BEFORE THE STATE CORPORATION COMMISSION
OF THE STATE OF KANSAS

In the Matter of the Application of Westar Energy, Inc. for a Siting Permit for the Construction of a 345 kV Transmission Line in Leavenworth County, Kansas.	))))	Docket No. 17-WSEE-063-STG

APPLICATION

COMES NOW Westar Energy, Inc. (Westar) pursuant to K.S.A. 66-1,178, et seq., and any other applicable statutes, rules and/or regulations, and files this Application with the State Corporation Commission of the State of Kansas (Commission or KCC) for a siting permit granting Westar the right to construct a 345 kV transmission line from Westar's Stranger Creek Substation to an interface with KCP&L's transmission line, located north of Leavenworth, Kansas. In support of this Petition, Westar states:

1. Westar is a corporation duly incorporated under the laws of the State of Kansas and is engaged, among other things, in the business of an electric public utility, as defined by K.S.A. 66-104, in legally designated areas within the State of Kansas. Westar holds certificates of convenience and authority issued by this Commission authorizing it to engage in such utility business. Westar does business under the name "Westar Energy."

2. In this Application, Westar seeks a siting permit authorizing it to construct a new, 345 kV transmission line from Westar's Stranger Creek Substation to an interface with KCP&L's transmission line, located north of Leavenworth, Kansas to replace the existing 161 kV line between these same end points. The new transmission line will be engineered and constructed to 345 kV standards.

3. Support for the filing is provided in the testimony of the following witnesses:

Kelly B. Harrison	Overview and Policy
Mo Awad	Need for the line and the cost recovery mechanism for the line
Jamie Precht, Burns & McDonnell, Inc.	Process used to determine the preferred route

4. In addition to undersigned counsel, the names, addresses and telephone numbers of Westar's representatives upon whom all notices, pleadings, correspondence, and other documents regarding this Application should be served are as follows:

Jeff L. Martin Vice President, Regulatory Affairs P.O. Box 889 818 S. Kansas Avenue Topeka, Kansas 66601 (785) 575-6362 jeff.martin@westarenergy.com	Kelly B. Harrison Vice President, Transmission P.O. Box 889 818 S. Kansas Avenue Topeka, Kansas 66601 (785) 575-1636 kelly.harrison@westarenergy.com

5. During its development of its Integrated Transmission Plan (ITP), the Southwest Power Pool (SPP) identified an economic need related to the existing 161 kV line between the Stranger Creek substation and the KCP&L interface. Westar received a Notice to Construct (NTC) from SPP to replace the 161 kV line with a 345 kV line that is the subject of this Application as a solution for the economic need identified by SPP. The SPP Board of Directors approved the project on October 27, 2015.

6. The proposed line will address the congestion issue that currently exists with the 161 kV line between the Stranger Creek substation and the KCP&L interface and will allow for greater access to less expensive power.

7. Westar currently estimates that it will cost approximately $28.0 million to construct its portion of the proposed line. This is a preliminary estimate based on current costs

of labor and materials and the cost to acquire needed right of way. The actual costs of construction may differ from this estimate and will be affected by, among other things, the final route selected, structure design, changes in commodity prices and labor rates.

8. The proposed line will benefit electric customers both inside and outside of Kansas, ensuring better access to low-cost power from areas north of the Iatan Generation Station. SPP will be filing testimony shortly after Westar's filing of this Application in order to present the results of the ITP10 Assessment.

9. Westar selected the route after an open house through which it received input from landowners and residents in the areas along potential routes. Westar also sought and received input from state and federal agencies and public interest groups. All of the information received from these contacts was used to identify a route that minimizes adverse social and environmental impacts of the line. Ms. Precht's testimony describes the route selection process in detail.

10. Westar will submit a wire stringing application pursuant to K.S.A. 66-183 and K.A.R. 82-12-1, *et seq.*, after design of the line is complete.

Proposed Facilities

Overview of project

11. Westar is proposing to construct a single-circuit 345 kV transmission line from the Stranger Creek substation to the KCP&L interface located on the Kansas side of the Missouri River north of Leavenworth, Kansas.

12. The length of Westar's proposed line will be approximately 11.8 miles. Exhibit KBH-1 to Mr. Harrison's testimony is a map showing the proposed line. The line is located in Leavenworth County.

Transmission Facilities

13. The transmission line will be constructed using either tubular steel "H-Frame" structures or single pole tubular steel structures. The structures will be spaced approximately 600 to 1400 feet apart. The poles for each individual H-frame structure will be approximately 27 feet apart. H-frame structures and single pole structures may be either directly embedded using a crushed rock backfill or may utilize a concrete pier foundation. The minimum ground clearance for the 345 kV circuit will be above that required by the National Electric Safety Code.

14. Drawings of typical single-circuit, H-frame and single pole structures are provided in Exhibit KBH-8. The height of the structures will vary depending on span length, required clearances, and local terrain, but will typically range between 80 and 160 feet.

15. The proposed line will be constructed using aluminum, steel-reinforced (ACSR) conductors, 1590 KCM-ACSR 45/7 (Code Name "Lapwing") conductor. This conductor is constructed of 45 strands of aluminum wrapped around 7 steel strands with an overall diameter of 1.502 inches. This line will utilize a two-conductor bundle for each of the three phases. The two conductors in each bundle will be approximately 18 inches apart and will be arranged in a horizontal bundle. In a conductor of this type, the aluminum strands carry the load current; the mechanical strength to support the conductors is provided by the steel core. Toughened glass dead end insulators and polymer suspension insulators will be used to suspend the bundled phase conductors.

16. The line will be protected from lightning by overhead shield wires strung at the uppermost extremity of the supports. One shield wire will be an optical ground wire composed of ten strands of aluminum-coated steel (alumoweld) wire wrapped around a centrally located

aluminum alloy pipe that contains the optical fibers. The optical fibers will be used as a communications medium for line protective relaying and for internal communications.

17. Non-electric wire fence within a distance of 150 feet from the center of the right-of-way will be grounded at intervals to limit the electromagnetically induced levels of static charges to safe levels. Fences that cross the line route will be grounded at both edges of the right-of-way. Electric fences will be grounded where necessary with the addition of a 60 Hz series filter at each grounding location. Permanently installed metallic objects within 150 feet of the outside phase conductor of the line will be grounded. Minimum ground clearance for the conductor will be chosen to limit induced voltage in ungrounded metallic objects (such as a vehicle parked near the line) to a value that keeps induced current to less than 5 milliamperes.

18. A minimum horizontal clearance distance of 50 feet from the closest phase of the line to existing dwellings will be maintained wherever possible. Construction of the line will consist of right-of-way clearing, structure assembly, structure erection, stringing and tensioning of conductors and shield wires, energizing the line, and cleanup/re-vegetation. Timber within the right-of-way will be removed or trimmed as necessary to assure reliability and safety of the line. All conductors and shield wires will be tension strung.[1] Use of this method will ensure that the conductor will not touch the ground or other objects during construction. Care in handling the conductor will keep its surface smooth, thereby minimizing corona and associated radio-TV interference and audible noise.

19. Structures will be assembled in the field. Tangent structures will be unguyed. Heavy angles and dead ends will be self-supported steel structures. The construction crew will

[1] This system involves stringing a rope between structures for each conductor and shield wire. The rope pulls a steel cable, which in turn strings the electrical conductor through neoprene-lined stringing blocks to protect the conductor from abrasion.

be composed of approximately 50 to 75 workers using equipment that includes foundation drilling equipment, cranes, stringing rigs, conductor tensioners, excavators, skid steers, trucks, cars and other items.

20. Construction equipment and other vehicles will travel along the right-of-way, where possible, and the need for access roads to the work areas will be minimized by the design and construction teams. Westar will apply for a construction activity, National Pollutant Discharge Elimination System (NPDES) permit from the Kansas Department of Health and Environment (KDHE) pursuant to the provisions of K.S.A. 65-164 and 65-165, and the Federal Water Pollution Control Act as amended, 33 U.S.C. 1251 et seq.

21. Before construction begins, a storm water pollution prevention plan (SWPPP) will be developed and submitted to KDHE. The purpose of the SWPPP is to ensure the design, implementation, management, and maintenance of "best management practices" (BMPs) in order to reduce the amount of sediment and other pollutants in storm water runoff from the construction site. Westar, its representative, and/or the contractor(s) responsible for installation, operation, and maintenance of the BMPs will have a current copy of the SWPPP with them during construction. The construction site will be inspected on a regular schedule and within 24 hours after a storm event as listed in the approved permit. A report of each inspection will be prepared, and KDHE will be notified when final stabilization of the site is complete.

22. Westar will inspect the construction and clean-up operations to assure compliance with specifications and standard procedures. Maintenance inspections will be performed by walking, driving or flying along the line routes.

Right-of-Way Requirements

23. The nominal width of the right-of-way will be 150 feet. However, the right-of-way could be more or less in specific areas depending on span length, conductor sag and wind characteristics.

24. Landowners will be able to use the right-of-way for any agricultural purpose that does not interfere with use of the line at full rated capacity. However, landowners will not be permitted to conduct business in the right-of-way that would be hazardous to the landowner, the line, or to the general public (such as a pipe storage yard or tree farm). No foreign structures will be permitted in any part of the right-of-way. Trees and brush in the right-of-way will be trimmed or removed. Herbicides will be used to control woody vegetation and re-growth of trees and brush in the right-of-way except in the case of certified organic farms or similar situations.

25. Easements will be procured from landowners prior to construction. Landowners will be compensated for all damages including crop losses that are directly attributable to construction.

Project Schedule

26. Westar anticipates that construction of its proposed project will be completed by December 2018.

27. Surveying and design work associated with the acquisition of easements would be done in conjunction with acquiring the easements. Upon approval of this Application, these activities would begin in January 2017. Construction activities on the right-of-way, including vegetation clearing, would take approximately 17 months beginning in August 2017, if right-of-way can be acquired in time.

Siting and Environmental

28. A description of siting activities and Westar's approach to issues surrounding siting, such as environmental issues, is provided in Ms. Precht's testimony.

Landowner List

29. A list with the names and addresses of the landowners of record whose land or interest therein is proposed to be acquired in connection with the construction of the proposed line or is located within 1000 feet of the center line of the easement where the line is proposed to be located is included with this application as Attachment 1.[2]

WHEREFORE, Westar requests that the Commission issue its order authorizing Westar to site and construct the proposed transmission line and for such other and further relief as may be appropriate.

Respectfully submitted,

Westar Energy, Inc.

Cathryn Dinges

Cathryn J. Dinges, #20848
Senior Corporate Counsel
818 South Kansas Avenue
Topeka, Kansas 66612
(785) 575-8344; Telephone
(785) 575-8136; Fax

ITS ATTORNEY

[2] K.S.A. 66-1,178 requires the applicant to specify "the names and addresses of the landowners of record whose land or interest therein is proposed to be acquired in connection with the construction of or is located within 660 feet of the center line of the easement where the line is proposed to be located." In its route selection process, Westar identified landowners within 1000 feet of the proposed line in order to have a better assurance that affected landowners would be identified and have an opportunity to provide input concerning location of the line. The list provided in Attachment 1 therefore exceeds the requirement of K.S.A. 66-1,178.

VERIFICATION

STATE OF KANSAS)
) ss:
COUNTY OF SHAWNEE)

Cathryn J. Dinges, of lawful age, being first duly sworn upon oath, deposes and states: That she is the attorney for the within named applicant, that she has read the above and foregoing application, and that the statements therein contained are true according to her knowledge and belief.

Cathryn Dinges
Cathryn J. Dinges

SUBSCRIBED AND SWORN to before me this 17th day of August, 2016.

Donna G. Quinn
Notary Public

My Appointment Expires: 8/28/2016

Donna G. Quinn
NOTARY PUBLIC—STATE OF KANSAS
MY APPT EXP: 8/28/2016

Attachment 1

Last Name	Owner Name	2nd Owner Name	Mailing Address	City	State	ZIP
AUCHARD	GARY L. & MARTHA S. AUCHARD		34058 167TH ST.	LEAVENWORTH	KS	66048
BARBA TRUST	BARBA FAMILY TRUST		16990 MT. OLIVET RD.	LEAVENWORTH	KS	66048
BEARDSLEY	JAMES PATRICK & ALICE BERG BEARDSLEY		30342 175TH ST.	LEAVENWORTH	KS	66048
BEASLEY	JOHN A. & VICKY SUE BEASLEY		19355 SPRINGDALE RD.	LEAVENWORTH	KS	66048
BECKER & HEBBELN LEASING	DUANE L. BECKER TRUST &	HEBBELN LEASING CO.	PO BOX 87	LEAVENWORTH	KS	66048
BERG	ORVILLE ANTON, JR. & SUSAN M. BERG		30197 175TH ST.	LEAVENWORTH	KS	66048
BETHARD	LINDA BETHARD		34092 167TH ST.	LEAVENWORTH	KS	66048
BEYING	JULIE D. & BRIAN K. BEYING		30922 179TH ST.	LEAVENWORTH	KS	66048
BREWER	ALBERTA M. BREWER		18032 SPRINGDALE RD.	LEAVENWORTH	KS	66048
BRIGHTWELL	MICHAEL L. & KARIN R. BRIGHTWELL		20214 SEVEN SISTERS RD.	LEAVENWORTH	KS	66048
BROCK & FOX	CHARLES BROCK &	REBECCA R. FOX	2503 SUMMIT RIDGE TRL.	CHARLOTTESVILLE	VA	22911
BRYANT	CHARLES D. & PHYLLIS BRYANT		34042 167TH ST.	LEAVENWORTH	KS	66048
BUCHANAN	RICHARD E. & JOAN BUCHANAN		16288 HILDEBRANDT RD.	LEAVENWORTH	KS	66048
CLOWERS & BULLOCK	RANDY CLOWERS &	LINDA M. BULLOCK	33588 167TH ST.	LEAVENWORTH	KS	66048
DAVIDSON	CHACE H. DAVIDSON		18933 LECOMPTON RD.	LEAVENWORTH	KS	66048
EDMONDS-SELAS	LILLIAN M. EDMONDS-SELAS		1309 LIMIT ST.	LEAVENWORTH	KS	66048
ELLIOTT	LAWRENCE V. & SANDRA S. ELLIOTT		16621 DANIEL RD.	LEAVENWORTH	KS	66048
EZELL	WINDELL H. EZELL		32328 171ST ST.	LEAVENWORTH	KS	66048
EZELL	JOSEPH W. & MARY I. EZELL		29704 207TH ST.	EASTON	KS	66020
FORGE TRUST	JAMES M. FORGE TRUST		32830 167TH ST.	LEAVENWORTH	KS	66048
FORGE TRUST	JUANITA R. FORGE TRUST		18112 SANTA FE TRAIL	LEAVENWORTH	KS	66048
FORGE TRUST	CYRIL T. & THERESA A. FORGE		16997 SANTA FE TRAIL	LEAVENWORTH	KS	66048
FOX TRUST	DONALD F. & PHYLLIS R. FOX TRUST		28400 195TH ST.	LEAVENWORTH	KS	66048
FREDERICK	MIKE F. & M. MICHELLE FREDERICK		19402 HIGH PRAIRIE RD.	LEAVENWORTH	KS	66048
FREDERICK	VIRGIL C., JR. & LORETTA C. FREDERICK		19330 HIGH PRAIRIE RD.	LEAVENWORTH	KS	66048
GUENTHER	KENNETH A. GUENTHER		30725 172ND ST.	LEAVENWORTH	KS	66048
HATTOK	FRANCIS W. & SANDRA HATTOK		1908 MIAMI ST.	LEAVENWORTH	KS	66048
HEIM	GARY D. HEIM		17661 MT OLIVET RD.	LEAVENWORTH	KS	66048
HILDEBRANDT	GEORGE B., JR. & PATRICIA A. HILDEBRANDT		34324 159TH ST.	LEAVENWORTH	KS	66048
HILL, ZINK & HILL	ALICE M. HILL &	BARBARA A. ZINK & CHARLES R. HILL, JR.	29100 187TH ST.	LEAVENWORTH	KS	66048
HILL	THOMAS A., SR. & LENA HILL		29064 187TH ST.	LEAVENWORTH	KS	66048
HINZ	JO ELLEN HINZ		16626 DANIEL RD.	LEAVENWORTH	KS	66048
HOPPE TRUST	HOPPE FAMILY TRUST		30356 179TH ST.	LEAVENWORTH	KS	66048
HOPPE TRUST	RAYMOND E., JR. & LINDA S. HOPPE		30278 179TH ST.	LEAVENWORTH	KS	66048
HUND	JOHN M. & SHIRLEY C. HUND		32751 171ST ST.	LEAVENWORTH	KS	66048
JENKINS TRUST	JANET J. JENKINS TRUST		18701 HEMPHILL RD.	TONGANOXIE	KS	66086
KAAZ	MATT & ERIN KAAZ		4801 PARK LN.	LEAVENWORTH	KS	66048

Attachment 1

Last Name	Owner Name	2nd Owner Name	Mailing Address	City	State	ZIP
KANSAS GAS	KANSAS NATURAL GAS CO		2720 2nd Ave.	LEAVENWORTH	KS	66048
KERN	GARY A. KERN		33528 167TH ST.	LEAVENWORTH	KS	66048
KERN	JEROME L. KERN		936 MIAMI ST.	LEAVENWORTH	KS	66048
KERN	MAURICE L. KERN		33526 167TH ST.	LEAVENWORTH	KS	66048
KERN	RICHARD J. & JENNIFER KERN		33458 167TH ST.	LEAVENWORTH	KS	66048
KICKAPOO FIRE DEPT.	KICKAPOO TWP. VOLUNTEER FIRE DEPT.		19895 SEVEN SISTERS RD.	LEAVENWORTH	KS	66048
LANCE	JOHN L. & CARA L. LANCE		17475 KRECKLER RD.	LEAVENWORTH	KS	66048
LEAVENWORTH CO.	LEAVENWORTH COUNTY		300 WALNUT ST.	LEAVENWORTH	KS	66048
LIST	ALOYSIUS G. & VIRGINIA D. LIST		19132 SPRINGDALE RD.	LEAVENWORTH	KS	66048
LOMBARDO TRUST	LOMBARDO TRUST		19224 SPRINGDALE RD.	LEAVENWORTH	KS	66048
LWL & TKL PROPERTIES	LWL & TKL PROPERTIES, LLC		28370 175TH ST.	LEAVENWORTH	KS	66048
MADDEN	PATRICK & LISA RAE MADDEN		32821 167TH ST.	LEAVENWORTH	KS	66048
MAGEE	DONALD E. & FLORA M. MAGEE		32863 167TH ST.	LEAVENWORTH	KS	66048
MARSHALL	MARY M. MARSHALL		17807 SPRINGDALE RD.	LEAVENWORTH	KS	66048
MEIER	THOMAS A. & MELANIE J. MEIER		31302 175TH ST.	LEAVENWORTH	KS	66048
MICHAUD TRUST	ROGER L. & GERALDINE K. MICHAUD TRUST		29058 187TH ST.	LEAVENWORTH	KS	66048
MORLEY	KEVIN M. & MARLENE E. MORLEY		28964 183RD ST.	LEAVENWORTH	KS	66048
MT. ZION CEMETERY	MOUNT ZION CEMETERY		PO BOX 330	LEAVENWORTH	KS	66048
O'BEA	MICHAEL B. & REBECCA L. O'BEA		17432 MT OLIVET RD.	LEAVENWORTH	KS	66048
PARKER	JOHN M. & KAREN C. PARKER		17256 MT OLIVET RD.	LEAVENWORTH	KS	66048
PARRETT TRUST	MARTHA JANE PARRETT TRUST		28527 187TH ST.	LEAVENWORTH	KS	66048
PARSONS	JAMES W. & MARILYN PARSONS		17381 MT OLIVET RD.	LEAVENWORTH	KS	66048
PENDERGRAFT	DOYLE A. & LEANNE PENDERGRAFT		16753 COFFIN RD.	LEAVENWORTH	KS	66048
PETITE	ERNEST E. & ANGELA L. PETITE		16536 HILDEBRANDT RD.	LEAVENWORTH	KS	66048
PHILLIPS	JOSEPH G. & ATHENA PHILLIPS		34106 167TH ST.	LEAVENWORTH	KS	66048
POFF	RONALD E. & DEBORAH J. POFF		34314 167TH ST.	LEAVENWORTH	KS	66048
POPPE	TONY L. & KATHLEEN R. POPPE		16848 AMELIA EARHEART DR.	LEAVENWORTH	KS	66048
REDFORD TRUST	JEAN M. REDFORD TRUST		32435 167TH ST.	LEAVENWORTH	KS	66048
REGENOLD	GARY D. REGENOLD		726 S. 4TH ST.	OSAGE CITY	KS	66523
REINDL	VICKI A. REINDL		16682 HILDEBRANDT RD.	LEAVENWORTH	KS	66048
RENO	JAMES E. & MARJORIE G. RENO		33251 199TH ST.	LEAVENWORTH	KS	66048
SACHSE	HERMAN J. & KIMBERLY J. SACHSE		28290 203RD ST.	LEAVENWORTH	KS	66048
SANDIEGO	JERRY W. SANDIEGO		4036 10TH AVE.	LEAVENWORTH	KS	66048
SANDIEGO	JERRY W. SANDIEGO	ATTN: USAA FEDERAL SAVINGS BANK	10750 MCDERMOTT FWY.	SAN ANTONIO	TX	78288
SCANLON	PATRICK M. & SUSAN V. SCANLON		16550 LECOMPTON RD.	LEAVENWORTH	KS	66048
SCHWARTZ TRUST	NICHOLAS J. SCHWARTZ &	GREGORY L. SCHWARTZ TRUST	16654 COFFIN RD.	LEAVENWORTH	KS	66048

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Last Name	Owner Name	2nd Owner Name	Mailing Address	City	State	ZIP
SCHWINN, MURPHY, TODD & ADAMS	HERBERT T. & GENEVIEVE M. SCHWINN	JEANINE E. MURPHY & SUSAN M. TODD & KATHLEEN A. ADAMS	20454 SPRINGDALE RD.	LEAVENWORTH	KS	66048
SHARP TRUST	WALTER, JR. SHARP TRUST		34244 167TH ST.	LEAVENWORTH	KS	66048
SHELLEY	ROBERT & MARY SHELLEY		29932 179TH ST.	LEAVENWORTH	KS	66048
SIMPSON TRUST	SIMPSON FAMILY TRUST		16952 SANTA FE TRAIL	LEAVENWORTH	KS	66048
SLOAN	JAMES M. & AMY S. SLOAN		32849 167TH ST.	LEAVENWORTH	KS	66048
SMITH	BRIAN THOMAS & JESSICA S. SMITH		32959 167TH ST.	LEAVENWORTH	KS	66048
SMITH	STEVEN H. & KAREN J. SMITH		16610 HILDEBRANDT RD.	LEAVENWORTH	KS	66048
STEWART LLC	STEWART FAMILY, LLC		29228 179TH ST.	LEAVENWORTH	KS	66048
STEWART TRUST	HELEN F. STEWART TRUST		29228 183RD ST.	LEAVENWORTH	KS	66048
STRAND	JOHN A., III & VIRGINIA L. STRAND		29303 183RD ST.	LEAVENWORTH	KS	66048
TAYRIEN TRUST	BEVERLY J. TAYRIEN TRUST		16195 SANTA FE TRAIL	LEAVENWORTH	KS	66048
TISH TRUST	TISH FAMILY LIVING TRUST		33474 167TH ST.	LEAVENWORTH	KS	66048
TODD & SCHWINN	D. RYAN TODD &	JAMES TE. SCHWINN	19974 SPRINGDALE RD.	LEAVENWORTH	KS	66048
TREXLER	JERRY L. & SANDRA L. TREXLER		30748 172ND ST.	LEAVENWORTH	KS	66048
VAN DYKE	RODNEY A. & LISA E. VAN DYKE		34118 167TH ST.	LEAVENWORTH	KS	66048
VANDERSTAAY	JAMES L. VANDERSTAAY		34024 167TH ST.	LEAVENWORTH	KS	66048
VANDERSTAAY TRUST	EUGENE E. & CLARA E. VANDERSTAAY TRUST		1225 PAWNEE ST.	LEAVENWORTH	KS	66048
WALNUT HILL, LLC	WALNUT HILL, LLC		9611 US HWY. ONE BOX 390 N.	SEBASTIAN	FL	32958
WEBER	DARREN G. & CRISTINA WEBER		28992 183RD ST.	LEAVENWORTH	KS	66048
WEBER	EDWARD G. WEBER &	LEO F. WEBER	33473 167TH ST.	LEAVENWORTH	KS	66048
WEBER	LEO F. & DONNA J. WEBER &	ROBERT J. WEBER	33511 167TH ST.	LEAVENWORTH	KS	66048
WESTON	DAWN M. WESTON		34074 167TH ST.	LEAVENWORTH	KS	66048
ZINK	BARBARA A. ZINK &	KENNETH F. ZINK, JR.	1416 FRANKLIN	LEAVENWORTH	KS	66048

BEFORE THE STATE CORPORATION COMMISSION

OF THE STATE OF KANSAS

DIRECT TESTIMONY

OF

KELLY B. HARRISON

WESTAR ENERGY

DOCKET NO. _____

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. Kelly B. Harrison, 818 South Kansas Avenue, Topeka, Kansas 66612.

