9: Looking north along Minnich Road



Figure 12: Looking south along Minnich Road



Figure 13: Looking south along Minnich Road



Figure 14: Looking south along Minnich Road



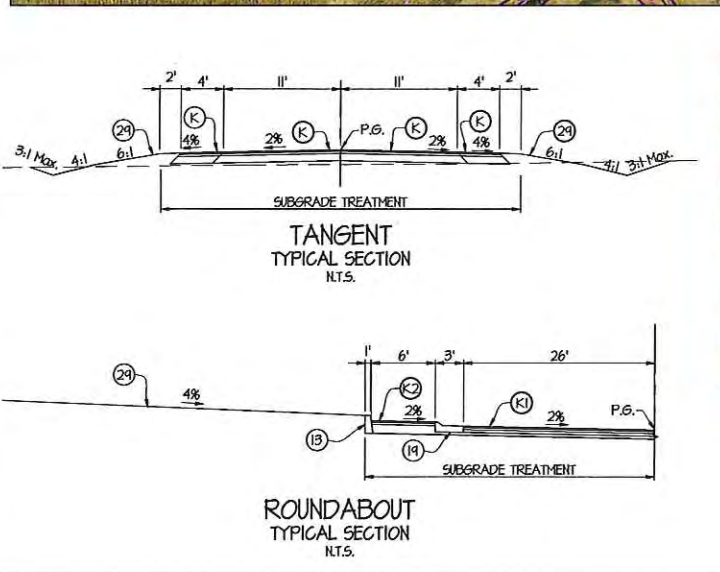
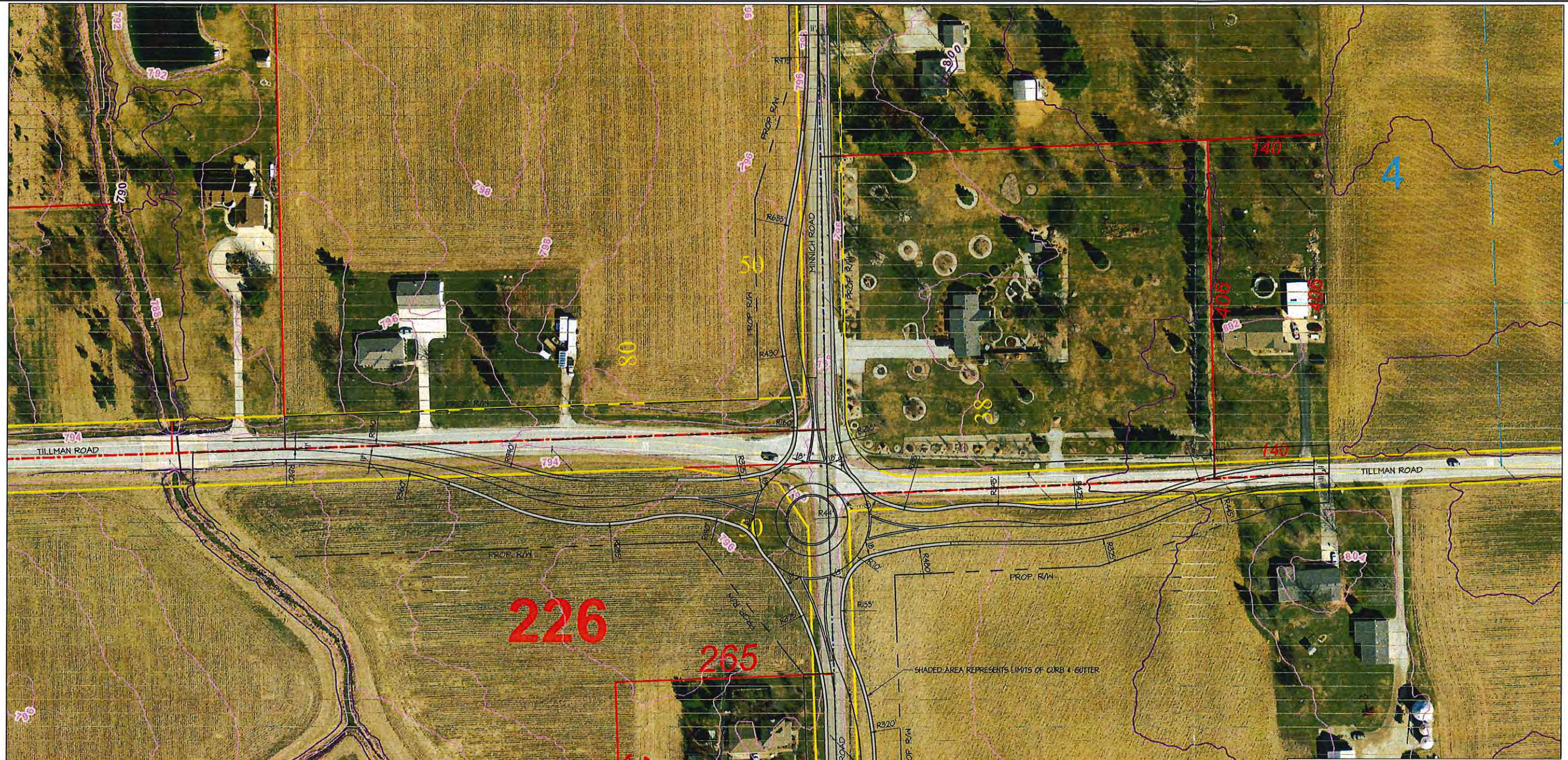
Figure 15: Looking south along Minnich Road

