Alternative Routes B and C are within the estimated 7,500 foot obstruction zone for the private Farris Strip. While these routes are approximately 6,900 feet from the vicinity of the airfield (within the FAA notification zone), they are approximately 8,400 feet from the northern end of the runway. Due to the distance of the Alternative Routes to the end of the runway, impacts to the operation of the airfield are not anticipated. Interstate 29 and several residences are located between the runway and the Alternative Routes.

Alternative Routes B and C are within the estimated 7,500 foot obstruction zone for the private Plattsburg Airpark. The Alternative Routes are approximately 4,700 feet from the northern end of the unimproved landing strip. Any impacts from the Alternative Routes on the operation of Plattsburg Airpark would be assessed as part of the FAA Part 77 notification.

Alternative Route A crosses the estimated 7,500 foot obstruction zone for a private, unnamed landing strip on the far eastern edge of Segment 1. This unimproved landing strip is approximately 4,700 feet from the termination of Alternative Route A. This landing strip is not listed on the FAA's list of certified and non-certified private-use facilities.

Segment 2

All of the Alternative Routes in Segment 2 cross Interstate 35. **Table 5-22** lists the number of times U.S. highways and state highways are crossed by each Alternative Route.

Table 5-22. Transportation Infrastructure Crossed by Alternative Routes in Segment 2

	D	E	F	G	H	I
Public airfields (miles of FAA Notification Zones crossed)	-	4.3	6.9	4.3	6.9	6.2
Private airfields (miles of estimated obstruction zone crossed)	10.4	8.4	5.9	4.6	2.1	2.1
Railroad crossings	8	7	7	8	8	10
Interstate crossings	1	1	1	1	1	1
U.S. highway crossings	6	5	5	5	5	5
State highway crossings	12	11	10	10	9	9

Alternative Route D crosses the most U.S. and state highways (6 and 14 crossings, respectively), while Alternative Routes E, F, G, H, and I all cross five different U.S. highways. These remaining Alternative Routes do not cross any U.S. highway more than once. Alternative Routes H and I cross the fewest number of state highways.

There are few public airfields in proximity to any of the Alternative Routes (**Figure 5-7**). Alternative Route D is the only Alternative Route that does not cross the estimated FAA

Notification Zone of a public airfield (**Table 5-23**). Alternative Routes E, F, G, and H are within the estimated 15,000 foot FAA notification zone for Omar N. Bradley Airport in Moberly, MO. The Alternative Routes are approximately 18,150 feet and 12,400 feet from the northern and southern ends of the main runway, respectively, and approximately 13,400 feet from the eastern end of the second runway. Additionally, as these Alternative Routes traverse the notification zone, existing transmission lines are paralleled in an effort to minimize the impact to the airport's flight paths.

Alternative Routes E, F, G, H, and I are within the general 15,000 foot FAA notification zone for Captain Ben Smith Airfield (Monroe City Regional Airport). The Alternative Routes are approximately 13,500 feet from the westernmost end of the runway. Due to the distance of the Alternative Routes to the end of the runway, impacts to the operation of the airfield are not anticipated.

All Alternative Routes cross the estimated 7,500 foot estimated obstruction zone for a private, unnamed landing strip on the far western edge of Segment 2. This unimproved landing strip is approximately 3,200 feet from Alternative Routes G, H, and I. Alternative Routes D, E, and F are approximately 1,500 feet from the southernmost end of the landing strip. This landing strip is not listed on the FAA's list of certified and non-certified private-use facilities.

Alternative Routes D, E, and F cross the estimated 7,500 foot obstruction zone for the private landing strip, Shiloh Airpark. The far southernmost end of the landing strip is approximately 3,300 feet from the Alternative Routes. Because of the distance of the Alternative Routes from the runway and the preexisting tree cover on the runway approach, impacts to the operation of the airfield are not anticipated. This landing strip is not listed on the FAA's list of certified and non-certified private-use facilities.

Alternative Route D crosses the estimated 7,500 foot obstruction zone for an additional private, unnamed landing strip on the southern edge of the Study Area. The eastern edge of the landing strip is approximately 6,300 feet from Alternative Route D. Following the same trajectory towards Alternative Route D, aircraft operators would first encounter an existing 161 kV transmission line approximately 1,000 feet from the eastern edge of the landing strip. Because of the distance of the Alternative Route to the end of the runway and the proximity of the existing transmission line to the airfield, impacts to the operation of the airfield are not anticipated.

Alternative Routes D, E, and G cross the estimated 7,500 foot obstruction zone for a private, unnamed grass airfield in Monroe County. The Alternative Routes are approximately 3,100 feet from the southwestern end of the runway. This landing strip is not listed on the FAA's list of certified and non-certified private-use facilities.

Table 5-23. Public and Private Airports in Segment 2							
Alternative Route Affected	**Airfield Name**	**Ownership**	**Runway Type**	**Runway Length (feet)**	**Distance from Alternative Route**	**Orientation of Runway**	**Orientation of Alternative Route from Runway**
D, E, F, G, H, I	Unnamed (Clinton County)	Private	Grass	1,650*	3,220 feet from the northwestern end of the runway to Alternative Routes G, H, and I; 1,450 feet from the southern end of the runway to Alternative Routes D, E, and F	NW - SE	Perpendicular (GHI) Perpendicular (DEF)
D, E, F	Shiloh Airpark	Private	Grass	1,300*	3,290 feet from the southern end of the runway to Alternative Routes D, E, and F	N -S	Perpendicular (3,290 feet) Parallel (2,800 feet)
D	Unnamed (Salisbury, MO)	Private	Grass	2,050*	6,300 feet from the eastern end of the runway to Alternative Route D	E - W	Perpendicular
E, F, G, H	Omar N Bradley Airport	Public	(A) Paved (B) Paved	(A) 5,000 (B) 3,350	18,150 feet from the northwestern end of runway A to Alternative Routes E, F, G, and H; 12,470 feet from the southeastern end of	(A): NW - SE (B): NE - SW	Perpendicular (A) Perpendicular (B)

Table 5-23. Public and Private Airports in Segment 2							
Alternative Route Affected	**Airfield Name**	**Ownership**	**Runway Type**	**Runway Length (feet)**	**Distance from Alternative Route**	**Orientation of Runway**	**Orientation of Alternative Route from Runway**
					runway A to Alternative Routes E and G; 13,460 feet from the northeastern end of runway B to Alternative Routes E and G		
D, E, G	Unnamed (Monroe County)	Private	Grass	1,380*	3,150 feet from the southwestern end of the runway to Alternative Routes D, E, and G.	SW-NE	Perpendicular
F, H, I	Captain Ben Smith Airfield (Monroe City)	Public	Paved	3,515	13,460 feet from the western end of the runway to Alternative Routes F, H, and I; 7,430 feet from runway to parallel of Alternative Routes F, H, and I	E - W	Perpendicular (13,460 feet) Parallel (7,430 feet)

*Runway information was not available from the FAA and was measured using aerial imagery.

5.3.2 Other Existing Infrastructure

Cellular and Radio Towers

Cellular and radio towers exist throughout the Study Area. Although these structures have a relatively small base, many have guy wires that extend 150 feet or more from the base of the structure. To avoid interference with the maintenance and operation of these features, transmission lines typically avoid crossing over or under guy wires.