Q. BY WHOM AND IN WHAT CAPACITY ARE YOU EMPLOYED?

A. Westar Energy, Inc. (Westar). I am Vice President, Transmission. I am responsible for transmission line and substation planning, engineering, construction, and system operations.

Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL EXPERIENCE.

A. I received a B.S. Degree in Electrical Engineering in 1981, a M.S. Degree in Engineering Management Science in 1985 and a M.B.A. in 1994, all from Wichita State University. Following my graduation in 1981, I began work at Kansas Gas and Electric Company (KG&E) as an engineer in the System Planning department. I held various

engineering positions until 1987 when I was promoted to Supervisor of Planning and Forecasting in the Rate department. I was promoted to Manager of Planning and Forecasting in 1988, and I remained in that position after the acquisition of KG&E by The Kansas Power and Light Company (now Westar) in March 1992. From March 1992 until October 1999, I held various positions in the Regulatory Affairs department. In October 1999, I became Senior Director, Restructuring and Rates. In 2001, I was named Executive Director, then Vice President, Regulatory in December 2001. In March 2006, I became Vice President, Transmission Operations and Environmental Services. I assumed my current responsibilities in August 2011.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. I will provide an overview of the filing and will discuss the need for and benefits that will result from the proposed transmission project. I also describe the basics of the process used by Westar to determine the preferred route for the proposed line.

II. OVERVIEW OF FILING

Q. WHAT IS THE PURPOSE OF THIS FILING?

A. This application seeks Commission approval for Westar to site and construct a new transmission line to replace the existing 161 kV transmission line from Westar's Stranger Creek Substation, located west of Lansing, to an interface point with KCP&L's transmission line. The KCP&L interface point is located on the Kansas side of the

Missouri river north of Leavenworth. The existing 161 kV transmission line will be removed and replaced with a new 345 kV transmission line.

The filing substantiates the need for the line and details the siting process that was used to select a preferred route. The filing includes testimony and exhibits that: 1) describe the preferred route for the line, 2) list all affected landowners whose land would be crossed by the preferred route or whose land lies within 1,000 feet of the centerline of the preferred route, 3) summarize the environmental characteristics of the areas studied for siting the line; and 4) explain the benefits of the proposed line to Kansas electric customers, electric customers in the region, and economic development within Kansas.

Q. IS THE LINE FOR WHICH WESTAR SEEKS SITING AUTHORITY INTEGRAL TO WESTAR'S PROVISION OF ELECTRIC SERVICE IN KANSAS?

A. Yes, in at least two important ways. First, Westar's witnesses demonstrate the benefits and enhanced reliability from this new line for Westar's retail and wholesale customers in Kansas, for other Kansas electric utilities and their customers, and for the entire Southwest Power Pool (SPP) region.

Second, constructing this line is consistent with Westar's business plan of being a basic Kansas electric utility. Westar is capable of financing, engineering, constructing and maintaining this and other major new expansions of the transmission grid. Such

investment opportunities in new transmission lines traversing our service territory are essential for Westar to succeed in its business strategy of modest growth and moderate returns.

Q. PLEASE DESCRIBE THE BENEFITS THAT WILL BE REALIZED AS A RESULT OF WESTAR'S COMPLETION OF THIS LINE.

A. Under certain conditions, the existing 161 kV transmission line is creating a restriction in the transmission system. This condition limits the ability to move less expensive electric power from areas north of Iatan Generating Station to areas toward the south and east of Stranger Creek Substation. Along with providing a remedy for this issue, the new line will contribute to a stronger, more robust transmission grid, with Kansas and the entire region benefiting from increased access to lower power costs and also increased reliability.

Q. HOW MUCH WILL IT COST TO CONSTRUCT THE NEW LINE?

A. We currently estimate that it will cost approximately $28.0 million to construct Westar's portion of the line and the required substation upgrades. This is an estimate that could change after we have an approved route and as we move toward final design of the line. The cost to construct the line will be affected by numerous factors. Among the items that will affect construction costs are changes to the preferred route; changes in prices of metals such as copper, nickel, steel, and aluminum that affect the cost of poles, wire, and other

components of the line; changes in labor costs as the demand for workers with the necessary skills to construct transmission facilities increases; structure design; and the actual cost to acquire necessary rights-of-way.

Q. HOW WILL THE COST OF THE LINE BE RECOVERED?

A. Because the line has been approved by the SPP as a base plan project, all of the costs associated with the project will be allocated regionally across the SPP's fourteen state footprint on a load-ratio share basis under the highway-byway allocation method. Westar witness Mo Awad will further discuss how the cost of the line will be recovered.

Q. WHEN DOES WESTAR EXPECT THE LINE TO BE IN SERVICE?

A. We expect the line to be completed and in service in December of 2018.

Q. WILL WESTAR PRESENT OTHER TESTIMONY IN THIS CASE?

A. In addition to my testimony, Westar is submitting testimony from the following witnesses:

> Mo Awad, Westar Energy - Director of Regulatory Compliance – discussing the method through which Westar's costs for building the proposed line will be recovered and charged to customers; and
>
> Jamie Precht, Burns and McDonnell Engineering - Project Manager – discussing the preferred route for the line and the siting process that was used to select the preferred route.

Westar understands that the SPP will be submitting testimony in support of Westar's application within a few days of Westar's filing

with the Commission. In that testimony, SPP will present the results of the benefit-cost analysis it conducted when deciding whether to authorize construction of the project for which Westar is requesting siting approval.

III. DESCRIPTION OF THE PROPOSED PROJECT

Q. DESCRIBE THE PROJECT AND THE PREFERRED ROUTE PROPOSED BY WESTAR IN THIS DOCKET.

A. This project involves replacing the existing single circuit 161 kV line from Stranger Creek Substation to the KCP&L interface point. The new line will be a single circuit 345 kV line with larger bundled conductor. Westar's project will also involve removing the 161 kV equipment and installing new 345 kV components in the Stranger Creek Substation. The upgrades at Stranger Creek substation will provide a minimum emergency rating of 3,000 amps. Figure 1 is a map depicting the location of the existing 161 kV line that we are replacing.

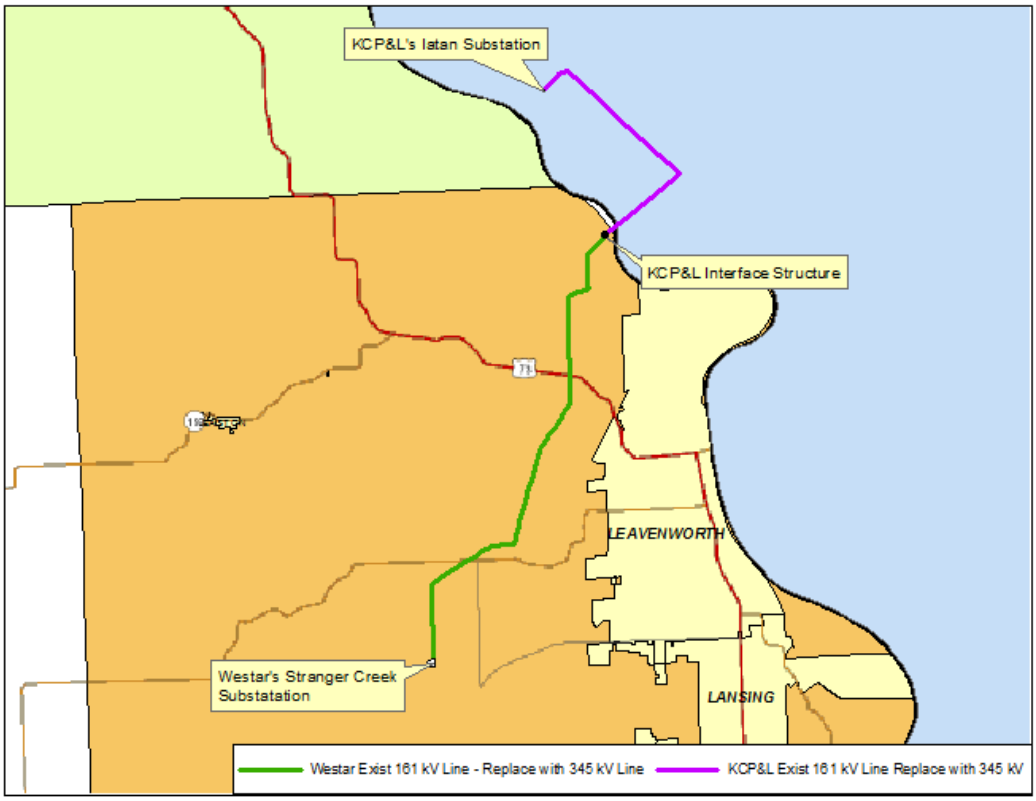


Figure 1

The final preferred route selected by Westar is on the same general alignment as the existing transmission line that it will replace. The line is located in Leavenworth County and Westar's portion of the transmission line is approximately 11.8 miles long. An overview of the final preferred route is shown below as Figure 2. Detailed maps of the final preferred route that Westar is submitting for approval are shown as Exhibit KBH-1, Sheets 1 through 6.

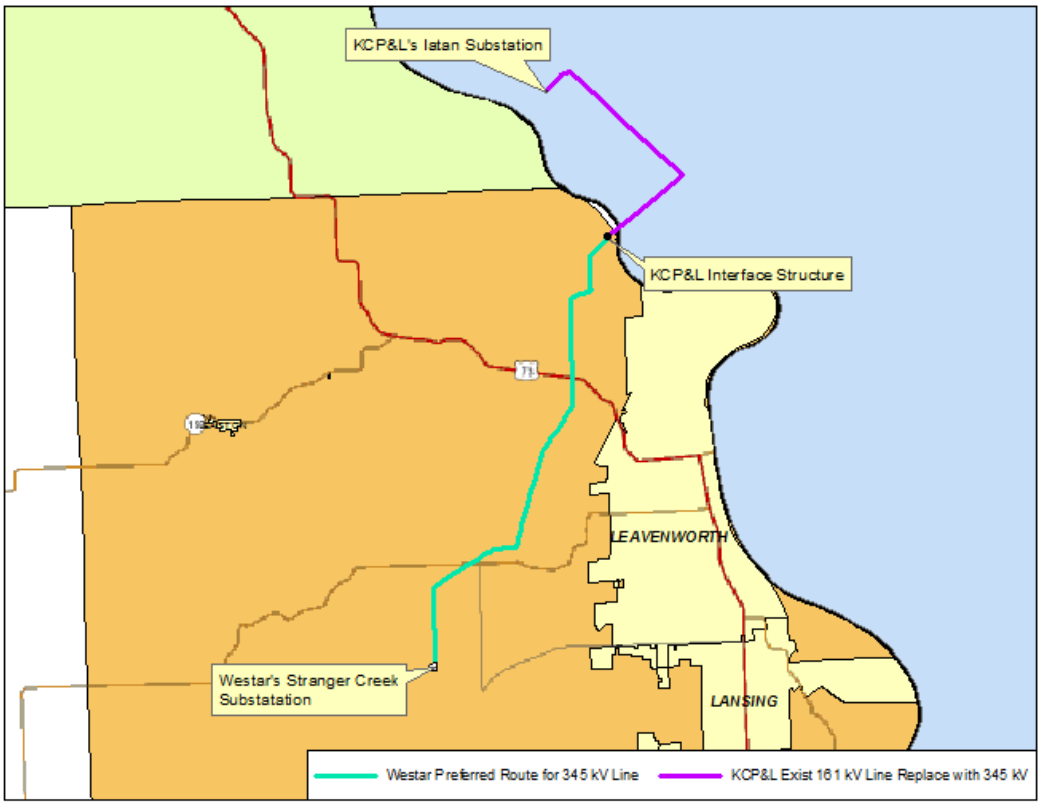


Figure 2

Q. PLEASE DESCRIBE HOW THE STRANGER CREEK TO IATAN PROJECT WAS IDENTIFIED AS A TRANSMISSION PROJECT.

A. The Integrated Transmission Plan (ITP) is SPP's approach to planning transmission needed to maintain reliability, provide economic benefits, and achieve public policy goals to the SPP region in both the near and long-term. The ITP enables SPP and its stakeholders to facilitate the development of a robust transmission grid that provides regional customers improved access to the SPP region's diverse resources. Development of the ITP is driven by planning principles developed by the Synergistic Planning Project Team (SPPT), a team that I served on, including the need to develop a transmission backbone large

enough in both scale and geography to provide flexibility to meet SPP's future needs.

The ITP 10-Year (ITP10) Assessment is included in SPP's iterative three-year study process that includes the 20-Year, 10-Year, and Near Term Assessments. The 10-Year Assessment focuses on facilities 100 kV and above to meet system needs over a ten-year horizon. The ITP10's goals are to:

1. Focus on regional transmission needs
2. Utilize a value-based approach to analyze 10-year out transmission system needs
3. Identify 100 kV and above solutions stemming from such needs as:
    a. Resolving potential reliability criteria violations
    b. Mitigating known or expected congestion
    c. Improving access to markets
    d. Meeting expected load growth demands
    e. Facilitating or responding to expected facility retirements
4. Meet public policy initiatives
5. Synergize the Generation Interconnection and Transmission Service Studies with other planning processes
6. Assess the zonal benefits of the final portfolio

A group of Economic projects, including the Stranger Creek to Iatan voltage conversion project, was approved by the SPP Board of Directors as part of the 2015 ITP10 Assessment on January 27, 2015. The project was identified to relieve congestion on the transmission system from areas north of Iatan Generating Station to areas toward the south and east of Stranger Creek Substation.

Q. DOES WESTAR AGREE WITH THE SPP STUDY THAT THE PROJECT WILL ELIMINATE THE CONGESTION ON THE TRANSMISSION SYSTEM?

A. Yes, Westar agrees with the SPP ITP10 study results that the 161 kV Stranger Creek-Iatan transmission line will need to be replaced and converted to 345 kV to ensure the transmission system continues to be operated in the most economical manner.

If we do not perform this project it may prevent SPP from running the most economic generation, creating higher costs that would be passed on to the entire SPP Region (including Westar).

Q. HAS SPP ISSUED A NOTIFICATION TO CONSTRUCT (NTC) FOR WESTAR'S PROPOSED PROJECT?

A. Yes. On February 25, 2015, SPP issued a NTC for this project to Westar. The NTC required Westar to provide SPP a written commitment to construct the project within 90 days of the date of the NTC and provide a construction schedule and an updated +/- 20% cost

estimate. A copy of this initial NTC received by Westar is attached as Exhibit KBH-2, Sheets 1 through 3.

Q. DID WESTAR RESPOND TO SPP WITH A WRITTEN COMMITMENT TO CONSTRUCTION THEIR PORTION OF THE PROJECT?

A. Yes. Westar responded to SPP in a letter dated May 22, 2015 which is attached as Exhibit KBH-3, Sheets 1 through 3. Westar provided a detailed cost estimate for the project which included recommendations for additional scope at the Stranger Creek Substation. Westar recommended that the scope of the project include the interchange of two terminal positions. Without interchanging these two terminal positions the loss of one breaker would result in the loss of both Iatan-Stranger Creek 345 kV lines or both 345/115 kV transformers at Stranger Creek.

Q. WAS WESTAR'S RESPONSE TO THE NTC WITHIN THE SPP ALLOWED VARIANCE BANDWIDTH TO RELEASE THIS PROJECT FOR CONSTRUCTION?

A. No. The detailed cost estimate provided by Westar was above the 20% variance bandwidth of the estimated cost of the project calculated by SPP and included in the NTC.

Q. DID SPP RESPOND TO WESTAR'S COMMITMENT TO CONSTRUCT?

A. Yes. Westar received a notice letter from SPP on August 24, 2015. This letter is attached as Exhibit KBH-4. SPP informed Westar that the SPP Board of Directors decided to suspend the NTC on July 28, 2015. They informed Westar to suspend all activities until further notice.

Q. DID SPP REINSTATE THE NOTICE TO CONSTRUCT FOR THE PROJECT?

A. Yes. On November 3, 2015, SPP provided notice that they had re-evaluated the NTC and the SPP Board of Directors reinstated the NTC on October 27, 2015. A copy of the notice is attached as Exhibit KBH-5. The SPP accepted all the terms and conditions of Westar's commitment to construct. This includes the additional scope to interchange the existing 161 kV terminal with the 345/115 kV transformer terminal at Stranger Creek substation. The estimated cost for the Westar portion of the project became $28,010,000.

IV. ROUTING STUDY

Q. WHY DID WESTAR DECIDE TO PERFORM A ROUTING STUDY SINCE THIS PROJECT INVOLVES REPLACING AN EXISTING TRANSMISSION LINE?

A. Westar reviewed the NTC requirements, the easements for the existing 161 kV line, our transmission system operating parameters, and the current land uses near the existing 161 kV line.

We also understand that many things have changed since the existing 161 kV line was built in the early 1980's. Today we have many more permitting requirements, environmental concerns, and different land uses. After much deliberation, we concluded that we needed to perform a thorough siting study to determine how the existing 161 kV alignment compared to alternate routes on a new alignment. We also wanted to engage the public in the process to get feedback on the project and any current or potential routes.

Q. PLEASE DESCRIBE THE PROCESS USED TO PERFORM THE ROUTING STUDY AND SELECT THE PREFERRED ROUTE FOR THE LINE.

A. The first step was to assemble an internal project team that consists of Westar employees from Real Estate Services, Transmission Planning, Transmission Operations, Transmission and Substation Engineering, Transmission & Substation Construction, Conservation, Corporate Communications, Government Affairs, Regulatory, and Legal. With a goal of minimizing impacts to landowners, residents, and the environment, we engaged the consulting firm of Burns & McDonnell (BMcD) to assist us with the transmission line siting process. BMcD's Mrs. Precht led the siting process and the attached testimony describes the routing study process used to determine the preferred route.

Q. WHAT OBJECTIVES DID WESTAR PURSUE IN CHOOSING POTENTIAL ROUTES FOR THE PROPOSED TRANSMISSION LINE?

A. The objective of the routing analysis was to identify economically feasible routes that connect Stranger Creek Substation to the KCP&L interface point. Routes were developed that offered the most benefits in terms of providing reliable electric power transmission and also minimized adverse impacts to the social and natural environment. The major concerns during the development of potential routes were to:

1) Maximize the distance of the line from existing homes, businesses and public buildings,
2) Maintain reliable electric service by developing realistic and feasible routes,
3) Minimize overall environmental impacts by maximizing the use of existing road and transmission line rights-of-way,
4) Minimize, to the extent practicable, diagonal routes across tilled agricultural fields,
5) Avoid impacts to private airstrips in the project area,
6) Avoid impacts to any existing center-pivot irrigation system by locating the lines along the tangent of the system's arc,

7) Avoid crossing directly over oil wells, water wells and oil storage tanks, and

8) Minimize potential impacts to wetlands and other environmentally sensitive areas, threatened and endangered species and lesser prairie chicken habitat.

Q. WAS WESTAR ABLE TO IDENTIFY A ROUTE THAT AVOIDED ALL IMPACTS?

A. No. The routing study comprised 20 individual segments that could be combined to form 30 alternate routes. Even though we studied numerous alternate routes, it was not possible to find a route that avoided all impacts. The routing study was successful in identifying the routes that had least amount of impact and was instrumental in selecting the preferred route that we are seeking to be approved.

Q. HOW WERE LANDOWNERS INFORMED OF WESTAR'S INTENT TO SOLICITE FEEDBACK REGARDING POTENTIAL ROUTES REGARDING CONSTRUCIOTN OF THE NEW LINE?

A. Once the potential routes were finalized, we used property ownership data from each county to identify the landowners within 1000 feet of the centerline of each of the potential routes. This includes the landowners along the alignment of the existing 161 kV transmission line. All the potential routes were located in Leavenworth County in north-east Kansas. Burns & McDonnell obtained digital property

ownership data for all property owners who own property located within 1,000 feet of the proposed routes from Leavenworth County.

Using information gathered in this manner, we sent a letter to each landowner to advise him/her that Westar was proposing to rebuild the existing 161 kV line and construct a new high-voltage line near his/her property and inviting each of them to the open house. We identified the date, time and location of the June 9, 2016 open house in the letter. Copies of the invitation form letter are shown in Exhibit KBH-6, Sheets 1 through 3.

The potential routes under consideration were shown to the public by Westar at the open house meeting in June 2016 in order to gather additional input from area landowners. The open house was held in the Leavenworth High School on June 9, 2016. Westar representatives provided information on the purpose and need for the project and potential routes (shown on aerial photographs and maps of the project area). Burns & McDonnell attended the open house using several computer stations with operators that allowed landowners to zoom in to their respective properties, measure distances to potential routes, and provide feedback that was captured electronically in real time. We also provided information on the design and construction of the project, typical land requirements for the new line, and the process Westar will use to obtain easements. During these public meetings, Westar and Burns & McDonnell made notations

to the maps and photos with information provided by the area landowners for consideration during the route selection process.

At the open house, Westar representatives also handed out project fact sheets, routing process information, and questionnaires included as Exhibit KBH-7, Sheets 1 through 5. Participants were encouraged to complete the questionnaires and turn them in before leaving the open house or to mail them in at a later date. Some people who were unable to attend the open house and later called Westar and requested information or provided comments. These individuals were provided information as requested. A total of 67 responses were received from those who attended the open house or requested individual information. A detailed summary of the questionnaire results is presented as part Mrs. Pretch's testimony.

Q. HOW WIDE ARE THE EXISTING EASEMENTS FOR THE EXISTING 161 KV TRANSMISSION LINE?

A. Westar has not performed a thorough analysis of the property records at this time. Westar has performed a high level review of our internal records. This high level review indicates that the width of the easements varies from approximately 100 feet to 140 feet and include areas adjacent to a 115 kV transmission line where the easement width is approximately 230 feet for both transmission lines.

Q. HOW WIDE WILL THE RIGHT-OF-WAY BE FOR THE PROPOSED 345 KV LINE?

A. The nominal width of the right-of-way will be 150 feet. However, the right-of-way could be more in specific areas depending on span length, conductor sag and wind characteristics. The terrain along the route has some very large changes in elevation which can lead to long span lengths. The horizontal movement (blowout) of the line from wind is directly dependent on the span length. For these reasons we need to perform the detailed design to confirm the final right-of-way width. We would not expect the width of the right of way to exceed 200 feet.

Q. IS IT POSSIBLE TO BUILD THE NEW 345 KV TRANSMISSION LINE WITHIN THE SAME RIGHT-OF-WAY AS THE 161 KV TRANSMISSION LINE?

A. We are unable to determine if this is possible at this time. We need to perform a sizable portion of the detailed design before we answer this question. Changing the voltage from 161 kV to 345 kV requires us to increase the electrical clearances to the energized conductor. This results in wider spacing between conductors and longer structure arms, among other things. The increased clearances and longer arms push the conductor father away from the center line making it difficult to use the same right of way as the existing transmission line.

Q. ARE THERE ANY LANDOWNER IMPROVEMENTS ALONG THE EXISTING 161 KV LINE SUCH AS HOMES, BARNS, IRRIGATION WELLS THAT WOULD NEED TO BE MOVED IF THE RIGHT-OF-

WAY IS EXPANDED TO ACCOMIDATE THE 345 KV TRANSMISSION LINE?

A. No. Westar used aerial photography and performed field reconnaissance of the existing route and can see no improvements that would be inside the nominal 150 foot right-of-way for the new transmission line.

Q. WILL LANDOWNERS BE ABLE TO USE THE LAND ON WHICH THE TRANSMISION LINE WILL BE CONSTRUCTED?

A. Yes. Landowners will be able to use the line right-of-way for any agricultural purpose that does not interfere with use of the line at its full rated capacity. However, landowners will not be permitted to conduct business in the right-of-way that would be hazardous to the landowner, the line, or the general public (such as a pipe storage yard or tree farm). No foreign structures or buildings will be permitted in any part of the right-of-way. Trees and brush in the right-of-way will be trimmed or removed. Herbicides will be used to control the re-growth of woody vegetation in the right-of-way except in the case of certified organic farms or similar situations.

Q. WILL WESTAR OBTAIN REVISED EASEMENTS FOR THE RIGHT-OF-WAY ON WHICH THE LINE WILL BE CONSTRUCTED?

A. Yes. Revised easements will be obtained from landowners prior to construction of the proposed line. Landowners will also be

compensated for all damages including crop losses that are directly attributable to construction of the proposed line.