# **Appendix B**

## **Proposed Geometrics & Typical Sections**



S:\2013 Projects\13-343\_ACHD-Minnich-Tillman\CAD\Non-Production DWG\A&Z Prelim Design.dwg — 3/14/2013 9:13 AM — Jennifer Sharkey



- LEGEND**
- (13) CURB, CONCRETE
  - (14) CURB & GUTTER, B, MODIFIED
  - (K) HMA FOR MAINLINE PAVEMENT  
165 #/SY HMA GC/OA, 4, 64, SURFACE, 9.5mm ON  
215 #/SY HMA GC/OA, 4, 64, INTERMEDIATE, 14.0mm ON  
6" MIN. COMPACTED AGGREGATE, NO. 53, BASE  
SUBGRADE TREATMENT TYPE IC OR IIIA
  - (K1) HMA FOR MAINLINE PAVEMENT  
165 #/SY HMA GC/OA, 4, 64, SURFACE, 9.5mm ON  
215 #/SY HMA GC/OA, 4, 64, INTERMEDIATE, 14.0mm ON  
330 #/SY HMA BASE, TYPE B ON  
3" MIN. COMPACTED AGGREGATE, NO. 53, BASE  
SUBGRADE TREATMENT TYPE IC
  - (2) HMA FOR MAINLINE PAVEMENT  
165 #/SY HMA GC/OA, 4, 64, SURFACE, 9.5mm ON  
215 #/SY HMA GC/OA, 4, 64, INTERMEDIATE, 14.0mm ON  
10" MIN. COMPACTED AGGREGATE, NO. 53, BASE  
SUBGRADE TREATMENT TYPE IC
  - (29) MULCHED SEEDINGS, R