Alternatives Comparison

Segment 1

One cellular tower is located within 500 feet of Alternative Routes B and C. No impacts to the operations or maintenance of the cellular/radio tower are expected because the base of the guy wires is more than 200 feet from the centerline of the Alternative Routes.

Segment 2

See **Table 5-24** for the number of cellular/radio towers within 500 feet of the Alternative Routes in Segment II. As discussed in Segment 1, no impacts are expected to cellular towers from any of the Alternative Routes.

Table 5-24. Cellular/Radio Towers in Segment 2

	D	E	F	G	H	I
Cell/radio towers (within 500 feet)	3	3	2	2	1	-

5.3.3 Existing Utility Corridors

Efforts were made to have Alternative Routes parallel existing transmission lines or pipeline corridors where feasible. Paralleling existing infrastructure is generally considered an acceptable practice for siting new transmission lines. However, there are a few construction and engineering considerations to consider when paralleling existing infrastructure. Existing infrastructure paralleled throughout the Study Area includes:

- Nashua–Lake Road 161 kV transmission line
- Gower–Plattsburg 115 kV transmission line
- Northwest Missouri Electric Coop 69 kV transmission line
- Chillicothe–Thomas Hill 161 kV transmission line
- Kansas City Power & Light Co 161 kV transmission line

- Salisbury–Thomas Hill 161 kV transmission line
- Central Electric Power Coop 115 kV transmission line
- Ameren Missouri 69 kV transmission line
- Keystone Gas Pipeline
- Kinder Morgan Interstate Gas Transmission Pipeline
- Rockies Express Pipeline
- Platte Pipeline
- Transource Sibley- Nebraska City 345 kV transmission line (In-Service date 2017)

General Mitigation Measures

During construction, outages may be required when working near other transmission lines. Outages are often difficult to schedule due to peak use seasons (summer and winter) when utilities are unable to take lines out of service and could result in a longer construction time. In addition, there are areas where existing transmission lines would be crossed. The proposed line would be constructed over the top of existing transmission lines and require taller structures to provide for adequate clearance between the conductors.

Existing pipelines are similar to existing transmission lines in terms of ROWs. The utilities can abut ROWs but not overlap them. Subsurface surveying may be required to determine the exact location of the pipelines prior to construction. Steel plating or matting may also be required when crossing over the top of pipelines to protect them from large construction vehicles.

Alternative Comparison

Segment 1

The number of transmission and pipeline crossings for the Alternative Routes in Segment 1 is shown below in **Table 5-25**. All Alternative Routes cross the same number of <115 kV, 161 kV, and 345 kV transmission lines and cross pipeline corridors. Alternative Route C crosses the least number of pipelines and pipeline ROWs. The pipeline corridors would likely be able to be crossed by a single span at the crossing locations.

Table 5-25. Transmission and Pipeline Crossings for Alternative Routes in Segment 1			
Transmission Lines Crossed	**A**	**B**	**C**
<115 kV	3	3	3
161 kV	1	1	1
345 kV	2	2	2
Pipeline ROW crossings (approximate)	4	6	3
Pipelines crossed (approximate)	10	12	3
Total Crossings	10	12	9

Segment 2

Transmission and pipeline crossings for the Alternative Routes in Segment 2 are shown in **Table 5-26**. Alternative Route G has the most total transmission line crossings, 20 of which are of 69 kV and 115 kV transmission lines. Although engineering challenges still exist when crossing any transmission line, crossing lower voltage lines is typically less of a challenge. Alternative Route I has the fewest transmission line crossings overall, and it also crosses the fewest higher voltage transmission lines (345 kV). Overall, engineering challenges associated with any Alternative Routes would be comparable, given the tradeoffs in crossing lower and higher voltage transmission lines.

Table 5-26. Transmission and Pipeline Crossings for Alternative Routes in Segment 2						
Transmission Lines Crossed	**D**	**E**	**F**	**G**	**H**	**I**
<115 kV	11	16	11	20	15	10
161 kV	7	7	8	8	9	7
345 kV	3	3	3	3	3	2
Pipeline ROW crossings (approximate)	21	19	17	14	12	16
Pipelines crossed (approximate)	42	36	34	17	15	19
Total Crossings	42	45	39	45	39	35

6. Identification of the Proposed Route

6.1 Rationale for the Selection of the Proposed Route

As stated in the introductory chapters, the goal in selecting a suitable route for the Project is to minimize impacts on the natural, cultural, and human environment while avoiding circuitous routes, extreme costs, and non-standard design requirements. However, in practice, it is not usually possible to optimally minimize all potential impacts at all times. There are often inherent tradeoffs in potential impacts to every routing decision. For example, in heavily forested study areas, a route that avoids the most developed areas would likely require the greatest amount of forest clearing, while the route that has the least impact on vegetation and wildlife habitats often impacts more residences or farm lands. Thus, an underlying goal inherent to a routing study is to reach a reasonable balance between minimizing potential impacts on one resource versus increasing the potential impacts on another. The following section presents the rationale for selection of the Proposed Route and, thus, the route that the Routing Team considered to best minimize the impacts of the Project overall. The rationale is derived from the accumulation of the routing decisions made throughout the process, the knowledge and experience of the Routing Team, comments from the public and regulatory agencies, and comparative analysis of potential impacts presented in Chapter 5.

6.2 Summary of Alternative Route Comparison

6.2.1 Segment 1

Alternative Route A

Advantages

- Requires the fewest number of total stream crossings (53)
- Crosses through the shortest length of the estimated obstruction zones for private airfields (3.5 miles)
- Parallels the most miles of existing pipelines (6.3 miles)
- Crosses the fewest number of pipeline ROWs (4)

Disadvantages

- Requires the greatest number of waterbody crossings (9)
- Crosses the most developed acreage (11 acres)
- Contains the most acres of total wetlands within the ROW (41 acres)
- Contains the most acres of forested wetlands within the ROW (21 acres)
- Crosses the largest number of total parcels (127)
- Greatest number of houses within 250 feet (3) and 500 feet (27)

Alternative Route B

Advantages

- Contains the fewest acres of forested wetlands within the ROW (11 acres)
- Contains the fewest acres of potential Indiana and northern long-eared bat habitat within the ROW (124 acres)
- Parallels the most miles of existing transmission line (4.4 miles or 13%)
- Crosses the fewest number of parcels <10 acres in size (5, tied with C)
- Crosses the fewest number of total parcels (115)
- No residences within 250 feet of the ROW (same as C)
- Most cell towers within 500 feet (1, same as C)

Disadvantages

- Crosses the greatest number of pipeline ROWs (6)
- Contains the greatest acres of agricultural land within the ROW (501 acres)
- Contains the fewest acres of grassland/pasture within 200 feet of the ROW (163 acres)
- Crosses through the greatest length of the estimated obstruction zones for private airfields (5.9 miles)

Alternative Route C

Advantages

- Requires the fewest number of waterbody crossings (3)
- Contains the fewest acres of total wetlands within the ROW (33 acres)
- Crosses the fewest number of parcels <10 acres in size (5, tied with B)
- No residences within 250 feet of the ROW (same as B) and the fewest residences within 500 feet (7)
- Crosses fewest number of total parcels (111)
- Parallels the most miles of parcel boundaries (7.5 miles)

Disadvantages

- Requires the greatest number of stream crossings (63)
- Contains the most acres of potential long-eared and Indiana bat forested habitat within the ROW (168 acres)
- Parallels no existing transmission or pipeline ROWs
- Contains the most cell towers within 500 feet (1, same as B)