Q. HAS WESTAR TAKEN STEPS TO MINIMIZE EXPOSURE TO ELECTROMAGNETIC FIELDS?

A. Yes. Westar took the electromagnetic field produced by operation of the line into consideration when establishing its route siting criteria. Westar does not consider electromagnetic fields to be a health threat based on published information. However, Westar has adopted a prudent avoidance approach to the siting of all electric facilities. This approach is characterized by the siting of transmission facilities in a manner that minimizes exposure to electromagnetic fields. A minimum horizontal clearance distance of 50 feet from the closest phase of the line to existing dwellings will be maintained wherever possible.

Q. HOW WILL WESTAR MITIGATE THE EFFECT OF THE ELECTRIC AND MAGNETIC FIELDS PRODUCED BY THE PROPOSED LINE?

A. Non-electric wire fence within 150 feet of the center of the line right-of-way will be grounded at intervals to limit the electromagnetically induced level of static charges to a safe level. Wire fences that cross the line route will be grounded at both edges of the right-of-way. Electric fences will be grounded where necessary with the addition of a 60 Hz series filter at each grounding location. Permanently installed metallic objects within 150 feet of the outside phase conductor of the line will be grounded. Conductor minimum ground clearance will be

chosen to limit induced voltage in ungrounded metallic objects (such as a vehicle parked near the line) to a value that keeps induced current to less than 5 milli-amperes.

Q. PLEASE DESCRIBE WHAT WESTAR HAS DONE TO MINIMIZE THE ENVIRONMENTAL IMPACT OF THE LINE?

A. Westar has a stated objective to minimize adverse social and environmental impacts of the line. To accomplish this objective, Westar avoided all major environmental constraints and utilized criteria to select the line's route that by design prevent or minimize social and environmental impacts. Westar has followed and will continue to adhere to the recommendations given by state and federal agencies for procedures that protect the biological, cultural, and historical resources for the areas traversed by the line.

V. TRANSMISSION LINE AND SUBSTATION DESIGN

Q. HOW WILL THE NEW 345 KV TRANSMISSION LINE BE DESIGNED?

A. Detailed design work for the proposed line has not yet been done, but we can describe designs that are typical for a line of this type. The proposed line will be constructed using steel tubular structures in either a single pole or H-frame configuration. The structures would be spaced approximately 600 to 1500 feet apart. Tangent structures (structures in a straight line) will either be directly embedded using a crushed rock backfill or placed on concrete pier foundations,

depending on the soil conditions encountered. The minimum ground clearance for the line will conform to 345 kV circuit standards required by the National Electric Safety Code. Drawings of typical H-frame and single pole structures are provided in Exhibit KBH-8, Sheets 1 through 5. The height of these structures will vary depending on span length, required clearances, and local terrain, but will typically range between 80 and 160 feet.

The proposed line will be constructed using 1590 KCM-ACSR 45/7 (Code Name “Lapwing”), aluminum, steel-reinforced conductors. This conductor is composed of 45 strands of aluminum wrapped around 7 steel strands. This line will utilize a two-conductor bundle for each of the three phases. The diameter of each conductor comprising the two-conductor bundle will be 1.502 inches. The two conductors in each bundle will be approximately 18 inches apart and will be arranged in a horizontal or vertical bundle. In a conductor of this type, the aluminum strands carry the load current; the mechanical strength to support the conductors is provided by the steel core. Toughened glass dead end insulators and polymer suspension insulators will be used to suspend the bundled phase conductors.

The line will be protected from lightning by two overhead ground wires strung at the uppermost extremity of the supporting structures. One shield wire will be a steel cable and one will be comprised of ten strands of aluminum-coated steel (alumoweld) wire wrapped around a

centrally located aluminum alloy pipe that contains a number of optical fibers. The optical fibers will be used as a communications medium for line protective relaying and for internal communications.

Q. PLEASE DESCRIBE THE DESIGN OF THE SUBSTATION EQUIPMENT FOR THIS PROJECT.

A. At the Stranger Creek substation all improvements will be rated for a minimum of 3000 Amps. The existing 6-position 345kV ring bus will remain intact with the exception of converting the existing Iatan 161 kV line terminal to 345 kV operation and interchanging the new Iatan line terminal with the existing 345 kV/115 kV transformer TX-3 terminal. The project will include replacing switches, breakers, electrical and meter panels, and removing the existing 161 kV equipment and associated panels, cabling, etc. All this work will occur within the existing fence of the Stranger Creek substation.

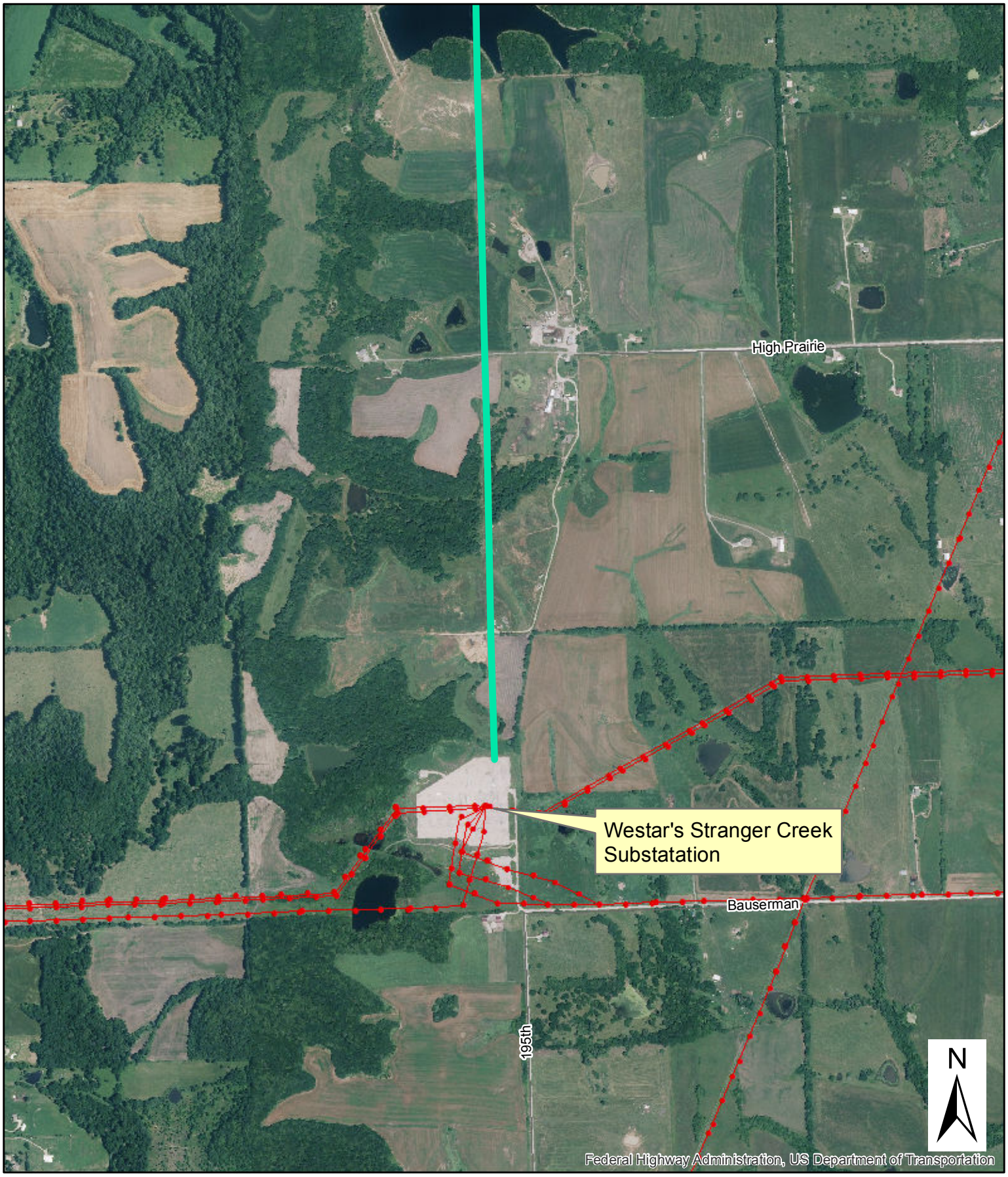
VI. CONCLUSION

Q. DO YOU HAVE ANY CONCLUDING COMMENTS?

A. Yes. The Commission should grant Westar a siting permit for the proposed line. Westar's analysis demonstrates that: 1) the line will provide substantial economic benefits to Kansas electric customers and the SPP region and will support economic development in Kansas; 2) the SPP has authorized construction of the line; and 3) the siting process Westar used was reasonable and appropriate.

Q. THANK YOU.

Exhibit KBH-1



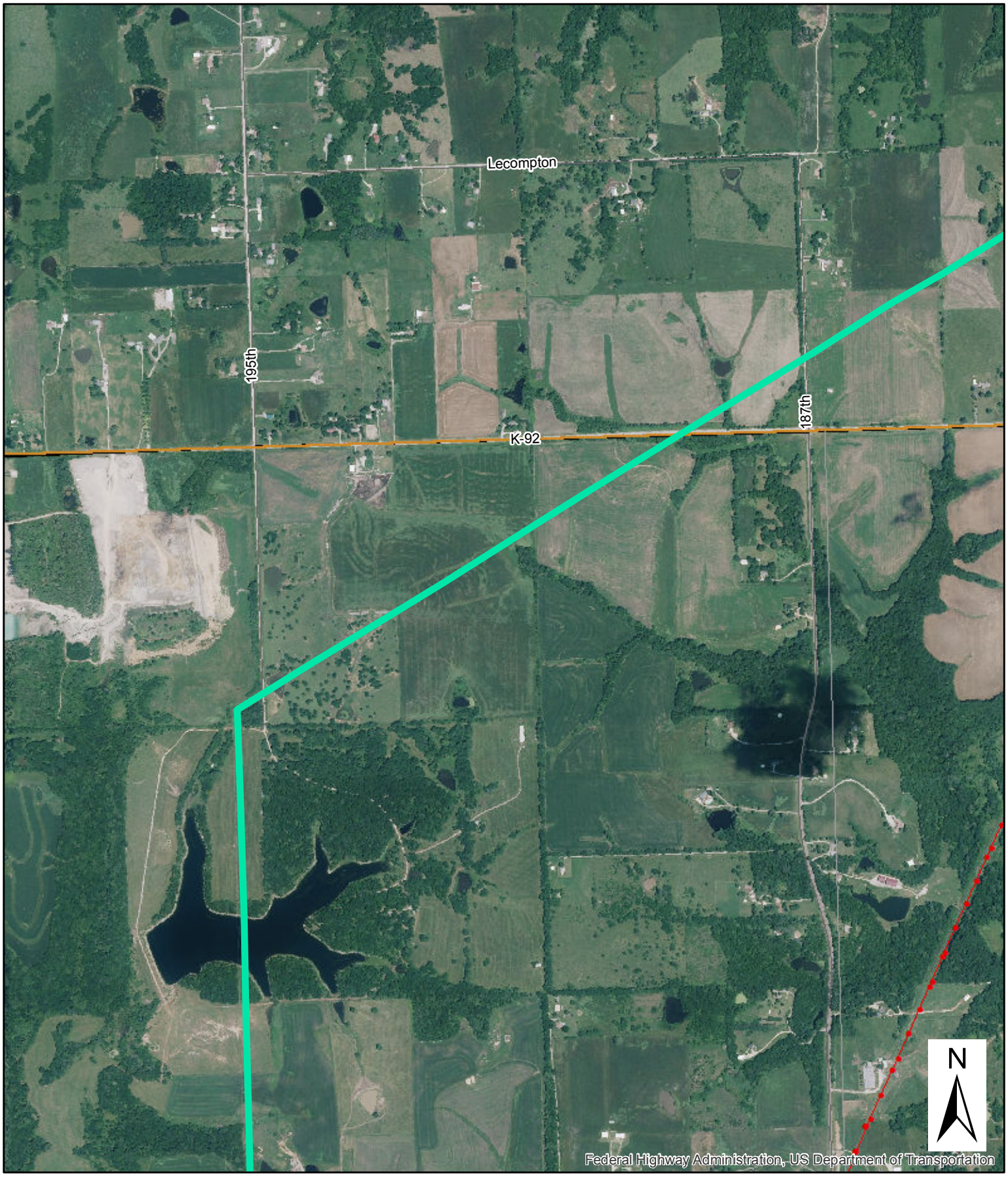
Westar Energy Stranger Creek to Iatan 345 kV Project

Westar Stranger Creek to Iatan Preferred Route | KCP&L Exist 161 kV Line Replace with 345 kV | Other Transmisssion Lines

Date: August 2, 2016

Sheet No. 1

Exhibit KBH-1



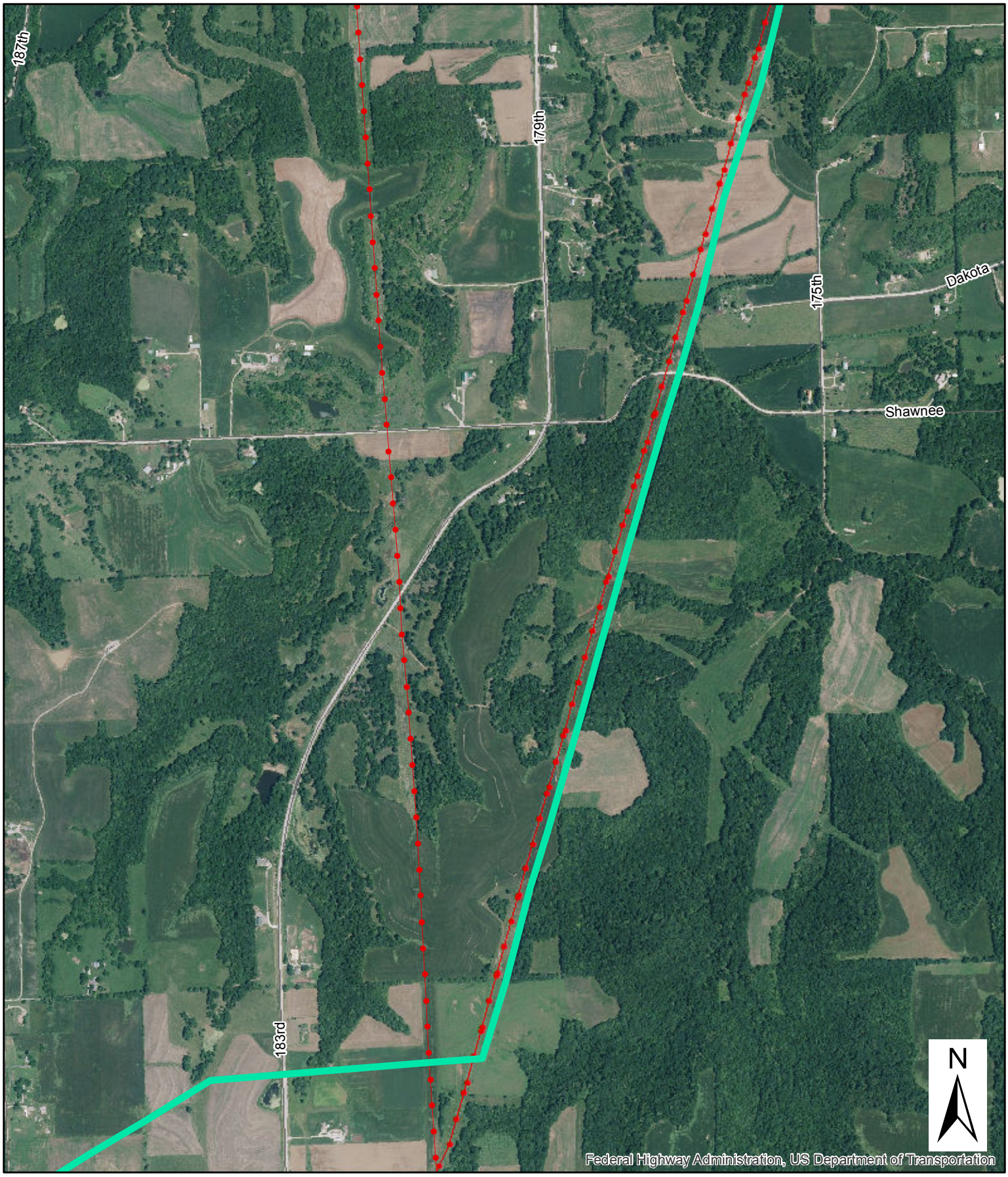
Westar Energy Stranger Creek to Iatan 345 kV Project

Westar Stranger Creek to Iatan Preferred Route | KCP&L Exist 161 kV Line Replace with 345 kV | Other Transmisssion Lines

Date: August 2, 2016

Sheet No. 2

Exhibit KBH-1



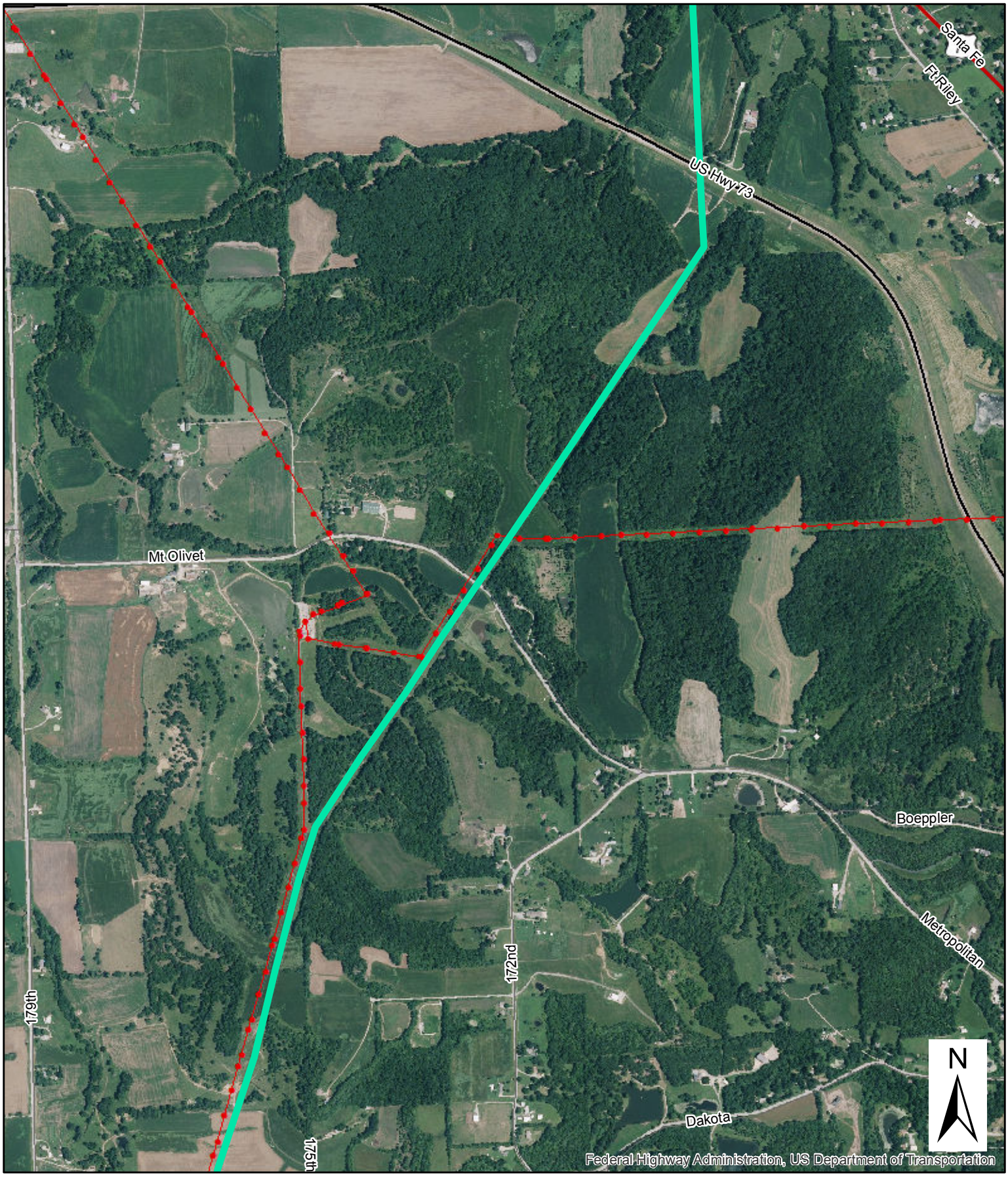
Westar Energy Stranger Creek to Iatan 345 kV Project

Westar Stranger Creek to Iatan Preferred Route | KCP&L Exist 161 kV Line Replace with 345 kV | Other Transmisssion Lines

Date: August 2, 2016

Sheet No. 3

Exhibit KBH-1



Westar Energy Stranger Creek to Iatan 345 kV Project

Westar Stranger Creek to Iatan Preferred Route | KCP&L Exist 161 kV Line Replace with 345 kV | Other Transmisssion Lines

Date: August 2, 2016

Sheet No. 4

Exhibit KBH-1

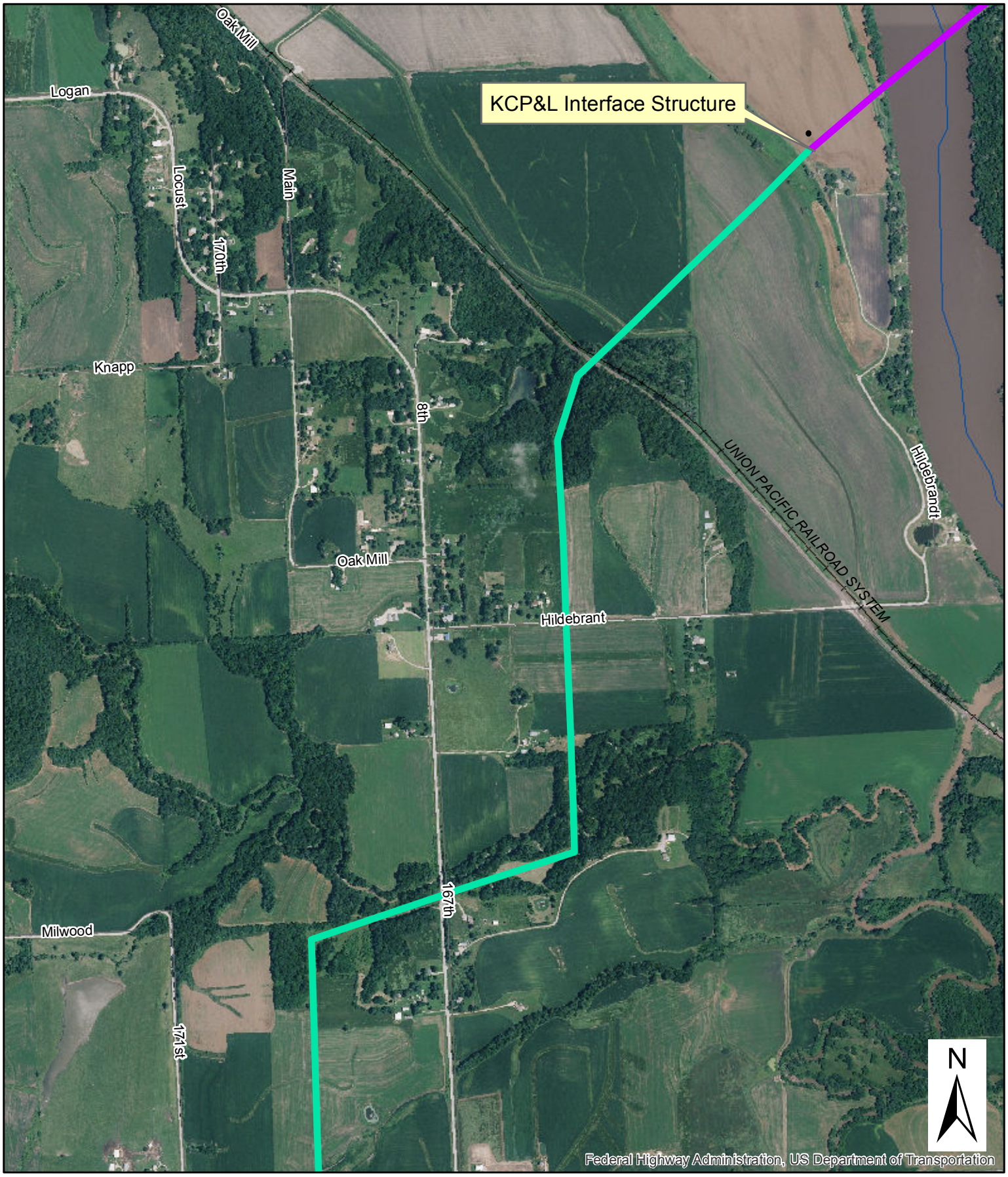
Westar Energy Stranger Creek to Iatan 345 kV Project

Westar Stranger Creek to Iatan Preferred Route | KCP&L Exist 161 kV Line Replace with 345 kV | Other Transmisssion Lines

Date: August 2, 2016

Sheet No. 5

Exhibit KBH-1



Westar Energy Stranger Creek to Iatan 345 kV Project

Westar Stranger Creek to Iatan Preferred Route | KCP&L Exist 161 kV Line Replace with 345 kV | Other Transmisssion Lines

Date: August 2, 2016

Sheet No. 6

SPP-NTC-200338

SPP
Notification to Construct

February 25, 2015

Mr. Mo Awad
Westar Energy, Inc.
P.O. Box 889
Topeka, KS 66601

RE: Notification to Construct Approved ITP10 Network Upgrades

Dear Mr. Awad,

Pursuant to Section 3.3 of the Southwest Power Pool, Inc. ("SPP") Membership Agreement and Attachments O and Y of the SPP Open Access Transmission Tariff ("OATT"), SPP provides this Notification to Construct ("NTC") directing Westar Energy, Inc. ("WR"), as the Designated Transmission Owner, to construct the Network Upgrade(s).

