

# Chapter 4 Environmental Resources, Impacts, and Mitigation

## 4.0 Environmental Resources, Impacts, and Mitigation

Chapter 3 discussed the process by which the preferred alternative was chosen. Based on this process, Revised South Alternative 2 was chosen for the southern portion of the project, and North Alternative 2 was chosen for the northern portion of the project. These alternatives were chosen because they have the least overall environmental impacts.

Once the preferred alternative was selected, further design was conducted using more refined data. The more detailed design determined that the roadway geometry requires more width than the preliminary design assumed. As a result, some environmental impacts will exceed those originally predicted for the preferred alternative. These differences are shown in [Table 4-1](#). Due to the need for a wider project corridor, there would have been the same relative increase in all environmental impacts for the alternatives not chosen. Although there is an increase in environmental impacts over what was originally predicted for the preferred alternative, it minimizes the impacts compared to the other build alternatives that were evaluated.

**Table 4-1: Comparison of Preferred Alternative Impacts**

Topic <sup>1</sup>		Preferred Alternative	
		Preliminary Estimate of Impacts for Alternatives Analysis (See Chapter 3)	Impacts based on Refined Preferred Alternative
Environmental	<b>Displacements</b>		
	Residential	1	3
	Commercial	0	2
	<b>Wetlands</b>		
	Acres	14.4	25.77
	Number	35	50
	<b>Floodplains</b>		
	Acres	23.5	18.83
Number	5	7	

This Section discusses the anticipated environmental impacts from the proposed improvements. The project area was inventoried for environmental resources. The environmental inventory map (See [Exhibit 4-1](#), located in the back of this document) identifies all sensitive cultural, natural, physical, and socio-economic resources in the study area. Resources potentially impacted by the proposed action or that require discussion pursuant to applicable laws and regulations are addressed in this Section. Coordination with resource/regulatory agencies regarding these

resources is also described in this Section. Copies of coordination correspondence with these agencies can be found in [Appendix A](#).

### 4.1 Social, Economic, and Community

#### 4.1.1 Community Characteristics and Cohesion

The Villages of Huntley and Lake in the Hills are located in the southern-most portion of the project corridor, between Reed Road and Conley Road. Within the Village of Huntley, most of the properties adjacent to IL 47 are commercial or retail establishments. Small portions adjacent to IL 47 are zoned residential (estate). The 2010 census data indicates that Huntley had an area of 14.07 square miles and a population of 24,291.

Within the Village of Lake in the Hills, properties adjacent to IL 47 are zoned for business and commercial uses. The 2010 census data indicates the Village of Lake in the Hills had an area of 10.38 square miles and a population of 28,965.

North of Lake in the Hills, in the vicinity of IL 176 is the Village of Lakewood. A small portion of Lakewood adjacent to IL 47 is zoned agricultural. The Village has recently annexed a parcel near IL 176 that is zoned for retail, light commercial, and office space. The Village does not have its own census block; therefore, its 2010 size and population are included in County statistics.

The central portion of the project corridor is unincorporated McHenry County and is primarily zoned agricultural and consists of production fields with associated farmsteads. There is one section in the central portion of the corridor that is zoned for estate development. According to the 2010 census, McHenry County had an area of 603.17 square miles and a population of 308,760.

The northern-most portion of the project corridor, between IL 176 and US 14, is located within the City of Woodstock, which is the County Seat. US 14, the northern project boundary, is located in the southern portion of the City. The City had a population of 24,770 according to 2010 census data. Properties adjacent to IL 47 are zoned primarily for business or commercial. A few properties are zoned either as residential or for manufacturing.

Since the project is proposing improvements to existing IL 47, no new community divisions would be introduced, neighborhoods would not experience any divisions, none would be isolated, and community cohesion would not be affected. Properties adjacent to IL 47 within incorporated communities are primarily zoned for commercial uses. Adjacent properties outside of incorporated communities are primarily agricultural, although the comprehensive plans for the communities show planned developments along most of the corridor. The proposed improvements would not alter these property uses and would therefore have no effect on community characterization.

### 4.1.2 Title VI and Other Protected Groups

The project corridor was evaluated for the presence of ethnic, racial, or religious minorities, and elderly or disabled groups. **Table 4-2** provides information on the demographics of the communities in the vicinity of the project corridor. As can be seen from the table, all of the communities have less than the state average of racial minorities or disadvantaged persons. The one exception is the Hispanic population within the City of Woodstock. Woodstock has a Hispanic population of 23.6%, compared to the state average of 16.3%.

Further evaluation of the Hispanic community was sought by evaluating census block data available from 2010. The Hispanic population is located in the central portion of the City of Woodstock, which is north of the project corridor, and will therefore not be affected.

Based on the census data available, and the current land uses adjacent to IL 47, groups of ethnic, racial, religious minorities, elderly, or disabled people are not present within any areas the proposed improvement would affect. No groups of individuals have been or will be excluded from participation in public involvement activities, denied the benefit of the project, or subjected to discrimination in any way on the basis of race, color, age, national origin, disability, or religion.

### 4.1.3 Environmental Justice

The project corridor was evaluated for the presence of minority or low-income populations. The information obtained is presented in **Table 4-2** and in *Section 4.1.2 - Title VI and Other Protected Groups*. As can be seen from the table, all of the communities have less than the state average of racial or disadvantaged persons. The one exception is the Hispanic population in the City of Woodstock. Woodstock has a Hispanic population of 23.6%, compared to the state average of 16.3%. This Hispanic population is located in central Woodstock, which is north of the project corridor.

**Table 4-2** presents the 2012 Department of Health and Human Services' poverty guidelines. These guidelines are a simplification of the poverty thresholds used for administrative purposes and are calculated in a slightly different manner than the poverty thresholds determined by the Census Bureau. These values are given for comparative purposes only, and cannot be used to calculate the percentage of persons below poverty numbers presented in **Table 4-2**.

Based on the discussion presented in *Section 4.1.2 - Title VI and Other Protected Groups*, it has been determined that this project is not located within or through identified minority and/or low income areas, or adjacent to minority and/or low income neighborhood communities. There would be no disproportionately high and adverse effects on minorities or low-income residents or communities because populations of minority and/or low income groups are not concentrated along the project corridor.

**Table 4-2: Demographics of Project Corridor**

Population Characteristic*	Village of Huntley	Village of Lake in the Hills	City of Woodstock	McHenry County	State of Illinois
Percentage White	89.5	86.7	83.5	94.2	77.9
Percentage Black	1.2	2	2.3	1.3	14.8
Percentage Hispanic	7.7	11.6	23.6	11.9	16.3
Percentage Asian	5.2	5.2	2.3	2.7	5.0
Persons 65 or older (%)	29.2	5.2	10.1	11.0	13.2
Per capita income	\$35,289	\$32,560	\$26,168	\$32,408	\$29,519
Median household income	\$70,524	\$85,429	\$56,479	\$77,325	\$56,853
Persons below poverty (%)	3.4	5.6	13.3	7.5	13.7

**Department of Health and Human Services  
2012 Poverty Guidelines for 48 Contiguous States**

Persons in family/household	Poverty guideline
1	\$11,170
2	\$15,130
3	\$19,090
4	\$23,050
5	\$27,010
6	\$30,970
7	\$34,930
8	\$38,890
For families/households with more than 8 persons, add \$3,960 for each additional person.	

\* US Bureau of Census, Quick Facts - Demographics based on 2012, Income 2008-2012. Data does not add up to 100% due to factors related to rounding numbers and persons claiming more than one race.

### 4.1.4 Public Facilities and Services

Public facilities located within one-half mile of the project corridor were identified. Identification of emergency services, such as police, fire, and hospitals, was also made for facilities within one mile of the project corridor.

There are two fire protection districts within the project corridor. The Huntley Fire Protection District covers Huntley, Lake in the Hills, and unincorporated McHenry County in the southern portion of the project corridor. Woodstock Fire and Rescue District covers Woodstock, Lakewood, and unincorporated McHenry County in the northern portion of the corridor. Each of the incorporated municipalities has its own police department. The McHenry County Sheriff responds to police calls in unincorporated McHenry County.

Within Huntley, there is one educational facility (Learning Tree Child Care Center) located approximately 0.15 mile east of IL 47; the Grafton Township Offices are located 0.25 mile west of IL 47; and two sports facilities owned by the Huntley Park District are near the project corridor; Pinecrest Golf Club located 0.10 mile south of the corridor, and Tomaso Sports Park located 0.3 mile west of IL 47. The Huntley Fire Department, Village Hall, and Police Department are all located one mile from the project corridor. The Contegra Immediate Care Clinic in Huntley is located 1.2 miles from the project corridor.

There are no public schools within one-half mile of the project corridor, but there is one church; New Life Christian Center is located 0.5 mile from IL 47. The Mercy Woodstock Medical Center, which contains an Immediate Care Clinic, is located 0.6 mile east of IL 47.

There is no bus service or Metra commuter rail service within the project corridor. Pace bus route #808 is adjacent to the study area and travels on IL 47 north of US 14, and on US 14 east of IL 47. The nearest Metra commuter rail service is the Union Pacific/Northwest line station located in downtown Woodstock, approximately two miles north of the project corridor.

**Table 4-3** summarizes the public facilities located in the project corridor. **Exhibit 4-2** indicates the public facilities in or near the project corridor.

**Table 4-3: Public Facilities in Project Corridor**

Public Facility	Location	Distance from Corridor	Impacts
Grafton Township Supervisor's Office	10109 Vine Street Huntley	0.25 mile	no impacts - outside project limits
Pinecrest Golf Club	11220 Algonquin Road Huntley	0.10 mile	no impacts - outside project limits
The Learning Tree Child Care Center	11424 Rainsford Drive Huntley	0.15 mile	no impacts – continued access via Rainsford Drive
Huntley Fire Protection District Station #2	Northeast corner Haligus and Reed Road, Huntley	1 mile	no impacts - outside project limits
Huntley Village Hall	10987 E. Main Street Huntley	1 mile	no impacts - outside project limits
Huntley Police Department	10911 E. Main Street Huntley	1 mile	no impacts - outside project limits
Centegra Immediate Care Walk-In Clinic	10350 Haligus Road Huntley	1.2 miles	no impacts - outside project limits
Tomaso Sports Park	Ackman Road Huntley	0.3 mile	no impacts - A break in the median will be located at Ackman Road, allowing for left turns from northbound IL 47
Mt Thabor Cemetery	Northwest corner Rt 176 and Mt. Thabor Road, Crystal Lake	1 mile	no impacts - outside project limits
Crystal Woods Golf Club, Privately Owned, Open to the Public	5915 S. Rt 47 Woodstock	adjacent	Access changes will allow right in/right out access only. Northbound traffic on IL 47 will need to do U-turn at IL 176.
Craig Woods Golf Course, Part of Crystal Woods	southeast corner Rt 176 and Rt 47 Woodstock	adjacent	Access changes will allow right in/right out access only. Southbound traffic on IL 47 will need to do U-turn at Ballard Road
New Life Christian Center	5115 Dean Street Woodstock	0.5 mile	no impacts - outside project limits
Mercy Woodstock Medical Center	2000 Lake Avenue Woodstock	0.6 mile	no impacts - outside project limits
Jehovah's Witnesses	1320 Catalpa Lane Woodstock	0.6 mile	no impacts - outside project limits
Woodstock Sewage Treatment	800 Dieckman Street Woodstock	0.3 mile	no impacts - continued access via Dieckman Street
IDOT Woodstock Maintenance Facility	11908 Catalpa Lane Woodstock	0.5 mile	no impacts - outside project limits
Dorr Township Road Maintenance Facility	12322 Davis Road Woodstock	0.5 mile	no impacts - outside project limits
McHenry County Memorial Park Cemetery	11301 Lake Avenue Woodstock	0.9 mile	no impacts - outside project limits

Two privately owned but open to the general public facilities would be impacted by the proposed improvements and are therefore included in the Table. Crystal Woods Golf Club, is located on the west side of IL 47 between Ballard Road and IL 176 (East Leg). Because of the median that would be constructed between the north bound and south bound lanes of IL 176, only right in / right out turns would be allowed. Northbound travelers wishing to access Crystal Woods Golf Club would have to complete a U-turn at IL 176.

Similarly, Craig Woods Executive Golf Course located on the east side of IL 47 directly across from Crystal Woods Golf Club, would also be accessible only to right in / right out traffic. Southbound travelers wishing to access Craig Woods would have to complete a U-turn at Ballard Road.

The proposed widening of IL 47 is expected to result in overall improvements to emergency services. Improved mobility and decreased traffic congestion would result in the ability of emergency services such as ambulances, fire trucks, and police to respond more quickly. The presence of a median that allows for left turns every half mile is expected to have minimal impacts on emergency service access as all major subdivisions would include at least one entrance cut in the median. Future subdivisions are also expected to have breaks in the median to provide direct access. The improved mobility would offset the increased travel time caused by inclusion of non-traversable medians at those locations where access roads have not been provided. The proposed improvements may have temporary impacts to services during construction, however, as emergency response may experience short delays due to construction activities and related traffic congestion.

Pedestrian and bicycle access to public facilities would be improved as a result of the proposed improvements. Five foot sidewalks are proposed along the west side of IL 47, and eight foot wide shared use paths would be added to the east side of the roadway. Shared use paths and sidewalks would require local agency commitment before being included in the final design.

### **4.1.5 Change in Travel Patterns**

IL 47 is an important north-south transportation linkage because it provides access to residential, retail, commercial, agricultural, and recreational lands throughout the region, including Wisconsin. The proposed improvements would have no effect on regional travel patterns because they call for improvements to existing IL 47, essentially within the existing corridor. Where there is current access to other roadways, left turn lanes would be developed in advance of most intersections with other roadways, so access to intersecting roadways would not change, and there would be minor corresponding change in travel patterns.

Minor impacts to local travel patterns may occur for those traveling to commercial or residential properties located on IL 47 within the project limits. A barrier median is proposed to separate north bound from southbound traffic, with breaks in the median at intersections. Because of the barrier median, residential and commercial driveways that currently enter/exit directly to/from IL 47 would be converted to right in / right out access only. U-turn capability would be provided at side road access points, approximately every half mile, thereby minimizing these impacts.

The proposed improvements would not create any barrier effects; change access for police, fire and/or health services (except for residential and commercial driveways that would be converted to right in / right out only access); all major subdivisions would include at least one entrance cut in the median and future subdivisions are expected to have breaks in the median to provide direct access. The proposed improvements would not create economic impacts on transportation-orientated commercial facilities; no new accesses would be created, and no current accesses to any areas would be eliminated.

Pedestrian and bicycle travel would be improved as a result of the proposed improvements. With local agency commitments, five foot sidewalks are proposed along the west side of IL 47, and eight foot wide shared use paths would be added to the east side of the roadway, allowing for non-motorized transportation where it does not currently exist.

### 4.1.6 Relocations (Business and Residential)

Transportation projects can result in the acquisition of the necessary real property interests and can cause the displacement of residents and businesses when new right of way is required. Any land acquisition needed would be accomplished in accordance with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 as Amended*, commonly known as the *Uniform Act*, and the *IDOT Land Acquisition Manual*. The Uniform Act is applicable to all programs or projects undertaken by Federal agencies or with Federal financial assistance that require the acquisition of real property or that cause displacement of any person or business.

The proposed improvements would result in the displacement of three residential homes and two commercial enterprises. The displaced structures are identified on the environmental inventory map presented in [Exhibit 4-1](#) (located in the back of this document), and summarized below.

- Residence immediately north of Rainsford Drive, west side of IL 47
- Residence 1,000 feet south of Pleasant Valley Road, east side of IL 47
- Residence 1,100 feet south of Lucas Road, east side of IL 47
- Vacant Business (barn) 1,050 feet south of Lucas Road, east side of IL 47
- Red Barn Farm Market, 1,000 feet south of Hercules Road, east side of IL 47

In addition to these displacements, a portion of four businesses will be impacted. The impacted businesses are identified on [Exhibit 4-1](#) (located in the back of this document), and summarized below.

- Crystal Wood Golf Course, 1,050 feet south of Pleasant Valley Road, west side of IL 47, north of Ballard Road, a portion of parking lot will be impacted, resulting in the loss of 26 parking spaces
- Craig Woods Executive Golf Course, 750 feet south of Pleasant Valley Road, east side of IL 47, a portion of parking lot will be impacted, resulting in the loss of 38 parking spaces
- Craig Woods Executive Golf Course, 650 feet south of Pleasant Valley Road, east side of IL 47, Green #5 will be impacted
- Eddie's Landscape and Supplies, 2,000 feet north of IL 176 (West Leg), west side of IL 47, a portion of their materials storage will be lost
- Advantech Plastic LLC, 1,200 feet south of Cobblestone Way, west side of IL 47, will lose four visitor parking spaces



The proposed improvements were designed to minimize the number of displacements to the greatest reasonable extent. Multiple alternatives were studied and an impact evaluation was done on each of them (See *Section 3.4 – Build Alternatives*). Based on the evaluations, the alternatives with the least number of displacements were initially chosen. These alternatives underwent additional refinement in order to further minimize displacements. For example, the median was reduced to 30 feet south of Hercules Road and shoulders were eliminated north of Hercules Road, both of which further reduce the width of the right of way and minimized impacts. Curb and gutter were added to the proposed improvements south of Hercules Road to further reduce the width of right of way that otherwise would have been needed for ditches.

For impacts to parking spaces (Craig Woods, Advantech Plastic), material storage (Eddie’s Landscaping), and golf course green (Craig Woods), replacement parking spaces, storage, and green #5 will be developed with the landowner during the Phase II Design. Replacement of lost parking will be consistent with local zoning requirements.

Additionally a private, recreational air strip (Phyllis Air Field) on the east side of IL 47, approximately 2,000 feet north of Conley Road, will be reduced in length by approximately 70 feet on the western end of the runway. The 2,000 foot runway will be shortened to 1,930 feet, which will still be greater than the 1,600 foot minimum required by the Illinois Division of Aeronautics (see Appendix A).

### **4.1.7 Mitigation of Right of Way Acquisition Impacts**

The acquisition of these properties would be accomplished in accordance with the *Uniform Relocation Assistance and Real Property Acquisition Act (Uniform Act)*. The *Uniform Act* provides for uniform, fair and equitable treatment of persons whose real property is acquired or who are displaced in connection with federally funded projects.

Under the *Uniform Act*, in addition to just compensation, displaced residents are entitled to benefits to minimize hardships of relocation such as acquisition and relocation assistance designed to help residents and businesses with reimbursement claims and the lease or purchase of new locations. Relocation advisory assistance would be provided to owners and renters of displaced properties. Relocation advisory benefits would include determining the needs and preferences of displaced persons, providing current and ongoing listings of comparable dwellings for residential displacements, providing transportation to search for replacement housing, as well as financial referrals and housing inspection. Displaced residents would also be entitled to counseling and other assistance to minimize hardship in adjusting to the relocation. The *Uniform Act* would allow for reimbursement for moving expenses and payment for the added cost of renting or purchasing comparable replacement housing.