6.2.2 Segment 2

Alternative Route D

Advantages

- Requires the fewest number of stream crossings (228)
- Requires the fewest number of waterbody crossings (24, same as E and G)
- Contains the fewest acres of total wetlands within the ROW (118 acres)
- Contains the fewest acres of forested and grassland habitat within the ROW (759 and 1,154 acres, respectively)
- Contains the fewest acres of potential Indiana and long-eared bat forested habitat within the ROW (759 acres)
- Crosses the second fewest number of small parcels (<10 acres in size) (13)
- Fewest number of residences within 250 feet (5)
- Fewest number of residences within 500 feet (50)
- Crosses through no FAA Notification Zones for public airfields
- Parallels the most miles of existing pipeline corridors (44.6 miles)
- No NR-listed architectural sites within 1 mile (same as E and G)

Disadvantages

- Crosses through the greatest length of the estimated obstruction zone for private airfields (10.4 miles)
- Highest number of U.S. highway crossings (6) and state highway crossings (12)
- Crosses the greatest number of pipeline ROWs (21)
- Crosses the second greatest length of agricultural lands (90.7 miles)
- Contains the most cell/radio towers within 500 feet (3, same as E)

Alternative Route E

Advantages

- Parallels the most miles of existing linear infrastructure (transmission lines and pipelines) (70.3 miles)
- Parallels the second most miles of existing pipelines (39.3 miles, same as F)
- Contains the second fewest acres of potential Indiana and long-eared bat forested habitat within the ROW (813 acres)
- Requires the fewest number of waterbody crossings (24, same as D and G)
- No NR-listed architectural sites within 1 mile (same as D and G)
- Requires the fewest railroad crossings (7, same as F)

Disadvantages

- Contains the greatest number of acres of NWI forested and scrub/shrub wetland acres within the ROW (70 acres)
- Crosses the most developed acreage (44 acres)
- Crosses the most miles of agricultural land (90.9 miles)
- Greatest number of residences within 250 feet (11, same as F and I)
- Greatest number of transmission line and pipeline ROWs (45)
- Crosses the most city and/or county public land (2614 feet, same as G)
- Second longest route (176.5 miles)
- Most cell/radio towers within 500 feet (3, same as D)

Alternative Route F

Advantages

- Crosses the fewest miles of Karst topography (46.1 miles)
- Crosses the greatest number of large (>80 acres) parcels (306)
- Fewest cemeteries within 500 feet (1, same as H)
- Contains the fewest railroad crossings (7, same as E)

Disadvantages

- Crosses the most streams (252)
- Crosses the most parcels (557)
- Greatest number of residences within 250 feet (11, same as E and I)
- Crosses through the most FAA Notification Zones for public airfields (6.9 miles, same as H)
- Is located in proximity to National Register-listed St. Peter's Catholic Church (3,000 feet, same as H and I)

Alternative Route G

Advantages

- Parallels the most miles of existing transmission line (39.0 miles or 22%)
- No NR-listed architectural sites within 1 mile (same as D and E)
- Requires the fewest number of waterbody crossings (24, same as D and E)

Disadvantages

- Is the longest Alternative Route (177.5 miles)
- Crosses the Lower Grand MDC-designated Heritage Hot Spot (4.5 miles, same as H and I)
- Crosses the most city and/or county public land (2614 feet, same as E)

- Crosses the most miles of karst topography (51.0 miles)
- Is located within 1 mile of Swan Lake National Wildlife Refuge (same as H and I)

Alternative Route H

Advantages

- Crosses through the fewest miles of the estimated obstruction zone for private airfields (2.1 miles, same as I)
- Crosses the fewest number of state highways (9, same as I)
- Parallels the greatest length of 161kV transmission lines (30.9 miles)
- Fewest cemeteries within 500 feet (1, same as F)

Disadvantages

- Contains the most acres of potential Indiana and long-eared bat forested habitat within the ROW (1,056 acres)
- Crosses the most small parcels (<10 acres in size) (22)
- Crosses the Lower Grand MDC-designated Heritage Hot Spot (4.5 miles, same as G and I)
- Crosses through the most FAA Notification Zones for public airfields (6.9 miles, same as F)
- Is located within 1 mile of Swan Lake National Wildlife Refuge (same as G and I)
- Is located in proximity to National Register-listed St. Peter's Catholic Church (3000 feet, same as F and I)

Alternative Route I

Advantages

- Is the shortest Alternative Route (163.2 miles)
- Crosses the fewest number of parcels (493)
- Crosses the fewest number of transmission line and pipeline ROWs (35)
- Crosses the fewest miles of agricultural land (67.3 miles)

Disadvantages

- Contains the greatest acreage of total wetlands within the ROW (acres)
- Greatest number of residences within 250 feet (11, same as E and F)
- Requires the greatest number of waterbody crossings (27)
- Contains the second most acres of potential Indiana and long-eared bat forested habitat within the ROW (1,054 acres)
- Crosses the Lower Grand MDC-designated Heritage Hot Spot (4.5 miles, same as G and H)
- Parallels the fewest miles of existing transmission line (4.3 miles)

- Parallels the fewest miles of existing linear infrastructure (transmission lines and pipelines) (4.3 miles)
- Is located within 1 mile of Swan Lake National Wildlife Refuge (same as H and G)
- Is located in proximity to National Register-listed St. Peter's Catholic Church (3000 feet, same as F and H)