On January 27, 2015, the SPP Board of Directors approved the Network Upgrade(s) listed below to be constructed as part of the 2015 Integrated Transmission Planning 10-Year ("ITP10") Assessment.

New Network Upgrades

Project ID: 30850
Project Name: Line - Iatan - Stranger 345 kV Ckt 1 Voltage Conversion
Need Date for Project: 1/1/2019
Estimated Cost for Project: $15,726,289 (this project cost contains Network Upgrades not included in this NTC)
Date of Estimated Cost: 12/1/2014
Estimated Cost Source: SPP

Network Upgrade ID: 51284
Network Upgrade Name: Iatan - Stranger Creek 345 kV Ckt 1 Voltage Conversion (WR)
Network Upgrade Description: Convert WR's portion of the existing 18.2-mile 161 kV line from Iatan to Stranger Creek to 345 kV operation. Install any necessary terminal equipment at Stranger Creek.
Network Upgrade Owner: WR
MOPC Representative(s): John Olsen, Tom Stuchlik

SPP-NTC-200338

TWG Representative: Mo Awad
Categorization: Economic
Network Upgrade Specification: All elements and conductor must have at least an emergency rating of 1195 MVA.
Network Upgrade Justification: Identified in ITP10 primarily as an economic project.
Cost Allocation of the Network Upgrade: Base Plan

Commitment to Construct
Please provide to SPP a written commitment to construct the Network Upgrade(s) within 90 days of the date of this NTC, in addition to providing a construction schedule and an updated ±20% cost estimate, NTC Project Estimate, in the Standardized Cost Estimate Reporting Template for the Network Upgrade(s). Failure to provide a sufficient written commitment to construct as required by the SPP OATT could result in the Network Upgrade(s) being assigned to another entity.

Mitigation Plan
The Need Date represents the timing required for the Network Upgrade(s) to address the identified need. Your prompt attention is required for formulation and approval of any necessary mitigation plans for the Network Upgrade(s) included in the Network Upgrade(s) if the Need Date is not feasible. Additionally, if it is anticipated that the completion of any Network Upgrade will be delayed past the Need Date, SPP requires a mitigation plan be filed within 60 days of the determination of expected delays.

Notification of Commercial Operation
Please submit a notification of commercial operation for each listed Network Upgrade to SPP as soon as the Network Upgrade is complete and in-service. Please provide SPP with the actual costs of these Network Upgrades as soon as possible after completion of construction. This will facilitate the timely billing by SPP based on actual costs.

Notification of Progress
On an ongoing basis, please keep SPP advised of any inability on WR's part to complete the approved Network Upgrade(s). For project tracking, SPP requires WR to submit status updates of the Network Upgrade(s) quarterly in conjunction with the SPP Board of Directors meetings. However, WR shall also advise SPP of any inability to comply with the Project Schedule as soon as the inability becomes apparent.

All terms and conditions of the SPP OATT and the SPP Membership Agreement shall apply to this Project, and nothing in this NTC shall vary such terms and conditions.

Don't hesitate to contact me if you have questions or comments regarding these instructions.

SPP-NTC-200338

Thank you for the important role that you play in maintaining the reliability of our electric grid.

Sincerely,

Lanny Nickell
Vice President, Engineering
Phone: (501) 614-3232 • Fax: (501) 482-2022 • lnickell@spp.org

cc: Carl Monroe - SPP
Antoine Lucas - SPP
John Olsen - WR
Tom Stuchlik - WR
Dave Benak - WR
Nathan McNeil - WR

Exhibit KBH - 3, Sheet 1

Mo Awad
Email: Mo.Awad@WestarEnergy.com
Office: 785-575-1674

May 22, 2015

Mr. Lanny Nickell
Vice President, Engineering
Southwest Power Pool
201 Worthen Drive
Little Rock, AR 72223-4936

Ref: SPP-NTC-200338

Dear Mr. Nickell,

This letter is in response to the SPP Notification to Construct SPP-NTC-200338 issued on February 25, 2015.

Per this letter, Westar Energy is committed to constructing the upgrades listed in SPP-NTC-200338 including:

Project ID: 30850
Project Name: Line - Iatan - Stranger 345 kV Ckt 1 Voltage Conversion
Need Date for Project: 1/1/2019
Estimated Cost for Project: ~~$15,726,289~~ (this project cost contains Network Upgrades not included in this NTC) **$28,010,000**
Date of Estimated Cost: 12/1/2014
Estimated Cost Source: SPP

> **Network Upgrade ID:** 51284
> **Network Upgrade Name:** Iatan - Stranger Creek 345 kV Ckt 1 Voltage Conversion (WR)
> **Network Upgrade Description:** Convert WR's portion of the existing 18.2-mile 161 kV line from Iatan to Stranger Creek to 345 kV operation. Install any necessary terminal equipment at Stranger Creek.
> **Network Upgrade Owner:** WR
> **MOPC Representative(s):** John Olsen, Tom Stuchlik
> **TWG Representative:** Mo Awad
> **Categorization:** Economic
> **Network Upgrade Specification:** All elements and conductor must have at least an emergency rating of 1195 MVA.
> **Network Upgrade Justification:** Identified in ITP10 primarily as an economic project.
> **Cost Allocation of the Network Upgrade:** Base Plan

Westar is committed to constructing PID 30850 and associated UID 51284 by SPP's need date of 1/1/2019. Westar's cost estimate of $28,010,000 and the corresponding SCERT information have been entered in TAGIT.

Exhibit KBH - 3, Sheet 2

The scope of work to convert Westar's portion of the Iatan-Stranger Creek 161 kV line to 345 kV operation includes tearing down approximately 11.8 miles of the 161 kV transmission line owned by Westar and rebuilding it in the existing right-of-way. The existing 161 kV line structures and insulators are not designed for 345 kV operation and will need to be replaced to meet the NESC code. During the NTC review, Westar evaluated the costs associated with reusing the existing bundled 1192.5 MCM ACSR 'Bunting' conductor with new structures capable of supporting bundled 1590 MCM ACSR in the future and using structures designed only to support bundled 1192.5 MCM ACSR. Although these options could result in a cost savings of approximately $2.1M and $2.8M respectively, Westar believes the prudent long-term solution is to replace the conductor with bundled 1590 MCM ACSR 'Lapwing' during this project rather than utilizing the existing lower capacity aged conductor. Westar remains open to discussing line rebuild strategies on this project as needed going forward.

Additionally, modifications will be made to the Stranger Creek substation 345 kV ring bus to interchange the existing 345/161 kV position with that of the 345/115 kV transformer #3 to provide increased reliability. If the 161 kV line were to be converted to 345 kV at its existing location on the ring bus, both Iatan-Stranger Creek 345 kV lines would share a common breaker on the ring bus, and both 345/115 kV transformers share a breaker on the ring bus. This arrangement would result in loss of both Iatan-Stranger Creek 345 kV lines or both 345/115 kV transformers at Stranger Creek for the failure of a single 345 kV breaker. Interchanging the terminals at Stranger Creek would result in the loss of one Iatan-Stranger Creek 345 kV line and one 345/115 kV transformer for a single breaker failure event, which is a more desirable result from an operational reliability perspective.

In addition to the proposed conversion of the existing Stranger Creek 345 kV ring bus described above, Westar also developed an alternative substation option to rebuild the Stranger Creek 345 kV bus to a breaker-and-a-half arrangement. The existing six-position ring bus will not allow for expansion at Stranger Creek beyond the conversion of the existing Iatan-Stranger Creek 161 kV line to 345 kV as required in this NTC. Any future requirements for an additional 345 kV terminal at Stranger Creek will require expansion to breaker-and-a-half which entails dismantling and rebuilding nearly all of the existing 345 kV side of the substation including the majority of modifications made to the ring bus as described above. Also, although this line conversion is not adding a terminal at Stranger Creek, many current industry design standards, including SPP's Minimum Design Standards for Competitive Upgrades, require breaker-and-a-half configuration for buses with more than five terminals. Westar already owns the required land at Stranger Creek to expand the substation and convert the 345 kV bus to breaker-and-a-half. The preliminary cost estimate for conversion of the Iatan-Stranger Creek 161 kV line to 345 kV operation with construction of a breaker-and-a-half bus at Stranger Creek is approximately $44.1M. This estimate includes the same cost for the transmission line portion of the project as the modified ring bus option.

Westar is prepared to expand Stranger Creek to breaker-and-a-half configuration in conjunction with the conversion of the Iatan-Stranger Creek 161 kV line to 345 kV operation as required in SPP-NTC-200338 if SPP believes it is prudent to do so. A SCERT estimate for this option can be provided upon request.

If you have any questions, please do not hesitate in contacting us.

Sincerely,

Mo Awad
Westar Energy
785-575-1674
Mo.Awad@westarenergy.com

cc: Carl Monroe (Southwest Power Pool)
Antoine Lucas (Southwest Power Pool)
John Olsen (Westar Energy)
Tom Stuchlik (Westar Energy)
Dave Benak (Westar Energy
Nathan McNeil (Westar Energy)

Exhibit KBH - 4

SPP Southwest Power Pool

HELPING OUR MEMBERS WORK TOGETHER
TO KEEP THE LIGHTS ON... TODAY AND IN THE FUTURE

Notice to Suspend Notification to Construct

August 24, 2015

Mr. Mo Awad
Westar Energy, Inc.
P.O. Box 889
Topeka, KS 66601

RE: Acceptance of Commitment to Construct Approved ITP10 Network Upgrades

Dear Mr. Awad,

Southwest Power Pool, Inc. ("SPP") issued Notification to Construct ("NTC") No. 200338 on February 18, 2015 directing Westar Energy, Inc. ("WR"), as the Designated Transmission Owner, to construct the specified Network Upgrade(s). This letter acknowledges SPP's receipt on May 22, 2015 of WR's Commitment to Construct the transmission project specified in NTC No. 200338.

Based upon the decision by the SPP Board of Directors on July 28, 2015, SPP will re-evaluate the project specified in NTC No. 200338. Please suspend all activities and future expenditures for this project until further notice. SPP will inform you as soon as the re-evaluation has been completed.

Please do not hesitate to contact me if you have questions or comments.

Sincerely,

Lanny Nickell
Vice President, Engineering
Phone (501) 614-3232 • Fax: (501) 821-3198 • lnickell@spp.org

cc: Carl Monroe - SPP
Antoine Lucas - SPP
John Olsen - WR
Tom Stuchlik - WR
Dave Benak - WR
Nathan McNeil - WR

Exhibit KBH - 5

SPP Southwest Power Pool

HELPING OUR MEMBERS WORK TOGETHER
TO KEEP THE LIGHTS ON... TODAY AND IN THE FUTURE

Notice to Reinstate Notification to Construct

November 3, 2015

Mr. Mo Awad
Westar Energy, Inc.
P.O. Box 889
Topeka, KS 66601

Dear Mr. Awad,

Southwest Power Pool, Inc. ("SPP") issued Notification to Construct ("NTC") No. 200338 on February 25, 2015 directing Westar Energy, Inc. ("WR"), as the Designated Transmission Owner, to construct the specified Network Upgrade. On August 24, 2015, SPP issued a notice to WR to suspend the NTC pending a re-evaluation of the Network Upgrade.

Based upon the results of that re-evaluation and corresponding decision by the SPP Board of Directors on October 27, 2015, the letter is to inform WR that NTC No. 200338 has been reinstated, and all terms and conditions of the NTC are applicable.

Please do not hesitate to contact me if you have questions or comments.

Sincerely,

Lanny Nickell
Vice President, Engineering
Phone (501) 614-3232 • Fax: (501) 821-3198 • lnickell@spp.org

cc: Carl Monroe - SPP
Antoine Lucas - SPP
John Olsen - WR
Tom Stuchlik - WR
Dave Benak - WR
Nathan McNeil - WR

Exhibit KBH - 6, Sheet 1

May 24, 2016

Name
Address
City, ST ZIP

Dear Property Owner,

In the past few years, the need for energy has increased in northeast Kansas. Recent studies of the transmission system have identified the need to replace a power line that connects a substation west of Lansing with one near Iatan Generation Station northwest of Weston, Missouri. The rebuilt line between these two substations will help keep electricity in your area and northeast Kansas reliable and affordable.

We understand replacing the line along its current route may seem like the obvious location, but we don't want to presume we understand how you or your neighbors view that choice. Many things, such as land use, have changed since the original line was built. For these reasons, we have decided to take a look at alternate routes, too, and solicit feedback from you and your neighbors.

Because you live along the existing route or one of the potential new routes, we would like to visit with you about this project. The enclosed map shows the *potential* routes for the new power line in purple and the existing line that needs to be replaced in yellow overlaying blue. We want you to help us determine which route is best. Please join us for an open house to discuss the *potential* routes for the new power line.

- **Who is invited?** Landowners and residents along the potential routes and the existing route are receiving this letter of invitation. Anyone may attend.

- **When and where is the open house?** 5 to 8 p.m., June 9th, at the Leavenworth High School, 2012 10th Ave, Leavenworth. Come and go during that time at your convenience.

Your attendance is important to us. Here are a few reasons why:

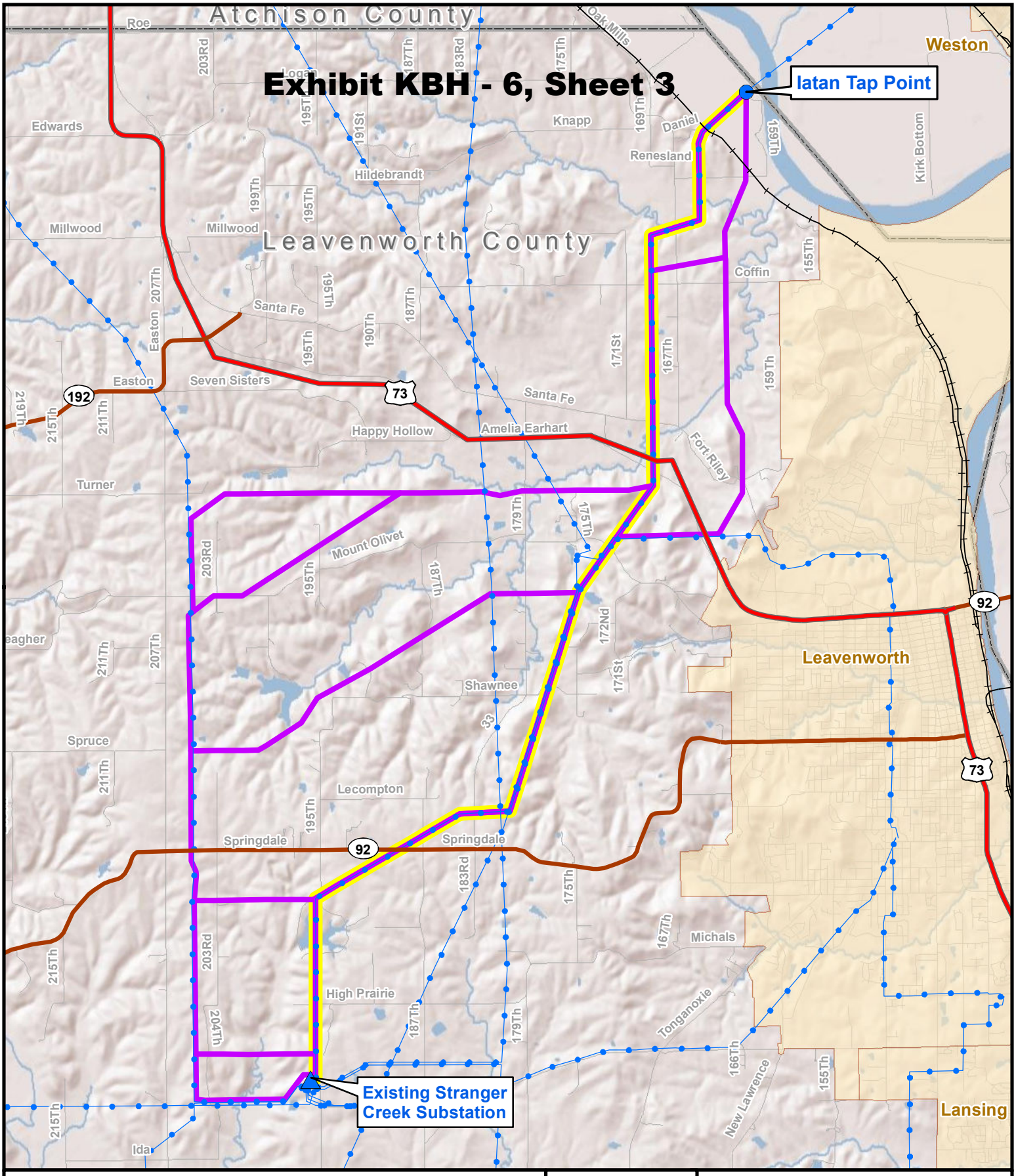
- Help us determine the preferred route from those shown on the map
- Complete a survey about how routes are evaluated
- Learn about the logistics and benefits of the project
- Learn about the process to determine the final route
- Learn how the project could affect your land
- Share your concerns and questions

Exhibit KBH - 6, Sheet 2

We look forward to meeting with you at the open house. If you have any questions prior to our open house, please contact Martha Long at 785-575-1989 or Martha.Long@westarenergy.com.

Sincerely,

Kelly Harrison, Vice President - Transmission



Source: ESRI, Westar Energy, Burns & McDonnell Engineering Commpany, Inc.

Issued: 5/11/2016

Exhibit KBH - 7, Sheet 1

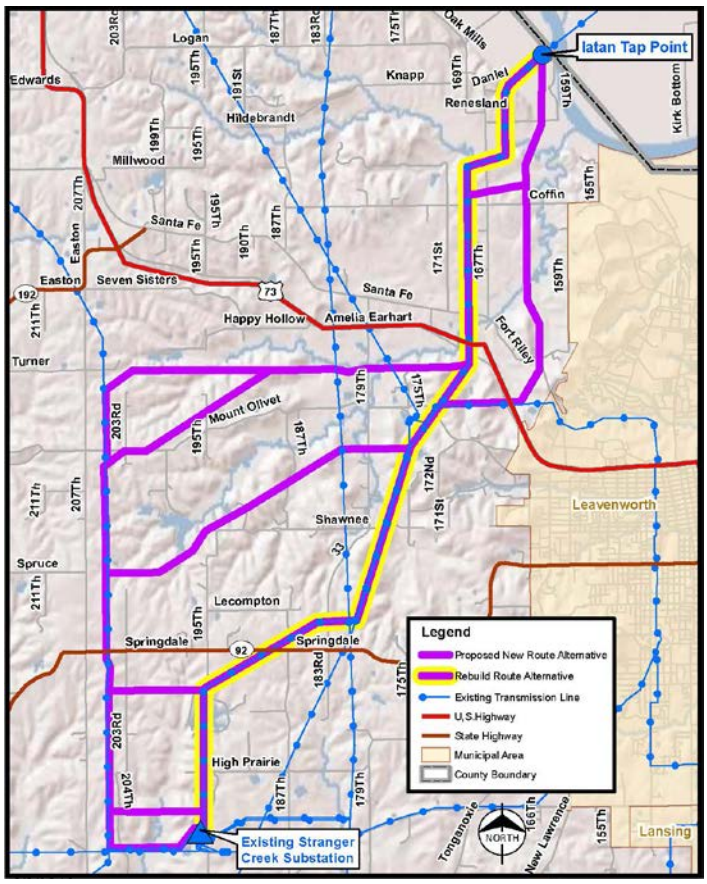
LEAVENWORTH TRANSMISSION PROJECT OPEN HOUSE

Westar Energy
Taking energy to heart.

Project Overview

In the past few years, the need for access to low cost energy has increased in northeast Kansas. Recent studies of the transmission system have identified the need to replace an existing power line connecting a substation west of Lansing to one northwest of Weston, Missouri, at Iatan Generation Station. The new replacement line between these two substations will allow better access to low cost energy sources and also keep energy in your area and northeast Kansas reliable.

The map at right shows the *potential* routes for the new power line in purple; the existing line that will be replaced is highlighted in yellow. This is a $28-million-dollar investment in the Leavenworth area.



Project Benefits

- Provide additional access to lower cost energy sources
- Improve power grid reliability overall
- Enable economic growth
- Strengthen the regional transmission grid

Project Timeline

Summer 2016 → **Winter 2018**

Open house to gather public feedback on potential routes	KCC determines final route	Surveying, soil boring/sampling, line engineering	Construction and right-of-way preparation work; install gates, culverts, remove vegetation	Construction scheduled to be complete no later than Dec 2018	Right of way restoration work complete

June 2016

LEAVENWORTH TRANSMISSION PROJECT OPEN HOUSE

Westar Energy
Taking energy to heart.

About the Line

The route must be determined before engineers can determine the correct structure types to use, but the structures will likely be:

- Steel poles
- Between 120 and 160 feet tall
- Spacing between each pole will be around 800 feet

Route Selection

Potential routes were developed by defining routes that would minimize adverse impacts to residents, their land and the natural environment while providing a technically viable and cost-effective route. Input received from residents in the area will help us determine which of these routes should be selected as the preferred route. The siting study report that includes the preferred route and all the feedback from stakeholders will be submitted to the KCC. The KCC uses a 120-day process to determine the final route for this project which Westar must follow. Their process includes opportunities for public input.

Keeping You Informed

Thank you for your interest in the project. Martha Long is available to help you as your dedicated Westar representative for this project. You may reach her at 785-575-1989 or Martha.Long@westarenergy.com.

More project information and updates are available at www.westarenergy.com/LeavenworthTransmission.

June 2016

Westar Energy®
Taking energy to heart.

Which route is the best?

A QUICK OVERVIEW ON HOW LANDOWNERS AND WESTAR WORK TOGETHER TO DETERMINE THE BEST ROUTE FOR A PROJECT.

Routing a transmission line is a lengthy process, and for those along the selected route, the beginning of a relationship that will last for decades. We realize this can be a challenging process, and we want to be a good neighbor. To that end, we seek feedback from local property owners early in the process to determine the final route for the transmission line.

HERE IS A SUMMARY OF THAT PROCESS:

Using aerial photos, public records and visits to the area, we identify potential routes the transmission line could follow.

Westar identifies property owners along the potential routes and invites them to open houses about the project. These open houses give property owners a chance to learn about the project and Westar an opportunity to learn more about how the routes may impact property owners. We ask property owners for feedback in person and through questionnaires. Often property owner feedback will result in some adjustment to the routes. This information is used to apply scores to each of the potential routes. The route with the highest score is called the preferred route.

At this stage the regulatory process begins. Westar submits a filing with the Kansas Corporation Commission identifying the preferred route in the siting study. During the KCC process, landowners along the route will be notified and given information about how they can participate in the KCC's decision making process. Public comments may be submitted in writing and at least one public hearing will be conducted. The KCC staff and engineers also evaluate the siting study and the preferred route. They will make a recommendation to the KCC Commissioners who will approve, request modifications or deny Westar's application.

Once a route is selected, we notify property owners and begin working with them to obtain easements for the transmission line.