**A&Z ENGINEERING**  
 9017 Coldwater Road, Suite 500  
 Fort Wayne, IN 46825  
 260.485.7077  
 www.az-engineering.net

PRELIMINARY USE ONLY  
NOT FOR CONSTRUCTION

RECOMMENDED FOR APPROVAL: \_\_\_\_\_  
 DESIGN ENGINEER: JLS 3/12/2013  
 DATE: \_\_\_\_\_  
 CHECKED: WJZ CHECKED: WJZ

ALLEN COUNTY HIGHWAY DEPARTMENT  
 MINNICH RD & TILLMAN RD ROUNDABOUT

PROPOSED ROUNDABOUT GEOMETRICS

HORIZONTAL SCALE	1" = 60'
VERTICAL SCALE	N/A
DESIGNATION	SHEETS
CONTRACT	PROJECT NUMBER

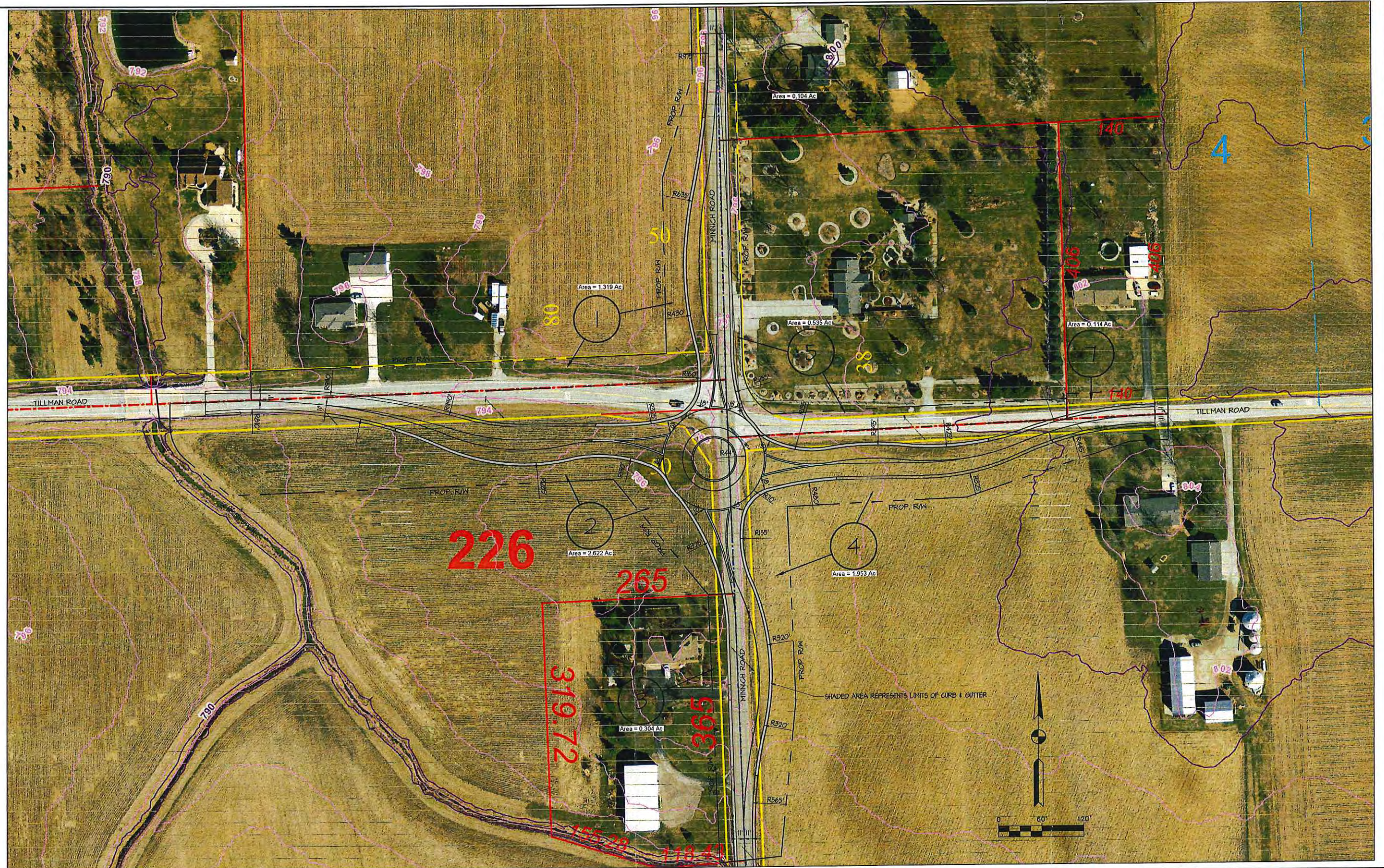


# **Appendix C**

## **Right-of-Way Figure**



S:\2013 Projects\13-343 ACHD - Minnich-Tillman\CAD\Non-Production DWG\A&Z Prelim Design.dwg — 3/14/2013 10:44 AM — JenniferSharkey