6.2.3 Combined Proposed Route

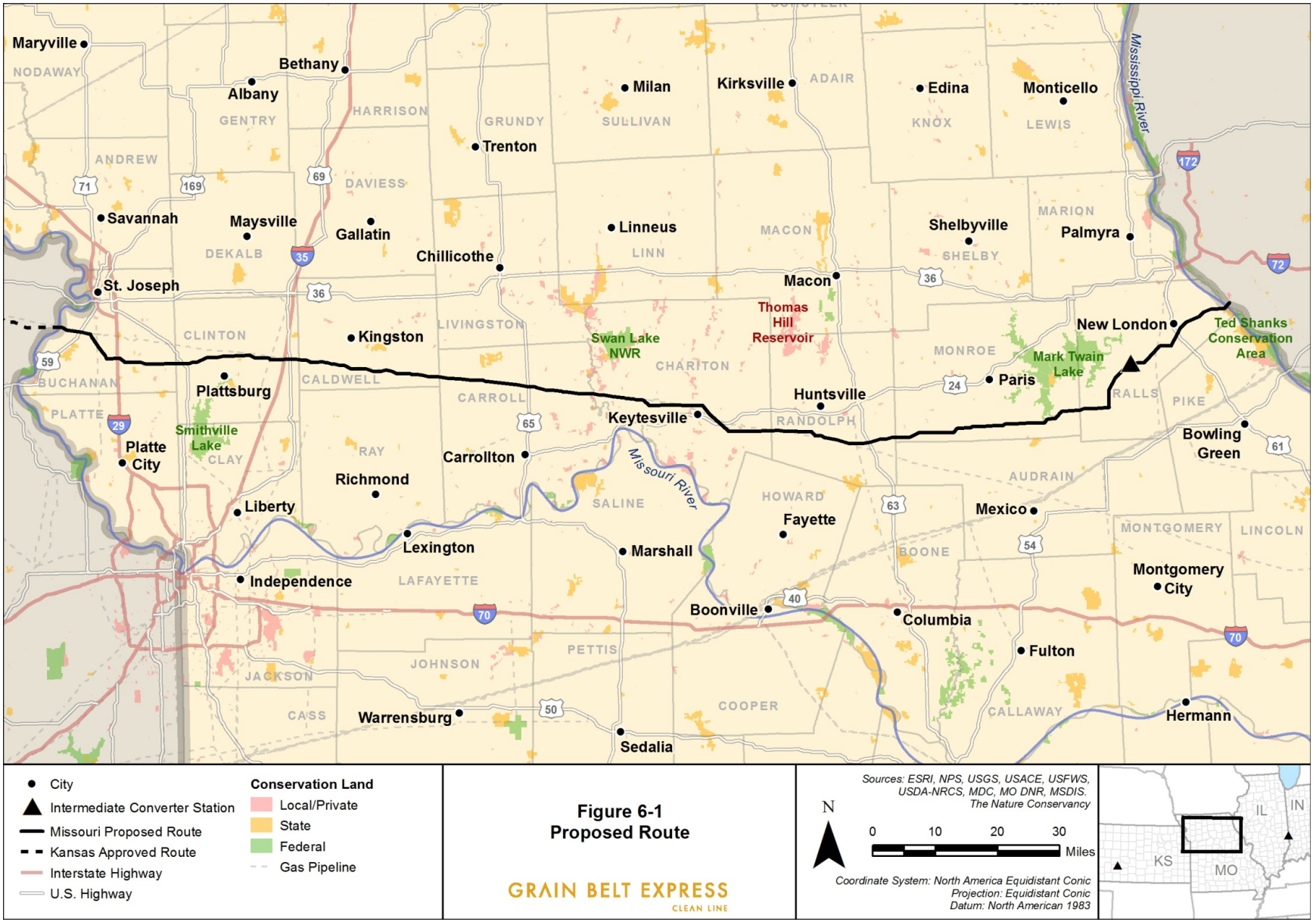
The Routing Team recommends a combination of Alternative Routes B and D as the Proposed Route for the Project (**Figure 6-1**). This combination of routes meets the overall goal of minimizing impacts on the natural, human, and historic resources, while making best use of existing linear infrastructure ROWs and avoiding non-standard design requirements. The Proposed Route has a total length of 206 miles and parallels existing linear infrastructure ROWs for 28 percent of its total length.

Alternative Route B was selected in Segment 1. Alternative Route B parallels a combination of pipelines, an existing transmission line, and parcel boundaries. Initial alignments cross the eastern floodplain of the Missouri River and into the rolling hills along the pipeline. Approximately 3 miles beyond the eastern bluffs, the route turns southeast adjacent to an existing transmission line to avoid residential development along the pipeline and the town of Agency. The route continues along the existing transmission line for 4.5 miles and then turns due east, eventually joining the pipeline corridor. Alternative Route B has a range of benefits over other Alternatives. It has no residences located within 250 feet of the route centerline, avoids the residential congestion located farther east along the pipeline corridor, and avoids crossing through the town of Agency. Alternative Route B has the least impact on forested areas and parallels existing linear infrastructure, thereby reducing fragmentation of potential habitat for the Indiana bat and northern long-eared bat. Alternative Route B also reduces the fragmentation of area land use, by locating the line adjacent to existing utility infrastructure.

Alternative Route D was selected in Segment 2. It follows the Rockies Express/Keystone pipelines, existing transmission lines, and parcel boundaries for approximately 57 percent of its total length. Alternative Route D has the least number of residences within 250 and 500 feet. Alternative Route D is also located approximately 5 miles south of the Swan Lake National Wildlife Refuge, which is an important area for migratory birds. In addition, the area around Swan Lake National Wildlife Refuge has large complexes of wetlands, some of which are protected under the Natural Resource Conservation Service's Wetland Reserve Program. Considering Alternative Route D parallels existing linear infrastructure for a significant portion of the total length, new fragmentation in forested areas would be minimized. Furthermore, Alternative Route D also has the fewest acres of forested habitat within the right-of-way, which results in the least potential impact to the Indiana bat and northern long-eared bat habitat.

The combination of Alternative Routes B and D comprise a Proposed Route for the Project that is reasonable and sound because: 1) the selection of the Proposed Route integrated input from government agencies, local officials, and the general public into the route development, analysis, and selection process; and 2) the Proposed Route best minimizes the overall effect of

the Grain Belt Express transmission line on the natural and human environment while avoiding unreasonable and circuitous routes, unreasonable costs, and special design requirements.


Maryville
Bethany
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Milan
Kirksville
Edina
Monticello
Mississippi River
Trenton
Savannah
Maysville
Gallatin
Linneus
Shelbyville
Palmyra
Chillicothe
St. Joseph
Macon
Thomas Hill Reservoir
New London
Ted Shanks Conservation Area
Kingston
Swan Lake NWR
Mark Twain Lake
Paris
Plattsburg
Huntsville
Keytesville
Smithville Lake
Platte City
Carrollton
Missouri River
Bowling Green
Richmond
Liberty
Fayette
Mexico
Lexington
Marshall
Montgomery City
Independence
Boonville
Columbia
Fulton
Warrensburg
Hermann
Sedalia
NODAWAY
ANDREW
GENTRY
HARRISON
GRUNDY
SULLIVAN
ADAIR
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DAVIESS
DEKALB
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City
Intermediate Converter Station
Missouri Proposed Route
Kansas Approved Route
Interstate Highway
U.S. Highway
Conservation Land
Local/Private
State
Federal
Gas Pipeline
Figure 6-1
Proposed Route
GRAIN BELT EXPRESS
CLEAN LINE
Sources: ESRI, NPS, USGS, USACE, USFWS, USDA-NRCS, MDC, MO DNR, MSDIS. The Nature Conservancy
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Miles
Coordinate System: North America Equidistant Conic
Projection: Equidistant Conic
Datum: North American 1983
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7. References

Chapman, Carl Haley. 1983. Indians and Archaeology of Missouri. University of Missouri Press, Columbia, Missouri.

Federal Energy Regulatory Commission. 1970. Guidelines for the Protection of Natural, Historic, Scenic, and Recreational Values in the Design and Location of Rights-of-Ways and Transmission Facilities. Federal Power Commission Order No. 414. November 27, 1970.

Howard Wight Marshall. 1981. Folk Architecture in Little Dixie: A Regional Culture in Missouri. Columbia: University of Missouri Press.

Jacobs, B. and J.W. Wilson. 1997. Missouri Breeding Bird Atlas 1986–1992. Natural History Series, No. 6, Missouri Department of Conservation, Jefferson City.

Johnson, T.R. 2000. The Amphibians and Reptiles of Missouri. Second Edition. Missouri Department of Conservation, Jefferson City.

MDC (Missouri Department of Conservation). 2013. Missouri Fish and Wildlife Information System. Available online at: http://mdc4.mdc.mo.gov/applications/mofwis/mofwis_search1.aspx. Accessed on December 4, 2013.

MDC. 2005. Lower Grand River Conservation Opportunity Area. Missouri Department of Conservation, Jefferson City, MO.

MDC. 2003. Missouri Department of Conservation Strategic Plan. Missouri Department of Conservation, Jefferson City, MO, 48 pp.