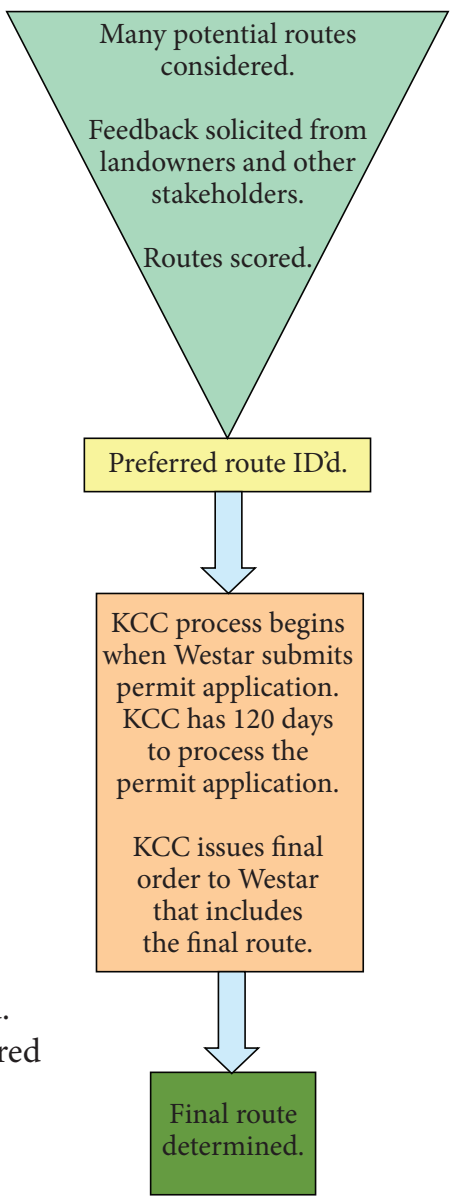


Exhibit KBH - 7, Sheet 4

Westar Energy Stranger Creek to Iatan Transmission Project
QUESTIONNAIRE

This questionnaire is designed to help identify issues related to the proposed routes. Your answers will assist the study team in understanding public interests and concerns, and will allow the team to incorporate this information in the route selection process. Please complete this questionnaire **after** you have reviewed the information presented at the open house today. Thank you for your input.

PROJECT NEED

1. Do you believe the need to replace the existing transmission line has been explained adequately?
   _____Yes _____No _____Uncertain

   If "No" or "uncertain," what additional information would be helpful to you?

   _____

   _____

LINE ROUTING CONSIDERATIONS

2. The routing of a transmission line involves many considerations. Please circle the number corresponding to the level of importance of that factor to you.

		Not Important	……	Somewhat Important	……	Most Important
a)	Maximize distance from residences	1	2	3	4	5
b)	Maximize distance from businesses	1	2	3	4	5
c)	Maximize distance from public facilities (e.g., parks, schools, churches, cemeteries)	1	2	3	4	5
d)	Maximize the distance the new transmission line follows the existing line route that it is replacing	1	2	3	4	5
e)	Maximize length along other existing transmission lines in the area	1	2	3	4	5
f)	Maximize length along roads	1	2	3	4	5
g)	Improve reliable electric service	1	2	3	4	5
h)	Minimize length through wetlands and number of stream / river crossings	1	2	3	4	5
i)	Minimize length across tilled agricultural land	1	2	3	4	5
j)	Minimize length across center pivot irrigation systems	1	2	3	4	5
k)	Minimize loss of trees	1	2	3	4	5
l)	Minimize visibility of the line	1	2	3	4	5
m)	Minimize total length of line (reducing the total cost)	1	2	3	4	5
n)	Minimize length through grassland or pasture	1	2	3	4	5
o)	Minimize impacts to archaeological and historic sites	1	2	3	4	5
p)	Minimize distance through sensitive habitat areas	1	2	3	4	5

Westar Energy®

3. If you would like to comment further on any of the above factors, or identify any other factors or issues that you feel should be considered, please use the space below or a separate page to describe your comments.

_____

_____

4. If you have a concern with, or a suggestion for, a particular transmission line route(s) shown on the display of potential routes, please indicate the route segment number and describe your concern or suggestion.

Segment No.	**Concern**
_____	_____
_____	_____
_____	_____

ADDITIONAL INFORMATION

5. Which of the following applies to you?

_____a. Potential line route is near my home.

_____b. Potential line route is near my farm or business.

_____c. Not affected by potential route.

_____d. Other, please specify _____

6. Do you believe the public open house format and the information provided was helpful for your understanding of the project?

Open house format:	_____helpful	_____ not helpful
Information provided:	_____helpful	_____ not helpful
Westar staff:	_____helpful	_____ not helpful

How can we improve this format to better inform you and hear your concerns?

_____

_____

7. If you would like to know the results of this routing study, please enter your name and address below. (Names and addresses are considered confidential.)

Name: _____Phone: _____

Address: _____

_____

ADDITIONAL COMMENTS OR QUESTIONS

_____

_____

_____

We encourage you to fill out and submit your questionnaire at the meeting. If you take the questionnaire with you, please mail completed questionnaires before June 24, 2016 to:

Martha Long
818 S Kansas Avenue
PO Box 889
Topeka, KS 66601

Open House: June 9, 2016

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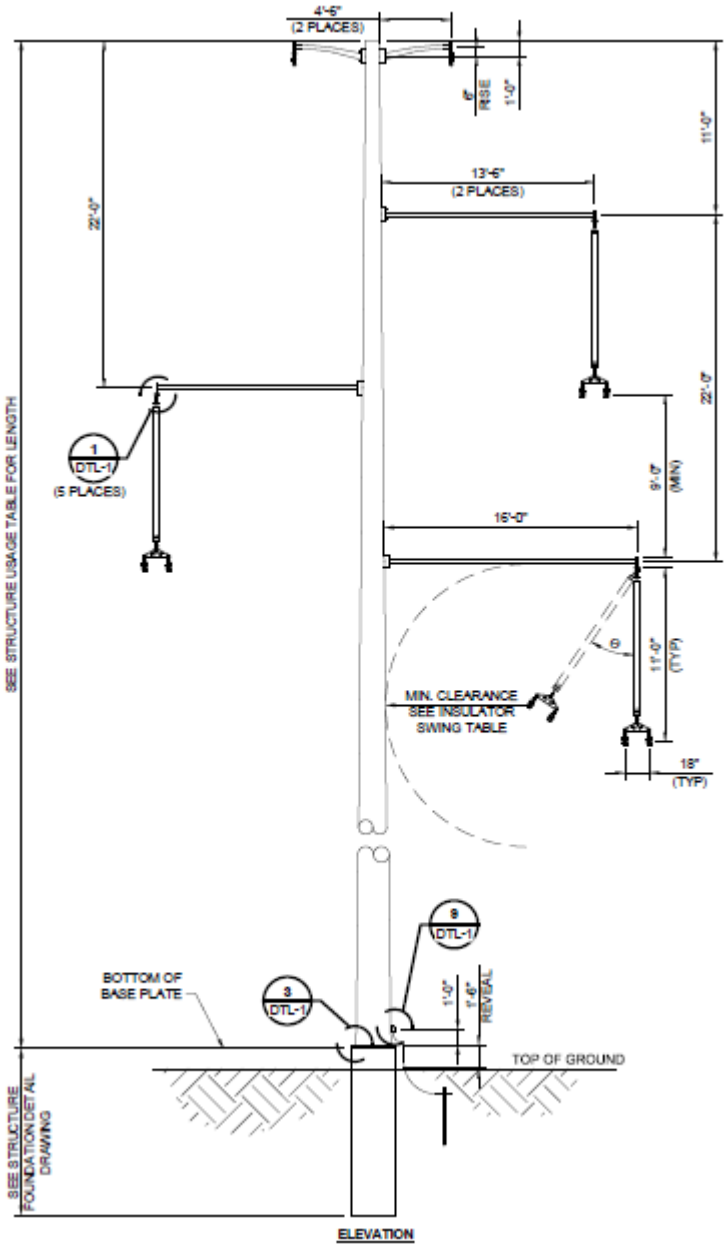
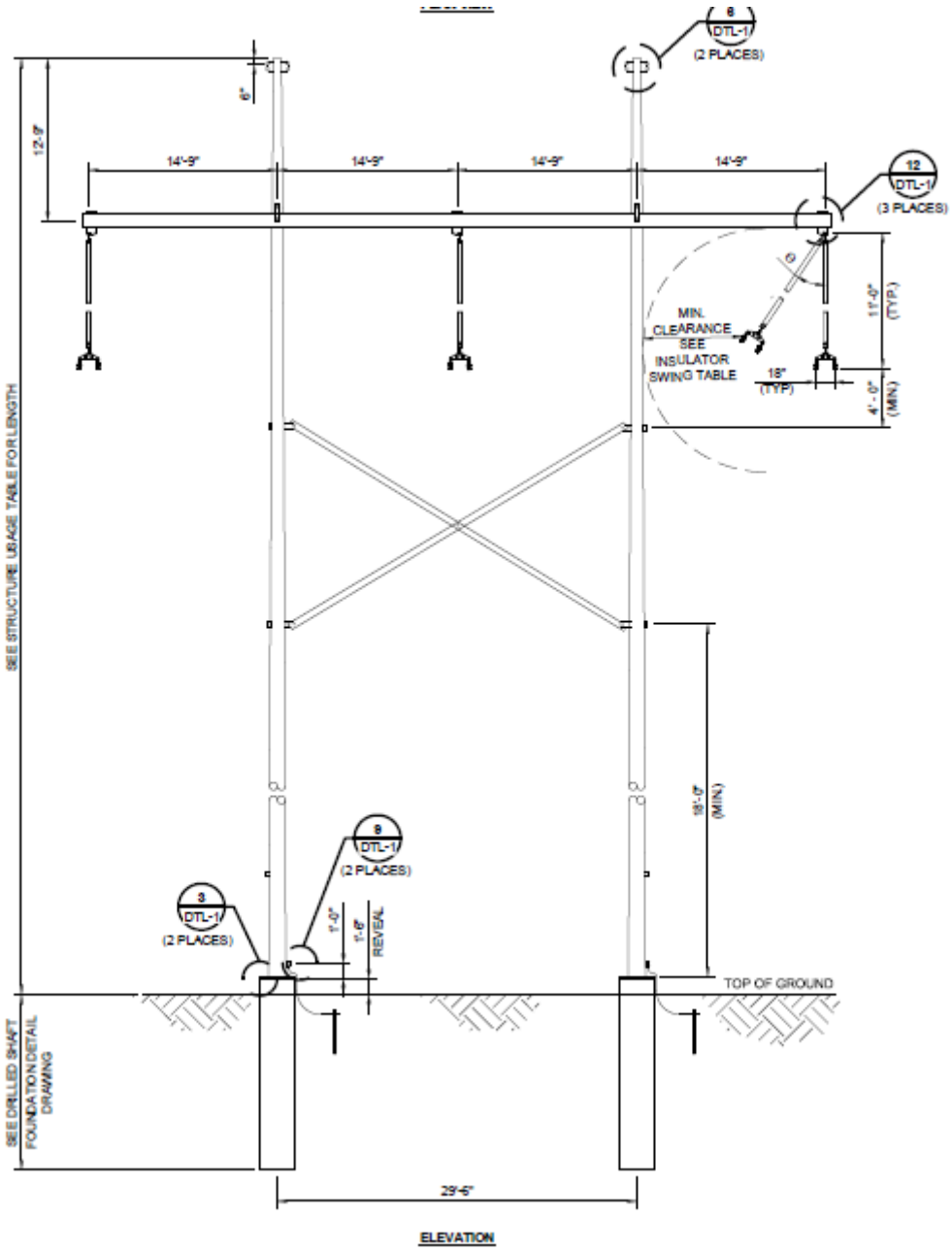
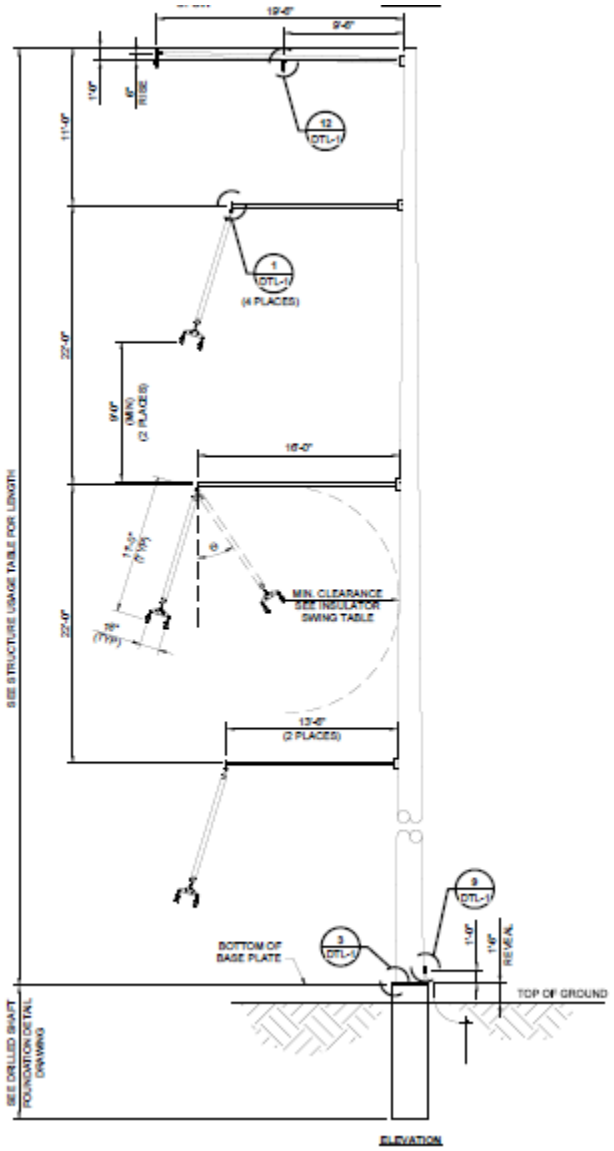
KBH – 8, Sheet 1


4'-6"
(2 PLACES)
6"
RISE
1'-0"
11'-0"
13'-6"
(2 PLACES)
22'-0"
22'-0"
1
DTL-1
(5 PLACES)
9'-0"
(MIN)
16'-0"
θ
11'-0"
(TYP)
MIN. CLEARANCE
SEE INSULATOR
SWING TABLE
18"
(TYP)
SEE STRUCTURE USAGE TABLE FOR LENGTH
9
DTL-1
BOTTOM OF
BASE PLATE
3
DTL-1
1'-0"
1'-6"
REVEAL
TOP OF GROUND
SEE STRUCTURE
FOUNDATION DET AIL
DRAWING
ELEVATION

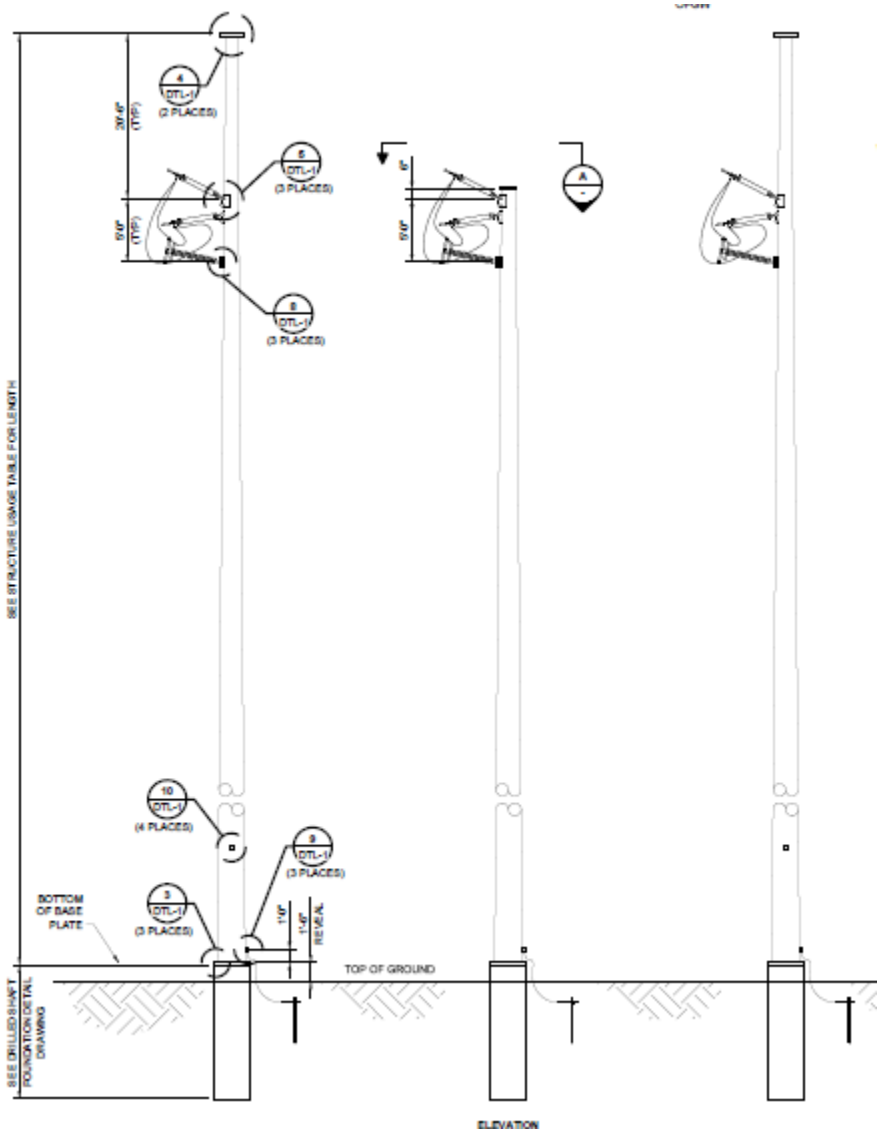
KBH – 8, Sheet 2


8
DTL-1
(2 PLACES)
6"
12'-9"
14'-9"
14'-9"
14'-9"
14'-9"
12
DTL-1
(3 PLACES)
MIN.
CLEARANCE
SEE
INSULATOR
SWING TABLE
18"
(TYP)
11'-0"
(TYP.)
4'-0"
(MIN.)
SEE STRUCTURE USAGE TABLE FOR LENGTH
9
DTL-1
(2 PLACES)
3
DTL-1
(2 PLACES)
1'-0"
1'-6"
REVEAL
18'-0"
(MIN.)
TOP OF GROUND
SEE DRILLED SHAFT
FOUNDATION DETAIL
DRAWING
29'-6"
ELEVATION

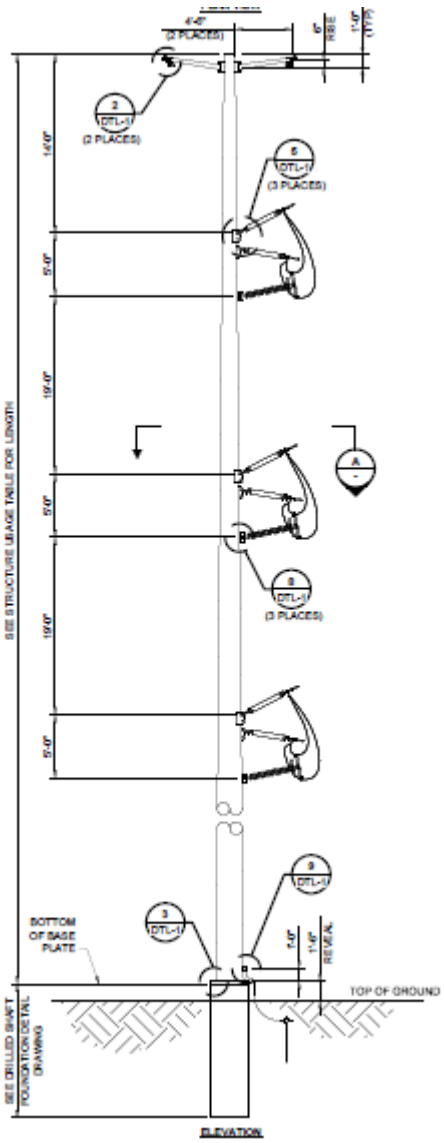
KBH – 8, Sheet 3


19'-6"
9'-6"
1'-0"
6" RISE
11'-0"
12 DTL-1
1 DTL-1
(4 PLACES)
22'-0"
9'-0" (MIN) (2 PLACES)
16'-0"
MIN. CLEARANCE SEE INSULATOR SWING TABLE
22'-0"
13'-6" (2 PLACES)
SEE STRUCTURE USAGE TABLE FOR LENGTH
9 DTL-1
3 DTL-1
BOTTOM OF BASE PLATE
1'-6"
1'-0" REVEAL
TOP OF GROUND
SEE DRILLED SHAFT FOUNDATION DETAIL DRAWING
ELEVATION

KBH – 8, Sheet 4


4 DTL-1 (2 PLACES)
6 DTL-1 (3 PLACES)
8 DTL-1 (3 PLACES)
10 DTL-1 (4 PLACES)
9 DTL-1 (3 PLACES)
3 DTL-1 (3 PLACES)
BOTTOM OF BASE PLATE
TOP OF GROUND
SEE STRUCTURE USAGE TABLE FOR LENGTH
SEE DRILLED SHAFT FOUNDATION DETAIL DRAWING
ELEVATION

KBH – 8, Sheet 5


4'-0"
(2 PLACES)
6"
REF.
1'-0"
(TYP.)
2
DTL-1
(2 PLACES)
6
DTL-1
(3 PLACES)
14'-0"
5'-0"
19'-0"
5'-0"
19'-0"
5'-0"
A
9
DTL-1
(3 PLACES)
9
DTL-1
3
DTL-1
BOTTOM
OF BASE
PLATE
7'-0"
1'-6"
REVEAL
TOP OF GROUND
SEE STRUCTURE USAGE TABLE FOR LENGTH
SEE DRILLED SHAFT
FOUNDATION DETAIL
DRAWING
ELEVATION

DIRECT TESTIMONY

OF

JAMIE PRECHT

ON BEHALF OF

WESTAR ENERGY

I. INTRODUCTION

Q: PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A: Jamie L. Precht. 9400 Ward Parkway, Kansas City, Missouri 64114.

Q: BY WHOM AND IN WHAT CAPACITY ARE YOU EMPLOYED?

A: I am employed by Burns & McDonnell Engineering Company, Inc. (BMcD) as a Project Manager in the Environmental Studies and Permitting Global Practice. In this position, I am responsible for managing and directing the completion of activities related to routing, public involvement, permitting, and right-of-way (ROW) for projects for various electric utility clients, such as Westar Energy (Westar). For Westar's Stranger Creek to Iatan Project (Project), I directed the completion of routing and public involvement activities.

Q: PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL EXPERIENCE.

A: I received a B.S. Degree in Biology with emphasis in Pre-Fisheries and Wildlife from Pittsburg State University in May 2003, and a M.S. Degree in Biology from Pittsburg State University in December 2006. I joined BMcD in March 2005 as an Assistant Environmental Scientist. I was promoted Staff Environmental Scientist in 2008 and Senior Environmental Scientist in 2012. In 2015, I was promoted to Project Manager. In this position, I manage routing, public involvement, and permitting activities for high-voltage transmission line projects for various clients across the country. I first performed these services for Westar on the Wichita Water Utilities 138 kilovolt (kV) transmission line project beginning in 2009, and I have worked with Westar on an additional nine routing projects between 2009 and 2016.

Q: HAVE YOU PROVIDED TESTIMONY IN PRIOR REGULATORY PROCEEDINGS?

A: No, I have not.

Q. ON WHOSE BEHALF ARE YOU TESTIFYING?

A. I am testifying on behalf of Westar.

Q: WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A: The purpose of my testimony is to describe the process used to determine the preferred route to replace the existing 161 kV transmission line with a new 345 kV transmission line from Westar's Stranger Creek Substation to the Kansas City Power & Light (KCP&L) interface point located on the Kansas side of the Missouri River, north of Leavenworth, Kansas.

II. ROUTE SELECTION PROCESS

Q: DID WESTAR PROVIDE TRANSMISSION LINE ROUTING OBJECTIVES FOR YOU TO PURSUE IN CHOOSING PROPOSED ROUTES FOR THE TRANSMISSION LINE ROUTING STUDY?

A: Yes, Westar provided BMcD with the following routing objectives for this Project: Provide technically and environmentally feasible proposed routes for the transmission line, broken into manageable segments. The proposed routes should be economical routes with minimal adverse social and environmental impacts. In general, the proposed routes should: attempt to maximize the distance of the line to residences, businesses, public facilities, parks, cemeteries, and communication towers; avoid interference with center pivot irrigation systems; where possible and when practical, parallel existing utilities, roads or railroads, accounting for existing ROWs and potential increased construction

costs; avoid wetlands, riparian areas, conservation lands, and protected species and their habitats for both the transmission line corridor and access for construction and maintenance; avoid placing the line directly over tanks and oil, gas, or water wells; maintain a reasonable overall route length with as few angles as possible to minimize costs; and avoid Federal Aviation Administration (FAA) controlled areas that would restrict structure height or proximity to navigational aids.

Q: PLEASE DESCRIBE THE ENVIRONMENT IN WHICH THE LINE WAS SITED.

A: A description of the physiography, soils, climate, hydrological resources, biological resources, demographics, land uses, and cultural resources is included with my testimony as Section 2 of Exhibit BMcD-1.

Q: PLEASE DESCRIBE THE PROCESS USED TO SELECT THE ALTERNATIVE OR POTENTIAL ROUTES FOR THE TRANSMISSION LINE.