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RECOMMENDED FOR APPROVAL: 3/12/2013  
 DESIGN ENGINEER: JLS  
 ASSIGNED: WJZ  
 DRAWN: JLS  
 CHECKED: WJZ  
 CHECKED: AJO

ALLEN COUNTY HIGHWAY DEPARTMENT  
 MINNICH RD & TILLMAN RD ROUNDABOUT

PROPOSED RIGHT-OF-WAY FIGURE

HORIZONTAL SCALE	1" = 60'
VERTICAL SCALE	N/A
DESIGNATION	SHEETS
CONTRACT	of
	PROJECT NUMBER



# **Appendix D**

## **Environmental Maps**

(Minnich - Tillman Roundabout)

85° 0' 33" 41° 1' 29" 84° 59' 26" 41° 0' 53"







Map Scale: 1:7,510 if printed on A size (8.5" x 11") sheet.





## MAP LEGEND

 Area of Interest (AOI)	 Very Stony Spot
 Soils	 Wet Spot
 Area of Interest (AOI)	 Other
 Soil Map Units	<b>Special Line Features</b>
<b>Special Point Features</b>	 Gully
 Blowout	 Short Steep Slope
 Borrow Pit	 Other
 Clay Spot	<b>Political Features</b>
 Closed Depression	 Cities
 Gravel Pit	<b>Water Features</b>
 Gravelly Spot	 Streams and Canals
 Landfill	<b>Transportation</b>
 Lava Flow	 Rails
 Marsh or swamp	 Interstate Highways
 Mine or Quarry	 US Routes
 Miscellaneous Water	 Major Roads
 Perennial Water	 Local Roads
 Rock Outcrop	
 Saline Spot	
 Sandy Spot	
 Severely Eroded Spot	
 Sinkhole	
 Slide or Slip	
 Sodic Spot	
 Spoil Area	
 Stony Spot	

## MAP INFORMATION

Map Scale: 1:7,510 if printed on A size (8.5" x 11") sheet.  
The soil surveys that comprise your AOI were mapped at 1:15,840.

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

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

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

Source of Map: Natural Resources Conservation Service  
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>  
Coordinate System: UTM Zone 16N NAD83

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

Soil Survey Area: Allen County, Indiana  
Survey Area Data: Version 12, Sep 27, 2012

Date(s) aerial images were photographed: 7/19/2003; 7/13/2003

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

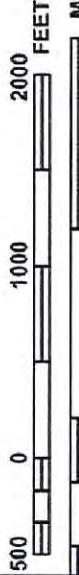
## Map Unit Legend

Allen County, Indiana (IN003)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BibA	Blount silt loam, ground moraine, 0 to 2 percent slopes	109.8	41.4%
MrB2	Morley silt loam, 2 to 6 percent slopes, moderately eroded	24.2	9.1%
Na	Nappanee silt loam	4.9	1.8%
Pe	Pewamo silty clay loam	126.1	47.6%
<b>Totals for Area of Interest</b>		<b>264.9</b>	<b>100.0%</b>





MAP SCALE 1" = 1000'



# NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0320G

## FIRM

FLOOD INSURANCE RATE MAP  
ALLEN COUNTY,  
INDIANA  
AND INCORPORATED AREAS

PANEL 320 OF 495

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ALLEN COUNTY	180302	0320	G
FORT WAYNE, CITY OF	180003	0320	G
NEW HAVEN, CITY OF	180004	0320	G