Comparable business locations and residential housing are generally characterized as housing that would meet the needs of displacees in terms of price, size, location and market availability. Market data from multi-listing services (<http://www.realtor.com> and <http://www.illinoisproperty.com>) were reviewed to determine the availability of similar replacement properties. The market data shows that a sufficient number of comparable replacement homes at similar values and in the same general areas are available.

### 4.1.8 Economic Impacts

Commercial and retail businesses are predominantly located within the Village of Huntley, and within the City of Woodstock. The environmental inventory map, **Exhibit 4-1** (located in the back of this document), indicates the businesses located adjacent to IL 47. The largest employers in the study area are located in the Village of Huntley and the City of Woodstock. **Table 4-4** indicates those employers who employ more than 100 employees.

The proposed improvements would result in measurable impacts to five businesses; two businesses will be displaced and three will be impacted by having portions of their facility converted. These impacts are discussed above in *Section 4.1.6 - Relocations (Business and Residential)*. In addition, impacts to businesses will occur due to access being converted to right in / right out access by way of a non-traversable median. These impacts would be minimized with the U-turn capability that would be provided at the side road access points, at approximately half mile intervals.

The proposed improvements were designed to minimize impacts to businesses, including farms, to the greatest extent possible. In the northern half of the project corridor, the chosen alternative generally fits within the existing right of way, which results in minimal impacts to businesses. The median was reduced to 30 feet and shoulders were eliminated, both of which further reduce the width of the right of way and minimized impacts.

Table 4-4: Major Employers in Project Vicinity

Employer <sup>1</sup>	Location	Number of Employees
Centegra Health Systems	Huntley	583
Dean's Foods Company	Huntley	210
GFS Group	Huntley	145
Huntley Outlet Center	Huntley	300
Weber-Stephens Products Company	Huntley	200
H.S. Crocker Company, Inc.	Huntley	124
Rush Truck Center	Huntley	165
LDI Industries, Inc.	Huntley	150
Union Special	Huntley	120
Centegra Health System	Woodstock	1,059
Brown Printing Company	Woodstock	715
Cardinal Health	Woodstock	700
Claussen Pickle Company	Woodstock	360
Wells Manufacturing Company	Woodstock	342
D.B. Hess Company	Woodstock	300
Guardian Electric Manufacturing Company	Woodstock	250
Thatcher Tubes LLC	Woodstock	190
Blain's Farm & Fleet	Woodstock	175
The Village of Hearthstone Communities	Woodstock	175
Jewel-Osco	Woodstock	120
Precision Quincy Corporation	Woodstock	120
The Woodstock Residence	Woodstock	120
McHenry County Government	Woodstock	1,100
Woodstock Community Unit School District #200	Woodstock	600
Special Education District of McHenry County	Woodstock	350
City of Woodstock	Woodstock	135

<sup>1</sup> Information on the Village of Huntley major employers obtained from <http://huntleyfirst.com> (June 18, 2012). Information on the City of Woodstock major employers obtained from Woodstock Chamber of Commerce based on 2005 data. When available, employer names are updated.

### 4.1.9 Land Use

Land use varies through the project corridor. The southern portion of the project corridor is located within the Village of Huntley. There is residential development on the east side of IL 47 just north of Reed Road. On the west side, the land immediately adjacent to IL 47 is currently under agricultural production but is zoned for residential development. Further north along the corridor, there are parcels zoned for commercial uses immediately adjacent to IL 47 on both the east and west sides. The Village of Huntley Land Use Plan (2005) indicates the Village intends to incorporate land on the west side of IL 47, north of the current Village limits up to Pleasant Valley Road. This property is currently under agricultural production but is intended to be developed as either residential or retail.

The Village of Lake in the Hills is adjacent to and immediately north of Huntley. The properties located in this portion of Lake in the Hills, on both sides of IL 47, are undeveloped. Most of it is under agricultural production but is zoned “Business – Transitional”. Future land use maps for this area indicate the Village intends it to be developed for commercial use.

North of Lake in the Hills, between Conley Road and Lucas Road, properties are located in unincorporated McHenry County. The properties adjacent to IL 47 are primarily agricultural with scattered farmsteads or open space. The McHenry County Future Land Use Plan indicates that these areas are planned for retail development and estate residential (lots between one and five acres) in the southern portion of the corridor, and residential and retail development in the northern portion of the project corridor. The Future Land Use Plan also sets aside environmentally sensitive areas for properties adjacent to the Kishwaukee River, its tributaries, and Kishwaukee Creek.

A small parcel of land located on the east side of IL 47 south of Foster Road is within the Village of Lakewood. This parcel is zoned agricultural. The Village’s Future Land Use Plan calls for the annexation of properties adjacent to IL 47 south of the current Village limits. Land use planning for the new properties includes residential, mixed use, and commercial/office development, with open space set aside adjacent to Conley Road.

The City of Woodstock’s southern city limits begin in the vicinity of Lucas Road. The properties are currently in agricultural production but are zoned residential; there are also areas designated as open space adjacent to the Kishwaukee River.

From Hercules Road to Novean Parkway the properties adjacent to IL 47 are in unincorporated McHenry County. Land here is in agricultural production or is open space. The City of Woodstock Comprehensive Land Use Plan (2008) indicates that the City intends to annex these properties, which will then be zoned for commercial uses.

The northern-most portion of the project corridor, north of Novean Parkway to the project limits is located within the city limits of Woodstock. There is a mixture of residential, business, and manufacturing zoning in this portion of the corridor, although property associated with the Kishwaukee River is dedicated to open space. This open space land is

consistent with the open space land identified in the McHenry County Future Land Use Plan as set aside as an environmental sensitive area (as discussed above).

**Exhibit 4-3** demonstrates existing land use in the project corridor. **Exhibit 4-4** demonstrates proposed land use in the project corridor.

The proposed improvements would not have any effect on municipal plans. The communities adjacent to IL 47 have all anticipated improvements to this roadway that include widening. All of the communities have planned for residential, retail, or commercial development adjacent to the roadway. Various communities have planned for open space in more environmentally sensitive areas. The proposed improvements would not result in the need for the involved communities or jurisdictions to alter any of the proposed land use or zoning.

### **4.1.10 Economic Activity and Development**

Locally, IL 47 serves as a transportation corridor within the adjacent communities and contains mixed use, multi-family residential, public/institutional, and commercial land uses.

The communities along the corridor have tools in place, such as formal comprehensive plans and zoning restrictions, to allow for planned residential and commercial growth. Currently, two major residential developments are planned within the project corridor; the Huntley Village Center North, located between Talamore Boulevard and Ackman Road; and the properties formerly known as the Apple Creek Estates, located between Lucas Road and Hercules Road. In addition, commercial centers are planned for the intersection areas near both IL 176 (East and West Legs) and IL 47 intersections. Smaller commercial and residential developments are planned as well throughout the corridor. The viability of current and future economic activity and development along the IL 47 corridor is restricted under current traffic operations.

The selection of the No-Action Alternative would result in continued restriction on the viability of current and future economic activity and development along the IL 47 corridor due to the congestion and safety issues that are currently being experienced.

The proposed alternative facilitates planned economic growth by improving capacity, accessibility, and mobility, thereby allowing for efficient movement of goods, employees, and customers.

### **4.1.11 Pedestrian and Bicycle Facilities**

Within the project corridor, a bicycle path exists on the east side of IL 47 between Reed Road and Rainsford Drive. This path is approximately six feet in width and is asphalt covered. Three short sections of sidewalk exist in the northern portion of the project corridor, on the west side of IL 47 across from Novean Parkway, on the east side of IL 47 north of Cobblestone Way, and on the west side of IL 47 south of US 14. Pedestrian and bicycle facilities also exist along some of the cross streets within the study area including: Reed Road, Rainsford Drive, Talamore Boulevard, Ackman Road, and Cobblestone Way.

IL 47 is designated as “Not Recommended for Bicycling” as defined by the McHenry County Bicycle Map (<http://www.dot.il.gov/bikemap/pdf/McHenry.pdf>). The *Kishwaukee Headwaters Proposed Intergovernmental Bike Trail Plan*, however, has designated portions of IL 47 in the northern and southern sections of the project corridor as slated for bicycle trails to be developed as future infrastructure improvements allow.

Future bicycle demand for the project corridor was assessed. According to *the American Community Survey* (<http://www.census.gov/acs/www>), cyclists accounted for 0.53% of the nationwide commuters in the Year 2010. Applying this usage rate to existing traffic (2011 ADT of 13,900 to 20,800 vehicles per day) suggests that bicycle traffic along the IL 47 corridor could be 74 to 110 bicycles per day, if bicycle accommodations were available.

The proposed improvements would maintain the existing sidewalks and bicycle paths, as well as make accommodations for new ones. On May 29, 2009, Stakeholder Workshop #2 reached a consensus that a bicycle path was desired for the project corridor. In response to that consensus, accommodations for five foot sidewalks are proposed along the west side of IL 47, and accommodations for eight foot wide shared use paths would be added to the east side of the roadway, depending on local cost participation. Shared use paths and sidewalks would require local agency commitment before being included in the final design. A graded shelf will be provided if local agencies do not participate in cost sharing. The new sidewalks and shared use paths would improve the corridor’s pedestrian and bicycle facilities.

The shared use path would allow bicyclists to access existing bike paths located in Woodstock, the Kishwaukee Park and Conservation Area, Crystal Woods Golf Club, Craig Woods Executive Golf Club, and residential subdivisions at the southern limits of the project corridor within the Village of Huntley. The shared use path would provide connectivity to the existing and proposed bike paths located within the municipalities along the project corridor. The proposed shared use path would provide the only off-road dedicated bicycle crossing over the Kishwaukee River within several miles of this location.

Openlands, a Chicago region conservation organization, provided a local bicycle plan including an exhibit on October 5, 2009 recommending four potential bicycle crossing locations. These will be coordinated with the local municipalities and addressed by the design engineer as the project progresses.

## 4.2 Agricultural

### 4.2.1 Farmland and Soils Identification

#### *Existing Farmland*

The study area extends approximately eight miles along IL 47 from Reed Road to US 14. The current land use in many places along the project corridor is agricultural. Long term land use plans and coordination with the municipalities however, indicate most of this will be developed for residential, retail, or commercial use. Nearly the entire project corridor is within a formal municipal planning boundary.

As discussed in *Section 4.1.8 – Land Use*, most of the corridor is within municipal boundaries, or is scheduled for annexation. Land use that is currently under agricultural production is for the most part zoned for residential, retail, commercial or open space use. Land use planning by the various municipalities identifies and plans for development that is compatible with a transportation corridor.

The proposed improvements would convert 91.6 acres of land currently under agricultural production. Coordination with the Illinois Department of Agriculture (IDOA) was undertaken utilizing a Farmland Conversion Impact Rating (FormAD-1060) (see [Appendix B](#)). The IDOA gave the project a score of 162 out of a possible 300-point maximum, using the Illinois Land Evaluation and Site Assessment (LESA) process. Using the LESA System, alternatives that receive a score of 175 or lower have a low rating for protection and additional evaluation is not necessary.

Due to the fact that the land that is currently under agricultural production is committed to urban development, and the proposed improvements received a LESA site assessment score of 162, it has been determined that the farmland impacts are not substantial.

#### *Soils*

Soils in the project corridor consist primarily of loams, silt loams, and silty clay loams. In the southern portion of the project corridor, the soils frequently found are:

- 146 – Elliot silt loam
- 232 – Ashkum silty clay loam
- 223 – Varna silt loam

In the northern portion of the project corridor, the soil most frequently found is:

- 530 – Ozaukee silt loam

Scattered throughout the corridor are various pockets of other soil types, including:

- 67 – Harpster silty clay loam
- 148 – Proctor silt loam
- 626 – Kish loam
- 149 – Brenton silt loam

- 8776 – Comfrey loam
- 802 – Orthents, loamy
- 327 – Fox silt loam
- 343 – Kane silt loam
- 323 – Casco loam
- 298 – Beecher silt loam

A loam soil is one that is composed of sand, silt, and clay in relatively even amounts. Loam soils are the most desirable for growing crops because they retain nutrients and water, while still allowing for drainage. This soil type is often associated with prime farmland. Loam soils have engineering properties that make them suitable for road construction and no special design measures would be needed for construction in areas containing these soils.

Houghton muck (soil 103 or 1103), is interspersed throughout the project corridor. This soil, composed primarily of organic matter, is associated with wetlands and located primarily in small depressional pockets or adjacent to creek/streams. There is one large area north of Conley Road, to approximately 600 feet north of Foster Road, where this soil dominates; this is approximately one mile in length. Houghton muck does not possess the engineering qualities necessary for the construction of a roadway and would have to be removed or altered in order to construct the proposed road improvements. Determinations on how to best deal with this unsuitable soil will be made during the final engineering design with the preparation of contract plans and specifications.

### ***Farm Operations***

The proposed improvements would not directly affect farm operations. No parcels would be severed and there are no locations where access to agricultural fields would be impeded.

There may be adverse travel during spring planting and fall harvesting for those parcels where left turns are no longer permitted due to the introduction of the median. Adverse travel will be minimized because right turns will be allowed, with U-turns permitted at cut outs located approximately every 1/2 mile. Additionally, any adverse travel would only occur in one direction as the reverse trip would not be affected by the median.

### ***Prime Farmland***

The USNRCS *National Soil Survey Handbook* Section 622.04 defines prime farmland as “land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and that is available for these uses.” (<http://soils.usda.gov/technical/handbook/contents/part622.html>)

Prime farmland is recognized by the U.S. Department of Agriculture under the Farmland Protection Act. Land does not have to be under agricultural production to be considered prime farmland, but land that is urbanized or developed is not considered prime farmland. Of the 39.7 acres of agricultural land located outside of current municipal boundaries, the



USNRCS determined that 31.2 acres are prime or unique farmland and 7.5 acres are state or locally important.

### ***Centennial Farms***

A Centennial Farm is one that has been owned by the same family for at least 100 years. The family must be in the direct line of descent, such as a child or a grandchild, or of collateral descendent, but is otherwise closely related, such as a brother, sister, uncle, aunt, or cousin.

Per the U.S. Consolidated Farmed Service Agency, there are no Centennial Farms within the project corridor (see Appendix A).

### **4.2.2 Protected Agricultural Areas**

#### ***Conservation Reserve Program***

The Conservation Reserve Program (CRP) is a voluntary program for agricultural landowners. Agricultural property can be converted to a vegetative cover such as grassland. The CRP reduces erosion while enhancing water quality, wildlife habitat, and stormwater management.

Per the U.S. Consolidated Farmed Service Agency, there are no properties within the project corridor that are enrolled in the CRP program (see Appendix A).

### **4.2.3 Erodible Soils**

Information regarding erodible soils was obtained from USNRCS and examination of corridor cross sections. Information on the soil types present in the project corridor was evaluated based on classifications of soils with regards to the slopes identified in the McHenry County Soil and Water Conservation *Soils Data Book*. In Illinois, highly erodible soils are those soils found in areas with slopes greater than 4%. Extremely erodible soils are those found in areas with slopes greater than 12%. Based on the information provided by the soil classifications, those areas with soils that developed at slopes greater than 4% were examined. Cross sections of the roadway that coincided with these soils were examined to determine the actual slope. In this manner, areas with slopes greater than 4% and 12% were identified.

The project corridor has 21.7 acres of highly erodible soils and 0.5 acres of extremely erodible soils.

During construction, a Storm Water Pollution Prevention Plan (SWPPP) will be developed that will identify BMPs for erosion and sediment control to be used throughout construction. The SWPPP will be developed using guidance from IDOT's Bureau of Design and Environment Manual and Section 280 of IDOT's *Standard Specification for Road and Bridge Construction* (2012). The choice of BMPs for use in areas with highly erodible and extremely erodible soils will be developed during the Phase II design and may include erosion control blankets, more robust sediment control fencing, earlier vegetative seeding,

more closely spaced ditch checks, or other forms of BMPs that would minimize erosion or sediment runoff in these areas.

### 4.3 Cultural

An Environmental Survey Request (ESR) and Addendum ESRs were processed. The State Historic Preservation Officer (SHPO) concurred on November 17, 2009 with IDOT's determination that no sites subject to protection under Section 106 of the National Historic Preservation Act of 1966 would be affected by the proposed improvements. The SHPO further determined on November 24, 2010 that no survey or further coordination is required for Cultural Resources.

The SHPO provided updated concurrence on December 3, 2013 with IDOT's determination that no historic properties would be affected by the project. Copies of the correspondences with the SHPO are included in [Appendix A](#).

#### 4.3.1 Archaeological Sites

Per IDOT's archaeological report and Phase I documentation completed by the University of Illinois, four archaeological sites were recorded. These sites consist of scatters of late 19<sup>th</sup> to early 20<sup>th</sup> century cultural materials that do not meet the criteria for listing on the National Register.

Per SHPO concurrences dated November 17, 2009 and November 24, 2010, no archaeological sites subject to protection under Section 106 of the National Historic Preservation Act of 1966 will be affected by the proposed improvements.

#### 4.3.2 Historic Bridges

Per IDOT's Phase I documentation completed by the University of Illinois, no bridges eligible for listing on the National Register are present in the project corridor.

Per SHPO concurrences dated November 17, 2009 and November 24, 2010, no historic bridges subject to protection under Section 106 of the National Historic Preservation Act of 1966 will be affected by the proposed improvements.

#### 4.3.3 Historic Districts and Buildings

Per the older structures photographic log provided with the ESR submitted on May 6, 2008, several structures older than 50 years are present in the project corridor. IDOT Bureau of Design and Environment (BDE) determined that none of the structures are eligible for listing on the National Register.

Per SHPO concurrences dated November 17, 2009 and November 24, 2010, no sites subject to protection under Section 106 of the National Historic Preservation Act of 1966 would be affected by the proposed improvements.

### 4.3.4 Unanticipated Discovery during Construction

If any unanticipated discoveries of historic properties, sites, artifacts, or objects occur during the implementation of any project, IDOT will coordinate with Federal Highway Administration (FHWA) to comply with 36 CFR 800.13 and the Illinois *Human Skeletal Remains Protection Act* [20 Illinois Compiled Statutes (ILCS)] 3440), as appropriate. This will involve stopping work in the immediate area, and informing the SHPO and County Coroner of the unanticipated discoveries or effects within two business days. IDOT will coordinate with Illinois State Archaeological Survey to ensure that any necessary archaeological investigations are conducted according to the provisions of the Illinois *Human Skeletal Remains Protection Act*.

Work on the portion of the site where human remains are found cannot resume until a plan for the treatment of the human remains is developed and approved in consultation with the SHPO and any appropriate consulting parties. IDOT's BDE will coordinate with FHWA to ensure the plan complies with the Illinois *Human Skeletal Remains Protection Act*, and all other appropriate Federal and State guidelines, statutes, rules, and regulations.

If any unanticipated effects on historic properties are found to be occurring during the implementation of any project, IDOT will coordinate with FHWA to comply with 36 CFR 800.13 and inform the SHPO immediately.