A: BMcD was engaged by Westar to assist with the transmission line siting process. BMcD's routing report, which describes in detail the route identification and selection process, as well as the public involvement process, is attached to my testimony as Exhibit BMcD-1. BMcD was tasked with gathering and evaluating information regarding land uses, environmental concerns, and historic, cultural and other criteria considered pertinent to the construction of an overhead electric transmission line.

In Exhibit BMcD-1, Figure 2-1 shows the regional area and Figure 1-1 shows the study area for the proposed Project. The Project study area encompasses approximately 65 square miles in northeastern Kansas. After establishing the study area, the objective was to identify economically feasible routes that connected the two endpoints, while avoiding or minimizing impacts to both social and natural resources. Alternative routes

were identified that would connect the Stranger Creek Substation to the KCP&L interface point.

To determine community values relative to the proposed Project, the route selection process included two forms of public input. The first outreach effort included letters to State, Federal, and local agencies to provide input on threatened and endangered species, wetlands, wildlife resources, and other potential permitting issues. Federal agencies contacted included the U.S. Army Corps of Engineers (USACE), U.S. Fish and Wildlife Service (USFWS), Environmental Protection Agency (EPA), the FAA, and the Natural Resources Conservation Service (NRCS). State agencies contacted included the Kansas Biological Survey (KBS), Kansas Department of Health and Environment (KDHE), State Historic Preservation Office (SHPO) at the Kansas Historical Society (KHS), Kansas Department of Agriculture (KDA), Kansas Department of Transportation (KDOT), and the Kansas Department of Wildlife, Parks and Tourism (KDWPT). The Nature Conservancy (TNC), a private conservation organization working to protect ecologically important lands and waters, was also contacted. Letters were also sent to the Leavenworth County Public Works Department, the Leavenworth County Planning and Zoning Department, City of Leavenworth Public Works Department, as well as the city planner for the City of Leavenworth. A summary of the responses received is included in Chapter 4 of Exhibit BMcD-1. A sample request letter and the actual responses received from the agencies are provided in Appendix D of Exhibit BMcD-1.

In addition, one public information meeting was held by Westar in Leavenworth, located adjacent to the study area. Input from residents and public officials helped the Project team identify the appropriate factors and their importance to the public. This

information was used during the route evaluation process. The intent of the public participation program was to provide the potentially affected landowners near the alternative routes with an understanding of the need for the Project, the decision-making process used to select the preferred route, and a forum to voice concerns about the proposed Project.

Following the public comment period, BMcD then quantified the impacts along the proposed routes. This quantitative data, the public and agency input, and engineering factors were used to evaluate the alternatives and assist Westar with the selection of a preferred route for the proposed transmission line.

Q: DID YOU RECEIVE FEEDBACK FROM THE STATE AND FEDERAL AGENCIES?

A: Yes, we did. USFWS mentioned the possible presence of four federally listed species in the study area. These include the pallid sturgeon, northern long-eared bat, Mead's milkweed, and western prairie fringed orchid. The USFWS requested that caution be taken during routing and construction to avoid listed species habitat. USFWS anticipated no impact to pallid sturgeon as long as the Project did not impact the Missouri River channel configuration in any way. For avoiding impacts to the northern long-eared bat, USFWS requested that caution be taken during routing and construction to avoid habitat. This habitat includes forested areas with trees greater than 3 inches diameter at breast height. The USFWS states that, if northern long-eared bat habitat is encountered along the preferred route, a presence/absence survey will be required to formally determine that the Project will have no impact. The survey must be completed between May 15 and August 15, which is pupping season for the species. Mead's milkweed and western prairie fringed

orchid are located in unplowed native tallgrass prairie, and USFWS requested the Project avoid those areas as well. Formal consultation with the USFWS may be required during permitting, depending on the final approved route and surveys of potential habitat located along the route. USFWS also recommended incorporating guidelines to minimize the electrocution threat to large birds of prey from electrical lines and requested that Westar minimize the spread of invasive species and avoid impacts to nesting migratory birds as well.

The USACE discussed that, based on a review of the study area, it is unlikely that the Project would require a Section 10 permit. USACE stated that Department of the Army permit authorization may be required if wetland areas are trenched or damaged, or if fill and dredge material are discharged into any water of the U.S. or wetland.

In its response, the FAA noted that the Project may require notice and airspace review under the Federal Aviation Regulation Part 77, Objects Affecting Navigable Airspace. FAA recommended use of its "Notice Criteria Tool," found online, to determine if the Project would require formal filing.

The Kansas SHPO recommended having a professional archeologist conduct background research of the study area to identify potential survey areas. Of particular concern was the area along the Missouri River where a large number of archaeological sites, as well as some of the oldest standing structures in the State (some of which are listed on the National Register of Historic Places), are located. It was recommended that historical structures be avoided as well as any undisturbed areas that could possess good archaeological potential. The Kansas SHPO commented that Section 106 of the National

Historic Preservation Act could apply to the Project if any Federal funding, permitting, or other Federal connection were involved.

KDWPT requested a figure showing the section, township, and ranges for the Project study area. That figure was created and sent on May 6, 2016. KDWPT used that information to review the study area for potential impacts to current State-listed threatened or endangered species, species of concern, species in need of conservation, and public recreation areas under KDWPT authority. The KDWPT review identified the Missouri River as habitat for nine State-listed aquatic species, and other areas within the study area as habitat for two State-listed bird species. If any of these species were to be affected, special authorizations from KDWPT would be required. KDWPT also noted the presence of two snake species (redbelly snake and smooth earth snake) within Leavenworth County that are not State-listed but are in need of conservation due to habitat fragmentation. KDWPT recommended that the Project avoid oak dominated woodlands as well as native tallgrass prairie. KDWPT also recommended the use of cropland, grazed land, developed land, and existing ROWs, and that placement of the Project within one of these areas would be preferred. The response letter ended with a list of recommendations for the Project, including the avoidance of wetlands, native vegetation, timberland, and encroachment in floodplains. KDWPT also recommended the use of existing corridors, replanting of disturbed grasslands with native forbs and grasses, and installation of perch guards on poles that are subject to repeat avian mortality events. It was also noted that no KDWPT managed lands are present within study area boundaries.

KDA sent an Agency Review Transmittal form granting clearance for the Project with no comment. It also mailed a response letter that noted that the Project would likely

not require any KDA permitting as long as no construction activities occur in the floodplain or floodway of the Missouri River or any stream courses. KDA mentioned that, if the Project did involve construction in a floodplain, permitting may be required. KDA noted that the Project will likely use an existing appropriation of water. If that is not the case, a permit would be required.

KDHE had no objections to the proposal and recommended that clearance of the Project be granted. KDHE Bureau of Water stated that a National Pollutant Discharge Elimination System (NPDES) permit application for storm water runoff resulting from construction activities would be required if the construction activity disturbed greater than or equal to 1 acre of land.

The KBS response indicated that two federally listed species are known to occur within Leavenworth County: Mead's milkweed and western prairie fringed orchid. KBS recommended that any native prairie crossed by the Project should be surveyed for these two plant species. KBS also indicated that most of Kansas has not been surveyed, and the absence of records should not be interpreted as an indication that other rare species do not occur in the study area.

During its review, TNC noted the presence of two federally listed plant species (Mead's milkweed and western prairie fringed orchid) within the vicinity of the Project, as well as several Species of Greatest Conservation Need and Species in Need of Conservation. Because of the assumed presence of these species, TNC recommended that the Project avoid crossing native prairie and grasslands. TNC also recommended the use of existing transmission line corridors, specifically recommending utilizing the existing 161 kV corridor for the line being replaced for this Project. The use of an existing corridor

as opposed to an entirely new alignment would avoid further habitat fragmentation, according to TNC. Cropland and cool season grasslands were also recommended as possible routing options due to their reduced habitat value when compared to native tallgrass prairie or woodlands.

Q: WHERE YOU ABLE TO IDENTIFY A ROUTE THAT AVOIDED ALL IMPACTS?

A: It was not possible to find a route that avoided all impacts. Many of the alternative routes, sometimes called potential routes, were located along existing transmission line corridors to limit impacts to the local environment as much as possible. In some cases, residences that are near the existing transmission lines may be closer to the new ROW, though it may be possible to adjust the route slightly to increase the distance from the homes when the line is surveyed and designed. Routes along new ROWs sometimes offer more flexibility to avoid homes than routes along existing lines. However, routes removed from the direct path between the two end points of each line, or routes that zigzag through the area, were not considered reasonable because of the significant cost resulting from the extra length and greater overall impacts.

Following the identification of alternative or potential routes, the routes were checked against recent aerial photography and reviewed in the field by driving publicly accessible roads near the alternative routes to check that the land uses were accurately mapped along each alternate route.

In addition, BMcD quantified resources potentially impacted by the alternative routes using digital data in an ArcGIS system, and these potential impacts were then evaluated to compare impacts between routes and to select one of the least-impacting

alternative routes (see Section 3.5 in Exhibit BMcD-1). Though there will still be impacts resulting from the construction of the new transmission line, the preferred route would have low impacts by comparison to the other routes evaluated.

Q: WHAT WERE THE ALTERNATIVE OR POTENTIAL ROUTES THAT WERE OFFERED TO THE PUBLIC FOR COMMENT?

A: Figure 3-1 in Exhibit BMcD-1 is a map of the alternative routes for which we sought comment from the public. To help obtain feedback specific to each landowner, each route was broken into a number of segments. This allowed each landowner to identify concerns he/she had with a particular segment of an alternative route. The alternative routes consist of individual segments that may be combined in different arrangements to form a continuous path from the Stranger Creek Substation to the KCP&L interface point. Each segment begins and ends at an intersection with one or more other segments. All the alternative routes for Stranger Creek to Iatan and their components are shown in Figure 3-1 of Exhibit BMcD-1. A total of 20 segments were identified that combine to form 30 different alternative routes (Figure 3-1 and Appendix C in Exhibit BMcD-1). The alternative routes shown in Figure 3-1 were shown to the public during the open house held on June 9, 2016, in Leavenworth, Kansas.

Q: HOW WERE THE LANDOWNERS IDENTIFIED ALONG THE ALTERNATIVE OR POTENTIAL ROUTES SO THEY COULD BE NOTIFIED OF WESTAR'S INTENT TO CONSTRUCT A NEW TRANSMISSION LINE?

A: Once the alternative or potential routes were finalized, we used property ownership data from Leavenworth County to identify landowners within 1,000 feet of the centerlines of the entire alternative route network. The landowner information was derived from digital

parcel and ownership data obtained from Leavenworth County. Using this information, these landowners were sent an informational letter advising them that Westar was proposing to replace the existing 161 kV line and construct a new high-voltage line near their property and inviting each of them to the open houses. In the letter, Westar identified the date, time, and location of the June open house and also included a small-scale map of the proposed route network. Copies of the invitation form letter are shown in Appendix E of Exhibit BMcD-1.

The alternative routes were shown to the public by Westar at one open house meeting to provide residents of the area information about the Project and gather public input from area landowners on the alternative routes. Westar held this open forum informational open house on June 9, 2016, at the Leavenworth High School in Leavenworth.

At the open house, Westar and BMcD representatives provided information on the purpose and need for the Project and alternative routes. The alternate routes where shown on aerial photographs and maps of the Project area, as well as on interactive computer stations on which landowners could record their concerns. We also provided information on the design and construction of the Project, typical land requirements for the new line, and the process Westar will use to obtain easements. During these meetings, Westar and BMcD collected information provided by the area landowners for consideration during the route selection process.

At the open house, Westar representatives handed out the Project fact sheets and questionnaire shown in Appendix E of Exhibit BMcD-1. Participants were encouraged to complete the questionnaire that solicited their input on the routing factors, the route

locations, and issues of concern regarding the Project. They were asked to return their questionnaires either at the open house or by mail shortly afterwards. A total of 67 responses were received either at the open houses or by mail. A detailed summary of the questionnaire results is presented in Chapter 5 of Exhibit BMcD-1.

Q: DID PUBLIC INPUT HAVE ANY BEARING ON THE SITING PROCESS?

A: Yes. The principal concerns documented by the public were proximity to residences and a preference for building the new 345 kV line in the same corridor as the existing 161 kV line that it will replace. Segments 6, 11, 12, and 16 were identified numerous times as segments of concern, primarily related to potential impacts to residences, land use, and a concern that Segment 11, which would parallel an existing 115 kV line, would result, in their perception, of an excessively large easement width for those property owners. Maximizing length along roads, minimizing length across center pivot irrigation, and maximizing distance from businesses were ranked as issues of lesser importance by the public open house respondents.

The public input from the open house questionnaires was used in the route comparison through the weighting of the routing factors. After receiving information from the public open houses, BMcD tabulated the information provided on the questionnaire forms and recorded on the computer stations at the open house. Representatives from Westar and BMcD reviewed this information and used it to help assign weights to the various routing factors. These weights were then used to calculate a score for each route, which reflected the impact of the alternative routes between the Stranger Creek Substation and the KCP&L interface point.

A quantitative analysis of land use data, public input, and engineering criteria was employed in the final evaluation of the route alternatives. This evaluation resulted in the selection of Westar's preferred route for the proposed line. The preferred route selected between Stranger Creek and the KCP&L interface point is illustrated in Figure 3-2 of Exhibit BMcD-1.

Q: WAS THERE AN OVERLYING THEME OR ISSUE THAT RESONATED WITH THE MAJORITY OF THE PUBLIC BASED ON THE FEEDBACK THAT WAS RECEIVED?

A: Yes. The majority of the public comments we received indicated a desire to keep the new transmission line near the existing line that needs to be replaced.

Q: PLEASE PROVIDE MORE DETAIL WITH RESPECT TO EVALUATING THE INPUT RECEIVED FROM MEMBERS OF THE PUBLIC.

A: BMcD and Westar established several criteria for evaluating the route alternatives (Section 3.5.1 of Exhibit BMcD-1). This team then determined the relative importance of each impact. The team considered input received from the public in assessing the significance of the evaluation criteria. The team then assigned a weight to each evaluation criterion based upon the importance identified by the public and agency personnel, as well as on Westar's and BMcD's experience with other transmission line projects and their impacts. The evaluation criteria and their assigned weights are listed in Table 3-3 of Exhibit BMcD-1.

The factor for heavy angles was not ranked by the public but was included in the evaluation of the routes. This factor was determined to warrant inclusion in the evaluation

given the added cost, permitting and construction time, and engineering requirements associated with heavy angles.

Additionally, a visibility analysis was not run for the Project based on the existing geographical features in the study area, including wooded rolling hills and large bluffs that obscure the visibility of a transmission line. A large network of existing transmission lines also exists in the study area (Figure 1-1 of Exhibit BMcD-1); thus, landowners with visibility over the topography are already likely affected by transmission lines in their view. Based on a combination of the rolling topography, densely wooded areas, and a large existing transmission network, it was determined that a visibility factor would not have resulted in a differentiator for the Project analysis.

Overall, proximity to residences was identified by the public as the most important factor, and thus, it received the highest weight in the analysis.

Of the factors evaluated, the public ranked streams/rivers crossed and wetlands crossed as the two least important factors, so they were assigned lower weights. While the USACE regulates wetlands and the Project may need to acquire a permit for crossing wetlands, the size and distribution of the wetlands were such in this study area that the overall impacts to wetlands should be relatively minor.

Q: PLEASE DESCRIBE THE EVALUATION PROCESS FOR SELECTING THE PREFERRED ROUTE FOR THE TRANSMISSION LINE.

A: The route network between the Stranger Creek Substation and the KCP&L interface point consisted of 20 segments that could be combined to form 30 different routes. These route segments are illustrated in Figure 3-1 in Exhibit BMcD-1. The list of segments that make

up each of the top-ranked routes and the route data for these routes are presented in Table 3-4 in Exhibit BMcD-1.

Once totals were summed for each of the routing factors for the 30 alternative routes between the Stranger Creek Substation and the KCP&L interface point, BMcD staff calculated a score based on the route's proportional distribution between the minimum and maximum values for each criterion evaluated. This statistical Minimum-Maximum Method (Min-Max) reflects the variability among the routes for each factor, and transforms route data into relative scores. When a Min-Max analysis is performed, each evaluation criterion is compared against the minimum and maximum values for that criterion across all routes. In this case, the analysis resulted in a score between 1 and 10 for each analysis criterion. The higher the score, the greater the route values were for that factor. These "raw" scores were then multiplied by the weights developed by the Project team using the public and agency input and knowledge of the potential Project impacts, and then summed for all factors for each route. The resultant weighted scores for the routes for the Stranger Creek to KCP&L interface point are shown in Table 3-5 in Exhibit BMcD-1. The Min-Max analysis allowed the routes to be screened so the lesser impacting routes could be identified for further evaluation. The route selection process included this systematic analysis of the alternatives, combined with an understanding of the circumstances in the study area and the non-quantifiable public input received. The weighted scores ranged 335.4 points, from a low of 140.4 (Route 28) to a high of 475.8 (Route 27). Table 3-5 in Exhibit BMcD-1 presents the weighted Min-Max scores for the routes sorted from lowest to highest score. A lower score indicates fewer overall impacts, while higher scores typically indicate greater impacts.

The scores are not necessarily considered a definitive comparison of routes; rather, they are intended to provide a useful index of the relative overall impact associated with the alternatives. Because the Project only had 30 route alternatives, all routes were investigated individually, with focus paid to the top 5 routes (ranging in score from 140.4 to 261.7). The point of this methodology is to narrow the analysis to a few routes that could then be evaluated further using the route data to make a final recommendation for a preferred route.

Q: WHICH ROUTE WAS SELECTED AS THE PREFERRED ROUTE FOR THE TRANSMISSION LINE?

A: All of the top five routes would substantially follow the existing 161 kV transmission line being replaced through this Project. The first route to deviate considerably from the existing corridor is ranked 10th, with a Min-Max score 203.9 points higher than the top ranked route. The top ranking routes differed only in a few segment options along the existing line. Route 28 scored 140.4 and was the top ranking route of the 30 that were evaluated. It is comprised of Segments 2, 5, 8, 13, 15, 17, and 18. The second highest ranking route scored 178.9 and only differed from the top route by using Segments 19 and 20 instead of Segment 18 into the KCP&L interface point. Likewise, the top five routes ranged in scores from 140.5 to 261.7 and only differed in the areas around Stranger Creek Substation and the Iatan tap point. Routes that deviated considerably from the existing 161 kV alignment by using Segments 7, 9, 10, 11, and 12, tended to score lower than the re-build routes, suggesting greater impacts.

After a careful review of all the route data, the top ranking route (Route 28) was selected as the preferred option. This route follows the alignment of the existing 161 kV

transmission line being replaced by this Project. A detailed map showing the preferred route is shown on Figure 3-2 in Exhibit BMcD-1 and overlaid on an USGS topography map background in Appendix C in Exhibit BMcD-1.

Because of the generally anticipated lower impacts of re-building a transmission line in the same location and acquiring only the extra ROW required, Route 28 ranked substantially better in the analysis than any other route. When examining the raw route data, Route 28 had the lowest number of cultural sites within 0.25 mile of all routes considered. It also had the second lowest residential proximity score, with no homes within 200 feet and only three between 201 and 300 feet. Route 28 had the third lowest acreage of wetlands within Project ROW, the second lowest number of streams and rivers crossed, the second lowest number of heavy angles, and the least amount of new ROW required. Though Route 28 only had the absolute lowest impact in 3 of the 13 analysis factors when compared across all 30 routes, Route 28 was well below the mean for 12 of the 13 factors evaluated. The only factor where the preferred route was found to be above average was length of re-build.

The consistently low impacts across all evaluated factors caused Route 28 to rank well above the other routes in terms of engineering, social, and environmental impacts. In addition to the quantitative data, over 79 percent of public questionnaires received about the Project during and after the June 9, 2016, open house noted a preference for constructing the Project along the existing 161 kV corridor. Being preferred by the public and supported by the analysis data as the least impacting route were the major factors that contributed to the selection of Route 28 as the preferred route for the Project.

Preferred Route 28 begins at the Stranger Creek Substation and follows the same corridor as the existing 161 kV transmission line being replaced for the Project all the way to the KCP&L interface point. Figure 3-2 of Exhibit BMcD-1 is a map showing the preferred route corridor overlaid on an aerial photo background.

Q: DOES THIS COMPLETE YOUR TESTIMONY?

A: Yes, it does.

Routing Study

Westar Energy

Stranger Creek to Iatan 345 kV Transmission Line Project
Project No. 91475

Revision 2
August 2016

Routing Study

prepared for

Westar Energy
Stranger Creek to Iatan 345 kV Transmission Line Project
Leavenworth County, Kansas

Project No. 91475

Revision 2
August 2016

prepared by

Burns & McDonnell Engineering Company, Inc.
Kansas City, Missouri

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LIST OF ABBREVIATIONS

Abbreviation	Term/Phrase/Name
^{o}F	degrees Fahrenheit
Burns & McDonnell	Burns & McDonnell Engineering Company, Inc.
CSA	Community Supported Agriculture
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
GIS	Geographic Information System
GLO	General Land Office
KBS	Kansas Biological Survey
KCC	Kansas Corporation Commission
KCP&L	Kansas City Power & Light
KDA	Kansas Department of Agriculture
KDHE	Kansas Department of Health & Environment
KDOT	Kansas Department of Transportation
KDWPT	Kansas Department of Wildlife, Parks and Tourism
KGIS	Kansas State Archeological Site and Survey GIS Coverage
KGS	Kansas Geological Survey
KHS	Kansas Historical Society
KNHI	Kansas Natural Heritage Inventory
kV	kilovolt
Min-Max	Minimum – Maximum Method
NLCD	National Land Cover Database

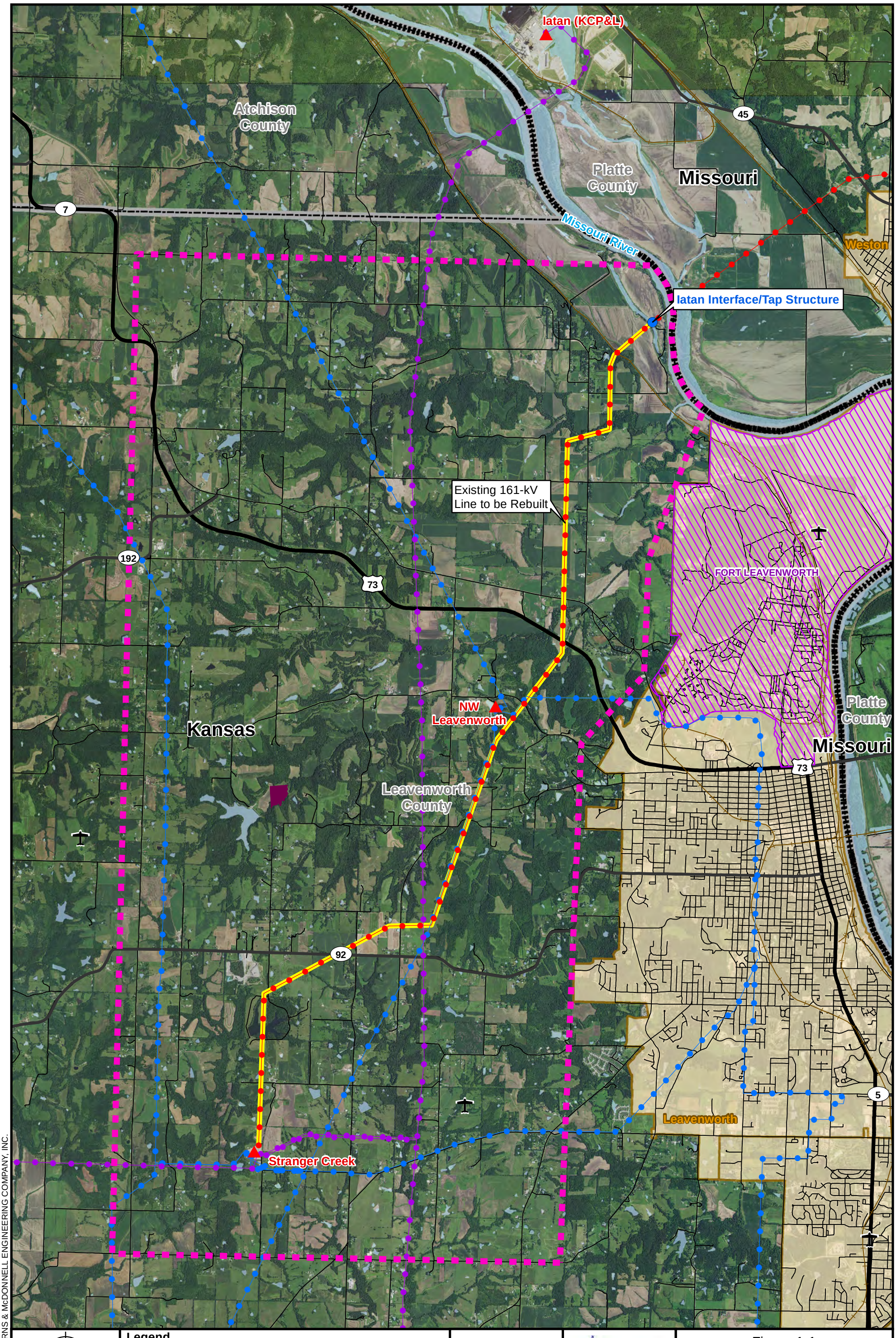
Abbreviation	Term/Phrase/Name
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NPDES	National Pollutant Discharge Elimination System
ROW	right-of-way
SHPO	State Historic Preservation Office
TNC	The Nature Conservancy
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish & Wildlife Service
USGS	U.S. Geological Survey
Westar	Westar Energy

1.0 INTRODUCTION

Westar Energy (Westar) proposes to replace an existing 161-kilovolt (kV) transmission line in Leavenworth County, Kansas, with a new 345 kV line. The existing 161 kV currently connects Westar's Stranger Creek Substation, located approximately 5 miles west of the southern portion of the City of Leavenworth, with the existing Iatan Substation, owned by Kansas City Power & Light (KCP&L) and located approximately 4 miles northwest of Weston, Missouri. The proposed 345 kV transmission line would have the same connection points as this existing 161 kV line. Westar proposes to own the approximately 12 miles of this line that are within the State of Kansas (the Project), while KCP&L would own the remaining 6 miles across the Missouri River and into Missouri. KCP&L is handling the route selection and construction of its portion of the overall project. This report has been prepared to document Westar's activities for its portion of the Project from Westar's Stranger Creek Substation to the KCP&L Iatan interface/tap structure located on the Kansas side of the Missouri River. A detailed view of the Project study area can be found in Figure 1-1. The line being replaced is older infrastructure and in need of upgrading. This upgrade would provide better access to lower cost power and strengthen the electric transmission system in the region. Westar determined that it should study all reasonable route alternatives, in addition to rebuilding along the existing 161 kV line corridor.