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

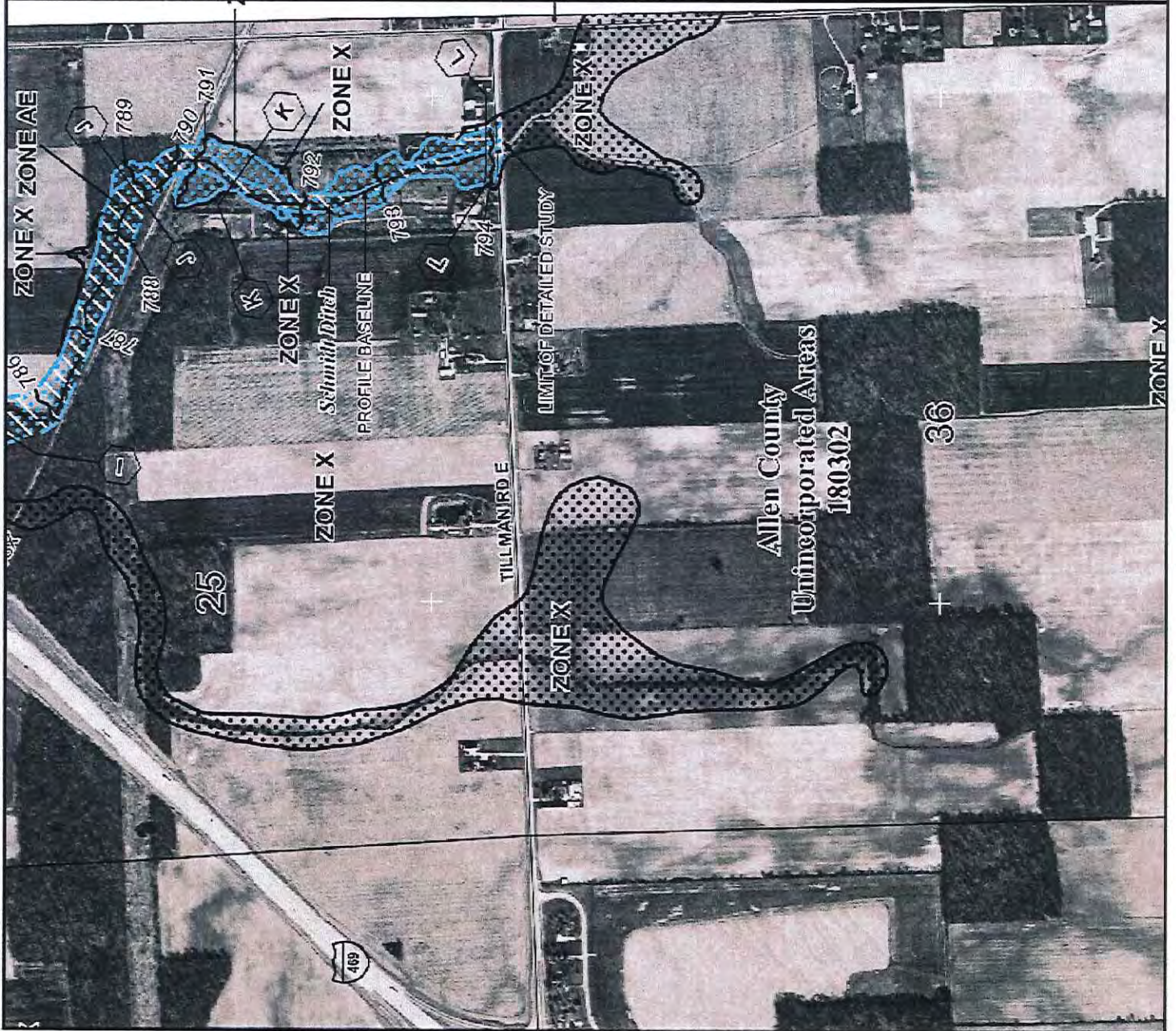
MAP REVISED  
AUGUST 3, 2009

MAP NUMBER  
18003C0320G



Maumee River Basin Commission  
Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at [www.msc.fema.gov](http://www.msc.fema.gov)







U.S. Fish and Wildlife Service

# National Wetlands Inventory

Minnich-Tillman  
Roundabout

Mar 14, 2013



## Wetlands

- Freshwater Emergent
- Freshwater Forested/Shrub
- Estuarine and Marine Deepwater
- Estuarine and Marine
- Freshwater Pond
- Lake
- Rivoline
- Other