## 4.4 Air Quality

### 4.4.1 Microscale Analysis

The IDOT Carbon Monoxide Screening for Intersection Modeling (COSIM) 4.0 model, Pre-Screen feature is used to provide project documentation that the project is “exempt” from a project-level carbon monoxide (CO) air quality analysis. **Specifically, a project is exempt if the highest design-year approach-volume on the busiest leg of the intersection is less than 5,000 vehicles per hour (VPH) or 62,500 average daily traffic (ADT).** The FAP 326, IL 47, IL 176; from Reed Road to US 14 (Northwest Highway), McHenry County meets this criteria for “exemption”. (See [Appendix C](#) for copy of the COSIM Pre-Screen modeling results.)

### 4.4.2 Air Quality Conformity

The National Ambient Air Quality Standard (NAAQS), established by the U.S. Environmental Protection Agency (USEPA), set maximum allowable concentration limits for six criteria air pollutants. Areas in which air pollution levels persistently exceed the NAAQS may be designated as “nonattainment.” States where a nonattainment area is located must develop and implement a State Implementation Plan (SIP) containing policies and regulations that will bring about attainment of the NAAQS. Areas that had been designated as nonattainment, but that have attained the NAAQS for the criteria pollutant(s) associated with the nonattainment designation, will be designated as maintenance areas.

All areas of Illinois currently are in attainment of the standards for four of the six criteria pollutants: CO, nitrogen dioxide, sulfur dioxide, and lead. For the eight-hour ozone and particulate matter with particles smaller than 2.5 micrometers (PM<sub>2.5</sub>) standards, Cook, DuPage, Kane, Lake, McHenry, and Will Counties have been designated as moderate nonattainment areas for the eight-hour ozone standard. The Lake Calumet area and Lyons Township in Cook County have been designated as a maintenance area for the particulate matter with particles smaller than 10 micrometers (PM<sub>10</sub>) standard.

This project is included in the FY 2010 - 2015 TIP endorsed by the Metropolitan Planning Organization Policy Committee of the CMAP for the region in which the project is located. Projects in the TIP are considered to be consistent with GO TO 2040, the 2040 regional transportation plan endorsed by CMAP. The project is within the fiscally constrained portion of the plan.

On October 13, 2010, the FHWA and the Federal Transit Administration determined that the 2040 regional transportation plan conforms to the SIP and the transportation-related requirements of the 1990 Clean Air Act Amendments. On March 26, 2014, the FHWA and the Federal Transit Administration determined that the TIP also conforms to the SIP and the Clean Air Act Amendments. These findings were in accordance with 40 CFR 93, "Determining Conformity of Federal Actions to State or Federal Implementation Plans." The project's design concept and scope are consistent with the project information used for the TIP conformity analysis. Therefore, this project conforms to the existing SIP and the transportation-related requirements of the 1990 Clean Air Act Amendments. The TIP number for this project is: **11-07-0014**.

The proposed improvements for IL 47 are not an air quality concern under *40 CFR 93.123(b)(1)* due to the fact that the project is an expanded add lanes highway project; it does not generate a significant increase in the number of diesel vehicles; it does not affect intersections that are at LOS "D", "E", or "F" with significant number of diesel vehicles; and it would not change intersections to Level of Service "D", "E", or "F" because of increased traffic volumes from a significant number of diesel vehicles related to the project. It has been determined that the project would not cause or contribute to any new localized PM<sub>2.5</sub> or PM<sub>10</sub> violations or increase the frequency or severity of any PM<sub>2.5</sub> or PM<sub>10</sub> violations. The USEPA has determined that such projects meet the Clean Air Act's requirements without any further Hot-Spot analysis.

### 4.4.3 Mobile Source Air Toxics

For the proposed improvements to IL 47, the design year (2040) traffic level is predicted to be less than 140,000 vehicles annual ADT.

A qualitative analysis provides a basis for identifying and comparing the potential differences among *Mobile Source Air Toxic* (MSAT) emissions, if any, from the various alternatives. The qualitative assessment presented below is derived in part from a study conducted by the FHWA entitled *A Methodology for Evaluating Mobile Source Air Toxic Emissions among Transportation Project Alternatives*, found at:

[http://www.fhwa.dot.gov/environment/air\\_quality/air\\_toxics/research\\_and\\_analysis/mobile\\_source\\_air\\_toxics/msatemissions.cfm](http://www.fhwa.dot.gov/environment/air_quality/air_toxics/research_and_analysis/mobile_source_air_toxics/msatemissions.cfm).

The amount of MSAT emitted from the proposed improvements would be proportional to the vehicle miles traveled (VMT), assuming that other variables such as fleet mix are the same for each alternative. The VMT estimated for the proposed improvements is slightly higher than that for the No-Action Alternative, because the additional capacity increases the efficiency of the roadway and attracts rerouted trips from elsewhere in the transportation network. This increase in VMT would lead to higher MSAT emissions in the project corridor, along with a corresponding decrease in MSAT emissions along the parallel routes. The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds; according to USEPA's MOVES2010b model, emissions of all of the priority MSAT decrease as speed increases. Because the estimated VMT under each of the studied build alternatives are nearly the same, it is expected there would be no appreciable difference in overall MSAT emissions among the various alternatives. Also, regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of USEPA's national control programs that are projected to reduce annual MSAT emissions by over 80 percent between 2010 and 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the USEPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

The additional travel lanes contemplated as part of the IL 47 proposed improvements would have the effect of moving some traffic closer to nearby homes, schools, and businesses; therefore, the proposed improvements may result in localized areas where ambient concentrations of MSAT could be higher under the proposed improvements than the No-Action Alternative. The localized increases in MSAT concentrations would likely be most pronounced along the expanded roadway sections that would be built from Reed Road to US 14 due to the proposed improvements. However, the magnitude and the duration of these potential increases compared to the No-Action Alternative cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific MSAT health impacts. In summary, when a highway is widened, the localized level of MSAT emissions for the build alternative could be higher relative to the No-Action Alternative, but this could be offset due to increases in speeds and reductions in congestion (that are associated with lower MSAT emissions). Also, MSAT would be lower in other locations when traffic shifts away from them. However, on a regional basis, USEPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than today.

#### **4.4.4 Construction-Related Particulate Matter**

Demolition and construction activities can result in short-term increases in fugitive dust and equipment-related particulate emissions in and around the project corridor. (Equipment-related particulate emissions can be minimized if the equipment is well maintained.) The potential air quality impacts from this construction would be short-term,

occurring only while demolition and construction work is in progress and local conditions are appropriate.

The potential for fugitive dust emissions typically is associated with building demolition, ground clearing, site preparation, grading, stockpiling of materials, on-site movement of equipment, and transportation of materials. The potential is greatest during dry periods, periods of intense construction activity, and during high wind conditions.

IDOT's *Standard Specifications for Road and Bridge Construction* includes provisions on dust control. Under these provisions, dust and airborne dirt generated by construction activities will be controlled through dust control procedures or a specific dust control plan, when warranted. The contractor and IDOT will meet to review the nature and extent of dust-generating activities and will cooperatively develop specific types of control techniques appropriate to specific situations. Techniques that may warrant consideration include measures such as minimizing track-out of soil onto nearby publicly-traveled roads, covering haul vehicles, and applying chemical dust suppressants or water to exposed surfaces, particularly those on which construction vehicles travel. With the application of appropriate measures to limit dust emissions during construction, the proposed improvements would not cause any significant, short-term particulate matter air quality impacts.

Construction air quality dust control (particulate matter) shall consist of developing and implementing a detailed Dust Control Plan (DCP) when circumstances warrant, and in the non-attainment areas and "Maintenance" areas as specified in the currently adopted IDOT "Standard Specifications for Road and Bridge Construction", *Article 107.36, Dust Control*, the wind prone open areas of this project are considered to warrant a DCP. All construction activities shall be governed by a DCP. The nature and extent of dust generating activities, and specific control techniques appropriate to specific situations, shall be discussed at the pre-construction meeting, with subsequent development of the DCP.

IDOT's construction-related requirements dealing with the use of cleaner diesel fuel is addressed and specified in the currently adopted "Supplemental Specifications and Recurring Special Provisions", *Article 107.41(a) and (b), Construction Air quality for Idling Restrictions, and Diesel Vehicle Emissions Control*.

In addition, IDOT BDE "Special Provision" for *Construction Air Quality - Diesel Retrofit*, effective June 1, 2010, may also be applicable.

## 4.5 Noise

### 4.5.1 Traffic Noise - Impact – Abatement

A traffic noise study has been conducted to evaluate traffic noise for the proposed IL 47 proposed improvements, and is documented in the *IL 47 Noise Analysis Technical Report*. The traffic noise study evaluated a total of 39 Representative Receptors located within 39 Common Noise Environments (CNE). A CNE is a group of receptors within the same noise category that are exposed to similar noise sources and traffic noise levels.

For developed land use categories, a Representative Receptor was chosen for each CNE. The selected Representative Receptor was generally chosen as the closest receptor to IL 47 and therefore the worst-case traffic noise condition. **Table 4-5** lists the locations of the 39 CNEs; **Exhibit 4-5** indicates their location.

The Existing traffic noise levels range from 49 A-weighted decibel [dB(A)] to 67 dB(A). The projected No Action (2040) traffic noise ranges from 50 dB(A) to 68 dB(A). Generally, the receptor noise levels increased between 1 dB(A) and 3 dB(A) from the Existing scenario compared to the No Action (2040) as a function of increases in traffic volumes. **Table 4-5** indicates the predicted existing and predicted noise levels at each CNE.

The projected Build (2040) traffic noise levels range from 51 dB(A) to 70 dB(A). The projected Build (2040) noise levels increased between 0 dB(A) and 5 dB(A) from the existing condition as a function of increased traffic and a shift of the widened alignment.

There were three Representative Receptors from three CNEs for the Build (2040) improvement that were determined to approach, meet, or exceed the FHWA Noise Abatement Criteria, and therefore warranted consideration of traffic noise abatement. Of these three, only one remained viable since the receptors for the other two CNEs will be acquired based on preliminary engineering and right of way requirements for the Build Alternative geometrics, thereby removing these receptors from any Design Year (2040) traffic noise impact.

For the Representative Receptor for the remaining CNE that exceeds FHWA Noise Abatement Criteria (CNE 16), a traffic noise abatement wall was considered and evaluated. The evaluated wall met the *Feasibility* criterion but did not stand the test of reasonableness for the *Noise Reduction Design Goal* and *Cost Effectiveness* criterion. **Table 4-6** summarizes feasibility and reasonableness of noise abatement for CNE 16.

**Therefore, highway traffic noise abatement measures are not likely to be implemented for the proposed IL 47 preliminary engineering design.**

### What is Feasible per IDOT's Noise Policy?

A noise barrier is considered feasible if it will reduce noise impacts by at least 5 dB(A) for at least one impacted receptor.

### What is a Noise Impacted Receptor?

A facility or structure where noise levels are expected to increase to within 1 dB(A) of the Federal Highway Authority's Noise Abatement Criteria (NAC depends on type of property/facility), or where increases are expected to exceed 14 dB(A) over existing noise levels.

### What is Reasonable, per IDOT's Noise Policy?

A noise barrier is considered reasonable if it reduces noise impacts by at least 8 dB(A) for at least one benefited receptor location, or by at least 5 dB(A) for one sensitive receptor, and costs less than a specified dollar amount (based on noise level and ranging from \$24,000 to \$37,000 per benefited receptor).

## Chapter 4 Environmental Resources, Impacts, and Mitigation

**Table 4-5: Common Noise Environments (CNEs) and Predicted Noise Impacts**

CNE No.	FHWA Activity Category Property Use	Local Zoning and/or Comprehensive Plan Designation	Nearest Roadway to Representa- tive Receptor	Distance to IL 47 centerline (feet)	Number of Receptors in CNE	Existing Noise Levels [dB(A)]	No Action Noise Levels 2040 [dB(A)]	Build Noise Levels 2040 [dB(A)]	Noise Level Increase [dB(A)]
1	<b>B</b> Single Family Residences	H-Business Service PUD	IL 47	374	7	52	54	53	1
2	<b>C</b> Pinecrest Country Club	H-Single Family Residential	IL 47	344	1	53	55	54	1
3	<b>B</b> Single Family Residences	H-Single Family Residential	IL 47	207	5	58	60	59	1
4	<b>E</b> Business	H-Shopping Center Business	Reed Road	293	1	59	61	59	0
5	<b>B</b> Single Family Residences	H-Duplexes, Townhomes, Condominiums	Reed Road	769	1	51	53	52	1
6	<b>E</b> Business – Walgreens	H-Retail and Commercial	IL 47	216	1	62	64	62	0
7**	<b>B</b> Farmstead	H-Retail and Commercial	IL 47	142	none	64	66	<b>N/A</b>	<b>N/A</b>
8	<b>B</b> Farmstead	H-Retail and Commercial	IL 47	166	1	62	63	65	3
9	<b>E</b> Business	H-Retail and Commercial	Rainsford Road	278	1	62	63	62	0
10	<b>B</b> Single Family Residences	H-Residential Estate	IL 47	431	11	58	60	60	2
11	<b>B</b> Manufacturing	H-Townhomes, Condominiums	IL 47	804	10 (36 units)	49	50	52	3
12	<b>B</b> Single Family Residences	H-Residential Estate PUD	Talamore Rd	380	12	50	51	52	1
13	<b>E</b> Business	H-Shopping Center Business	Talamore Road	287	1	60	62	61	1
14	<b>B</b> Manufacturing	H-Townhomes, Condominiums	Ackman Road	750	6 (36 units)	56	57	56	0
15	<b>B</b> Farmstead	H-Retail & Commercial	Ackman Road	294	1	59	60	60	1
16	<b>B</b> Farmstead	H-Residential Estate	IL 47	149	2	64	65	<b>66</b>	2
17	<b>B</b> Farmstead	MC-Agriculture	Foster Road	410	1	59	62	63	4
18	<b>B</b> Farmstead	MC-Agriculture	Foster Road	462	1	51	54	56	5
19	<b>B</b> Farmstead	MC-Estate	Ballard Road	631	1	49	51	51	2
20	<b>B</b> Single Family Residences	MC-Estate	IL 47	158	3	60	61	61	1
21	<b>B</b> Single Family Residences	MC-Estate	IL 47	257	6	62	63	62	0
22	<b>B</b> Single Family Residences	MC-Estate	IL 47	143	5	61	62	62	1
23	<b>C</b> Crystal Woods Club House	L-INC	IL 47	304	3	59	60	59	0



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CNE No.	FHWA Activity Category Property Use	Local Zoning and/or Comprehensive Plan Designation	Nearest Roadway to Representative Receptor	Distance to IL 47 centerline (feet)	Number of Receptors in CNE	Existing Noise Levels [dB(A)]	No Action Noise Levels 2040 [dB(A)]	Build Noise Levels 2040 [dB(A)]	Noise Level Increase [dB(A)]
24	<b>B</b> Single Family Residences	L-INC	IL 47	147	4	63	64	64	1
25**	<b>B</b> Single Family Residences	L-INC	IL 47	175	none	60	61	N/A	N/A
26**	<b>C</b> Craig Woods #5 green	L-INC	IL 47	145	5	67	68	65	-2
27	<b>B</b> Farmstead	MC-Neighborhood Business and Estates	Pleasant Valley Road	692	1	55	56	55	0
28	<b>B</b> Farmstead	L-INC	Pleasant Valley Road	700	1	54	55	55	1
29	<b>B</b> Single Family Residences	MC-Agriculture	IL 47	710	1	50	51	52	2
30	<b>B</b> Farmstead	MC-Agriculture	IL 47	358	1	58	59	60	2
31	<b>B</b> Single Family Residences	MC-Agriculture	Lucas Road	742	1	50	51	53	3
32	<b>B</b> Single Family Residences	MC-Agriculture	IL 47	233	1	59	60	62	3
33	<b>E</b> Business	W-Shopping Center	IL 47	169	1	63	65	66	3
34	<b>B</b> Manufacturing (not occupied)	UNC-MFR	IL 47	351	1 (6 units)	54	55	56	2
35	<b>B</b> Single Family Residences	MC-Agriculture	IL 47	376	3	58	59	60	2
36	<b>B</b> Single Family Residences	W-Light Manufacturing	IL 47	174	1	58	59	60	2
37	<b>B</b> Single Family Residences	MC-Agriculture	IL 47	199	8	58	59	60	2
38	<b>B</b> Manufacturing	W-MFR PUD	Cobblestone Way	448	4 (8 units)	54	56	57	3
39	<b>B</b> Manufacturing	W-MFR District	IL 47	459	3 (64 units)	49	51	52	3

\*\* Receptor to be acquired based on preliminary engineering and right of way requirements

H = Village of Huntley  
 CL = City of Crystal Lake  
 LH = Village of Lake in the Hills  
 W = City of Woodstock  
 L = Village of Lakewood  
 MC = McHenry County

Table 4-6: Noise Abatement Summary Table

CNE No.	Barrier Height	Barrier Length	Total Cost	Noise Reduction Potential dB(A)	Estimated Cost per Benefited Receptor	Allowable Cost per Benefited Receptor	Likely to be Implemented	If No, Reasons Why
16	10 feet	650 feet	\$162,500	5	\$162,500	\$24,000	No	Although feasible, noise reduction goal of 8 dB(A) is not met and it is not economically reasonable.

#### 4.5.2 Undeveloped Lands Traffic Noise – Coordination

The majority of land within the project limits is undeveloped and / or currently agricultural. Future traffic noise levels for this project were projected for lands (either currently under the jurisdiction of McHenry County, the Villages of Huntley, Lake in the Hills, Lakewood and the Cities of Woodstock and Crystal Lake or land that may come under these jurisdictions) near the proposed IL 47 improvement. This included noise contours for land use planning of undeveloped and / or agriculture land that is zoned for uses other than agriculture, or land that is or may be planned for future development in the various jurisdictional comprehensive land use plans.

Traffic noise compatible land use planning is a community planning process and method to reduce or eliminate highway traffic noise that is explained in FHWA’s publication “*Entering the Quiet Zone: Noise Compatible Land Use Planning*”. The publication can be obtained at:

[http://www.fhwa.dot.gov/environment/noise/noise\\_compatible\\_planning/federal\\_approach/land\\_use/quitezon.pdf](http://www.fhwa.dot.gov/environment/noise/noise_compatible_planning/federal_approach/land_use/quitezon.pdf)

Traffic noise compatible land use planning is possible with advanced planning and responsibilities shared between local governing units and developers to minimize effects from traffic noise. Common methods used in the practice of noise compatible planning are:

- Identification of land uses specifically suited for areas adjacent to highways
- Open space next to highways is designated that allows room to accommodate the dissipation of noise before it reaches noise sensitive areas

The Zoning Maps depict the undeveloped lands along the IL 47 corridor for future development of business, commercial, industrial, office, residential and open space.

Traffic noise contours for land use planning of undeveloped and/or agriculture land that is zoned for uses other than agriculture, or land that is or may be planned for future development in the various jurisdictional comprehensive land use plans, was provided to the communities in March 2013. This information is contained in the *IL 47 Noise Analysis Technical Report*.