MDC and USDA Forest Service (Missouri Department of Conservation and U.S. Department of Agriculture, Forest Service). 2010. Missouri's Forest Resource Assessment and Strategy. Seeking a Sustainable Future for Missouri's Forest Resources. Missouri Department of Conservation, Jefferson City, Missouri, and USDA Forest Service, Northern Research Station.

MDNR (Missouri Department of Natural Resources). 2013. 2014 Proposed Section 303(d) Impaired Waters List. Available online at: http://www.dnr.mo.gov/env/wpp/sortable2014303dlist.htm. Accessed on November 22, 2013.

Miller, D.E., and Vandike, J.E. 1997. Missouri State Water Plan Series Volume II, Groundwater Resources of Missouri. Missouri Department of Natural Resources, Division of Geology and Land Survey. Water Resources Report No. 46. 210 pp.

Missouri Census Data Center. 2013. Available online at: http://mcdc.missouri.edu/trends/estimates.shtml Accessed on November 20, 2013.

Missouri Prairie Foundation. Education and Outreach. Available online at: http://www.moprairie.org/educational-resources/. Accessed on January 16, 2014.

Missouri SHPO (Missouri State Historic Preservation Office). 2013. CRM Database and Architectural Surveys.

MONHP (Missouri Natural Heritage Program). 2013. Missouri Species and Communities of Conservation Concern Checklist. Missouri Department of Conservation. Jefferson City, Missouri. Available online at: http://mdc.mo.gov/your-property/greener-communities/missouri-natural-heritage-program. Accessed on December 4, 2013.

Nelson, P.W. 2005. The Terrestrial Natural Communities of Missouri. Missouri Natural Areas Committee, Jefferson City.

Nigh, T.A. and W. Schroeder. 2002. Atlas of Missouri Ecoregions. Missouri Department of Conservation, Jefferson City.

O'Brien, M.J. and W.R. Wood. 1998. *The Prehistory of Missouri.* University of Missouri Press, Columbia, Missouri.

Oesch, R.D. 1995. Missouri naiads: a guide to the mussels of Missouri. Missouri Department of Conservation, Jefferson City.

Pflieger, W.L. 1997. The Fishes of Missouri. Missouri Department of Conservation, Jefferson City.

Pflieger, W. L. 1996. The crayfishes of Missouri. Missouri Department of Conservation. 152 pp.

Schwartz, C.W. and E.R. Schwartz. 2001. The Wild Mammals of Missouri. University of Missouri Press, Columbia, and Missouri Department of Conservation, Jefferson City.

State of Missouri. 2012. Rules of Department of Natural Resources, Division 20 Clean Water Commission, Chapter 7 Water Quality. 10 Code of State Regulations 20-7.

Stein, B.A. 2002. States of the union: ranking America's biodiversity. NatureServe, Arlington, Virginia.

Trial, L. 2005. Atlas of Missouri Odonata - Revised. Missouri Department of Conservation report.

U.S. Census Bureau. 2011. American FactFinder webpage. Available online at: http://factfinder2.census.gov/bkmk/table/1.0/en/PEP/2012/PEPANNRES/0400000US29.05000. Accessed on November 20, 2013.

USDA (U.S. Department of Agriculture). 2013. Official Soil Series Descriptions. Available online at: https://soilseries.sc.egov.usda.gov/osdname.asp. Accessed on December 2, 2013.

USDA. 2013. Missouri 2007 Census of Agriculture: State Profile. Available online at: http://www.agcensus.usda.gov/Publications/2007/Online_Highlights/County_Profiles/Missouri/. Accessed on November 20, 2013.

USDA. 2013. Census of Agriculture. Available online at: http://www.agcensus.usda.gov/Publications/2007/Full_Report/Volume_1,_Chapter_1_State_Level/Missouri/. Accessed on November 20, 2013.

USDA. 2006. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. USDA Handbook 296.

USDA CRP (United States Department of Agriculture, Conservation Reserve Program). 2013. *Conservation Reserve Program Factsheet.*

USDA Forest Service (United States Department of Agriculture, Forest Service). 1995. Landscape Aesthetics: A Handbook for Scenery Management. Available online at: http://www.fs.fed.us/cdt/carrying_capacity/landscape_aesthetics_handbook_701_no_append.pdf. Accessed on November 3, 2011.

USDA NASS (U.S. Department of Agriculture, National Agricultural Statistics Service). 2007. National Agricultural Statistics Service. Available online at: http://www.nass.usda.gov/Statistics_by_State/Missouri/index.asp. Accessed on November 20, 2013.

USDA NRCS (United States Department of Agriculture, Natural Resource Conservation Service). 2013. Available online at: http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements/wetlands/. Accessed in March 2013.

U.S. Environmental Protection Agency. 2010. Level III Ecoregions of Missouri. Available online at: ftp://ftp.epa.gov/wed/ecoregions/mo/mo_eco_l3.zip. Accessed on November 26, 2013

USFWS (U.S. Fish and Wildlife Service). 2013a. Swan Lake National Wildlife Refuge. Available online at: http://www.fws.gov/refuges/profiles/index.cfm?id=33570. Accessed on November 22, 2013.

USFWS. 2013b. Missouri County Distribution of Federally-Listed Threatened, Endangered, Proposed, and Candidate Species. Revised October 2013. Available online at: http://www.fws.gov/midwest/endangered/lists/missouri-cty.html. Accessed on December 4, 2013.

USFWS. 2009a. Gray bat (*Myotis grisescens*) 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service Midwest Region, Columbia, Missouri Ecological Services Field Office, Columbia, Missouri.

USFWS. 2009b. Topeka Shiner (*Notropis topeka*) 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service Midwest Region, Manhattan, Kansas Ecological Services Field Office, Manhattan, Kansas.

USFWS. 2007. Indiana Bat (*Myotis sodalis*) Draft Recovery Plan: First Revision. U.S. Fish and Wildlife Service, Fort Snelling, MN. 258 pp.

USFWS. 1982. Gray Bat Recovery Plan. Minneapolis, MN. 26 pp. + appendices.

Vandike, J.E. 1995. Missouri State Water Pan Series Volume 1, Water Resources of Missouri. Missouri Department of Natural Resources, Division of Geology and Land Survey. Water Resources Report Number 45. 122p.

APPENDIX A: ROUTING TEAM

ROUTING TEAM			
Member	**Affiliation**	**Title**	**Specific Role**
Mike Skelly	CLE	President	Project oversight
Jason Thomas	CLE	Environmental Director	Environmental oversight
Wayne Galli	CLE	Executive Vice President – Transmission and technical services	Engineering support and oversight
Mark Lawlor	CLE	Director of Development	Siting support, public outreach, agency consultation
Diana Rivera	CLE	Project Development Manager	Siting support and public outreach
Adhar Johnson	CLE	Manager	Siting support Public outreach and relations
Ally Smith	CLE	Associate	Siting support Public outreach
John Kuba	CLE	Associate – Environmental Specialist	Siting support, agency consultation, environmental and sensitive species
Cari vanAmburg	CLE	Associate	Public outreach support
Daniel Hodges Copple	CLE	Associate	Public outreach support
Alex Landon	CLE	Associate	Public outreach support
Claire Richard	CLE	Associate	Public outreach support
Louisa Kinoshi	CLE	Associate, Communications	Public outreach support and graphics
Ty White	CLE	Associate	GIS support
Timothy Gaul	LBG	Associate Vice	Project Director, siting support,