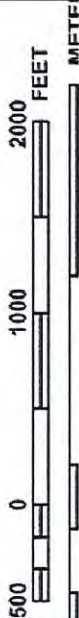
This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

User Remarks:





MAP SCALE 1" = 1000'



# NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0340G

## FIRM

FLOOD INSURANCE RATE MAP

ALLEN COUNTY,  
INDIANA  
AND INCORPORATED AREAS

PANEL 340 OF 495

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ALLEN COUNTY	180302	0340	G
NEW HAVEN, CITY OF	180004	0340	G

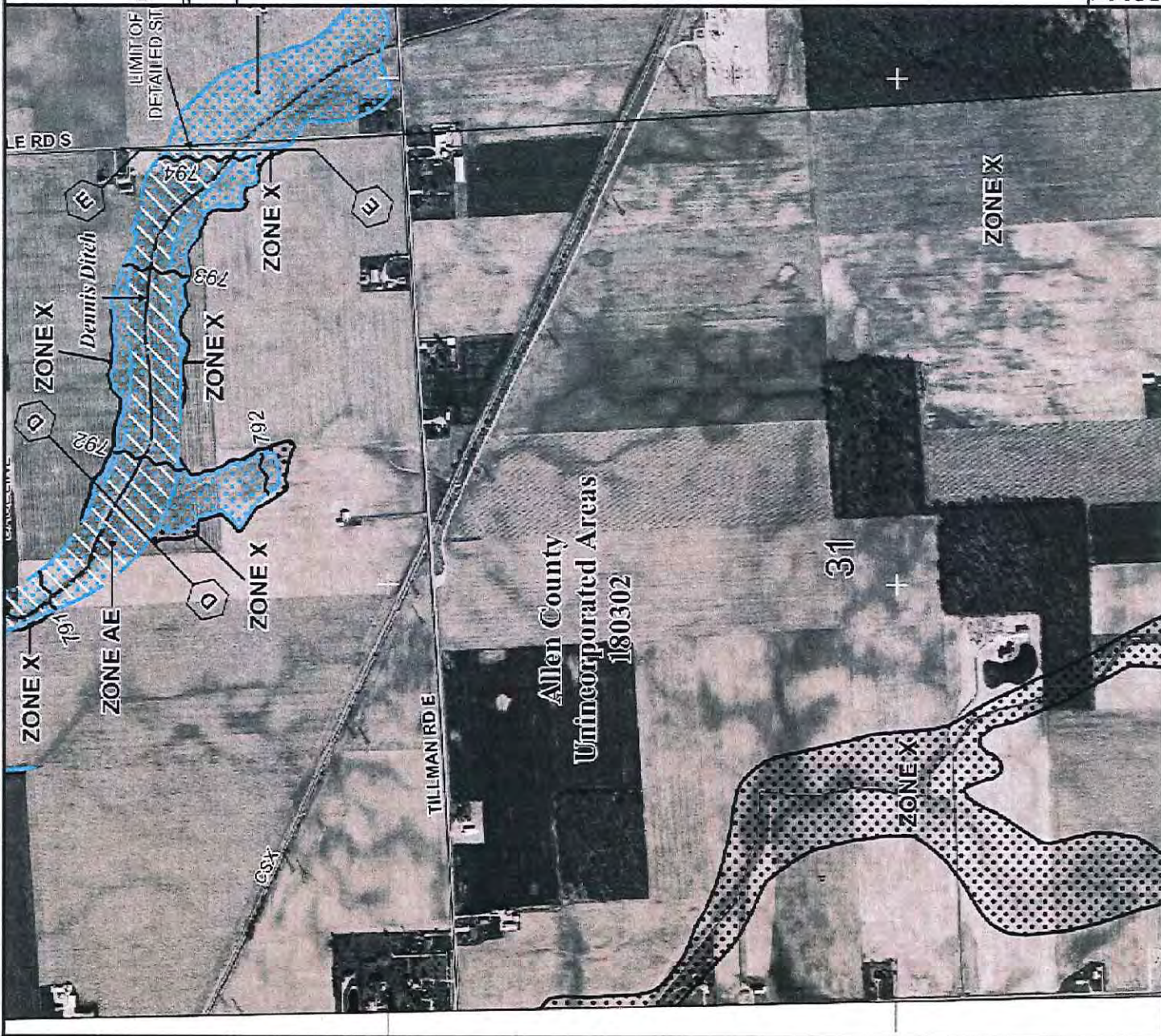
Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP REVISED  
AUGUST 3, 2009