### 4.5.3 Construction Noise

Trucks and machinery used for construction produce noise that may affect some land uses and activities during the construction period. Residents along the alignment would at some time experience perceptible construction noise from implementation of the proposed improvements. To minimize or eliminate the effect of construction noise on these receptors, mitigation measures have been incorporated into the currently adopted IDOT's *Standard Specifications for Road and Bridge Construction, Article 107.35, Construction Noise Restrictions*.

The construction methods to be used for proposed improvements are considered and determined in the final engineering design with the preparation of contract plans and specifications. Depending on the construction methods and potential for construction noise impacts, there are several potential abatement options that might be considered if they are warranted.

#### *Construction Staging*

Options for minimizing noise impacts during construction could include the installation of temporary barriers, such as temporary walls; stock piles of materials; equipment enclosures for noisy equipment, such as shields or heavy curtains; routing construction equipment away from identified sensitive receptors; or operating equipment as far from any identified sensitive receptors as is feasible and practical.

#### *Sequence of Operations*

Options for minimizing noise impacts could include scheduling and conducting louder construction operations during the day and not during the night, when people are much more sensitive to noise, or conducting multiple loud operations at one time. The total noise level from multiple activities would not substantially increase the overall noise level. Its effect is that it would reduce the total duration of that noise level in the defined area.

#### *Alternative Construction Methods*

Options for minimizing noise impacts include the evaluation of alternative pile driving methods, as this is a major noise contributor and can generate vibration complaints. The project could also consider quieter demolition methods or pavement removal methods, such as using special muffler systems, shields (such as structural barriers), or enclose equipment (such as portable curtains).

## 4.6 Natural Resources

### 4.6.1 Upland Plant Communities

The project corridor is composed primarily of developed or agricultural land; there are only small amounts of natural habitat left in the area.

There are some former cropland fields in the project corridor that have been out of production for multiple years. These fields range in size from approximately 20 acres to

160 acres and are scattered throughout the project corridor and have begun to undergo succession. Most are in the early successional stages and are dominated by invasive species such as *Melilotus alba* (white sweet clover), *M. officinalis* (yellow sweet clover), *Trifolium pretense* (red clover), *T. repens* (white clover), *Plantago major* (common plantain), *Taraxacum officinale* (common dandelion), *Erigeron annuus* (annual fleabane), *Pastinaca sativa* (wild parsnip), *Lolium perenne* (rye grass), and *Bromus racemosus* (smooth brome). There is also some low quality riparian habitat associated with several creek and tributary crossings in the project corridor. These areas are discussed below in *Section 4.6.2 -Wildlife Resources*, because they are primarily wetland habitats with interspersed upland habitats within the complexes.

Landscape trees are scattered throughout the project corridor and are located in developed areas (i.e. houses and businesses). The types of landscape trees most commonly found in the project corridor include honey locusts (*Gleditsia* species), pine (*Pinus* species), spruce (*Picea* species), maple (*Acer* species), ornamental pear (*Pyrus* species), ash (*Fraxinus* species), and oaks (*Quercus* species). Specimen trees are notable or valued, based on consideration of species, size, condition, age, longevity, visual quality, or genetic attributes, as determined by the public and/or resource agencies and IDOT. No trees were identified that would be considered specimen trees.

### 4.6.2 Wildlife Resources

Wildlife habitat present is minimal and consist of crops, mowed lawn, and ornamental plantings. The project corridor does not have substantial resources for wildlife. Wildlife habitat, the types of wildlife expected to be present, and the impacts to these resources are discussed below.

#### 4.6.2.1 Habitat in the Project Corridor

Land use in the corridor is primarily developed or under agricultural production and thus has limited wildlife value. Generally, the habitat present is associated with the various streams that pass through the corridor or successional agricultural land that is no longer in production. Both the riparian habitat associated with the streams and the successional agricultural land located in the project corridor are dominated by invasive species. Below is a discussion of the wildlife habitat located in the project corridor. [Table 4-7](#) summarizes the locations and attributes of the larger habitat areas.

Table 4-7: Wildlife Resources in Project Corridor

Location	Available Habitat/Resource	Perennial Water Available	Animals Most Likely Present
adjacent to the north side of Union Road and extending approximately 450 north (east side)	Early successional agricultural field located on east side of Rt 47, dominated by invasive species.	no	small mammals
300 feet north of Rainsford Drive	Open water detention pond located on east side of Rt 47, intermittent unnamed tributary to South Branch Kishwaukee River, and wetland located on west side (INHS Wetland 3). Wetland and tributary dominated by cattails and reed canary grass.	no	small mammals, amphibians, turtles
500 feet north of Talamore Blvd	Intermittent tributary to South Branch Kishwaukee River with narrow band of riparian habitat dominated by scrub/shrub on both east and west sides of Rt 47 (INHS Waters of US W1).	yes	small and large mammals, amphibians, turtles, birds
500 feet north of Talamore Blvd, extending for 1,000 feet north	Early successional agricultural field located on east side of Rt 47, dominated by invasive species. Adjacent to tributary to South Branch Kishwaukee River at Sta. 405, area includes INHS Wetlands 6 and 9.	yes	small mammals, birds
850 feet north of Ackman Rd	Tributary to Kishwaukee Creek with narrow band of riparian habitat dominated by scrub/shrub on west side of Rt 47, on east side by reed canary grass (INHS Waters of US W2).	yes	small and large mammals, amphibians, turtles, birds
Conley Rd	Tributary to Kishwaukee Creek on west side of Rt 47, narrow band of riparian habitat dominated by scrub/shrub (INHS Waters of US W3). IDOT data indicates vehicular/animal crashes have occurred here.	yes	small and large mammals, amphibians, turtles, birds
South of Foster Rd	Early successional agricultural field located on east side of Rt 47, dominated by invasive species (INHS Wetland 12).	no	small mammals, birds
600 feet south of Foster Road extending 400 feet north	Early successional agricultural field located on east side of Rt 47, dominated by invasive species. Includes INHS Wetland 17.	no	small mammals, birds
400 feet north of Foster Road extending 400 feet north	Early successional agricultural field located on east side of Rt 47, dominated by invasive species. Includes INHS Wetland 20. Adjacent to Kishwaukee River.	yes	small and large mammals, amphibians, turtles, birds
550 feet south of Ballard Rd	Kishwaukee River with narrow band of riparian habitat dominated by scrub/shrub and low quality woodland on both the east and west sides of Rt 47 (INHS Waters of US W6).	yes	small and large mammals, amphibians, turtles, birds
450 feet south of Rt 176 (East Leg)	IDOT data indicates vehicular/animal crashes have occurred here.	no	small and large mammals
adjacent to the northeast side of Rt 176 (East Leg) to Pleasant Valley Road, east side	ADID wetland K1008 located in northeast corner of intersection provides mosaic of wetland and forested habitats, portions of which have been identified as having high habitat value (INHS Wetlands 28, 32, 61). Wetlands also located in southwest corner of intersection. IDOT data indicates vehicular/animal crashes have occurred here.	yes	small and large mammals, amphibians, turtles, birds

## Chapter 4 Environmental Resources, Impacts, and Mitigation

Location	Available Habitat/Resource	Perennial Water Available	Animals Most Likely Present
300 feet south of Rt 176 (West Leg)	Unnamed intermittent tributary to Kishwaukee River with narrow band of riparian habitat dominated by scrub/shrub on the west side of Rt 47 and reed canary grass on the east side (INHS Wetland 45, Waters of US W11).	yes	small mammals, amphibians, turtles, birds
Rt 176 (West Leg)	A complex of wetlands identified in the ADID study as K984 is associated with an unnamed tributary of the Kishwaukee River, south of Rt 176, approximately 3/4 mile west of Rt 47. These wetlands, identified as ADID high habitat value wetlands, have forested habitat interspersed with open water wetlands. (INHS Wetlands 42 and 43, Waters of US W9 and W10.)	yes	small and large mammals, amphibians, turtles, birds
1,000 feet north of Rt 176 (West Leg)	Wetland complex that does not provide high quality habitat but includes scrub/shrub intermixed with wetlands. Could provide wildlife corridor to wetlands located west of project corridor. (INHS Wetland 46, ADID Wetland K925)	no	small and large mammals, birds
beginning 2,200 feet south of Lucas Road and extending to 250 feet south of Lucas Road	This location contains scrub/shrub habitat associated with fallow agricultural fields and a wetland complex (INHS Wetlands 46, 47, 48, and 49) on the west side of Rt 47. Property on the east side contains tree cover. This complex provides habitat not as high quality as ADID wetlands, but could be significant in an area dominated by development and agriculture. May provide a wildlife corridor to wetlands located west of the project corridor and woodlands located east. IDOT data indicates vehicular/animal crashes have occurred here.	yes	small and large mammals, amphibians, turtles, birds
adjacent to north side of Hercules Road, and extending 550 feet north	Early successional agricultural field located on west side of Rt 47, dominated by invasive species. Area includes INHS Wetland 56 and is adjacent to ADID Wetland K692.	no	small mammals, birds
350 feet south of Novean Parkway	Unnamed tributary to Kishwaukee River includes habitat composed primarily of wet meadow with scattered shrubs and trees, on east side of Rt 47 (INHS Wetland 56, Waters of US W12). IDOT data indicates vehicular/animal crashes have occurred here.	yes	small and large mammals, amphibians, turtles, birds
350 feet north of Novean Parkway, extending to 450 feet south of Dieckman St.	Headwaters of Kishwaukee River, located on the east and west sides of Rt 47, include habitat composed primarily of wet meadow interspersed with shrubs and trees (INHS Wetland 57, Waters of US W6).	yes	small mammals, amphibians, turtles, birds

The project corridor crosses the Kishwaukee River headwaters, the Kishwaukee River, four unnamed tributaries to the Kishwaukee River, and the Kishwaukee Creek in two locations.

Within the project corridor, wildlife habitat associated with the Kishwaukee River and its tributaries is low quality. Habitat associated with the headwaters, located near Dieckman Street, is composed primarily of wet meadow with interspersed shrubs and trees. [This area is noted by Illinois Natural History Survey (INHS) as Wetland 57 and Waters of US W6; it also corresponds to ADID Wetland K663.] The project corridor also crosses the Kishwaukee River at approximately 650 feet north of Foster/Union Road, where there is only a narrow band of riparian habitat dominated by scrub shrub and low quality woodlands.

For the other crossing locations, upland species composition is dominated by low quality species such as *Phalaris arundinacea* (reed canary grass), *Rhamnus* species (buckthorn), *Acer negundo* (box elder), *Cornus racemosa* (gray dogwood), and *Lonicera* species (honeysuckle).

The largest successional agricultural field is located between 250 and 2,200 feet south of Lucas Road, and is associated with wetland habitat (INHS Wetlands 46, 47, 48 and 49). This upland/wetland habitat is a large scrub/shrub complex located on both the east (50 acres) and west (60 acres) sides of IL 47. Multiple parcels of land in this area are no longer under agricultural production and have been allowed to naturalize. (Historical aerial photographs indicate most of the parcels, with the exception of the wettest located in the north, were under agricultural production in 1988. By 1999, agricultural production was no longer occurring on most of it.) This area likely provides substantial wildlife habitat due to the relatively large size and habitat diversity. Additionally, this area may provide a wildlife corridor to wetlands located west of the project corridor and woodlands located east of the corridor. The properties are privately owned so there is no permanent protection to ensure that this habitat remains undeveloped.

There are several other isolated areas of higher quality habitat in the project corridor. At the intersection of IL 176 (East Leg), a large wetland identified in the ADID study as ADID K1008 is located on the northeast side of the intersection. It contains a mosaic of wetland and forest habitat and a portion of it has been identified by the McHenry County ADID study as having high habitat value. (Portions of ADID wetland K1008 have been delineated by INHS. The INHS wetlands that correspond with this area are Wetlands 27, 28, and 61.)

Another wetland complex identified by the McHenry County ADID study as having high habitat value is wetland K984, located adjacent to IL 176 (West Leg). This complex is associated with an unnamed tributary to the Kishwaukee River. The tributary has not been channelized in this vicinity and a fair amount of forested habitat is associated with it, interspersed with open water habitat. (The INHS wetlands that correspond with this area are Wetlands 42 and 43, the INHS Waters of the U.S. that correspond with this area are Waters 9 and 10.)

Impacts to wildlife habitat in the project corridor, including impacts to the higher quality areas discussed here, are discussed in *Section 4.6.2.4 - Impacts to Wildlife and Habitat in Project Corridor*.

### **4.6.2.2 Wildlife Present in Project Corridor**

Wildlife present in the project corridor is represented by species that are adapted to suburban or agricultural environments and are common, disturbance tolerant species. The project corridor is within the eastern half of the Mississippi flyway, which is used by neotropical migrant birds in the United States and Canada. The species known to inhabit the project corridor are not sensitive and are common. In addition to birds, the project corridor is utilized by various mammals, reptiles, and amphibians.

### **4.6.2.3 Wildlife and Habitat in Project Corridor**

Below is a discussion of the proposed project's impact on wildlife and habitat in the project corridor.

#### ***Agricultural Land***

Agricultural land contains minimal habitat but can provide food and shelter to deer, raccoon, and opossum. The minimal amount of impacts to agricultural land is not anticipated to result in measurable impacts to any species present.

#### ***Urban Land***

Urban lands are located primarily at the northern and southern ends of the project corridor. The proposed improvements would result in impacts to 13.33 acres of urbanized land. Urbanized areas are habitat for species that can tolerate disturbances such as raccoon, opossum, and more common species of birds. The minimal amount of impacts to urban land is not anticipated to result in measurable impacts to these species, especially considering their tolerance to disturbance.

#### ***Riparian Habitat***

The proposed improvements would result in impacts to 0.71 acres of riparian habitat. Riparian areas can provide important habitat to wildlife due to the presence of a diversity of vegetation and water. Additionally, these areas can act as wildlife corridors. The riparian habitat in the project corridor is generally small and fragmented, and therefore provides only minor benefits. Wildlife expected to use riparian habitat in the project corridor include deer, fox, raccoon, opossum, muskrat, beaver, and song birds. The proposed improvements would not fragment any existing riparian habitat, but would only result in small losses at the edge of the existing habitat, immediately adjacent to IL 47. Because the proposed improvements would result in a minimal amount of impacts to riparian habitat, it is not anticipated that measurable impacts would occur to any species utilizing this habitat.



### *Forested Areas*

The proposed improvements would not impact any forested or woody riparian habitats larger than 20 acres, nor would it fragment forested parcels. The proposed improvements would impact 2.33 acres of low quality mix of scrub/shrub and forested land immediately adjacent to the IL 47 corridor. Wildlife within these areas may consist of deer, fox, raccoon, and various species of birds. Due to the low quality of this habitat adjacent to IL 47, and the fact that only small losses would occur at the edge of the existing habitat, it is not anticipated that measurable impacts would occur to any species utilizing this habitat.

### *Successional Agricultural Land*

The proposed improvements would impact 27.94 acres of successional agricultural land that is currently providing wildlife habitat. Many of the successional fallow lands are small and scattered throughout the project corridor with the exception of the largest field that is located between 2,200 feet south of Lucas Road and 250 feet south of Lucas Road (discussed above in Section 4.6.2.1 - *Habitat in Project Corridor*). Impacts to this successional field will be 3.17 acres (included in the 27.94-acre total). Due to the low quality of most of the successional agricultural habitat due to its fragmented condition, small size, and close proximity to IL 47, it is not anticipated that measurable impacts would occur to any species utilizing this habitat. Impacts due to the loss of 3.17 acres at the field located south of Lucas Road would include loss of breeding and foraging wildlife habitat. This loss would not be substantial because it is contained at the edge of the roadway and is therefore less suitable than more interior habitat.

### *Wetland Habitat*

Wetland habitat in the project corridor is primarily of low quality due to poor vegetative diversity, with the exception of the two higher quality ADID wetlands located at the intersections of IL 47 and IL 176. These two wetlands, ADID Wetlands K1008 and K984, have high habitat value; the project will have 0.67 acres and 0.14 acres of impacts to these wetlands, respectively. With regards to most of the wetland habitat in the project vicinity, it is of low quality, has low vegetative diversity, and is in close proximity to IL 47, it is therefore anticipated that there will be no substantial impacts to any species because this habitat is most likely under-utilized. With regards to the two ADID high habitat quality wetlands, the portions of these wetlands that will be impacted are adjacent to IL 47 and are therefore already degraded by this proximity, therefore impacts to this habitat are not expected to be substantial either.

### *Detention Ponds*

The proposed improvements would not impact any retention or detention ponds in the project corridor.

### 4.6.2.4 Vehicle/Wildlife Crashes in Project Corridor

In order to determine the areas of animal/vehicle collisions, data was obtained from IDOT on animal crashes that have occurred on IL 47 between 2008 and 2012. In conjunction with habitat assessments made via aerial photography and a site reconnaissance, this data was combined to determine the areas most likely to be used by animals for crossing the road.

Wildlife crossings under IL 47 are recommended and will be further studied during the final engineering design. The crossings recommended at this time consist of openings 4.0 feet wide by 5.0 feet high placed below ground level so that soil and other natural ground components can be added to bring the bottom of the crossing up to grade level. These crossings would accommodate small mammals and amphibians, but it is unlikely that deer will be able to utilize them due to their size. Enlarging the opening of the crossing, is not feasible as raising the profile to accommodate larger crossings would result in the need for additional right of way and increased wetland impacts. Further studies during final design may be able to identify locations where the crossings can be made large enough to accommodate deer. In any event, the length of the crossings would be determined by the width of the embankment, but in most cases would be slightly less than 100 feet. In most instances, the crossings would be placed adjacent and parallel to box culverts or bridges at stream crossings. The wildlife crossings would be raised slightly above the low flow line so they would be relatively dry during low flow periods.

There is one location for wildlife crossings that is not be associated with a nearby creek or river. This location, 100 feet south of Conley Road, should be designed for small mammals. IDOT data on animal crashes indicates this location has historically experienced animal crashes.

**Table 4-7** summarizes the larger wildlife habitat available in the project corridor and includes sections of roadway that have the highest potential for increased animal-vehicle collisions. **Table 4-8** indicates locations for recommended crossings and the types of animals that are expected to utilize them. The installation of wildlife crossings should serve to minimize the number of vehicle/wildlife crashes.

Table 4-8: Potential Wildlife Crossings

Location	Description	Wildlife Crossing
850 feet north of Ackman Rd	Tributary to Kishwaukee Creek culvert should be designed to promote amphibian and small mammal crossings	Wildlife crossing can be placed south of and adjacent to culvert for Kishwaukee Creek.
100 feet south of Conley Rd	IDOT animal crash data indicates a large mammal crossing should be considered here	Wildlife crossing can be placed south of Conley Road.
650 feet north of Union/Foster Rd	Accommodations for amphibians, small mammals, and large mammals should be considered. A large mammal crossing could be installed at Station 531, or a Kishwaukee River bridge could be designed to accommodate large mammals. The Kishwaukee River bridge should promote amphibian and small mammal crossings. The presence of the Iowa darter requires natural riverine conditions at the Kishwaukee River.	Wildlife crossing can be placed south of Kishwaukee River bridge.
100 feet south of relocated Pleasant Valley Rd	IDOT animal crash data indicates a large mammal crossing should be considered here. May be installed in conjunction with proposed drainage culvert at this location.	Wildlife crossing can be placed south of and adjacent to culvert.
900 feet south of Lucas Rd	IDOT animal crash data indicates a large mammal crossing should be considered here. May be installed in conjunction with proposed drainage culvert at this location.	Wildlife crossing can be placed north of and adjacent to culvert.
600 feet north of Hercules Rd	IDOT animal crash data indicates a large mammal crossing should be considered here. Should be placed outside of existing wetland.	Wildlife crossing can be placed south of and adjacent to culvert.
450 feet south of Dieckman St	Accommodations for amphibians, small mammals, and large mammals should be considered. A Kishwaukee River bridge could be designed to accommodate large and small mammals. The presence of the Iowa darter requires natural riverine conditions at the Kishwaukee River.	Wildlife crossing can be placed north of and adjacent to culvert for Kishwaukee River.