ROUTING TEAM			
Member	**Affiliation**	**Title**	**Specific Role**
		President, Energy Services	agency consultation, public outreach
Laurie Spears	LBG	Environmental Planner	Project Manager, siting support, agency consultation, public outreach
James Puckett	LBG	GIS Specialist	Siting support, GIS Analysis and Mapping
Todd McCabe	LBG	Environmental Scientist	Siting support, public outreach, agency consultation, GIS support, sensitive species, land use
Emily Larson	LBG	Environmental Scientist	Siting support & public outreach
Brad Fine	LBG	Environmental Planner	Siting support, public outreach support and logistics, Engineering
Linda Green	LBG	GIS Specialist	GIS Analysis and Mapping, public outreach
Chris Flannagan	LBG	Environmental Scientist	Soils and Geology
Josh Schanbel	LBG	Environmental Planner	Visual and Recreational Resources
Camilla Deiber	LBG	Cultural Resource Specialist	Architectural resources
Tina Fortugno	LBG	Cultural Resource Specialist	Archaeological resources
Laura Totten	LBG	Environmental Scientist	Wildlife and habitat and sensitive species

ROUTING TEAM			
Member	**Affiliation**	**Title**	**Specific Role**
Mike Snyder	LBG	Environmental Scientist	Water resources
Neeli Landon	LBG	Communications Specialist	Public outreach
Phil Robertson	POWER Engineers	Engineer	Siting support and engineering
Kelsey Rockey	Parris Communications	Communications Specialist	Public outreach
Kelly Cooper	Parris Communications	Communications Specialist	Public outreach

APPENDIX B: DATA SOURCES

Category	Definition	Units	Data Source
Aerial Photography			
National Agricultural Imagery	Missouri NAIP 2008, 2010, 2012		The National Agricultural Imagery Program (NAIP) obtains aerial imagery during agricultural growing seasons. The most current imagery for the state of Missouri when the project began was taken in 2008. Imagery flown in 2010 and 2012 was used once it became available. Imagery is collected at the spatial resolution of one square meter and with the spectral resolution as natural color.
Natural Resources			
Hydrology			
Streams	National Hydrography Dataset flowlines	Number of streams crossed	A statewide subset of the National Hydrography Dataset (NHD) model version 2 was downloaded from the United States Geological Survey (USGS). Feature classes used for calculations included canal/ditch, stream/river (intermittent and perennial), artificial path, and any named features. A member of the routing team verified each stream/river crossing point using 2012 NAIP imagery.
Water bodies	National Hydrography Dataset waterbodies	Length of water body crossed by potential route	A statewide subset of the National Hydrography Dataset (NHD) model version 2 was downloaded from the United States Geological Survey (USGS).
Wetlands	National Wetlands Inventory	Length of wetlands crossed by potential route, Acres of wetland within 200' ROW	National Wetland Inventory (NWI) data was downloaded from the U.S. Fish and Wildlife Service's (USFWS) website.
Floodplains	100 and 500-year floodplains		The Federal Emergency Management Agency (FEMA) provides a digital version of their National Flood Hazard Layer on DVDs. Floodplain data for Missouri was requested on November 14, 2011. Where possible, unmapped flood areas near the Missouri River crossing were digitized from georeferenced FIRMettes. Floodplain data provided by the Illinois Geospatial Data Clearinghouse was used to approximate the length of floodplains crossed by potential routes on the Illinois side of the Mississippi River.
Protected and Public Lands			

Category	Definition	Units	Data Source
Public and Conservation Lands	Local, private, state, and federally owned lands	Length of public/conservation land crossed	This data layer represents features from a wide variety of sources, including the U.S. Geological Survey's Protected Areas Database (PADUS v1.2); U.S. Army Corps of Engineers; National Resource Conservation Service; U.S. Fish and Wildlife Service; U.S. Forest Service; The Nature Conservancy; National Conservation Easement Database; Illinois Department of Natural Resources; Illinois Parks and Recreation; Illinois Nature Preserve Commission; Illinois State Geological Survey; Missouri Department of Natural Resources; Missouri Department of Conservation; Missouri Spatial Data Information service, Indiana Department of Natural Resources; Kansas Department of Wildlife, Parks, and Tourism; Kansas Data Access and Support Center; Kansas Parks and Recreation Association; and many counties and municipalities. Where possible, the boundaries of these protected areas have been edited to match parcel boundaries provided by the counties in the study area.
Sensitive Species and Habitat			
Indiana Bat and Long-Eared Bat Habitat	Potential habitat crossed by route	Miles	The United States Fish and Wildlife Service (USFWS) publish a list of Federally-Listed Threatened, Endangered, Proposed, and Candidate species by county for Missouri. Because all study area counties are listed as potential habitat for the Indiana Bat and the Long-Eared Bat, habitat for these species was calculated using Forest and Forested Riparian areas as determined by the Photo-Interpreted Land Cover dataset.
Heritage Hotspot	Hotspot length crossed	Miles	Heritage Hotspot data was provided by the Missouri Department of Conservation and is part of the Comprehensive Wildlife Strategy (CWS) project data. The CWS data description says that hotspots "represent areas with a concentration of species of conservation concern."
Illinois Natural Areas Inventory, Threatened and Endangered Species, Illinois Nature Preserves Commission sites			The Illinois Department of Natural Resources (IDNR) provided shapefiles of threatened/endangered species, Illinois Natural Areas Inventory sites, and Illinois Nature Preserves Commission sites. This data was used to analyze potential impacts to protected species and protected areas at the Mississippi River crossing locations.
Important Bird Areas (IBA)			The MDC Comprehensive Wildlife Strategy project provided data showing areas identified as Important Bird Areas by the Missouri Audubon society. Important Bird areas provide crucial habitat for species of conservation concern and avian species vulnerable due to their limited range or high congregation density.
Soils and Land Use			
Karst		Miles crossed	Data depicting regions of karst topography were acquired from the USGS (via the National Atlas Map).

Category	Definition	Units	Data Source
NLCD Land Cover			The National Land Cover Database 2006 (NLCD 2006) compiled by the Multi-Resolution Land Characteristics (MRLC) Consortium (including the U.S. Geological Survey, Environmental Protection Agency, U.S. Forest Service, National Oceanographic and Atmospheric Association, National Aeronautics and Space Administration, Bureau of Land Management, National Park Service, Natural Resource Conservation Service, and the U.S. Fish and Wildlife Service). NLCD 2006 products include 16 classes of land cover from Landsat satellite imagery.
Steep Slopes	Slopes > 20%	Feet crossed	Slopes (in percent) were derived from a digital elevation model (DEM) consisting of terrain elevations for ground positions at regularly spaced horizontal intervals (10 meters). The data used for this analysis was derived from the National Elevation Dataset (NED) prepared by the USGS.
Human Environment			
Residences	Residences within 250, 500, and 1000'	Counts	Residences were digitized using high resolution aerial image interpretation as well as field reconnaissance. Aerial imagery provided by the National Agricultural Imagery Program (2008/2012).
Schools, Churches, Cemeteries	Features within 1000 feet of route	Counts	The locations of churches, schools, and cemeteries were derived from the United States Geological Survey's Geographic Names Information System (GNIS) and augmented through high resolution aerial photo interpretation, field reconnaissance and public outreach efforts. The GNIS database serves as the Federal Government's repository of information regarding feature name spellings and applications for features in United States and its Territories. The names listed in the inventory are often published on Federal maps, charts, and in other documents and have been used in emergency preparedness planning, site-selection and analysis, genealogical and historical research, and transportation routing. Through field reconnaissance, the Routing Team recorded local schools, churches, and cemeteries to augment and verify this data layer.
Parcels	Tax parcel boundaries	Number of parcels crossed	The routing team contacted counties in the study area (Buchanan, Clinton, Caldwell, Livingston, Carroll, Chariton, Macon, Randolph, Audrain, Shelby, Monroe, Marion, Ralls, Pike) and purchased parcel data during April, May, and June 2013. All counties except for Ralls County provided digital GIS parcel boundary data and associated ownership information. Ralls County provided scans of parcel maps and a spreadsheet with property owner name and address information.
Household Density		Miles crossed	Household density was derived at the census block level from census population data obtained from the US Census Bureau (2010).