Maumee River Basin Commission  
Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at [www.msc.fema.gov](http://www.msc.fema.gov)





# **Appendix E**

## **Project Costs**

- **Preliminary Engineering**
- **Right-of-Way Engineering**
- **Right-of-Way Acquisition**
- **Construction Cost Estimate**

**APPENDIX E**

DESCRIPTION	AMOUNT
Environmental Services	
Categorical Exclusion; Section 106; Initial Site Assessment	\$ 50,000
Topographic Survey	\$ 25,000
Engineering Design Services	
Road and Drainage Design	\$ 132,000
Street Lighting Design	\$ 7,000
Geotechnical Investigation	\$ 22,000
Public Involvement	\$ 9,500
Utilities Coordination	\$ 10,000
Bidding; Preconstruction Conference	\$ 9,500
Total Preliminary Engineering Fee	\$ 265,000

DESCRIPTION	QTY	UNIT PRICE	TOTAL
Right-of-Way Plans	1	\$ 20,000	\$ 20,000
Boundary Research /LCRS Plats	1	\$ 5000	\$ 5,000
Title Report / Insurance ( per parcel)	10	\$ 400	\$ 4,000
Title Work Updates (per parcel)	10	\$ 120	\$ 1,200
Right-of-Way Engineering			
Legal Descriptions (per parcel)	15	\$500	\$ 7,500
Parcel Plats (per parcel)	10	\$ 500	\$ 5,000
Appraisal Problem Analysis (per parcel)	10	\$ 300	\$ 3,000
Right-of-Way Staking (per parcel)	20	\$ 500	\$ 10,000
Subtotal Right-of-Way Engineering Fee			\$ 55,700
Total Right-of-Way Engineering Fee (NTE with contingency)			\$ 65,000



**A&Z Engineering, LLC  
 ALLEN COUNTY - MINNICH AND TILLMAN ROUNDABOUT  
 R/W SERVICES & ACQUISITION ESTIMATE**

**APPENDIX E**

Parcel	Appraisal Type	Appraisal	Review Appraisal	Buying	Relocation Services	Management	Land, Improvements, & Damages
1	Res. Long Form	\$ 4,000.00	\$ 1,795.00	\$ 1,375.00		\$ 1,500.00	\$ 15,000.00
2	Res. Long Form	\$ 3,725.00	\$ 1,670.00	\$ 1,375.00		\$ 1,500.00	\$ 30,000.00
3	Res. Long Form	\$ 3,725.00	\$ 1,670.00	\$ 1,375.00		\$ 1,500.00	\$ 10,000.00
4	Value Finding	\$ 1,400.00	\$ 625.00	\$ 1,225.00		\$ 1,500.00	\$ 20,000.00
5	Value Finding	\$ 1,400.00	\$ 625.00	\$ 1,225.00		\$ 1,500.00	\$ 10,000.00
6	Waiver Valuation	\$ 350.00	\$ 155.00	\$ 1,225.00		\$ 1,500.00	\$ 5,000.00
7	Waiver Valuation	\$ 350.00	\$ 155.00	\$ 1,225.00		\$ 1,500.00	\$ 5,000.00
<b>Total</b>		<b>\$ 14,950.00</b>	<b>\$ 6,695.00</b>	<b>\$ 9,025.00</b>	<b>\$ -</b>	<b>\$ 10,500.00</b>	<b>\$ 95,000.00</b>