**4.6.3 Threatened and Endangered Species**

Threatened and endangered species are protected under the Endangered Species Act (ESA) (16 U.S.C. 1531-1544, 1973). The ESA provides a program for the conservation of threatened and endangered plants and animals and their habitats. The law requires federal actions, including actions authorized or funded by a federal agency, to ensure that those actions are not likely to jeopardize the continued existence of any listed species, or result in the destruction or adverse modification of designated critical habitat of such species.

Threatened and endangered species identified by the State of Illinois are protected by the Illinois Endangered Species Protection Act. Consultation for the protection of state-listed species is required by 17 Illinois Administrative Code (IAC) Part 1075.

4.6.3.1 Federally Listed Species

Federally-listed threatened and endangered species assessments were conducted through the use of the U.S. Fish and Wildlife Service’s (USFWS) web-based endangered species list by county, in the Midwest. The website is located at <http://www.fws.gov/midwest/endangered/lists/illinois-cty.html>.

Based on the USFWS website, three federally-protected species are known to occur within McHenry County. Additionally, the project corridor was assessed for the potential for the presence of *Myotis sodalis* (Indiana bat). There is no habitat for these species present in the project corridor as shown in **Table 4-9**.

**Table 4-9: Federally Listed Threatened and Endangered Species in Project Vicinity**

Species	Habitat Preferences	Habitat Present in Corridor	Status
<i>Platanthaera leucophaea</i> (eastern prairie fringed orchid)	Moderate to high quality wetlands, sedge meadows, marshes, and mesic to wet prairies.	no	Federally Threatened
<i>Lespedeza leptostachya</i> (prairie bush clover)	Dry to mesic prairies with gravelly soil.	no	Federally Threatened
<i>Myotis sodalis</i> (Indiana bat)	Caves, mines (hibernacula); small stream corridors with well-developed riparian woods; upland forests (foraging).	no	Federally Endangered
<i>Myotis septentrionalis</i> (northern long-eared bat)	Caves, mines (hibernacula); live or dead trees, woods/forests	no	Federally Proposed as Endangered

IDOT BDE, Environment Section, Natural Resources Unit prepared a Biological Resources Review (BRR) memo dated July 23, 2010. The BRR concluded that because there are no mesic to wet prairies in the project corridor, high quality emergent wetlands (i.e., with FQI more than 20 or mean C 3.5 or higher), there is no suitable habitat for the eastern prairie fringed orchid. Because there are no dry mesic prairies with gravelly soil in the project corridor, there is no suitable habitat for the prairie bush clover. A copy of this BRR is contained in **Appendix A**.

A second BRR dated August 30, 2011 was prepared for additional right of way. This review also determined that there is no suitable habitat for the eastern prairie fringed orchid or the prairie bush clover within the extended roadway footprint. A copy of this BRR is contained in **Appendix A**.

A blue ribbon study was performed in cooperation with IDOT, USFWS, and INHS. A USFWS letter dated April 10, 2008 advised that the blue ribbon study that included a two-year effort to capture Indiana bats in northeastern Illinois resulted in a determination that the Indiana bat is not likely present in northeastern Illinois. The letter further stated that transportation projects would not be required to consult for a period of five years as these projects are cleared from Indiana bat related Section 7 responsibilities until the summer of 2012. USFWS extended the exception for transportation projects from Indiana bat consultation in a letter

dated October 23, 2012. No specific end of the clearance from consultation was stipulated in this second letter. Based on the discussion above, IDOT has determined that the project is not likely to adversely affect the Indiana bat.

The IDOT BDE, Environment Section, Natural Resources Unit reviewed this project and determined that this project will not affect the northern long eared bat. This determination was made based upon the lack of suitable habitat in the project area. The only trees present are either residential landscape trees or are sparsely vegetated tiny wooded areas. In addition, this area is developing from a rural residential and agricultural area into a commercial/residential area with increasing populations.

#### 4.6.3.2 State-Listed Species

Coordination with the Illinois Department of Natural Resources (IDNR) was started through the IDNR Ecological Compliance Assessment Tool (EcoCAT). An EcoCAT was submitted to IDNR on September 24, 2008 and several state protected species were identified in the project vicinity. These species are listed in **Table 4-10**. (A copy of the EcoCAT report can be found in **Appendix A**.)

**Table 4-10: State Listed Threatened and Endangered Species in Project Vicinity**

Species	Habitat Preferences	Habitat Present in Corridor	Status
<i>Ixobrychus exilis</i> (least bittern)	Freshwater or brackish marshes with tall emergent vegetation.	yes	State Threatened
<i>Xanthocephalus xanthocephalus</i> (yellow-headed blackbird)	Breeds in prairie wetlands and along marshes where tall reeds and rushes are present. Forages in the wetlands and in surrounding grasslands and croplands.	yes	State Endangered
<i>Buteo swainsoni</i> (Swainson's hawk)	Found in open country such as grasslands, scrub/shrub, and agricultural areas.	yes	State Endangered
<i>Grus Canadensis</i> (sandhill crane)	Primarily found in open freshwater wetlands	yes	Delisted in 2009
<i>Emydoidea blandingii</i> (Blanding's turtle)	Found in shallow, marshy waters and ponds.	yes	State Endangered
<i>Etheostoma exile</i> (Iowa darter)	Found in sluggish streams or marshes with clear water, often found in areas with sand or organic matter substrates or with dense aquatic vegetation.	yes	State Threatened
<i>Alasmidonta viridis</i> (slippershell mussel)	Found in small to medium-sized streams with flowing water, sand or gravel bottoms.	possibly	State Threatened

IDNR responded to the EcoCAT submittal on September 29, 2008 and requested that IDOT conduct fish surveys due to the presence of the Iowa darter. The Illinois Natural History Survey conducted fish surveys on July 15, 2009 in the project corridor. Fish sampling was conducted at three locations. The first location was within the Kishwaukee River south of US 14. The second was

within the Kishwaukee River south of Ballard Road. The third one was within an unnamed tributary of the South Branch Kishwaukee River between Conley and Reed Roads. Thirteen Iowa darters were collected at Site 1 and six were collected at Site 2.

The Illinois Natural History Survey reported that the state-threatened *Erimystax x-punctatus* (gravel chubs), state-endangered *Notropis heterolepis* (blacknose shiners), and state-endangered *N. texanus* (weed shiners), are known to occur within the watershed. None were found during the fish survey.

In order to avoid impacts to the state threatened Iowa darter (*Etheostoma exile*), no in stream work shall be conducted from April 1 through June 15 of any construction year at the following locations:

- Site 1: Kishwaukee River at IL 47, approximately 200 feet to 600 feet south of Dieckman Road
- Site 2: Kishwaukee River at IL 47, approximately 650 feet north of Foster/Union Road

A decline in water quality has the potential to impact the Iowa darter. As discussed below in *Section 4.7.2 – Water Quality (Operational Impacts)*, it is expected that the stormwater management improvements would result in an overall improvement in water quality over existing conditions. Drainage of stormwater from the inside lanes to the center median where vegetation will remove contaminants, the installation of vegetated ditches, and the installation of bioswales will all result in the treatment of stormwater before it exits the right of way. Based on the commitment that no in stream work is conducted during the spawning season at the two sites identified as having Iowa darters, the proposed improvements are expected to have minimal impacts on this species.

The IDOT BDE determined that the project will not affect the state-protected species *Ixobrychus exilis* (least bittern), *Xanthocephalus xanthocephalus* (yellow-headed blackbird), *Buteo swainsoni* (Swainson's hawk), *Grus canadensis* (sandhill crane), *Emydoidea blandingii* (Blanding's turtle), and *Alasmidonta viridis* (slippershell mussel) in memos, labeled Biological Resource Review, dated July 23, 2010, August 30, 2011, and September 13, 2013 (please see appendix A). IDNR closed consultation via email (emails dated August 4, 2010 and November 29, 2010, see Appendix A). Although habitat for these species may be found in the project vicinity, habitat is not found immediately adjacent to IL 47 where the proposed improvements will occur.

### 4.6.4 Invasive Species

Invasive species are defined by the Federal Executive Order 13112 as “an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health”. McHenry County is the eighth leading county in the State of Illinois with the most invasive species. Per the Early Detection and Distribution Mapping System ([http://www.eddmaps.org/tools/statereport.cfm?id=us\\_il](http://www.eddmaps.org/tools/statereport.cfm?id=us_il)), the invasive species most likely to occur in McHenry County include:

- *Rosa multiflora* (multiflora rose)
- *Elaeagnus umbellata* (autumn-olive)
- *Lonicera maackii* (Amur honeysuckle)
- *Melilotus officinalis* (yellow sweet clover)
- *Daucus carota* (Queen Anne's lace, wild carrot)
- *Stellaria media* (common chickweed)
- *Verbascum thapsus* (common mullein)
- *Dactylis glomerata* L. (orchardgrass)
- *Allium vineale* (wild garlic)
- *Bromus tectorum* (cheatgrass)
- *Capsella bursa-pastoris* (shepherd's-purse)
- *Cerastium vulgatum* (common mouse-ear chickweed)
- *Eragrostis cilianensis* (stinkgrass)

Per the Illinois Noxious Weed Law, a noxious weed is “any plant which is determined by the Director, the Dean of the College of Agriculture of the University of Illinois and the Director of the Agricultural Experiment Station at the University of Illinois, to be injurious to public health, crops, livestock, land or other property” (505 ILCS 100/2).. Per the U.S. Department of Agriculture Natural Resource Conservation Service state-listed noxious weeds (<http://plants.usda.gov/java/noxious?rptType=State&statefips=17>) and the Illinois Noxious Weed Law, the following are noxious weeds and may be found in McHenry County per *Plants of the Chicago Region* (Swink & Wilhelm, Morton Arboretum, Lisle, IL 1994)

- *Ambrosia artemisiifolia* L. (common ragweed)
- *Ambrosia trifida* L. (giant ragweed)
- *Cannabis sativa* L. (marijuana)
- *Cardus nutans* (musk thistle)
- *Cirsium arvense* (Canada thistle)
- *Sonchus arvensis* (field thistle)

In addition to the above designated species, the following species are located within McHenry County and have the potential to be invasive.

- *Alliaria petiolata* (purple loosestrife)

- *Dipsacus* species (teasel)
- *Lonicera tatarica* (tartarian honeysuckle)
- *Phalaris arundinacea* (reed canary grass)
- *Rhamnus* species (buckthorn)

In addition to plant species, the project corridor is located within the Illinois Department of Agriculture quarantine area for *Agrilus planipennis* (emerald ash borer), and this insect has been confirmed in McHenry County (<http://www.agr.state.il.us/eab/>).

Construction of the proposed improvements may result in conditions that would allow for the establishment or expansion of populations of invasive species. Many of the invasive species are already occurring within the project corridor. Vegetative clearing and ground disturbances can create conditions that promote the establishment or spread of invasive species.

IDOT has developed Special Maintenance Provisions to combat invasive plant species. IDOT provisions include the use of herbicides and other measures to control invasive species within the roadway rights of way. These provisions also apply during construction activities. Measures that may be instituted to manage invasive species during construction include immediate seeding of bare soil, cleaning of construction equipment prior to entering areas near sensitive habitats, and active management of invasive plants that become established during construction. Measures that may be instituted to manage invasive species after construction include the use of herbicides, manual cutting, and timely mowing of rights of way. Utilization of these measures would minimize the potential for invasive species to become established.

Landscaping and erosion control plans developed for the proposed corridor will not use species listed as invasive species or noxious weeds. In areas adjacent to natural areas, such as the Kishwaukee River located in the northern portion of the project corridor, if invasive species and/or noxious weeds are found in or adjacent to construction areas, precautions will be taken to ensure the proposed improvements do not result in invasive species and/or noxious weed impacts the adjacent natural area.

### 4.6.5 State Designated Lands

State Designated Lands include Illinois Natural Areas, Land and Water Reserves, and Nature Preserves. There are no State Designated Lands in the project corridor.

## 4.7 Water Resources and Aquatic Habitats

### 4.7.1 Water Resources

The project corridor is located within the Kishwaukee River drainage basin, hydrologic unit code (HUC) 0709006. The INHS conducted wetland delineations in 2009, June 2011, and June 2013. In their reports *IL 47 (FAP 326) from Reed Road to US 14 - Addendum A* (August 2011) and *IL 47 (FAP 326) Addendum B Reed Road to US 14* (August 2013) the INHS reported 13 streams or creeks and one pond in the project



corridor. In addition to the 14 water resources identified by INHS, AECOM identified an additional location where an unnamed tributary to Kishwaukee Creek crosses the southern portion of the project corridor. The streams and ponds located in the project corridor are summarized in [Table 4-11](#) and their locations can be found in [Exhibit 4-1](#) (located in the back of this document).

The project corridor contains 14 streams that are crossed through the length of the project corridor. The Kishwaukee River is crossed twice, once in the southern portion of the project corridor as it flows westward, and again in the northern portion of the project corridor where it flows eastward. In the northern portion of the corridor, the Kishwaukee River currently crosses IL 47 approximately 400 feet south of Dieckman Street via 6 x 5 foot box culvert (see sheet 14 of [Exhibit 4-1](#), located in the back of this document). At this location, the river flows from the west, crosses under IL 47, and then runs parallel and adjacent to IL 47 southward along the east side of the roadway. A 700 foot segment of the river on the east side of IL 47 will have to be shifted towards the east to accommodate the proposed improvements. The existing box culvert will be replaced by a 10 x 6 foot box culvert slightly south of the existing culvert's location in order to better align the crossing of the Kishwaukee River. A retaining wall will be installed along the roadway at this location in order to minimize river and wetland impacts, and the roadway within the retaining wall limits will be drained via a proposed 30 inch diameter storm sewer. A hydrodynamic separator will be provided at the downstream end of this storm sewer system to improve water quality.

The Kishwaukee River in the project corridor has been given a biological rating of C for biotic integrity by the IDNR. Per fish surveys conducted by the INHS in July 2009, the Kishwaukee River at both the south and north crossings contains the Iowa darter.

In addition to the Kishwaukee River, IL 47 crosses the South Branch of the Kishwaukee River, Kishwaukee Creek, and several unnamed tributaries to these water resources in the project corridor.

A total of 1.49 acres of streams will be impacted by the project. Included in this total is 0.37 acres of aquatic habitat in the Kishwaukee River.

Impacts to the streams are not avoidable due to the fact that the proposed road improvements would be built upon an existing corridor and the streams are either adjacent to or crossing the roadway. Impacts were minimized by reducing the median to 30 feet, constructing curb and gutter south of Hercules Road, bringing the sidewalks and shared use paths closer to the roadway, utilizing a retaining wall at the northern Kishwaukee River crossing, and reducing the standard 10 foot shared use path to eight feet, all of which reduce the width of the right of way and minimized impacts. Impacts would be further minimized by the use of bridges or culverts. Bridges and culverts would be oversized so that the flow is not constricted. Culverts would be oversized and set one foot below the bottom of the flow line to allow silt to accumulate and provide a natural stream bottom.

Table 4-11: Streams and Ponds in Project Corridor

INHS Site No.	Location	Comments	NWI Code	Description	Community Type	Linear Feet <sup>2</sup>	Impacts (linear feet)	Impacts (acres)	Meets USEPA water quality standards	T&E Species Present	Riffles/ Pools Present <sup>3</sup>	Mussels Present <sup>3</sup>	Water Type <sup>4</sup>
	250 feet north of Rainsford Dr	West side of Rt 47 primarily		Unnamed tributary to South Branch Kishwaukee River	stream	200	120	0.03	yes				NRPW
1	350 feet north of Talamore Blvd			Unnamed tributary to South Branch Kishwaukee River	stream	720	150	0.09	yes		yes/yes	yes	RPW
2	850 feet north of Ackman Rd			Kishwaukee Creek	stream	660	120	0.40	yes		no/no	no	RPW
3	across from Conley Rd	West side of Rt 47 only		Kishwaukee Creek	stream	110	50	0.07	yes		no/no	no	RPW
4/14	50 feet north of Foster Rd	Pond on east side of Rt 47	freshwater pond	excavated quarry	deepwater aquatic habitat			0	yes				Isolated
5	400 feet to 650 feet north of Foster/Union Rd	East of Rt 47 only		Does not appear on USGS topo map, ditch feeds into Kishwaukee River	stream	540	450	0.24	yes		no/no	no	RPW

<sup>2</sup> Linear feet estimated based on Environmental Survey Request project limits

<sup>3</sup> As determined by the INHS Wetland Reports

<sup>4</sup> As determined by the INHS/AECOM, Waters type:

RPW- relatively permanent waters that flow directly or indirectly to traditionally navigable water

Isolated – waters isolated from Waters of the US

NRPW – non-RPWs that flow directly or indirectly to traditional navigable waters

**Chapter 4 Environmental Resources, Impacts, and Mitigation**

INHS Site No.	Location	Comments	NWI Code	Description	Community Type	Linear Feet <sup>2</sup>	Impacts (linear feet)	Impacts (acres)	Meets USEPA water quality standards	T&E Species Present	Riffles/ Pools Present <sup>3</sup>	Mussels Present <sup>3</sup>	Water Type <sup>4</sup>
6	650 feet north of Foster/Union Road		R2OWHx	Kishwaukee River	stream	810	240	0.07	no	lowa darter	no/no	no	RPW
7	On Rt 176 East Leg, north side of road, 1,000 feet east of Rt 47			Does not appear on USGS topo map, ditch feeds into wetland	stream	310	270	0.10	yes		no/no	no	NRPW
8	On Pleasant Valley Rd, north and side, 2,000 feet west of Rt 47	Waters 8, 9, 10, and 11 are all part of the same system. Waters 8, 9, and 10 are outside of the project limits.		Unnamed intermittent tributary to the Kishwaukee River	stream	50		0	yes		no/no	no	NRPW
9	On Pleasant Valley Rd, north side, 3,200 feet west of Rt 47		stream		830	0	yes	yes/yes	no	NRPW			
10	On Pleasant Valley Rd, north and side, 2,600 feet west of Rt 47		stream		2,650	0	yes	yes/yes	no	RPW			
11	350 feet south of IL Rt 176 (West Leg)				stream	230	180	0.11	yes		no/no	no	RPW
12	250 feet north of Hercules Rd	West side of Rt 47 only	PEMC	Unnamed tributary to Kishwaukee River	stream	110	60	0.01	yes		no/no	no	RPW
13	East side of Rt 47 across from Hawthorn Way	East side of Rt 47 only		Unnamed tributary to Kishwaukee River	stream	350		0	yes		no/no	no	NRPW
6	200 feet to 600 feet south of Dieckman Street		R2OWHx	Kishwaukee River	stream	700	700	0.02	no	lowa darter	no/no	no	RPW

The USEPA indicates that the Kishwaukee River did not meet water quality standards in 2014. Per the IEPA's *Illinois Integrated Water Quality Report and Section 303(d) List-2014*, in the project corridor, this watercourse does not meet water quality standards for fish consumption or aquatic life. This segment of the Kishwaukee River (IL\_PQ-13) is impaired for fish consumption due to mercury and polychlorinated biphenyls (PCBs) and for aquatic life due to low dissolved oxygen and excessive sedimentation/siltation. Three monitoring locations have been identified in this area. No monitoring data was available for these locations, however.