Category	Definition	Units	Data Source
Pivot Irrigation Systems	Pivots impacted	Counts	Pivot irrigation systems were digitized using high resolution aerial image interpretation. Members of the public were also encouraged to provide information about existing or planned pivot irrigation systems on their land, and this data aided in digitizing and verifying pivot locations. A pivot is considered potentially impacted when a potential route crosses more than 1,500 feet of irrigated area in a single span.
Energy Infrastructure			
Transmission Lines		Length parallel to existing transmission lines. Count of existing transmission lines crossed.	Information on existing transmission lines was collected from Platts Transmission Lines geospatial data layer. . The information was augmented through aerial photo interpretation and field review.
Oil and Gas Pipelines		Length parallel to existing gas line corridors.	Major natural gas and oil pipeline in formation was obtained through the EV Energy Map of North America. Spatial accuracy of the data was augmented through field review of pipeline line corridors, and pipeline ownership information was improved by comparison with the National Pipeline Mapping System online viewer.
Oil and Gas Wells		Counts	The Missouri Department of Natural Resources, Division of Geology and Land Survey, and Geological Survey Program maintain a list of permitted oils and gas well information within the State of Missouri.
Transportation			
Major Roads	Interstates, U.S. Highways, State Highways	Number of each road type crossed	Major roads data was prepared by the Environmental Systems Research Institute (ESRI), (2012) Redlands, California, USA.
Airport and Heliport Notification Zones	Airport points and FAA Notification Zone	Length of route within FAA Notification Zone	The location of airports and heliports was gathered from FAA databases, aerial photograph interpretation, field reconnaissance, public input, and navigational charts. An approximation of the air navigation obstruction zone was developed based on the Code of Federal Regulations (CFR) Title 14 Part 77, (Aeronautics and Space, Objects affecting navigable airspace). This approximation was calculated based on aerial interpretation of runway length, the average height of the proposed transmission towers, and approach zone formulas for airports and heliports in the CFR. Note: this is a rough approximation performed based on aerial photo interpretation without the inclusion of topographic effects or precise knowledge of runway length.
Recreation			
Recreation Trails			The Missouri Department of Conservation publishes data showing recreational trails in the state.

Category	Definition	Units	Data Source
Scenic Byways		Crossings	Information and driving directions from the National Scenic Byways Program enabled mapping of scenic and historic byways in Missouri, Illinois, and Indiana.
Historic Resources			
Historic and Archaeological Sites		Sites within ¼ mile, ½ mile, and 1 mile	The Missouri State Historic Preservation Office provided shapefiles showing locations of sites and districts listed on the National Register of Historic Places and a geodatabase with spatial and tabular data for archaeological sites across the state.

APPENDIX C: FEDERAL AND STATE AGENCY COORDINATION

CLEAN LINE
ENERGY PARTNERS

February 10, 2011

Joe Cothern
U.S. EPA Region VII
901 N. 5th Street
Kansas City, MO 66101

Re: Clean Line Energy Partners' Proposed Grain Belt Clean Line Transmission Project

Dear Mr. Cothern:

Clean Line Energy Partners LLC (Clean Line) is seeking your input on our proposed project to develop, construct and operate the Grain Belt Express Clean Line transmission project ("project"). Clean Line is a privately-owned company focused on developing high voltage direct current (HVDC) transmission lines that would connect the best renewable energy resource regions to communities and cities that have limited access to renewable energy. The proposed project will be capable of moving up to 3,500 megawatts (MW) of renewable energy from the wind-rich region of southwestern Kansas to southeastern Missouri and markets farther east.

Clean Line has retained The Louis Berger Group, Inc. (Berger) to conduct a siting study for the proposed project. We would like to request the following, and, if available, any Geographic Information Systems data identifying their location:

NPL	USEPA Superfund Sites, National Priorities List
CERCLIS	USEPA Potential Superfund Sites
RCRA-LgGen	USEPA RCRA Large Quantity Generators
RCRA-SmGen	USEPA RCRA Small Quantity Generators
RCRA-TSD	USEPA RCRA Treatment, Storage and Disposal Sites
RCRA-Transp	USEPA RCRA Transporters
ERNS	USEPA Emergency Response Notification System
HWMP-UST/ LUST	KDHE UST and LUST Sites
HWMP-CERCLIS	KDHE Superfund Sites
HWMP-RCRIS	KDHE RCRA Sites
HWMP-Registry	KDHE Registry of Confirmed or Abandoned or Uncontrolled Hazardous Waste Sites
HWMP-VCP	KDHE Voluntary Cleanup Program Sites

The development and environmental permitting process for this project will be a multi-year process, and we are still in a relatively early phase. This coordination will be the first of many opportunities for agencies to participate in the review of this project because Clean Line will need to obtain federal, state, and local permits from the appropriate agencies. A member of our project team will be contacting you in the next few weeks to schedule a follow-up meeting for a more interactive discussion of the project, to present the status of our studies, and to solicit your input on the siting process and corridor alternatives. Construction is anticipated to take approximately two years. Under the current schedule, Clean Line is proposing the project to be in service by the end of 2016.

1001 MCKINNEY, SUITE 700 HOUSTON, TX 77002 TEL 832-319-6310 FAX 832-319-6311
CLEANLINEENERGY.COM

The Grain Belt Express Clean Line, as currently proposed, will begin near the Spearville substation in Ford County, Kansas and end in southeastern Missouri near the St. Francois substation in St. Francois County, Missouri.

Proposed project facilities include a converter station and possibly ground beds at each terminus, two sets of bundled wire conductors per HVDC circuit, shield wire, and conductor support structures. Clean Line is proposing steel structures ranging in height from 120 to 150 feet that are spaced approximately 800 to 1,200 feet apart. The design and dimensions may vary based on terrain and other engineering considerations.

Please reply with your comments in writing and/or by email at your earliest convenience to:

Stephen Parker, Project Manager
The Louis Berger Group, Inc.
4050 Pennsylvania Avenue, Suite 121
Kansas City, MO 64111
sparker@louisberger.com

Although the route for the project has not been identified, the attached Overview Maps shows the entire project siting study area. We have also included a list of counties within the study area boundary. Upon request, the Louis Berger team can provide you with the electronic GIS boundary for the study area. Any additional comments or concerns you have that would assist us in siting the project would be greatly appreciated.

Thank you in advance for your assistance and please do not hesitate to contact Mr. Parker or me if you need additional information.