Westar retained Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) to assist with the line routing, public involvement, and Kansas Corporation Commission (KCC) documentation required for the Project. The evaluation ultimately resulted in the identification of a preferred route that would provide an upgraded link between the two interconnection points. The Project would include approximately 12 miles of new 345 kV transmission line to connect the Stranger Creek Substation with the interconnecting KCP&L structure just west of the Missouri River.

This report contains a description of the existing environment in the study area (Chapter 2), a description of the route evaluation process and the rationale behind the selection of the preferred route (Chapter 3), a summary of agency comments (Chapter 4), and a summary of the public input received through questionnaires and computer stations provided at the public open houses (Chapter 5). Appendices include a list of soil types and characteristics within the study area (Appendix A); a list of threatened and endangered species and species of special concern potentially found in Leavenworth County (Appendix B); detailed route maps (Appendix C); copies of agency correspondence (Appendix D); public involvement materials, including the landowner notification letter, a Project fact sheet, and a sample public questionnaire (Appendix E); and complete route analysis data (Appendix F).



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Source: USDA NAIP; NHD; NWI; Energy Velocity; ESRI; FAA; Westar Energy; Burns & McDonnell

Issued: 8/10/2016

2.0 EXISTING ENVIRONMENT

Included in this section is information regarding both natural and man-made resources in the study area that could influence the route for the Project. The study area is located in Leavenworth County in Kansas. The overall study area encompasses approximately 65 square miles west of the City of Leavenworth and the Missouri River. At the southwest end of the study area is the existing Stranger Creek Substation. At the northeast end of the study area is the existing Iatan interface/tap point structure that connects the Westar Project with KCP&L's portion of the line that extends into the Iatan Substation. The interface/tap point structure is located on the western bank of the Missouri River, along the existing 161 kV transmission line being replaced. Figure 2-1 shows the study area in a regional view, and Figure 1-1 provides a more detailed view of the study area.

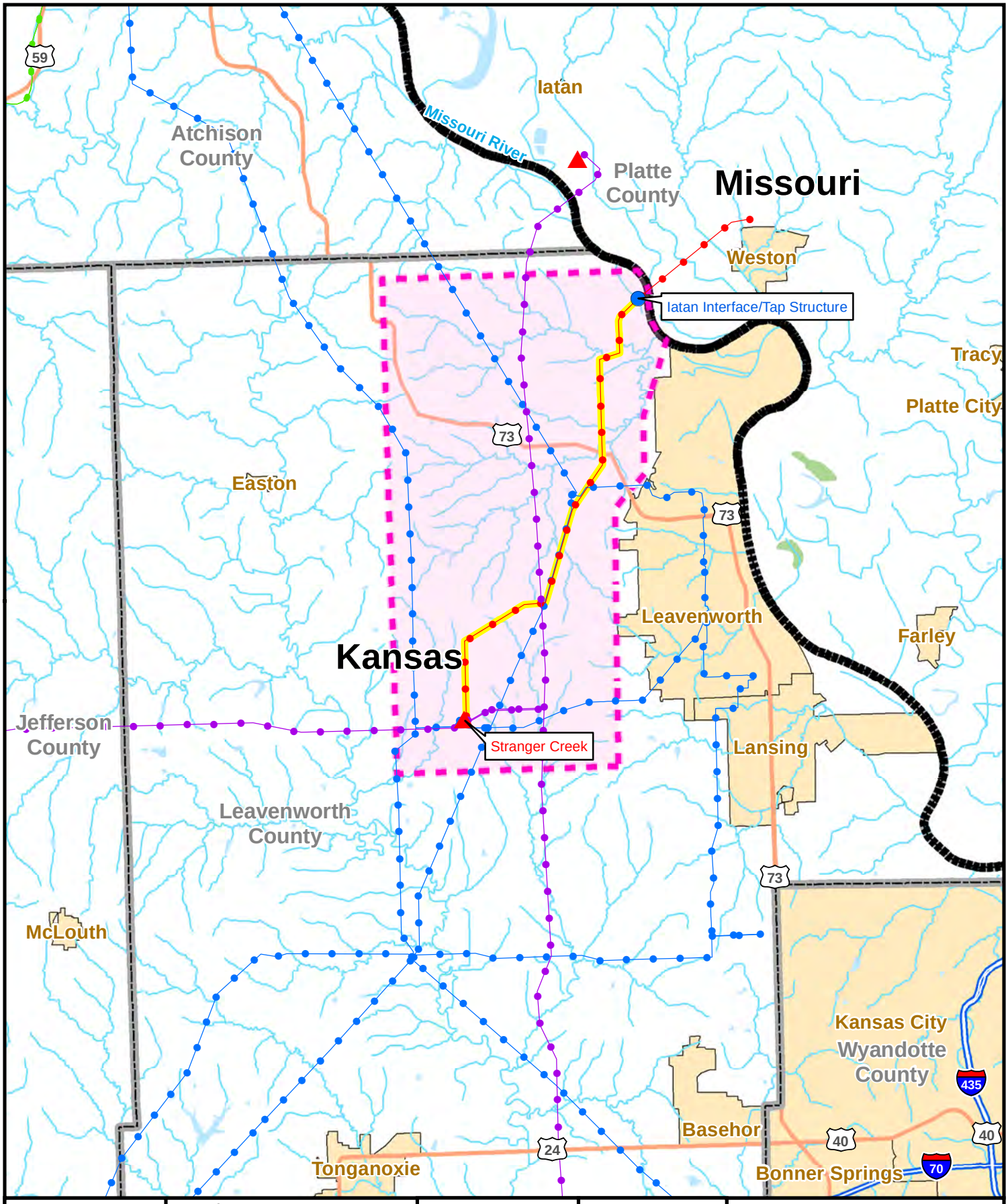
2.1 Physiography

Physiography describes the physical terrain, geology, and soils of the study area. The Project study area is located within the eastern and central portion of the Glaciated Physiographical Region. The Glaciated Region, found in the northern portion of Kansas, resulted from glaciers retreating during climate change events and depositing large quartzite boulders in their wake. The glaciers also deposited a layer of silt sediment called loess. Loess is a fine material that is easily distributed by wind or water (Kansas Geological Survey [KGS], 1997).

2.2 Soils

The Project study area has a wide variety of soils. The most prominent soil type is the Sharpsburg silty clay loam complex. This soil complex appears in the central and southern portions of the study area and is predominantly composed of silty clay loam. The Sharpsburg complex occurs in areas with 4 to 8 percent slopes, and is moderately well drained with a moderate flood frequency. Along the Missouri River at the eastern boundary of the study area occur the second and third most prominent soil types, Gosport-Sogn complex and Ladoga silt loam. The Gosport-Sogn complex is found in steeper areas with 7 to 35 percent slopes and is mainly silty clay. The Ladoga silt loam soils occur in areas with 3 to 8 percent slope and are composed mainly of silt loam and silty clay. Both Gosport-Sogn and Ladoga complexes have moderate flooding frequency and are moderately well drained.

A major soil type found in the northeastern portion of the study area is Marshall silt loam. Soils in this complex have low flooding frequency, as they are well drained. The Marshall complex is found in areas with 5 to 9 percent slopes and is composed mostly of silty clay loam.



NORTH

0 1.5 3

Miles

Legend

- Study Area
- WestarExistingSub
- Interface/Tap Structure
- Municipal Area
- County Boundary
- State Boundary
- Existing 69 kV
- Existing 115 kV
- Existing 161 kV
- Existing 345 kV
- Interstate Highway
- U.S. Highway

Kansas

Locator Map

Westar Energy

Figure 2-1
Westar Energy
Stranger Creek to Iatan
345 kV Transmission Line Project

Regional Map

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Source: ESRI, Westar Energy, Burns & McDonnell

Issued: 8/10/2016

A final soil type occurring with regularity within the Project study area is the Gosport complex. These soils are found in the northwestern portion of the study area where there are areas of elevation change. The Gosport complex soils are composed mostly of silty clay, are moderately well drained, and experience moderate frequency. Soils within this complex occur on lands with 10 to 30 percent slopes.

Of the five major soil types in the study area, three are classified as Prime Farmland. Sharpsburg silty clay loam, Ladoga silt loam, and Marshall silt loam complexes are all considered areas of Prime Farmland. The Gosport complex and the Gosport-Sogn complex are classified not prime farmland due to their occurrence in areas with slopes between 7 and 35 percent. (Natural Resource Conservation Service [NRCS], 2016). A list of all soil types in the study area is found in Appendix A.

2.3 Climate

The climate in the study area is characterized by large temperature variations. Winters are typically cold (average January low of 18.1 degree Fahrenheit [^{o}F]), and summers are warm (average July high of 90 ^{o}F). The area averages 41 days annually where the temperature reaches above 90 ^{o}F, and 11 days annually where the temperature is below 10 ^{o}F. The average total annual rainfall is approximately 39 inches, and snowfall is 15 inches. Moderate droughts also occur on occasion (National Oceanic and Atmospheric Administration, 2015).

2.4 Biological Resources

The following sections describe the biological resources found in the study area. These include wetlands, vegetation, and wildlife, as well as State- and federally threatened and endangered plants and animals.

2.4.1 Hydrological Resources

The study area lies in the southeast portion of the Missouri River Basin, which covers approximately 1,600 square miles in northeastern Kansas, as well as parts of 10 other states and Canada. In Kansas, the Missouri River Basin covers all or part of Marshall, Nemaha, Brown, Doniphan, Atchison, Leavenworth, and Wyandotte Counties (Kansas Water Office, 2009). The Missouri River forms the northeastern boundary of the study area. Larger tributaries within the study area include Salt, Plum, Three Mile, and Little Stranger Creeks. Salt and Plum Creeks drain into the Missouri River north of the City of Leavenworth, Kansas. Three Mile and Little Stranger Creeks drain into the Missouri River south of the Leavenworth city limits. Other hydrological resources are limited to cattle ponds, wetlands, residential lakes, and unnamed creeks and drainage systems found throughout the study area. Portions in the northeastern region of the study area are within the Missouri River floodplain (KGS, 2012).

2.4.2 Vegetation

The study area is situated within the Prairie Parkland Province ecological region. This transitional area historically included prairie plants and bands of deciduous trees (Bailey, 1995). Vegetation in this area was dominated by prairie species with a mixture of tall and short grasses, prairie forbs, and scattered woodlands. In addition to the mixed grasslands typical of this province, vegetation specific to the Prairie Parkland Province also includes large areas of cultivated land with row crops. The few areas of woodlands present are associated with creeks and streams, found on field boundaries, or near residences. Within study area boundaries, the topography is rolling, with riparian wooded vegetation concentrated near the Missouri River.

2.4.2.1 Threatened and Endangered Plant Species

According to data maintained by the U.S. Fish and Wildlife Service (USFWS) and the Kansas Department of Wildlife, Parks and Tourism (KDWPT), two federally listed and no State- listed threatened or endangered plant species are in Leavenworth County, Kansas. The federally listed species are Mead's milkweed (*Asclepias meadii*) and the western prairie fringed orchid (*Platanthera praeclara)*. Both of these plant species are classified as threatened. Project avoidance of native prairie habitat was recommended by USFWS and KDWPT. A desktop review of the study area was also conducted using Kansas rare species Geographic Information Systems (GIS) data from the Kansas Natural Heritage Inventory (KNHI) database. Based on this review, there are no records of occurrence for State- or federally listed plant species within the study area besides the two federally listed species above. In addition, early in the Project planning process, the Kansas Biological Survey (KBS) was consulted concerning threatened and endangered plant species in the study area. The KBS also reviewed the KNHI database and did not identify any records of State- or federally listed threatened or endangered plant species within the study area boundary other than the Mead's milkweed and western prairie fringed orchid. However, the agencies advised that absence of records does not always indicate that rare or listed species do not occur in a specific area. In addition to the two federally threatened plant species, the KBS identified 13 plant species within the study area that are classified as rare according to the State.

2.4.3 Wildlife

Burrowing mammals including ground squirrels, prairie dogs, pocket gophers, and badgers common to mixed grass prairie are likely to be found in the study area. Other mammals likely to occur within study area boundaries include cottontail rabbit, white-tailed deer, and coyote. Numerous bird species are found in the study area where suitable habitat is present. Bird species of the Prairie Parkland Province include: belted kingfisher, bank swallow, green-backed heron, and spotted sandpiper in the riverine forests; and

horned lark, eastern meadow lark, and mourning dove in the uplands. Fish species, such as smallmouth bass, blue catfish, and flathead catfish are present in the Missouri River, located just outside of the study area. These fish and others, such as channel catfish and various sunfish species, are likely found in ponds and waterways within the study area as well (Bailey, 1995).

2.4.3.1 Threatened and Endangered Animal Species

The USFWS, KDWPT, and KBS were also consulted early in the Project planning process concerning threatened and endangered animal species in the study area. The USFWS stated the federally listed pallid sturgeon (*Scaphirhynchus albus*) and northern long-eared bat (*Myotis septentrionalis*) may occur within Project boundaries. The pallid sturgeon is associated with the Missouri River channel, and avoidance of disturbance to the river was recommended. Additionally, Project construction activities and any tree removal will need to be timed to avoid taking northern long-eared bat habitat. KDWPT mentioned that Leavenworth County contained critical habitat for 11 state threatened or endangered animals. Of those 11 species, 9 are aquatic and 2 are avian. KDWPT mentioned that the Missouri River channel is critical habitat for all 11 species and recommended avoidance of the river during Project activities. The KBS only identified two federally listed plant species in its review; no protected animal species were mentioned.

A full list of animal species listed by the USFWS and the KDWPT as threatened or endangered and known to occur in Leavenworth County can be found in Table 2-1. A list including species in need of conservation occurring in the county can be found in Appendix B.

Table 2-1: State- and Federally Threatened and Endangered Species in Leavenworth County

Common Name	Latin Name	State Status	Federal Status
Flathead chub	*Platygobio gracilis*	Threatened	--
Least tern	*Sterna antillarum*	Endangered	Endangered
Mucket mussel	*Actinonaias ligamentina*	Endangered	--
Northern long-eared bat	*Myotis septentrionalis*	--	Threatened
Pallid sturgeon	*Scaphirhynchus albus*	Endangered	Endangered
Piping plover	*Charadrius melodus*	Threatened	Threatened
Plains minnow	*Hybognathus placitus*	Threatened	--
Shoal chub	*Macrhybopsis hyostoma*	Threatened	--
Sicklefin chub	*Macrhybopsis meeki*	Endangered	Candidate
Silver chub	*Macrhybopsis storeriana*	Endangered	--
Sturgeon chub	*Macrhybopsis gelida*	Threatened	Candidate
Western silvery minnow	*Hybognathus argyritis*	Threatened	--

Source: Kansas Department of Wildlife, Parks and Tourism 2016

2.4.4 Wetlands

Wetlands regulated by the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act are present in the study area. The predominant types of wetlands occurring are palustrine and are dispersed throughout the entire area. Palustrine wetlands include all non-tidal wetlands dominated by trees, shrubs, emergent plants, mosses or lichens and can be grouped into the following categories: aquatic bed, emergent, forested, scrub-shrub, unconsolidated bottom, and unconsolidated shore. Aquatic bed, unconsolidated bottom, and unconsolidated shore occur in ponds and open water and are not used when evaluating wetland impacts (USFWS, 1992).

Emergent, scrub-shrub, forested, and riverine wetlands are present within the study area. Emergent wetlands are characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for the majority of the growing season in most years. These wetlands are usually dominated by perennial plants. Scrub-shrub wetlands include areas dominated by woody vegetation less than 20 feet tall. These species include true shrubs, young trees (saplings) and trees or shrubs that are small or stunted because of environmental conditions. Forested wetlands are characterized by woody vegetation that is 20 feet tall or taller (USFWS, 1992). Riverine wetlands include deep water habitats contained in natural or artificial channels. These channels periodically or continuously contain flowing water that forms a connecting link between two bodies of standing water. Riverine wetlands in the study area are associated with the Missouri River.

2.5 Social and Community Resources

The following sections describe the built environment, as well as community resources and other social concerns within the study area. These include demographics, agriculture and other land uses, transportation, commercial and residential development areas, and cultural resources.

2.5.1 Demographics

The study area is located in Leavenworth County, Kansas. Based on a review of county parcel data and field reconnaissance, the study area is composed of both urban and rural environments. The eastern portion of the study area is more developed around the City of Leavenworth, as are the U.S. Highway 73 and Kansas Highway 92 corridors branching out northwest and southwest, respectively, from the Leavenworth city limits. Single family homes in this region are relatively evenly spaced, though concentrations exist along major roads and in closer proximity to the City of Leavenworth. Further north and west, the study area becomes more rural with land used for row crops, ranching, and other agricultural activities. Residential density is less in these parts of the study area compared to the more developed corridors mentioned above.

The 2015 population estimate for Leavenworth County was 79,315, an increase of 4.1 percent in 5 years. Over that same time period, the State of Kansas population increased 2.1 percent from 2,853,132 in 2010 to 2,911,641 in 2015 (U.S. Census, 2016). The median household income from 2010 to 2014 for Leavenworth County was $64,909, higher than the median household income for the State of Kansas over that same time frame ($51,872). In 2010, Leavenworth County had approximately 165 people per square mile. This population density is higher than that of the State of Kansas, which had approximately 35 people per square mile in 2010 (U.S. Census, 2016). Leavenworth County is densely populated when compared to the mostly rural landscape throughout the State of Kansas. This is due to the presence of the City of Leavenworth (2015 population: 35,980) located just east of the Project study area. Table 2-2 summarizes demographic data for Leavenworth County and the State of Kansas.

Table 2-2: Demographic Data for the Leavenworth County and the State of Kansas

Category	Leavenworth County	State of Kansas
Population (2010)	76,227	2,853,132
Population (2015)	79,315	2,911,641
Percent Increase	4.1%	2.1%
Median Household Income (2010-2014)	$64,909	$51,872
Persons Per Square Mile (2010)	164.7	34.9

Source: U.S. Census Bureau 2016

2.5.2 Agriculture

The primary land use within the study area is agriculture. Based on digital county parcel data, there are approximately 1,600 parcels of land within the study area that, when combined, total 41,455 acres of land. Of this area, approximately 90 percent is zoned as Rural Agricultural and Residential. Lands under this category include all crop and rangeland as well as wooded lots and residential areas with large lots. Smaller residential lots and commercially zoned areas are most common in the eastern portion of the study area near Leavenworth city limits where development is greater. The remaining 10 percent of the study area is zoned as either Industrial, General Business, or Planned Unit Development. The primary land uses within the Missouri River floodplain include agricultural and industrial zones, as is evidenced by center pivot irrigation systems in the area and the proximity of the Department of Defense's Fort Leavenworth.

Based on 2012 Census of Agricultural statistics for Leavenworth County, agricultural enterprises are a dominant part of the local economy. The market value of all agricultural products sold in 2012 was $32,098 per farm. There were 1,133 farms reported in Leavenworth County, with 184,471 acres of cropland. The primary crops reported in the county include corn and wheat, and the primary form of

livestock produced is cattle, both beef and dairy. Other livestock includes hogs and pigs, sheep, and poultry (U.S. Department of Agriculture [USDA], 2012).

2.5.3 Transportation

Major highways in the study area include U.S. Highway 73, which extends west out of Leavenworth city limits and crosses the northern part of the study area from east to west; and Kansas Highway 92, which also extends west out of the City of Leavenworth but branches south and crosses the southern portion of the study area from east to west. Other major roadways include: Santa Fe Trail/ Leavenworth County Road 14 that extends just north of U.S. Highway 73; and 187th Street that crosses the south-central portion of the study area from north to south between Kansas Highway 92 and the southern study area boundary. A network of local and residential roadways also supports local transportation.

The Federal Aviation Administration (FAA) Airport Facility Directory lists no public airports in the study area. The Sherman Army Airfield is a publicly registered FAA airport within Fort Leavenworth, approximately 1.6 miles from the eastern boundary of the study area. Eisenhower Veteran's Affairs medical center also has an FAA registered public heliport, approximately 4 miles from the eastern study area boundary. Both of these public facilities are within or adjacent to the Leavenworth city limits. One private airstrip registered with the FAA occurs within the study area, and two more occur within 5 miles of the study area boundaries.

A Union Pacific rail line crosses the northeast corner of the study area, extending north out of the City of Leavenworth and roughly following the Missouri River channel and state line. Because this rail line crosses the northeastern portion of the study area close to the Iatan tap point, the Project route will cross it.

2.5.4 Existing Utilities

Two Westar substations occur within the study area. The existing Stranger Creek Substation, located approximately 5 miles west of the southern portion of the City of Leavenworth, is associated with the Project. The existing Northwest Leavenworth Substation, located approximately 1 mile west of Leavenworth city limits in the center of the study area, is not associated with the Project. The Iatan Substation, owned by KCP&L, is located in Missouri across the Missouri River and state line. This substation is not located within the study area. The KCP&L portion of the Project will terminate at the Iatan Substation.

Many transmission lines exist in the study area, including the existing 161 kV line being replaced by this project that connects the Stranger Creek Substation with the Iatan Substation. This line cuts diagonally across the study area from southwest to northeast.

Two 345 kV transmission lines also exit the Stranger Creek Substation. One of those 345 kV lines turns west and exits the study area, and the other extends east for approximately 2 miles before turning north and bisecting the study area from north to south.

Three existing 115 kV transmission lines also exit the Stranger Creek Substation. Two of those 115 kV lines turn west as a double-circuit line for approximately a mile before splitting to two single-circuit lines with one line going north and the other south. The southern line exits the study area, while the other continues north within the study area for approximately 7 miles. The third 115 kV line coming out of the Stranger Creek Substation turns east and cuts across the southern portion of the study area for approximately 4 miles before entering the City of Leavenworth outside of the study area.

The three other existing transmission lines in the study area are 115 kV lines associated with the existing Northwest Leavenworth Substation. One of these lines enters the study area from the south and extends northeast diagonally across the study area for approximately 7 miles, some of that paralleling the existing 161 kV line being replaced by this project. A second existing 115 kV line exits the Northwest Leavenworth Substation to the north and extends northwest for approximately 6 miles before leaving the study area. The third 115 kV line extends east of the Northwest Leavenworth Substation, out of the study area, and into the City of Leavenworth.

2.5.5 Commercial and Residential Development

Business facilities, including restaurants, offices, shopping centers and other service-oriented services are found at the very eastern portion of the study area nearest to Leavenworth city limits and along U.S. Highway 73 and Kansas Highway 92. The highest concentrations are found closest to the City of Leavenworth. The population of the county is increasing (Section 2.5.1), and new commercial facilities continue to be constructed in the areas mentioned above, as observed during field visits. However, most of the development within the study area is residential.

Of the residential development that has occurred in the study area, most consisted of single family residences on large, semi-rural residential lots outside of city limits. No planned developments were encountered during initial research into the study area, and none were identified to the Project team by either the City or the County of Leavenworth's planning and zoning departments during government and

agency contacts (reference Chapter 4.0). No response was received about the Project from either the City or County of Leavenworth.