The other streams and tributaries in the project corridor all meet the USEPA's water quality standards.

The INHS discussed aquatic habitat of the streams and ponds [*IL 47 (FAP 326) from Reed Road to US 14 - Addendum A* (August 2011)] and *IL 47 (FAP 326) Addendum B Reed Road to US 14* (August 2013). **Table 4-11** summarizes the habitat community type associated with these streams and ponds, as reported by the INHS.

It is anticipated that Clean Water Act permits will be required for stream crossings. Both a Section 401 permit will be required from the Illinois Environmental Protection Agency (IEPA), as well as a Section 404 permit from the U.S. Army Corps of Engineers (USACE). Permits would be obtained prior to the initiation of any work in these streams, and all permit conditions will be complied with. As part of that permit application, coordination with the USACE and USFWS will take place. All permit conditions will be complied with, including any permit conditions developed for the protection of aquatic or riparian habitat.

### 4.7.2 Generalized Impacts

#### *General Impacts*

The proposed improvements have the potential to impact water quality. Increased erosion and sedimentation during construction can result in an increase in runoff to receiving waters, resulting in elevated suspended solids concentrations. During operations, contaminants such as sediments, metals, oil and grease, and chlorides may occur on roadway surfaces and wash into adjacent streams with stormwater runoff.

The proposed improvements are expanding an existing footprint; water quality impacts as a result of the current road operations are already being experienced in the project corridor. The proposed improvements would result in a small change in the amount of impervious surface, creating additional runoff, but stormwater management improvements would also be included. It is expected that because of the stormwater management improvements, water quality in the receiving streams would actually improve (see discussion below, under *Operational Impacts*).

#### *Construction Impacts*

Impacts to water quality can occur as a result of construction. Grading and earth moving activities, the removal of vegetative cover, and other activities that expose the soils create the potential for erosion during storm events. This erosion in turn has the potential to run

off into streams, causing sedimentation impacts and increased suspended solids. In addition, in-stream construction for the installation of bridges or culverts can increase turbidity by disturbing the stream bottom.

During construction, water quality impacts would be minimized through the use of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP will identify best management practices (BMP) for erosion and sediment control to be used throughout construction. The SWPPP will be developed using guidance from IDOT's Bureau of Design and Environment Manual and Section 280 of IDOT's *Standard Specification for Road and Bridge Construction* (2012). Standard BMPs will require that any in-stream construction or soil disturbing activities near streams be conducted during low or no-flow conditions.

Perimeter sediment control devices, such as silt fencing, would be installed before any soil disturbing activities. Perimeter silt fence, stabilized construction entrances, drainage inlet protection, ditch checks, diversions, sediment traps, and other appropriate BMPs will be used as defined by the SWPPP. The SWPPP will also describe appropriate responses should an accidental spill of hazardous materials occur.

Through the use of BMPs during construction, it is anticipated that there will be only minimal impacts to water quality.

### ***Operational Impacts***

Contaminants, including sediments, metals, oils, grease, and chlorides may occur on roadway surfaces as a result of vehicle operations. These contaminants can be washed from the roadway into adjacent streams during storm events. Additionally, increased impervious surfaces result in greater amounts of stormwater runoff, that may increase the velocity of the stream and increase erosion.

Stormwater management for the proposed improvements has been designed with the intention of minimizing impacts to water quality utilizing BMPs. The inside lanes and shoulders of the roadway would drain to a vegetated median; inlets placed in the median would then drain to outside ditches. Stormwater from the bridge over the Kishwaukee River headwaters, at 200 feet to 600 feet south of Dieckman Street, would be directed towards the ditches, before it is discharged to the Kishwaukee River. Stormwater from the portion of this section of the road that is adjacent to the retaining wall will have a hydrodynamic separator at the downstream end of the storm sewer.

Compensatory storage will be provided for the project throughout the corridor, their specific locations can be found on [Exhibit 4-1](#) (located in the back of this document). Compensatory storage will assimilate the extra stormwater runoff created by the increased impervious surface and prevent flooding.

Studies have indicated that detention basins and vegetated ditches can remove between 50% and 90% of suspended solids from stormwater because solids settle out when the

velocity of the stormwater is reduced<sup>5</sup>. Other pollutants, such as metals, are known to attach to the suspended solids. Furthermore, stormwater detention ponds provide for temporary storage of stormwater runoff and then release it at a controlled rate, thereby minimizing erosion in receiving streams. A detention basin will be provided at the northern end of the project corridor, its location can be found on [Exhibit 4-1](#) (located in the back of this document).

In addition to traditional stormwater management BMPs, bioswales would be installed along the outside ditches where feasible and practical. They would be installed in locations immediately upstream of surface water resources, such as streams and wetlands, to improve water quality prior to discharge to these resources. Bioswales will be developed during the final design, but proposed locations have been identified. [Exhibit 4-1](#) (located in the back of this document), indicates the proposed locations of the bioswales.

It is expected the stormwater management improvements would result in an overall reduction of contaminants that leave the right of way compared to that which is currently being experienced. The project would include several water quality BMPs that are not currently present, including stormwater drainage directed to vegetated medians followed by vegetated ditches, a new detention basin, bioswales, and a hydrodynamic separator. Operational impacts to water quality would therefore be less than is currently being experienced and stormwater runoff quality should be improved as a result of the proposed improvements.

### ***Impacts due to Maintenance Activities***

Maintenance activities associated with roadways includes deicing during the winter months and herbicide spraying for invasive/noxious weeds in the summer. IDOT and the Illinois State Toll Highway Authority use liquid calcium chloride and sodium chloride to deice roadways. The amount of deicing salt that leaves the right of way is dependent on the number and severity of winter storms as well as whether BMPs are present. The Illinois State Toll Highway Authority has installed several miles of bioswales on Interstate 294 and has been conducting studies for two years (2011-2012)<sup>6</sup>. Preliminary study results indicate the bioswales, once established, can remove approximately 50% of chloride from surface water runoff. It is anticipated that other contaminants would also be removed, but those studies are still ongoing.

The proposed stormwater BMPs for the IL 47 improvements would adequately manage the quality of the roadway runoff for total suspended solids and heavy metals. It is

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<sup>5</sup> USEPA, Storm Water Technology Fact Sheet: Vegetated Swales, September 1999. [http://water.epa.gov/scitech/wastetech/upload/2002\\_06\\_28\\_mtb\\_vegswale.pdf](http://water.epa.gov/scitech/wastetech/upload/2002_06_28_mtb_vegswale.pdf)

<sup>6</sup> Miner, James J.; Carr, Keith W.; Bryant, Kathleen E.; Higley, Melinda C.; Ackerman, Jessica R.; Plankell, Eric T.; Long, Colleen M (May 2013) *Year 2 Post-Construction Monitoring at Bioswales Along I-294 in Northern Cook County, Illinois*.

anticipated chloride reduction practices may be a condition of the 401 Water Quality Certification. The chloride reduction effort, as necessary, may include a review of current deicing practices, developing deicing salt application reduction goals, evaluation of alternative de-icing materials or blends, and aligning the chloride reducing practices that best fit roadway maintenance operations.

The impact of chlorides on surface water quality should be reduced through the use of bioswales, discussed above under *Operational Impacts*. Impacts from herbicide application would be minimized through the strict adherence to manufacturer's application instructions, that should minimize the amount of airborne drift or runoff into receiving waters. The IEPA requires a National Pollutant Discharge Elimination System (NPDES) permit if pesticides, including herbicides, are applied near Waters of the U.S. Water quality impacts would be minimized through conformity to permit requirements.

### 4.8 Groundwater Resources

McHenry County depends on groundwater for all of its potable water. All wells within the County obtain groundwater from either locally recharged shallow aquifers or deeper, regionally recharged aquifers (*Water Resources Action Plan*, County of McHenry – Division of Water Resources).

The following geologic, hydrogeologic, and well information was obtained from the Illinois State Geologic Survey's (ISGS) Preliminary Environmental Site Assessment (PESA) (ISGS: 1789, dated Feb. 3, 2009, and updated October 28, 2013 in ISGS 1789V).

#### 4.8.1 Geology

In the southernmost portion of the project corridor, between Reed Road and Foster Road, the project corridor is underlain by Ordovician-age rocks of the Maquoketa Group. Between US 14 and Foster Road, in the northern portion of the project corridor, the uppermost bedrock consists of Silurian-age dolomite of the Racine Formation. Bedrock in the area generally occurs at approximately 200 feet below the ground surface.

Surficial geology south of Foster Road is approximately 200 feet thick. Grayslake Peat, that consists predominantly of sandy peat, overlies more than 20 feet of fine-grained silts and clays of the Equality Formation. The Equality overlies more than 20 feet of the Wedron Group tills.

North of Foster Road, surficial geology ranges from 200 to 300 feet. Approximately 20 to 40 inches of loess overlies more than 20 feet of loamy and sandy tills of the Wedron Group. Lenses of sand and gravel may be present within the Wedron in this area.

In general, the potential impacts of construction projects on the local geology could include seismic or vibratory effects to existing landforms (e.g. unique geologic features, natural landmarks) or significant disturbance to the subsurface stratigraphic sequence, such as effects from extensive deep excavations or mining. The proposed roadway improvements include near surface activities only (no deep excavations), do not require the use of excessive blasting or vibration techniques and will not be conducted in the

vicinity of unique geologic features or natural landmarks. The proposed improvements would therefore not impact area geology in the project corridor.

### 4.8.2 Hydrogeology

The Kishwaukee River crosses IL 47 at two locations within the project corridor. The first location is approximately 650 feet north of Foster/Union Road (INHS Waters of the US number 6); in the area south of this crossing, the drainage direction is generally to the northwest. North of this location surficial drainage is generally towards the south.

The second location is approximately 200 feet to 600 feet south of Dieckman Street (INHS Waters of the US number 6); surficial drainage in the project corridor north of this crossing is generally in a south to southwest direction. South of this crossing, surficial drainage would be towards the north until the drainage divide is reached for this crossing, at that time surficial drainage would be towards the south. The drainage divide is expected to be in the general location of Lucas Road.

Groundwater depth data is available from only one groundwater monitoring station in the vicinity of the project corridor (monitoring station 421747088270701). At this location, groundwater depth varied from approximately 76.2 feet below ground surface to approximately 80.1 feet below ground surface for samples obtained from September 2009 through November 2011.

Excavations for the proposed build options will be near surface (< 10 feet deep) and will not extend to the groundwater table (> 75 feet deep). The proposed improvements would therefore not alter existing hydrogeology in the project corridor.

### 4.8.3 Groundwater Recharge

The project corridor is located in several groundwater recharge potential zones, where Zone 1 indicates the highest potential for groundwater recharge and Zone 7 indicates the lowest potential, as mapped by Keefer and Berg (1990). The groundwater recharge potential moves in and out of Zones 3 and 4 in the southern portion of the project corridor but becomes a Zone 1 at the northern project limit.

Per the McHenry County Water Resources Action Plan, portions of the project corridor are located within recharge areas that have a moderately high potential for aquifer contamination.

The proposed build options include the addition of highway lanes with relatively low areal coverage relative to the extensive recharge zone areas; therefore, the contribution of infiltrating surface water to underlying groundwater resources (if present) will not be significantly diminished. Furthermore, the addition of lanes to an existing roadway will not significantly increase the potential for aquifer contamination beyond the current potential already associated with existing Route 47. Therefore, the proposed improvements would not create or alter existing groundwater recharge areas.



### 4.8.4 Wellhead Protection Areas

There are no known public water wells within 1,000 feet of the project corridor's right of way. There are, therefore, no setback zones as determined by the IEPA, Division of Public Water Supplies.

The project corridor crosses two non-Community Water Supply Phase I Wellhead Protection Recharge Areas (WHPA). The first non-Community Water Supply WHPA is associated with the Crystal Woods Golf Course and is crossed by IL 47 approximately 435 to 2,315 feet south of IL 176 (East Leg). The second non-CSW WHPA is associated with the Red Barn Farm Market at 3500 S. IL 47 and is crossed by IL 47 from approximately 785 to 2,780 feet south of Hercules Road.

The proposed improvements would not impact wellhead protection areas. The proposed improvements do not create any new potential routes for groundwater pollution (e.g., dry wells, borrow pits) or any new potential sources of groundwater pollution (e.g., storage facilities for bulk road oil or de-icing salt). Any minor increases in contaminants in stormwater runoff, the result of increasing the amount of pavement, are not anticipated to result in groundwater pollution because these increases would be minimal and attenuated by stormwater management as discussed in Section 4.7.2 - *Water Quality (Operational Impacts)*.

### 4.8.5 Wells

Per the USEPA, the project corridor is not located within a designated sole source aquifer ([http://www.epa.gov/safewater/sourcewater/pubs/qrg\\_ssamap\\_reg5.pdf](http://www.epa.gov/safewater/sourcewater/pubs/qrg_ssamap_reg5.pdf)).

Per the ISGS, records indicate that water in the project corridor is obtained from sand and gravel at depths ranging from 55 to 345 feet below the surface. The closest public well in Huntley is approximately 2,135 feet west of the southern project limits. The closest public well in Woodstock is approximately one mile to the north-northwest of the northern project limits.

There are several private wells mapped within 200 feet of the project corridor. Most of these wells are located in the rural section of the project corridor and are most likely associated with farmsteads. Other wells not within the ISGS database may be present near the project corridor. The location of the known wells in the project corridor is shown on **Exhibit 4-1** (located in the back of this document).

All water wells that are on or adjoining the build alternatives will be properly capped and abandoned. Consequently, the proposed improvements would not create any new potential routes for groundwater pollution (e.g., dry wells, borrow pits) or any new potential sources of groundwater pollution (e.g., storage facilities for bulk road oil or de-icing salt). The proposed improvements are therefore not anticipated to result in any impacts to any wells, and the project would not be considered a new potential secondary source of groundwater pollution as defined in the Illinois Environmental Protection Act (415 ILCS 5/3.350 and 415 ILCS 5/3.355).

Accordingly, the project would not be subject to compliance with the minimum setback requirements for community water supply wells or other potable water supply wells as set forth in 415 ILCS 5/14, et seq.

### 4.8.6 Groundwater Quality

There is little published data on groundwater quality in the project corridor. One groundwater monitoring station is located approximately one mile west of the IL 47 in the northern portion of the project corridor. This groundwater monitoring station (421747088270701) has had only one sample taken. Laboratory analysis on the sample, taken on November 11, 2011, indicated that all parameters for which analyses were done met Illinois Title 35 groundwater quality standards for Class I, Potable Resource Groundwater.

Groundwater monitoring is occurring at the Village of Marengo's two community supply wells, Well #6 (IEPA ID#: 20193) and Well #7 (IEPA ED#: 00849). Sampling was conducted on Oct. 9, 1985, Nov. 12, 1986, and July 21, 1999. Laboratory analysis of samples indicated that the groundwater met all groundwater quality standards with the exception of an exceedance in manganese in Well #6. This exceedance was not considered a violation, however, because this level is within the normal background levels for manganese found in Illinois. The Village of Marengo is approximately 8.5 miles west of the project corridor.

Per the *Illinois Integrated Water Quality Report and Section 303(d) List-2008; Clean Water Act Sections 303(d), 305(b) and 314; Water Resource Assessment Information and Listing of Impaired Waters*, groundwater in the project corridor is in full support of use.

The proposed improvements would not create any new potential routes for groundwater pollution (e.g., dry wells, borrow pits) or any new potential sources of groundwater pollution (e.g., storage facilities for bulk road oil or de-icing salt). Any minor increases in contaminants in stormwater runoff, the result of increasing the amount of pavement, are not anticipated to result in groundwater pollution because these increases would be minimal and attenuated as stormwater is filtered through the ground. Additionally, the proposed improvements will include measures to protect water quality, such as vegetated ditches, bioswales, and stormwater basins that will reduce the contaminant loads prior to stormwater percolating through the soil. (See *Section 4.7.2 - Water Quality* for a description of the stormwater management.)

## 4.9 Floodplains

Federal Executive Order 11988, Floodplain Management, requires federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of floodplains, and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative.

Floodplains provide numerous values and benefits, including the storage of excess water during storm events, water quality benefits such as the filtering of nutrients and sediments, recharge of groundwater through infiltration, fish and wildlife habitat, and open space/recreational opportunities.

A regulatory floodplain is an area that is subject to flooding during a 100-year frequency storm. Regulatory floodplains within the project corridor are associated with the Kishwaukee River, the South Branch of the Kishwaukee River, Kishwaukee Creek, and several unnamed tributaries to these waterways. All of these floodplains are located within the Kishwaukee River drainage basin, HUC watershed 7090006. The locations of these floodplains are shown on [Exhibit 4-1](#) (located in the back of this document), and summarized in [Table 4-12](#).

**Table 4-12: Floodplain Locations and Impacts in the Project Corridor**

Floodplain Location	Waterway Association	Impacts (acres)	Transverse or Longitudinal Crossing	Location Page, Exhibit 4-1
Talamore Blvd, 350 south to 300 feet north of road	Tributary to South Branch Kishwaukee River	2.30	transverse	2
Ackman Road, 450 feet south of road	Tributary to South Branch Kishwaukee River	0.51	transverse	3
Ackman Road, 700 feet to 850 north of road	Kishwaukee Creek	2.13	transverse	3-4
Union/Foster Roads, adjacent to through 800 feet north of road	Kishwaukee River	7.15	transverse	6-7
Pleasant Valley Road, 450 feet north to 1,450 feet north of road	Intermittent tributary to Kishwaukee River	4.64	transverse	9-10
Hercules Road to Novean Parkway	Unnamed Tributary to Kishwaukee River	1.34	transverse	13-14
Novean Parkway, 350 feet to 700 feet north of road	Kishwaukee River	0.71	transverse	14
IL Route 176, West Leg, 850 feet west of Rt 47	Intermittent tributary to Kishwaukee River	0.05	longitudinal	17
<b>Total</b>		<b>18.83</b>		

Impacts to floodplains would be minimized in several ways:

- stream crossings will be designed to minimize the amount of fill within the floodplain
- road crossings avoided all but one longitudinal crossings
- the one longitudinal crossing is associated with IL 176 and cannot be avoided because IL 176 is longitudinal to the floodplain; impacts are minimal as only 0.05 acres of the very edge of the floodplain will be impacted
- at the Kishwaukee River crossing between Novean Parkway and Dieckman Street, retaining walls are proposed on both the southbound and northbound sides of IL 47. The proposed retaining walls reduced impacts to existing wetlands and floodplains on either side of IL 47.