Sincerely,

Jason Thomas
Director, Environment
Clean Line Energy Partners
cell 713-805-6840
tel 832-319-6357
jthomas@cleanlineenergy.com

Stephen Parker
Senior Scientist
The Louis Berger Group, Inc.
cell 816-674-1110
tel 816-398-8658
sparker@louisberger.com

Attachments:

I. Project Overview Maps
II. List of Counties within the Study Area

Cc: Mark Lawlor, Clean Line Energy Partners
Diana Coggin, Clean Line Energy Partners

Missouri Counties within Study Area			
Clay	Cooper	Johnson	Polk
Audrain	Crawford	Laclede	Pulaski
Barton	Dade	Lafayette	Randolph
Bates	Dallas	Lawrence	Ray
Benton	Dent	Livingston	Reynolds
Boone	Douglas	Madison	Saline
Buchanan	Franklin	Maries	Shannon
Caldwell	Gasconade	Miller	St. Charles
Callaway	Greene	Moniteau	St. Clair
Camden	Henry	Montgomery	St. Francois
Carroll	Hickory	Morgan	Ste. Genevieve
Cass	Howard	Newton	Texas
Cedar	Howell	Osage	Vernon
Chariton	Iron	Perry	Warren
Christian	Jackson	Pettis	Washington
Clinton	Jasper	Phelps	Webster
Cole	Jefferson	Platte	Wright

Kansas Counties within Study Area			
Allen	Doniphan	Kiowa	Pawnee
Anderson	Douglas	Labette	Pottawatomie
Atchison	Edwards	Leavenworth	Pratt
Barber	Elk	Lincoln	Reno
Barton	Ellis	Linn	Rice
Bourbon	Ellsworth	Lyon	Riley
Brown	Finney	Marion	Rush
Butler	Ford	Marshall	Russell
Chase	Franklin	McPherson	Saline
Chautauqua	Geary	Meade	Sedgwick
Cherokee	Gray	Miami	Shawnee
Clark	Greenwood	Mitchell	Stafford
Clay	Harper	Montgomery	Sumner
Cloud	Harvey	Morris	Wabaunsee
Coffey	Hodgeman	Nemaha	Washington
Comanche	Jackson	Neosho	Wilson
Cowley	Jefferson	Ness	Woodson
Crawford	Johnson	Osage	Wyandotte
Dickinson	Kingman	Ottawa	

CLEAN LINE
ENERGY PARTNERS

February 10, 2011

Charlie Scott, Field Supervisor
Columbia Ecological Services Field Office
U.S. Fish and Wildlife Service
101 Park DeVille Dr., Suite A
Columbia, MO 65203-0057

Re: Clean Line Energy Partners' Proposed Grain Belt Clean Line Transmission Project

Dear Mr. Scott:

Clean Line Energy Partners LLC (Clean Line) is seeking your input on our proposed project to develop, construct and operate the Grain Belt Express Clean Line transmission project ("project"). Clean Line is a privately-owned company focused on developing high voltage direct current (HVDC) transmission lines that would connect the best renewable energy resource regions to communities and cities that have limited access to renewable energy. The proposed project will be capable of moving up to 3,500 megawatts (MW) of renewable energy from the wind-rich region of southwestern Kansas to southeastern Missouri and markets farther east.

Clean Line has retained The Louis Berger Group, Inc. (Berger) to conduct a siting study for the proposed project. In accordance with the Endangered Species Act of 1973 (16 U.S.C. 1531-1544 as amended) we would like to request your comments on the project's potential to have adverse effects on federally threatened or endangered species. The development and environmental permitting process for this project will be a multi-year process, and we are still in a relatively early phase. This coordination will be the first of many opportunities for agencies to participate in the review of this project because Clean Line will need to obtain federal, state, and local permits from the appropriate agencies. A member of our project team will be contacting you in the next few weeks to schedule a follow-up meeting for a more interactive discussion of the project, to present the status of our studies, and to solicit your input on the siting process and corridor alternatives. Construction is anticipated to take approximately two years. Under the current schedule, Clean Line is proposing the project to be in service by the end of 2016.

The Grain Belt Express Clean Line, as currently proposed, will begin near the Spearville substation in Ford County, Kansas and end in southeastern Missouri near the St. Francois substation in St. Francois County, Missouri.

Proposed project facilities include a converter station and possibly ground beds at each terminus, two sets of bundled wire conductors per HVDC circuit, shield wire, and conductor support structures. Clean Line is proposing steel structures ranging in height from 120 to 150 feet that are spaced approximately 800 to 1,200 feet apart. The design and dimensions may vary based on terrain and other engineering considerations.

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CLEANLINEENERGY.COM

Please reply with your comments in writing and/or by email at your earliest convenience to:

Stephen Parker, Project Manager
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Thank you in advance for your assistance and please do not hesitate to contact Mr. Parker or me if you need additional information.

Sincerely,

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Benton	Dent	Livingston	Reynolds
Boone	Douglas	Madison	Saline
Buchanan	Franklin	Maries	Shannon
Caldwell	Gasconade	Miller	St. Charles
Callaway	Greene	Moniteau	St. Clair
Camden	Henry	Montgomery	St. Francois
Carroll	Hickory	Morgan	Ste. Genevieve
Cass	Howard	Newton	Texas
Cedar	Howell	Osage	Vernon
Chariton	Iron	Perry	Warren
Christian	Jackson	Pettis	Washington
Clinton	Jasper	Phelps	Webster
Cole	Jefferson	Platte	Wright

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Missouri Ecological Services Field Office
101 Park DeVille Drive, Suite A
Columbia, Missouri 65203-0057
Phone: (573) 234-2132 Fax: (573) 234-2181

January 12, 2014

John Kuba
1001 McKinney, Suite 700
Houston, Texas 77002

Dear Mr. Kuba:

This letter is in regards to the preliminary routing network for the proposed 600 kV Grain Belt Express transmission line from western Kansas to southern Indiana. The preliminary network was presented to my staff on December 5, 2013 during a webinar with representatives from Clean Line and the Louis Berger Group. Also participating in the webinar were staff from the Service's Rock Island Illinois Field Office and from the Missouri Department of Conservation. The comments herein are offered on behalf of the Columbia Missouri Ecological Services Field Office of the U.S. Fish and Wildlife Service (Service) under the authority of the Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.), National Environmental Policy Act of 1969 (42 U.S.C. 4321-4347), Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d), Migratory Bird Treaty Act (16 U.S.C. 703-712), and the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1544).

Western Portion of the Line

For the western half of the routing network in Missouri (Buchanan County to Chariton County), we recommend selecting the southern route with a terminal slightly east of Keytesville (Figure 1). The northern route intersects the Lower Grand River Conservation Opportunity Area and the Lower Grand River Wetlands Important Bird Area which contain a network of conservation lands including Swan Lake National Wildlife Refuge, Pershing State Park, and Fountain Grove Conservation Area. These lands support large numbers of migratory birds, especially shorebirds, waterbirds, and waterfowl; and birds are known to move between wetlands on these lands and those in surrounding areas. Placing a large transmission line within areas containing large numbers of migrating birds, especially those with long wingspans, heavy bodies, and poor maneuverability (e.g., ducks, geese, pelicans, herons, etc.), greatly increases the likelihood and frequency of collisions with power lines. While various measures can be implemented to reduce these impacts, the most effective measure is to site transmission lines away from these important bird areas.

According to information you provided during the December 5, 2013 webinar, sections of the southern route would parallel an existing right-of-way for the Rockies Express -West pipeline. Because paralleling an existing right-of-way would reduce the amount of fragmentation to