**SUB TOTAL:** \$136,170  
 CONTINGENCY 25% \$34,043  
 \$170,213

**GRAND TOTAL:** \$170,000

## Minnich Rd - Tillman Rd Roundabout Improvements

## Allen County, IN

Item	Description	Quantity	Unit	Unit Price	Extension
	Excavation, Common	14000.0	Cys	\$15.00	\$210,000.00
	Subgrade Treatment, Type IIIA (No. 53 - Drives)	2800.0	Sys	\$7.00	\$19,600.00
	Subgrade Treatment, Type IC (No. 53 - Mainline)	14750.0	Sys	\$9.00	\$132,750.00
	HMA QC/QA, Surface	1050.0	Tons	\$60.00	\$63,000.00
	HMA QC/QA, Intermediate	1750.0	Tons	\$50.00	\$87,500.00
	HMA QC/QA, Base	170.0	Tons	\$60.00	\$10,200.00
	HMA for Approach, Type B	600.0	Tons	\$80.00	\$48,000.00
	Compacted Aggregate, No. 53, Base	4130.0	Tons	\$20.00	\$82,600.00
	Curb and Gutter, Concrete, Modified	300.0	Lft	\$15.00	\$4,500.00
	Curb and Gutter, Concrete	2700.0	Lft	\$13.00	\$35,100.00
	Curb, Concrete	200.0	Lft	\$15.00	\$3,000.00
	Center Curb, Type C (Splitter Islands)	550.0	Sys	\$40.00	\$22,000.00
	Sheet Signs	1.0	LSum	\$3,000.00	\$3,000.00
	Pavement Markings	1.0	LSum	\$10,000.00	\$10,000.00
	Guardrail, W-Beam, 6.25 feet spacing	300.0	Lft	\$20.00	\$6,000.00
	Guardrail, GRET	2.0	Each	\$3,500.00	\$7,000.00
	Construction Sign, Type A	40.0	Each	\$120.00	\$4,800.00
	Construction Sign, Type B	4.0	Each	\$60.00	\$240.00
	Barricade, Type III-B	288.0	Lft	\$15.00	\$4,320.00
	Detour Route Marker Assembly	20.0	Each	\$120.00	\$2,400.00
	Road Closure Sign Assembly	8.0	Each	\$150.00	\$1,200.00
	Mulched Seeding, R, Undistributed	18000.0	Sys	\$0.50	\$9,000.00
	Temporary Seeding	18000.0	Sys	\$0.25	\$4,500.00
	Mobilization and Demobilization for Seeding	2.0	Each	\$750.00	\$1,500.00
	Revetment Riprap	170.0	Tons	\$30.00	\$5,100.00
	Geotextile Under Riprap	250.0	Sys	\$5.00	\$1,250.00
	Pipe, Type 1 or 3, Circular, 15"	500.0	Lft	\$50.00	\$25,000.00
	Pipe, Type 2, Circular, 12"	600.0	Lft	\$40.00	\$24,000.00
	Pipe, Type 2, Circular, 15"	800.0	Lft	\$50.00	\$40,000.00
	Pipe End Section, 15 inch	14.0	Each	\$200.00	\$2,800.00
	Inlet	14.0	Each	\$1,500.00	\$21,000.00
	Manhole (4')	2.0	Each	\$3,000.00	\$6,000.00
	Structure Backfill	875.0	Cys	\$25.00	\$21,875.00
	Field Office, B	10.0	Month	\$2,000.00	\$20,000.00
	Erosion Control Measures	1.0	LSum	\$20,000.00	\$20,000.00
	Light Pole High Mast 80'	1.0	LSum	\$30,000.00	\$30,000.00
	Clearing Right of Way	1.0	LSum	\$9,900.00	\$9,900.00
	Construction Engineering	1.0	LSum	\$19,800.00	\$19,800.00
	Maintaining Traffic	1.0	LSum	\$19,800.00	\$19,800.00
	Mobilization and Demobilization	1.0	LSum	\$49,500.00	\$49,500.00
	Contingency (25% )	1.0	LSum	\$247,300.00	\$247,300.00
	<b>Total</b>				<b>\$1,335,535.00</b>