Compensatory storage will be provided at a 1:1 ratio for fill in the floodplain. For fill that will occur with the floodplain associated with the Kishwaukee River between Novean Parkway and Dieckman Street, compensatory storage will be provided at the southeast corner of IL 47 and Cobblestone Way. The total compensatory storage provided for this impact will be 1.58 acre-feet between the normal and 10-year water surface elevations (WSE's), and 1.83 acre-feet between the 10 and 100-year WSE's. Stormwater detention storage will also be provided to meet McHenry County requirements of maintaining the allowable release rate at 0.15 cubic feet per second/acre for the added impervious area for the 100-year storm event. A total of 1.27 acre-feet of detention storage will be provided within a proposed basin located at the southeast corner of IL 47 and Cobblestone Way (just west of the proposed compensatory storage site).

The project will provide stormwater detention and compensatory storage to mitigate fill in all of the floodplains in the project corridor. Detention would be provided in a combination of oversized pipes with control structures, ditches with ditch checks, and on-site detention basins. Detention volume would be provided for the increased runoff from a 10-year storm event in ditches or oversized pipes. Detention volume for the increased runoff from the 100-year event would be stored in on-site basins. The proposed locations for the on-site basins are identified on [Exhibit 4-1](#) (located in the back of this document), and summarized below.

- 150 feet north of Talamore Boulevard, east side of IL 47
- 750 feet north of Ackman Road, east side of IL 47
- 850 feet north of Foster/Union Road, east side of IL 47
- 1,000 feet south of IL 176 (West Leg), east side of IL 47
- 100 feet south of Cobblestone Way, east side of IL 47

An IDNR, Office of Water Resources permit will be obtained for any construction in the regulatory floodplain (tributary area no less than 1 square mile) prior to any work within the floodplain.

Impacts from the loss of floodplain will not result in increased flood risks due to the incorporation of detention and compensatory storage. Natural and beneficial values, such as wildlife habitat and water quality functions, will not be substantially impacted because these values are already minimized due to the presence of the existing road. The proposed roadway improvements will not promote incompatible floodplain development any more than currently exists.

### 4.10 Wetlands

Executive Order 11990, Protection of Wetlands, requires federal agencies to take action to minimize the loss of wetlands. The USACE regulates the discharge of dredged or fill material into waters of the U.S., including wetlands, pursuant to Section 404 of the Clean Water Act. Wetlands are also protected under the Illinois' Interagency Wetland Protection Act of 1989.

#### *Project Corridor Wetlands*

In order to ensure compliance with Executive Order 11990 and the Clean Water Act, wetland delineations were performed by INHS May 9-12, June 23-24, and Aug 6, 2009. Additional delineations were done in June 2011 and June/July 2013 for select portions of the corridor. In total, INHS investigated 74 locations and determined that 63 of the areas are wetlands. One additional ADID wetland is located in the project corridor that was not investigated by INHS. The locations of the wetland sites identified during all delineation efforts are included in [Exhibit 4-1](#) (located in the back of this document). Most of the wetlands are highly disturbed due to historic farming activities and current urbanization. Several of the wetlands have been identified by McHenry County as ADID wetlands, most for having high functional value (stormwater storage). Two wetlands have been identified as having high habitat value. These two wetlands are:

- INHS Wetlands 27 and 32, coincides with ADID wetland K1008; FQIs range from 0.5 to 17.1; mean Cs range from 0.2 to 3.4
- INHS Wetland 42, coincides with ADID wetland K984, FQI of 10.5, mean C of 2.3

INHS determined that one of the wetlands qualifies as a High Quality Aquatic Resource under USACE Chicago District Regional Permit Program because of its high Mean-C value. INHS assessed Wetland 12 on three occasions, determining the Mean-C value as ranging between 2.3 to 4.0 and the FQI from 6.9 to 15.5. Based on the August 2013 delineation, the Mean C of 4.0 qualifies this wetland as being a High Quality Aquatic Resource.

There are numerous wetlands located within the project corridor. [Table 4-13](#) summarizes these wetlands and provides information on the community type, functions performed, dominant vegetation, and floristic quality as determined by INHS. For those wetlands that were also identified on the National Wetland Inventory map, the table provides the code for the wetland type as defined by Cowardin *et al.* (Cowardin, L. M., V. Carter, F. C. Golet, E. T. LaRoe. 1979. *Classification of wetlands and deepwater habitats of the United States*. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C).

Table 4-13: Wetlands in the Project Corridor

Site No.	NWI Code	Community Type	Area (acre)	>50% <sup>1</sup>	FQI	Mean C	ADID <sup>2</sup>	Functions Performed	USACE Jurisdictional	Dominant Plant Species	Waters Type <sup>3</sup>
2	PEMC	marsh	1.81	no	6.2	1.6	No	surface water storage, aquatic and terrestrial wildlife habitat	yes	<i>Phalaris arundinacean</i> (reed canary grass) <i>Polygonum</i> species, <i>Typha angustifolia</i> (narrow-leaved cattail)	
3	PSS1/PEMC	marsh	0.24	no	11.0	2.5	No	surface water storage, aquatic and limited terrestrial wildlife habitat	yes	<i>Agropyron repens</i> (quack grass), reed canary grass, narrow-leaved cattail	
3	PSS1/PEMC	marsh	approx. 15	no	11.0	2.5	K1453 high functional value	surface water storage, aquatic and limited terrestrial wildlife habitat	yes	<i>Agropyron repens</i> (quack grass), reed canary grass, narrow-leaved cattail	
4		marsh	0.57	yes	7.8	1.8	No	surface water storage, some wildlife habitat	yes	<i>Salix interior</i> (sandbar willow), reed canary grass	
5		marsh	1.51	no	7.5	1.8	No	surface water storage, limited wildlife habitat	no	<i>Aster simplex</i> (panicled aster), narrow-leaved cattail	isolated
6	PEMC	marsh, wet meadow	0.58	yes	11.0	2.8	No	surface water storage, part of a larger complex of wildlife habitats	yes	reed canary grass	RPWWD
7		marsh	0.17	no	6.9	1.9	No	surface water storage, limited wildlife habitat	yes	<i>Lersia oryzoides</i> (rice cut grass), <i>Scirpus fluviatilis</i> (river bulrush), narrow-leaved cattail	
8		marsh	0.36	yes	9.6	2.2	No	surface water storage, limited wildlife habitat	yes	narrow-leaved cattail	
9	PFO1C	forested	approx. 2	no	10.9	2.7	No	surface water storage, aquatic and terrestrial wildlife habitat	yes	<i>Salix fragilis</i> (crack willow), sandbar willow, reed canary grass	
10		marsh	0.80	yes	7.8	2.2	No	surface water storage, limited wildlife habitat	yes	reed canary grass, narrow-leaved cattail	
11		marsh	0.18	yes	6.9	2.1	No	surface water storage, very limited wildlife habitat	yes	reed canary grass, <i>Phragmites australis</i> (common reed)	
12	PEMCdf	wet meadow	approx. 206	no	15.5 6.9	2.3 4.0	No	surface water storage, wildlife habitat	yes	reed canary grass	RPWWN
13	POW Hx/PEMCdf	shallow pond	approx. 5	no	8.1	3.6	No	surface water storage, primary aquatic wildlife habitat	yes	<i>Potamogeton crispus</i> (beginner's pondweed), reed canary grass	
14		farmed	0.88	yes	1.6	0.7	No	surface water storage, limited wildlife habitat	yes	<i>Acrida altissima</i> (water hemp), <i>Cyperus esculentus</i> (field nut sedge)	
15		wet meadow	approx. 17	no	11.3	2.5	No	surface water storage, limited wildlife habitat	yes	panicled aster, reed canary grass, <i>Ranunculus sceleratus</i> (cursed buttercup)	

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Site No.	NWI Code	Community Type	Area (acre)	>50% <sup>1</sup>	FQI	Mean C	ADID <sup>2</sup>	Functions Performed	USACE Jurisdictional	Dominant Plant Species	Waters Type <sup>3</sup>
16		marsh	Approx. 2	no	3.0	1.1	No	surface water storage, limited wildlife habitat	yes	<i>Alisma subcordatum</i> (common water plantain), <i>Alopecurus carolinianus</i> (annual foxtail), cursed buttercup, narrow-leaved cattail	
17		wet meadow	1.61	yes	5.7	1.3	No	surface water storage, limited wildlife habitat	yes	reed canary grass	
18		farmed	0.38	yes	4.0	1.8	no	some surface water storage, minimal wildlife habitat	yes	<i>Polygonum</i> species, cursed buttercup, <i>Veronica peregrina</i> (purslane speedwell)	
19		marsh	approx 14	no	9.4	2	No	seasonal aquatic habitat mixed with terrestrial habitat, copious amounts of surface water storage	yes	common water plantain, annual foxtail, cursed buttercup, narrow-leaved cattail	RPWWN
20	PEMC	floodplain forest, marsh, wet meadow	2.64	yes	14.8	3.2	No	surface water storage, wooded wildlife habitat	yes	<i>Acer negundo</i> (box elder), reed canary grass, <i>Populus deltoides</i> (eastern cottonwood), narrow-leaved cattail	RPWWD
21	PEMC	wet meadow	approx 12	no	9.2	2.1	No	surface water storage, wildlife habitat	yes	narrow-leaved cattail	
23		wet meadow	0.04	yes	3.5	1.8	No	some surface water storage, minimal wildlife habitat	no	reed canary grass	isolated
25		forested	0.57	yes	9.4	2	No	surface water storage, wildlife habitat	yes	<i>Salix nigra</i> (black willow), sandbar willow, common reed	
27		forested	approx 27	yes	15.8	3.4	K1008 high habitat value	surface water storage, aquatic and terrestrial wildlife habitat INHS wetlands 27 and 32 are different portions of the same ADID wetland K1008	yes	<i>Fraxinus pennsylvanica</i> (green ash), <i>Rhamnus cathartica</i> (common buckthorn), <i>Glyceria septentrionalis</i> (floating manna grass), reed canary grass, <i>Rhynchospora longirostris</i> (longbeak buttercup), <i>Typha latifolia</i> (broad-leaved cattail), narrow-leaved cattail	
28		forested	0.17	yes	13.3	3.3	No	surface water storage; minimal, low quality wildlife habitat	no	reed ash, <i>Carex vulpinoidea</i> (fox sedge), <i>Eleocharis erythrodopa</i> (red-rooted spike rush), <i>Eleocharis smallii</i> (marsh spike rush), green ash, reed canary grass, common buckthorn, <i>Ulmus americana</i> (American elm)	
29	PEMC	wet meadow	1.16	yes	4.0	1.8	No	surface water storage, limited wildlife habitat, livestock watering	yes	<i>Agrostis alba</i> (redtop), red-rooted spike rush, <i>Ranunculus septentrionalis</i> (swamp buttercup)	
30		forested	0.33	yes	6.7	1.8	No	surface water storage, wildlife habitat	yes	black willow, sandbar willow, reed canary grass	

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Site No.	NWI Code	Community Type	Area (acre)	>50% <sup>1</sup>	FQI	Mean C	ADID <sup>2</sup>	Functions Performed	USACE Jurisdictional	Dominant Plant Species	Waters Type <sup>3</sup>
32 east	PEMC	wet meadow	approx 27	yes	6.3	1.8	K1008 high habitat value	surface water storage, wildlife habitat INHS wetlands 27 and 32 are different portions of the same ADID wetland K1008	yes	reed canary grass, narrow-leaved cattail	NRPWW
32 west	PEMC	wet meadow	0.37	yes	6.3	1.8	No	surface water storage, wildlife habitat	yes	reed canary grass, narrow-leaved cattail	NRPWW
33 east	PEMC	wet meadow	1.15	no	4.0	2.3	No	surface water storage, wildlife/aquatic habitat	yes	reed canary grass	
33 west	PEMC	wet meadow	approx 9	no	4.0	2.3	K1006 high functional value	surface water storage, wildlife/aquatic habitat	yes	reed canary grass	
34	PEMC	forested, wet meadow	3.43	no	13.7	2.6	no	surface water storage, wildlife/aquatic habitat	yes	box elder, crack willow, black willow, sandbar willow, reed canary grass	outside project limits
35	PEMC	wet meadow	0.36	yes	6.1	1.7	no	some surface water storage, minimal wildlife habitat	yes	red-rooted spike rush, reed canary grass, <i>Poa pratensis</i> (Kentucky blue grass)	outside project limits
37		marsh	unknown	unknown	unknown	unknown	no	some surface water storage, limited wildlife habitat	unknown	narrow-leaved cattail	outside project limits
39		farmed	0.70	yes	0.5	0.2	no	surface water storage, minimal wildlife habitat	yes	water hemp, <i>Ambrosia trifida</i> (giant ragweed)	outside project limits
40	PEMC	wet meadow	2.34	no	13.7	2.7	no	surface water storage, wildlife habitat	yes	reed canary grass	outside project limits
42	PEMC	wet meadow	approx 6	yes	10.5	2.3	K984 high habitat value	surface water storage, wildlife habitat	yes	reed canary grass	
43	PEMC	marsh	5.09	yes	17.1	3.4	no	fair quality wildlife habitat and drainage was for surface water	yes	reed canary grass, narrow-leaved cattail	
44	PEMC	marsh	1.88	no	8.7	1.7	no	surface water storage, wildlife habitat	no	common water plantain, narrow-leaved cattail	isolated
45	PEMC / PFO1 Cd	marsh/pond, wet meadow	approx 53	no	7.5	2.9	K925 high functional value	aquatic and terrestrial wildlife habitat complex, copious amounts of storm water storage INHS wetlands 45 and 46 are different portions of the same ADID wetland K925	yes	reed canary grass, narrow-leaved cattail	RPWWD



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Site No.	NWI Code	Community Type	Area (acre)	>50% <sup>1</sup>	FQI	Mean C	ADID <sup>2</sup>	Functions Performed	USACE Jurisdictional	Dominant Plant Species	Waters Type <sup>3</sup>
46 east		wet shrubland	approx 53	no	4.2	1.3	K925 high functional value	surface water storage, wildlife habitat INHS wetlands 45 and 46 are different portions of the same ADID wetland K925	yes	sandbar willow, reed canary grass	
46 west		wet shrubland	0.44	no	4.2	1.3	no	surface water storage, wildlife habitat	yes	sandbar willow, reed canary grass	
47	PEMC	farmed	0.27	no	3.6	1.6	no	some surface water storage, limited wildlife habitat	no	curled buttercup	Isolated
48		wet meadow	0.36	yes	8.9	2.6	no	surface water storage, wildlife habitat	no	reed canary grass	isolated
49		marsh	approx 13	no	6.0	1.9	no	surface water storage, terrestrial/aquatic wildlife habitat	no	reed canary grass, narrow-leaved cattail	isolated
52		wet meadow	0.55	yes	5.0	1.4	no	surface water storage, wildlife habitat	no	reed canary grass	isolated
53	PEMC	wet meadow	1.46	yes	2.8	2	no	surface water storage, wildlife habitat	no	reed canary grass	isolated
54	PEMC	wet meadow	approx 3	no	5.8	1.6	no	surface water storage, wildlife habitat	yes	panicked aster, reed canary grass	
55		farmed	0.20	no	0.6	0.3	no	limited wildlife habitat	no	<i>Zea mays</i> (corn)	isolated
56 east	PEMC d/PEMB	wet meadow	approx 8	no	5.3	2.2	K711 high functional value	surface water storage, wildlife habitat, acts as buffer for Kishwaukee River tributary	yes	reed canary grass	
56 west	PEMC d/PEMB	wet meadow	1.52	no	5.3	2.2	no	surface water storage, wildlife habitat, acts as buffer for Kishwaukee River tributary	yes	reed canary grass	
57	PEMC	marsh/wet meadow/shrub	approx 17	no	9.4	2.2	K663 high functional value	copious amounts of surface water storage, wildlife habitat, acts as buffer for Kishwaukee River	yes	sandbar willow, reed canary grass, narrow-leaved cattail	
58	PEMC	wet meadow	approx 0.5	no	6.4	2.4	no	surface water storage, wildlife habitat	yes	reed canary grass	
59	PEMC	marsh/wet meadow	approx 10	no	6.3	2.1	K633 high functional value	surface water storage, wildlife habitat	yes	reed canary grass, narrow-leaved cattail	
60		marsh	0.09	yes	11.5	3.1	no	not determined by INHS	yes	reed-rooted spike rush, narrow-leaved cattail	NRPWW
61	POW Hh	pond	approx 1	yes	12.7	3.5	no	not determined by INHS	yes	longbeak buttercup, common buckthorn, <i>Salix amygdaloides</i> (peach-leaved willow), narrow-leaved cattail	NRPWW

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Site No.	NWI Code	Community Type	Area (acre)	>50% <sup>1</sup>	FQI	Mean C	ADID <sup>2</sup>	Functions Performed	USACE Jurisdictional	Dominant Plant Species	Waters Type <sup>3</sup>
62		wet meadow	0.01	yes	8.3	3.1	no	not determined by INHS	yes	<i>Carex pallida</i> (wooly sedge), reed canary grass	NRPWW
63	POW Hx	marsh	0.04	yes	7.7	2.6	no	not determined by INHS	yes	reed canary grass, narrow-leaved cattail	RPWWD
64		pond	0.13	yes	10.7	3.6	no	not determined by INHS	yes	<i>Elodea canadensis</i> (elodea)	RPWWD
65	PEMC	Marsh	0.23	yes	6.8	2.6	no	not determined by INHS	no	red-rooted spike rush, narrow-leaved cattail	isolated
66	PEMC	Marsh	1.64	no	7.4	1.6	no	not determined by INHS	no	reed canary grass, common reed, narrow-leaved cattail	isolated
67		Marsh	0.36	yes	7.5	1.9	no	not determined by INHS	yes	common reed	NRPWW
68		Farmed	0.04	yes			no	not determined by INHS	yes	corn, broad-leaved cattail, field nut sedge	RPWWN
69		Farmed	0.28	yes			no	not determined by INHS	yes	corn, broad-leaved cattail	RPWWD
70		wet meadow	0.05	no	3.1	1.4	no	not determined by INHS	yes	reed canary grass, horned bladderwort, giant ragweed	NRPWW
71	PEMC	floodplain forest	1.35	yes	11.0	2.2	no	not determined by INHS	yes	box elder, common buckthorn, giant ragweed, panicled aster	RPWWN
73		wet meadow	0.68	no	7.2	2.2		not determined by INHS	yes	reed canary grass, common reed	RPWWD
74		Farmed	0.26	yes			no	not determined by INHS	yes	corn	RPWWN
ADID K669		farmed, forested	approx 17		not determined		K669 high functional value	not determined by INHS	yes		
ADID K692		wet meadow, forested	approx 13		not determined		K692 high functional value	not determined by INHS	yes		outside project limits
ADID K820		wet meadow, forested	approx 10		not determined		K820 high functional value	not determined by INHS	yes		outside project limits

<sup>1</sup> In INHS's best professional judgment, more than 50% of the total site area is within the ESR project limits

<sup>2</sup> Advanced Identification (ADID) High Habitat or High Functional Value wetland

<sup>3</sup> As determined by the INHS. Waters type:

- RPW - relatively permanent waters that flow directly or indirectly to traditionally navigable waters
- RPWWN - wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly to traditional navigable waters
- Isolate - isolated waters, including isolated wetlands
- NRPWW - wetlands adjacent to non-RPWs that flow directly or indirectly to traditional navigable waters
- RPWWD - wetlands directly abutting RPWs that flow directly or indirectly to traditional navigable waters

**Impacts**

The proposed improvements will impact a total of 25.77 acres of wetlands; INHS suggested that 21.16 acres would be considered jurisdictional by the USACE, and 4.61 acres are isolated and would not be considered jurisdictional. For those wetlands not jurisdictional by the USACE, they are still subject to the Illinois Interagency Wetlands Policy Act and will therefore require mitigation. Included in these totals, the proposed improvements would impact 0.67 acres of farmed wetlands. (Farmed wetlands are those that are artificially drained or those that hydrology is such that agricultural production is possible during dryer years. If farmed wetlands were altered prior to 1985, they are considered Prior Converted wetlands and are not subject to regulation under the Clean Water Act.)

Wetland habitat in the project corridor is primarily of low quality due to poor vegetative diversity. There are several ADID wetlands identified in the project corridor. Most have been identified as ADID wetlands based on their high functional value, usually stormwater storage. Two wetlands in the project vicinity have been identified as ADID based on their high habitat value; ADID wetland K1008 (INHS Wetlands 27 and 32) is located at the intersection of IL 176 (East Leg) in the northeast quadrant; ADID wetland K984 (INHS Wetland 42) is located adjacent to IL 176 (West Leg), approximately 750 feet west of IL 47. ADID wetland K1008 will have 0.69 acres of impacts; ADID wetland K984 will have 0.08 acres of wetland impacts.

**Table 4-14** summarizes the wetland impacts, provides information on the jurisdictional status of the wetland, the functions it performs, the floristic quality, the ADID number (if applicable) of the wetland, and provides the proposed amount of mitigation that would be provided.

**Table 4-14: Wetland Impacts**

Site No.	Wetland Acreage (acre)	extends outside ROW	FQI	Mean C	ADID <sup>1</sup>	Special Notes	USACE Jurisdictional	Impacts (acre)	Proposed Mitigation Ratio (in basin)	Proposed Mitigation Acreage	Proposed Mitigation Ratio (out of basin)	Proposed Mitigation Acreage
2	1.81	Yes	6.2	1.6		marsh	Yes	0.06	1.5 : 1	0.09	2.0 : 1	0.12
3 east	0.24	No	11.0	2.5		marsh	yes	0.24	1.5 : 1	0.36	2.0 : 1	0.48
3 west	approx 15	Yes	11.0	2.5	K1453 high functional value	marsh	yes	0.29	3.0 : 1	0.87	3.0 : 1	0.87
4	0.57	Yes	7.8	1.8		marsh	yes	0.57	1.5 : 1	0.86	2.0 : 1	1.14
5	1.51	Yes	7.5	1.8		marsh	no	0.05	1.5 : 1	0.08	2.0 : 1	0.10
6	0.58	Yes	11.0	2.8		marsh, wet meadow	yes	0.25	1.5 : 1	0.38	2.0 : 1	0.50
8	0.36	Yes	9.6	2.2		marsh	yes	0.25	1.5 : 1	0.38	2.0 : 1	0.50
9	approx 2	Yes	10.9	2.7		forested	yes	0.23	1.5 : 1	0.35	2.0 : 1	0.46
10	0.80	Yes	7.8	2.2		marsh	yes	0.33	1.5 : 1	0.50	2.0 : 1	0.66
11	0.18	No	6.9	2.1		marsh	yes	0.18	1.5 : 1	0.27	2.0 : 1	0.36
12	approx 206	yes	15.5	4.0		wet meadow	yes	4.94	5.5 : 1	27.17	5.5 : 1	27.17
13	approx 5	yes	8.1	3.6		shallow pond	yes	0.48	1.5 : 1	0.72	2.0 : 1	0.96

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Site No.	Wetland Acreage (acre)	extends outside ROW	FQI	Mean C	ADID <sup>1</sup>	Special Notes	USACE Jurisdictional	Impacts (acre)	Proposed Mitigation Ratio (in basin)	Proposed Mitigation Acreage	Proposed Mitigation Ratio (out of basin)	Proposed Mitigation Acreage
14	0.88	yes	1.6	0.7		farmed	yes	0.40	1.5 : 1	0.60	2.0 : 1	0.80
15	approx 17	yes	11.3	2.5		wet meadow	yes	0.38	1.5 : 1	0.57	2.0 : 1	0.76
16	approx 2	yes	3.0	1.1		marsh	yes	0.28	1.5 : 1	0.42	2.0 : 1	0.56
17	1.61	yes	5.7	1.3		wet meadow	yes	0.68	1.5 : 1	1.02	2.0 : 1	1.36
18	0.38	yes	4.0	1.8		farmed	yes	0.08	1.5 : 1	0.12	2.0 : 1	0.16
19	approx 14	yes	9.4	2.0		marsh	yes	0.80	1.5 : 1	1.20	2.0 : 1	1.60
20	2.64	yes	14.8	3.2		Floodplain forest, marsh, wet meadow	yes	0.34	1.5 : 1	0.51	2.0 : 1	0.68
21	approx 12	yes	9.2	2.1		wet meadow	yes	0.03	1.5 : 1	0.05	2.0 : 1	0.06
23	0.04	no	3.5	1.8		wet meadow	no	0.04	1.5 : 1	0.06	2.0 : 1	0.08
25	0.57	no	9.4	2.0		forested	yes	0.57	1.5 : 1	0.86	2.0 : 1	1.14
27	approx 27	yes	15.8	3.4	K1008 high habitat value <sup>2</sup>	forested	yes	0.19	3.0 : 1	0.57	3.0 : 1	0.57
28	0.17	no	13.3	3.3		forested	no	0.17	1.5 : 1	0.26	2.0 : 1	0.34
32 east	approx 27	yes	6.3	1.9	K1008 high habitat value <sup>2</sup>	wet meadow	yes	0.50	3.0 : 1	1.50	3.0 : 1	1.50
32 west	0.37	yes	6.3	1.9		wet meadow	yes	0.15	1.5 : 1	0.23	2.0 : 1	0.30
33 east	1.15	yes	4.0	2.3		wet meadow	yes	0.47	1.5 : 1	0.71	2.0 : 1	0.94
33 west	approx 9	yes	4.0	2.3	K1006 high functional value	wet meadow	yes	0.75	3.0 : 1	2.25	3.0 : 1	2.25
42	approx 6	yes	10.5	2.3	K984 high habitat value	wet meadow	yes	0.08	3.0 : 1	0.24	3.0 : 1	0.24
43	5.09	yes	17.1	3.4		marsh	yes	0.73	1.5 : 1	1.10	2.0 : 1	1.46
44	1.88	yes	8.7	1.7		marsh	no	0.05	1.5 : 1	0.08	2.0 : 1	0.10
45	approx 53	yes	7.5	2.9	K925 high functional value	marsh/pond, wet meadow	yes	0.83	1.5 : 1	1.25	2.0 : 1	1.66
46 east	approx 53	yes	4.2	1.3	K925 high functional value	wet shrubland	yes	0.54	3.0 : 1	2.49	3.0 : 1	2.49
46 west	0.44	no	4.2	1.3		wet shrubland	yes	0.44	1.5 : 1	0.66	2.0 : 1	0.88
47	0.27	yes	3.6	1.6		farmed	no	0.06	1.5 : 1	0.09	2.0 : 1	0.12
48	0.36	yes	8.9	2.6		wet meadow	no	0.36	1.5 : 1	0.54	2.0 : 1	0.72

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Site No.	Wetland Acreage (acre)	extends outside ROW	FQI	Mean C	ADID <sup>1</sup>	Special Notes	USACE Jurisdictional	Impacts (acre)	Proposed Mitigation Ratio (in basin)	Proposed Mitigation Acreage	Proposed Mitigation Ratio (out of basin)	Proposed Mitigation Acreage
49	approx 13	yes	6.0	1.9		marsh	no	2.38	1.5 : 1	3.57	2.0 : 1	4.76
52	0.55	no	5.0	1.4		wet meadow	no	0.55	1.5 : 1	0.83	2.0 : 1	1.10
53	1.46	yes	2.8	2.0		wet meadow	no	0.84	1.5 : 1	1.26	2.0 : 1	1.68
54	approx 3	yes	5.8	1.6		wet meadow	yes	1.16	1.5 : 1	1.74	2.0 : 1	2.32
56 east	approx 8	yes	5.3	2.2	K711 high functional value	wet meadow	yes	0.55	3.0 : 1	1.65	3.0 : 1	1.65
56 west	1.52	yes	5.3	2.2		wet meadow	yes	0.46	1.5 : 1	0.69	2.0 : 1	0.92
57	approx 17	yes	9.4	2.2	K663 high functional value	marsh/wet meadow/shrub	yes	1.28	3.0 : 1	3.84	3.0 : 1	3.84
58	approx 0.5	yes	6.4	2.4		wet meadow	yes	0.05	1.5 : 1	0.08	2.0 : 1	0.10
59	approx 10	yes	6.3	2.1	K633 high functional value	marsh/wet meadow	yes	0.68	3.0 : 1	2.04	3.0 : 1	2.04
62	0.01	no	8.3	3.1		wet meadow	yes	0.01	1.5 : 1	0.02	2.0 : 1	0.02
63	0.04	no	7.7	2.6		marsh	yes	0.04	1.5 : 1	0.06	2.0 : 1	0.08
64	0.13	no	10.7	3.6		pond	yes	0.13	1.5 : 1	0.20	2.0 : 1	0.26
65	0.23	yes	6.8	2.6		marsh	no	0.23	1.5 : 1	0.35	2.0 : 1	0.46
66	1.64	yes	7.4	1.6		marsh	no	0.05	1.5 : 1	0.08	2.0 : 1	0.10
67	0.36	yes	7.5	1.9		marsh	yes	0.04	1.5 : 1	0.06	2.0 : 1	0.08
68	0.04	yes				farmed	yes	0.01	1.5 : 1	0.02	2.0 : 1	0.02
71	1.35	yes	11.0	2.2		floodplain forest	yes	0.33	1.5 : 1	0.50	2.0 : 1	0.66
73	0.68	yes	7.2	2.2		wet meadow	yes	0.07	1.5 : 1	0.11	2.0 : 1	0.14
not IDed by INHS	approx 17	yes	not determined		K669 high functional value	farmed, forested	yes	0.12	3.0 : 1	0.36	3.0 : 1	0.36
<b>Wetland Impact Totals</b>								<b>25.77</b>		<b>67.24</b>		<b>74.64</b>

<sup>1</sup> Advanced Identification (ADID) High Habitat or High Functional Value wetland

### *Avoidance/Minimization/Compensatory Mitigation*

The proposed improvements were designed to minimize the amount of wetland impacts to the greatest extent practicable. Based on multiple impact evaluations, the alternatives with the least number of wetland impacts were selected. Once the alternatives were selected, they were further refined in order to minimize impacts. At the crossing of the Kishwaukee River headwaters, retaining walls are proposed to reduce wetland impacts by 0.7 acres. The median in the project corridor was narrowed from 50 feet to 30 feet between Rainsford Drive and Hercules Road to reduce wetland impacts by two acres.

For those wetland impacts that cannot be avoided, compensatory mitigation must be provided. Mitigation ratios are determined by both the USACE and the IDNR. The USACE mitigation ratios are a minimum of 1.5 acres for every 1.0 acre of impact for low quality wetlands and 3.0 acres or higher for every 1.0 acre of impact for high quality aquatic resources or ADID wetlands. Under the Programmatic Agreement that IDOT has with the IDNR for compliance with the Interagency Wetland Protection Act, mitigation ratios are determined based on whether or not the mitigation is provided within the watershed basin of the impacted wetland. For wetlands that are mitigated for within the basin, a ratio of 1.5 acres to 1.0 acre is required. For wetlands that are mitigated for outside the basin, a ratio of 2.0 acres to 1.0 acre is required.

Compensatory mitigation for the unavoidable wetland impacts will be provided. The appropriate mitigation ratios and methods will be finalized during Phase II design engineering when the Section 404 permit is applied for. At this time, it is estimated that either 67.4 acres (in basin mitigation) or 74.64 acres (out of basin mitigation) of wetland mitigation will be provided for the 25.77 acres of impacts. IDOT will provide compensatory mitigation in an approved wetland mitigation bank in coordination with the USACE and IDNR. Other mitigation options and locations will also be considered. In addition, impacts to Waters of the U.S. would also be mitigated for.

### *Only Practicable Alternative Finding*

Federal Executive Order 11990 requires the avoidance of adverse impacts to wetlands wherever there is a practicable alternative. The proposed improvements were designed to avoid and minimize wetland impacts to the greatest extent possible. There are no practicable alternatives that could avoid wetland impacts entirely. The roadway corridor is constrained to the setting where the current IL 47 is located. Construction on an entirely new corridor would be cost prohibitive, and would in all likelihood result in greater wetland impacts. All impacts have been avoided and minimized to the greatest extent practicable, as discussed above. Based upon these considerations, it is determined that there is no practicable alternative to the proposed construction in wetlands and that the proposed action includes all practicable measures to minimize harm to wetlands that may result from such use.

#### 4.11 Special Waste

The ISGS performed three PESAs for the project corridor. The third PESA, ISGS #1789V, dated October 28, 2013, covered the entire project corridor and incorporated results of the earlier two documents. Several Recognized Environmental Concerns (REC) were identified. Per PESA #1789V, 32 properties were identified with RECs.

**What is a Preliminary Environmental Site Assessment (PESA)?**

A PESA is a study conducted to determine if there is a potential for contaminated soils or groundwater in the project vicinity. Public records are examined and a site visit conducted to assesses the right-of-way and adjacent properties to determine if there are any natural or man-made hazards that might have resulted in contamination.

Copies of IDOT memorandums acknowledging the PESAs can be found in [Appendix A](#).

Based on the results from the various PESAs, if the Phase II determines that the project will require excavation, subsurface utility relocation, right of way purchase/easement, or building demolition at any of the identified RECs, then a Preliminary Site Investigation will be required.

It is the responsibility of Phase II design engineer to determine if any of the PESA sites or right of way adjacent to the PESA site will be impacted with the proposed work and/or if any right of way will be required at any of the PESA sites. Any acquisitions shall be discussed with the Bureau of Land Acquisition prior to responding to the PESA to request further studies.

#### 4.12 Special Lands

##### 4.12.1 Section 6(f)

Section 6(f) lands are those lands that have Land and Water Conservation (LAWCON) funds involved in their purchase or development. There are no State Designated Lands in the project corridor.

##### 4.12.2 Open Space Lands Acquisition and Development (OSLAD) Act Lands

The project corridor does not contain any lands that have funds involved in their purchase or development that was obtained from Open Space Lands Acquisition and Development (OSLAD) funding.

#### 4.13 Section 4(f) Evaluation

The project corridor does not contain any properties that would require Section 4(f) evaluation. Correspondence from the Village of Lakewood regarding public land proposed for acquisition acknowledged that the property is not used for recreational purposes. (Copy of correspondence can be found in [Appendix A](#).) There are no publicly owned parks, recreational areas, wildlife and waterfowl refuges, or any land from a historic site of national, State, or local significance.

#### 4.14 Permits/Certifications Required

The proposed improvements would require the following permits. All permits would be obtained prior to start of construction, and all permit conditions will be complied with.

- Clean Water Act, Section 401 – Water Quality Certificate
- Clean Water Act, Section 404 – Discharge of Dredged or Fill Materials into Waters of the US
- Clean Water Act – National Pollutant Discharge Elimination System Construction General Permit
- Illinois Department of Natural Resources-Office of Water Resources permit

### 4.15 Other Issues

#### 4.15.1 Aesthetics

The view shed along IL 47 is composed of primarily flat, open space land. In the southern and northern portions of the corridor, commercial and residential development exists. In the central portion of the corridor, the landscape is primarily agricultural or open space (associated with rivers and wetlands).

The proposed construction will not greatly affect the view shed or aesthetics. The project consists of the widening of an existing roadway, and changes will be minimal. Through most of the corridor, the road improvements will incorporate a central median, that will be grassed and/or landscaped. This central median will improve the aesthetics of the corridor.

#### 4.15.2 Construction Impacts

Construction activities have the potential to impact travel patterns if lane closures or temporary detours are needed; lane closures can also result in increased congestion. Emergency services should not be interrupted as a result of the proposed project.

Construction has the potential to impact water resources due to increased erosion and sedimentation. Vegetation removal and soil disturbances would increase the potential for erosion, and structures placed within stream crossings can result in increased sedimentation. Increased sedimentation in turn can impact aquatic habitat and species. Erosion and sediment control will be managed per the IDOT *BDE Manual* (Chapters 41 [Construction Site Storm Water Pollution Control] and 59 [Landscape Design]) (2010) and IDEM *Storm Water Quality Manual* (October 2007). Project specific sediment and erosion control plans and a SWPPP will be developed, coupled with compliance with the NPDES permit, these measures will help minimize sedimentation impacts.

During construction there is the potential for short term increases in fugitive dust and equipment related particulate emissions to impact air quality. Soil disturbance during grading activities and emissions released from construction equipment can contribute to these impacts. Any air quality impacts that would occur as a result of construction would be short term. Compliance with IDOT's *Standard Specifications for Road and Bridge Construction* (January 2012) provisions for dust control during construction will minimize these impacts.



During construction, increased noise will be experienced due to vehicles and equipment. These increased noise levels would be confined to normal working hours and would be experienced primarily by residents adjacent to the roadway. Increased noise would be temporary and localized.

Construction activities would generate solid wastes that would require offsite disposal. Wastes most often generated during construction would include vegetation, old pavement, and miscellaneous debris. Disposal of solid waste will be done in accordance with all state and federal laws. It is not anticipated that any hazardous waste will be generated, but if it is, the on-site storage, transportation, and disposal will be done in accordance with all state and federal laws.

### **4.15.3 Energy Consumption**

Construction of the proposed improvement would require indirect consumption of energy for processing materials, construction activities, and maintenance for the lane miles to be added within the project limits. Energy consumption by vehicles in the area may increase during construction due to possible traffic delays.

Operation of the proposed improvement would reduce traffic congestion and turning conflicts along the route and thereby reduce vehicular stopping and slowing conditions. Additional benefits would be realized from increased capacity and smoother riding surfaces. This would result in less direct and indirect vehicular energy consumption for the proposed improvements than for the No-Action Alternative. Thus, in the long term, post-construction operational energy requirements should offset construction and maintenance energy requirements and result in a net savings in energy usage.

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