2.5.6 Cultural Resources

To identify cultural resources that could be affected by the Project, an online search was completed of two databases housed by the Kansas Historical Society (KHS): Kansas State Archeological Site and Survey GIS Coverage (KGIS) and the Kansas Memory website containing historic-era plat maps and atlases. KGIS contains the following data: (1) archaeological sites, (2) archaeological surveys, (3) properties listed on the National Park Service's National Register of Historic Places (NRHP), (4) Historic Districts, and (5) General Land Office (GLO) data. Plat maps and atlases accessed through the Kansas Memory website included the 1877 Missouri Publishing Company's *Sectional Map of Leavenworth County, Kansas* and the 1903 George A. Ogle & Company *Standard Atlas of Leavenworth County, Kansas*. For comparative purposes, Burns & McDonnell georeferenced the sectional map and overlaid the Project study area on the maps. The sectional map includes names of landowners, structure locations, roads, and other improvements around the time of its publication. While the geographic accuracy of structure locations on the map may not be adequate by modern standards, the map does provide the general location of historic settlement and land use. The 1877 sectional map identifies land ownership and provides snapshots of where structures have been located over the last 139 years. Additionally, Burns & McDonnell reviewed church and cemetery location data created by the U.S. Geological Survey's (USGS) Geographic Names Information System and the Pioneer Cemetery dataset housed at the Data Access and Support Center.

The KHS databases were initially reviewed for this Project in April 2016 and again on July 7 to 11, 2016. The review included the Project and a buffer (study area) around the Project. The historic literature and map review revealed 54 previously recorded archaeological sites within the study area. Archaeological site forms for 53 sites have no NRHP determination listed, and it can be assumed that they are categorized as "Not Evaluated," meaning that they have not been evaluated for eligibility for listing in the NRHP. One archaeological site, a prehistoric Native American village identified as the Zacharius Site (14LV380), is listed on the NRHP. The 54 archaeological sites within the study area are listed in Table 2-3.

Table 2-3: Archaeological Sites within the Study Area

Site Number	Site Name	Site Component	Site Type	Recorded Date	NRHP Status
14LV19	--	Prehistoric	Camp	8/8/1966	Not Evaluated
14LV84	Land Site	Protohistoric	Burial/Camp	4/9/1979	Not Evaluated
14LV164	--	Historic	Domestic	4/5/2008	Not Evaluated
14LV301	Fort Cavagnial	Historic	Camp	12/5/1982	Not Evaluated
14LV302	--	Multicomponent	Camp	12/11/1962	Not Evaluated
14LV303	--	Historic	Camp	1/17/1964	Not Evaluated
14LV304	--	Historic	Camp	4/3/1964	Not Evaluated
14LV305	--	Multicomponent	Camp	4/3/1964	Not Evaluated
14LV306	--	Prehistoric	Camp	4/26/1965	Not Evaluated
14LV307	--	Prehistoric	Camp	4/26/1965	Not Evaluated
14LV308	--	Prehistoric	Camp	4/27/1965	Not Evaluated
14LV309	--	Prehistoric	Camp	4/27/1965	Not Evaluated
14LV310	--	Prehistoric	Camp	4/27/1965	Not Evaluated
14LV311	--	Prehistoric	Camp	4/27/1965	Not Evaluated
14LV312	--	Prehistoric	Camp	4/27/1965	Not Evaluated
14LV313	--	Unknown	Stone Mound	4/27/1965	Not Evaluated
14LV314	--	Prehistoric	Camp	4/27/1965	Not Evaluated
14LV316	--	Prehistoric	Camp	5/3/1966	Not Evaluated
14LV318	--	Prehistoric	Camp	5/2/1966	Not Evaluated
14LV319	--	Prehistoric	Camp	5/17/1966	Not Evaluated
14LV320	--	Prehistoric	Camp	5/17/1966	Not Evaluated
14LV321	--	Prehistoric	Camp	5/17/1966	Not Evaluated
14LV322	--	Multicomponent	Camp	5/17/1966	Not Evaluated
14LV323	--	Prehistoric	Camp	5/17/1966	Not Evaluated
14LV324	--	Prehistoric	Camp	5/17/1966	Not Evaluated
14LV325	--	Prehistoric	Camp	5/17/1966	Not Evaluated
14LV326	--	Prehistoric	Camp	5/17/1966	Not Evaluated
14LV327	--	Prehistoric	Camp	5/20/1966	Not Evaluated
14LV330	--	Historic Indian	Burial	11/17/1983	Not Evaluated
14LV333	--	Prehistoric	Camp	12/17/1971	Not Evaluated
14LV334	--	Multicomponent	Camp	2/9/1972	Not Evaluated
14LV338	--	Prehistoric	Camp	1/31/1974	Not Evaluated
14LV339	--	Prehistoric	Camp	1/31/974	Not Evaluated
14LV340	--	Multicomponent	Camp	2/1/1974	Not Evaluated
14LV341	--	Prehistoric	Camp	2/1/1974	Not Evaluated

Site Number	Site Name	Site Component	Site Type	Recorded Date	NRHP Status
14LV342	--	Prehistoric	Camp	2/4/1974	Not Evaluated
14LV343	--	Prehistoric	Camp	2/8/1974	Not Evaluated
14LV344	--	Prehistoric	Camp	2/11/1974	Not Evaluated
14LV345	--	Prehistoric	Camp	2/13/1974	Not Evaluated
14LV346	--	Prehistoric	Camp	2/14/1974	Not Evaluated
14LV347	--	Prehistoric	Camp	2/18/1974	Not Evaluated
14LV348	--	Prehistoric	Camp	2/27/1974	Not Evaluated
14LV349	--	Prehistoric	Camp	2/27/1974	Not Evaluated
14LV350	--	Historic	Isolated Find	2/28/1974	Not Evaluated
14LV351	--	Historic	Cave	2/28/1974	Not Evaluated
14LV379	--	Prehistoric	Isolated Find	3/23/1984	Not Evaluated
14LV380	Zacharius Site	Prehistoric	Village	11/1/1994	Listed
14LV381	--	Multicomponent	Camp	2/19/1987	Not Evaluated
14LV422	Aaron Site	Historic	Burial/ Domestic	--	Not Evaluated
14LV424	--	Historic Indian/Historic	Military	5/3/2007	Not Evaluated
14LV425	Kickapoo House and Burial (Cantrell 1)	Historic Indian	Burial/ Domestic	4/20/2016	Not Evaluated
14LV1301	Atkinson Site	Prehistoric	Unknown	10/6/2015	Not Evaluated
14LV1302	--	Prehistoric	Unknown	10/6/2015	Not Evaluated
14LV1305	Plum Creek Site	Historic Indian	Unknown	10/6/2015	Not Evaluated

Source: Kansas State Historical Society. *The Kansas State Archeological Site and Survey GIS Coverage.* http://koufax.kgs.ku.edu/kshs/ (Accessed July 2016).

Twelve archaeological surveys have been performed with in the study area (Table 2-4).

Table 2-4: Previous Archaeological Surveys within the Study Area

Report Title	Submitted To	Report Author	Report Date
Archeological Survey of a Contractor Furnished Borrow Area in Leavenworth County, Kansas, Project 52 C-1839-01.	Kansas Department of Transportation (KDOT)	Williams, Barry C.	1987
Archeological Survey of Secondary Road Project 14C-2784-01 in Clay County, Kansas.	KDOT	Williams, Barry C.	1989
The Testing of the Zacharias Site, 14LV380: Results of a Phase III Investigation of Highway Project K-1875, Leavenworth County, Kansas.	KDOT	Theis, Randall M.	1984
Salt Creek Bridge, Opossum Hollow: Results of an Archeological Investigation of Road Project C-1740, Leavenworth County, Kansas.	KDOT	Theis, Randall M.	1984
Archeological Survey of a Proposed Realignment of U.S. Highway 73 in Northern Leavenworth County, Kansas Project Number 73-52-K-5762-01.	KDOT	--	1998
Phase I and Phase II Archaeological Investigation of Two Segments of the Duel Leavenworth County Power Pipeline Proposed in Leavenworth County, Kansas	Malcolm Pirnie, Inc.	Latham, Mark A.	2001
Phase II Cultural Resource Survey Proposed Nextel Communications, Inc. KS 2502 D Lowemont Tower Project, Leavenworth County, Kansas KSR&C No. 04-11-149.	Selective Site Consultants, Inc.	K&K Environ-mental, LLC	2004
Phase I and Phase II Cultural Resources Investigation of a 40-Acre Tract at the USDB Vocational Farm Site Leavenworth County, Kansas.	Parsons	Ensor, H. Blaine and Cally Lence	2006
A Cultural Resources Survey of the Proposed KCYP Happy Hollow Cell Tower, Verizon Project Number 2008257840, Leavenworth County, Kansas.	Bureau Veritas North America, Inc.	Gannon, Thomas N.	2008
Cultural Resources Assessment of the Proposed Eisenhower Cellular Tower, Leavenworth County, Kansas.	Pyramid Network Services, LLC	Bozell, John R.	2008

Report Title	Submitted To	Report Author	Report Date
Cultural Resources Assessment of the Proposed Kickapoo Cellular Tower, Leavenworth County, Kansas.	Pyramid Network Services, LLC	Bozell, John R.	2008
Archeological Survey of KDOT Project 52 C-4597-01 Leavenworth County, Kansas.	KDOT	Waggoner, Tricia J.	2013

Source: Kansas State Historical Society. *The Kansas State Archeological Site and Survey GIS Coverage.* http://koufax.kgs.ku.edu/kshs/ (July 2016).

Additionally, a search of the NRHP database was conducted. This search revealed that three NRHP-listed sites, buildings, structures, or historic districts (in addition to the Zacharias archaeological site) are in the study area (Table 2-5).

Table 2-5: NRHP-Listed Properties and Districts within the Study Area

Resource Name	Address	Listing Date	NRHP Number	NRHP Classification
Hund School	31874 179th Street	01/24/2000	00000158	Building
Powers, David W., House	2 miles NW of Leavenworth off US-73.	09/30/1977	77000588	Building
St. Thomas Hospital	210 S. Range Ave.	01/02/2013	12001122	Building
Zacharius Site	--	--	19870108	Site

Source: National Register of Historic Places (July 2016).

The results of the Phase I background research are as follows:

- A total of 54 archaeological sites have been recorded within the Project study area, including one listed on the NRHP.
- Alignments for potential Project routes cross four archaeological sites: 14LV304, 14LV318, 14LV1301, and 14LV1305
- Twelve archaeological surveys have been conducted within the Project study area.
- Four NRHP-listed properties or districts are located within the Project study area.
- Two Pioneer cemeteries are located within the Project study area.
- Project alternative routes cross four 1856 GLO-recorded roads: the Fort Leavenworth to Fort Riley Military Road, the California Road, the Military Road to Fort Riley, and the Alexandria to Kickapoo Road.
- Project alternative routes cross the 1856 GLO-documented Union Town.

- Based on a review of historic plat maps, ten 19th century mapped buildings or structures are located along Project alternative routes.

3.0 ROUTE EVALUATION

Westar retained Burns & McDonnell to assist in the route selection, public involvement and documentation for the Project. This section presents the rationale behind the route identification and evaluation process used, which ultimately resulted in the selection of a preferred route. The Project extends from the Stranger Creek Substation to the KCP&L Iatan interface/tap structure. The Project includes route alternatives that use the existing 161 kV transmission line route, as well as new alternatives throughout the study area. The KCP&L Iatan interface/tap structure is located near the western bank of the Missouri River, in Kansas. Westar's Project will connect with KCP&L's project at the KCP&L Iatan interface/tap structure. KCP&L's project will then cross the Missouri River and extend into the Iatan Substation approximately 4 miles northwest of Weston, Missouri. Figure 1-1 shows the study area with the two Westar Project end points.

3.1 Overview of the Routing Process

Following is an overview of the steps involved in the identification of the alternative routes and the selection of a preferred route for the Project.

A study area was defined to incorporate the necessary endpoints, while offering a large enough area to provide a reasonable set of geographically distinct route alternatives. After establishing the study area, the objective was to identify economically feasible routes that connected the two endpoints while avoiding or limiting impacts to both social and natural resources. Alternative routes were identified that would connect the Stranger Creek Substation to the KCP&L Iatan interface/tap structure.

Local, State, and Federal agencies were contacted to obtain information relevant to the routing process. Following the identification of potential alternative routes, the Project team quantified the social and environmental resources that would be impacted by each possible route. The potential alternative routes were also shown to the public and local officials to obtain input for the evaluation of the alternatives. Quantitative data, public input, and engineering factors were used to evaluate the alternatives and to select a preferred route for the Project. Activities leading to the selection of the preferred route are described in more detail in the following sections.

3.2 Identification of Study Area

A study area was developed by reviewing available Graphical Information Systems (GIS) data. Major geographic constraints such as the City of Leavenworth, Fort Leavenworth, and the Missouri River were considered during the development of the study area.

The limits of the study area were established based on the endpoints identified by Westar and a preliminary review of possible constraints and co-location opportunities in the area. The overall study area, as shown in Figure 1-1, encompasses approximately 65 square miles. The study area was defined to incorporate the necessary endpoints, while offering an area large enough to provide a set of reasonable and geographically distinct route alternatives. The study area is located just west of the City of Leavenworth in Kanas. The southeastern corner is located at Stranger Road, and the eastern boundary of the study area continues north along the edge of the Leavenworth municipal boundary for approximately 10 miles before turning slightly west to follow the Missouri River channel for approximately 2 miles. At this point, the northern boundary of the study area begins just north of Logan Road and continues west for approximately 6 miles before turning south. The western boundary of the study area continues south, just west of an existing 115 kV transmission line, for approximately 11.5 miles where it reaches Stranger Road at the southwest corner of the study area. The southern boundary of the study area continues east along Stranger Road for approximately 5 miles until the southern and eastern borders meet.

3.3 Identification of Alternative Routes

The objective of the routing analysis was to identify economically feasible routes that would connect Stranger Creek Substation to the KCP&L Iatan interface/tap structure. The objective was also to identify routes that would offer the most benefits in terms of providing reliable electric power transmission while reducing potential adverse impacts to the social and natural environment. The alternative route development process included the following main components:

- Local, State, and Federal agencies were contacted to identify features in the study area that could affect the route development process
- Local planning and zoning information was reviewed for areas where a transmission route would be consistent with existing or future development
- A GIS-based desktop review of the study area was conducted using information gathered from the agencies, along with recent aerial photography, USGS topographic maps, and other data, to identify potential opportunities and constraint areas
- Alternative routes were developed based on the constraint map
- A field reconnaissance of the study area was conducted to verify the feasibility of the routes that were identified during the desktop review

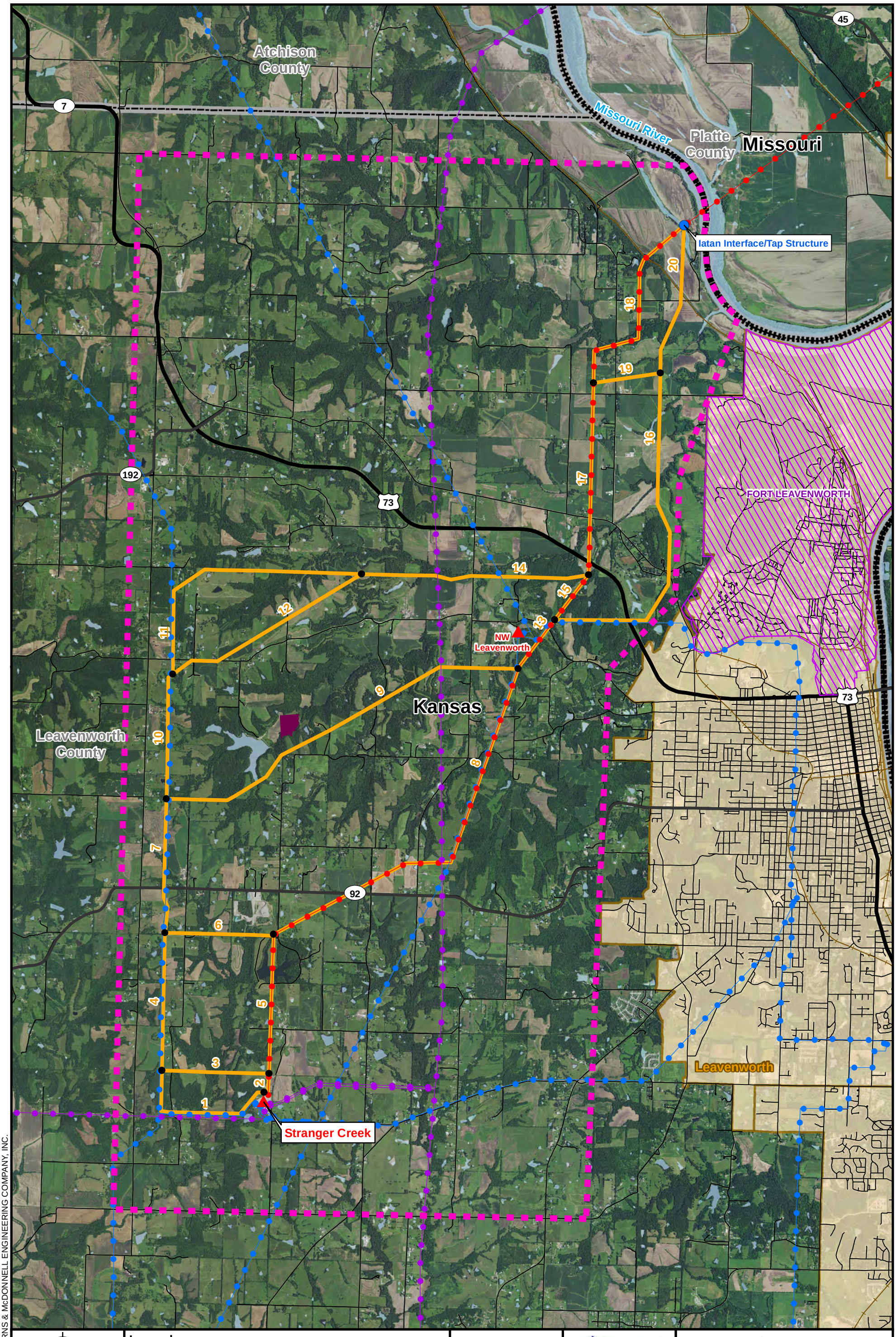
The major concerns during the development of routes were:

- Avoiding proximity of the line to residences, businesses, public facilities, parks, cemeteries, and communication towers
- Paralleling existing utilities, roads, or railroads when practical, accounting for existing right-of-way (ROW) and potential increased construction costs
- Avoiding wetlands, riparian areas, conservation lands, and protected species and their habitats for both the transmission line corridor and access for construction and maintenance
- Avoiding placing the line directly over tanks and oil, gas, or water wells
- Maintaining a reasonable length with as few angles as possible to minimize costs
- Avoiding FAA and U.S. military controlled areas that would restrict structure height or proximity to navigational aids

It was not possible to find a route that avoided all potential impacts. To reduce impacts to land uses, most of the alternatives were located along existing corridors, such as the 161 kV line being replaced, field lines, local roads, or paralleling other existing transmission lines.

The alternative routes consist of individual segments that may be combined in different arrangements to form a continuous path that connects the two end points. Each segment begins and ends at intersections with other segments. The final route segments are shown in Figure 3-1. A detailed map showing all the routes overlaid on a USGS topography map background is found in Appendix C (Figure C-1). A total of 20 segments were identified and were shown to the public at an open house on June 9, 2016. Section 3.4 further describes the public involvement activities for the Project.

The 20 segments could be combined to form 30 alternative routes. All route combinations were evaluated to identify a preferred route. Routes evaluated tend to follow one of two main paths out of the Stranger Creek Substation and across the study area: the corridor of the existing 161 kV line being replaced to the north or paralleling an existing 115 kV line headed west and then north. The routes following the existing 161 kV corridor branch off to the northeast, while those paralleling the existing 115 kV initially remain to the west as they head north. The western routes eventually turn east, in the direction of the KCP&L Iatan interface/tap structure, and connect back to the routes along the existing 161 kV corridor. At this point, the routes split again, with the existing 161 kV corridor remaining to the west and an eastern alternative extending into the KCP&L Iatan interface/tap structure from the south.



Path: Z:\Clients\TND\WestarEnr\91475_StrangerCreek\Studies\GeospatialDataFiles\ArcDocs\ReportFigures\Figure3-1_RouteAlternatives.mxd ebrenna 8/10/2016

Source: USDA NAIP; NHD; NWI; Energy Velocity; ESRI; FAA; Westar Energy; Burns & McDonnell

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3.4 Public Involvement Activities

Two forms of public input were used to determine community preferences and concerns relative to the Project. The first outreach effort included letters to State, Federal, and local agencies. In addition, a public information meeting was held by Westar near the study area on June 9, 2016. Input from residents and public officials helped the Project team identify the appropriate factors to use in route evaluation. The intent of the public participation program was to provide the potentially affected landowners near the alternative routes with an understanding of the need for the Project, the decision-making process used to select the preferred route, and a forum to voice concerns about the Project.

3.4.1 Letters to Agencies

State, Federal, and local agencies were contacted by letter to provide input on threatened and endangered species, wetlands, wildlife resources, and other potential permitting issues. Federal agencies contacted included:

- USFWS
- USACE
- NRCS
- FAA
- Environmental Protection Agency (EPA)

State agencies contacted included:

- Kansas State Historical Preservation Office (SHPO) at the KHS
- KDWPT
- Kansas Department of Agriculture (KDA)
- Kansas Department of Health and Environment (KDHE)
- Kansas Department of Transportation (KDOT)
- KBS

Local government offices contacted included:

- Leavenworth County Public Works Department
- Leavenworth County Planning and Zoning Department
- City of Leavenworth Public Works Department
- Leavenworth City Planner

The Nature Conservancy (TNC), a private conservation organization working to protect ecologically important lands and waters, was also contacted.

A summary of the responses received is included in Chapter 4. A sample request letter, list of individuals contacted, and the actual responses received from the agencies are provided in Appendix D.

3.4.2 Open House

To provide residents of the area with information about the Project and gather public input on route alternatives, Westar held an open forum informational open house on June 9, 2016. The meeting was held at Leavenworth Senior High School along 10th Avenue in Leavenworth, Kansas. Landowners within 1,000 feet of all alternative route centerlines were sent an invitation letter and a small-scale map notifying them of the date and location of the public open house. The landowner information was derived from digital parcel and ownership data obtained from Leavenworth County.

The meeting included display stations with information on route alternatives and environmental management, as well as a sign-in table with materials on the Project need and various informational handouts, including material on the routing process and a questionnaire. Real estate and ROW personnel, engineers, and routing specialists from Westar and Burns & McDonnell were present to answer questions and take comments raised by the public. Four sets of large maps were displayed showing the routes, parcel boundaries, township/range/section data, roads, and other features overlaid on an aerial photograph background. In addition to these large, printed maps, the meeting also included five computer stations showing the same spatial data so that attendees could get a more detailed view of their properties and provide more direct comments on their parcels. Photographs and drawings showing the different types of structures that could be used for the Project were also available.

Participants received a questionnaire that solicited their input on the routing factors, the alternative route locations, and issues of concern regarding the Project. They were asked to return their questionnaires either at the open house or by mail shortly afterwards. Appendix E includes a Project fact sheet, an informational routing process handout, a landowner notification letter, and a sample questionnaire from the Westar open house. A total of 67 questionnaires were received from the open house: 36 were collected at the June 9th meeting and an additional 31 questionnaires were returned by mail to Westar by the June 24, 2016, deadline. A more detailed summary of the questionnaire results is presented in Chapter 5.0.

3.4.3 Principal Concerns

The principal concerns documented by the public were proximity to residences, maximizing the length of the new transmission line along the same corridor as the existing 161 kV transmission line being replaced,

visibility of the line, and minimizing tree removal. Route segments 6, 11, 12, and 16 (see Figure 3-1 and Section 3.5) were identified numerous times as segments of concern, primarily related to potential impacts to residences, agricultural lands, property values, and visual degradation. Maximizing length along roads, minimizing distance across center pivot irrigation systems, and maximizing distance from businesses were ranked as issues of least concern by the respondents.

Public input was used in the route comparison through weighting of the routing factors and, ultimately, the selection of the preferred route. The following section describes the route evaluation process and the rationale behind the selection of a preferred route.

3.5 Identification of the Preferred Route

The analysis of alternatives was based on social, environmental, and engineering factors. A preferred route was identified connecting the Stranger Creek Substation and the KCP&L Iatan interface/tap structure while minimizing, to the extent practicable, the impacts of the proposed transmission line. Following is a description of the process that resulted in identification of a preferred route for the Project.

3.5.1 Evaluation Factors

Evaluation of the proposed routes included a systematic comparison of the alternatives based on the social, environmental, and engineering factors that represent the potential adverse effects on resources in the study area. Table 3-1 shows the routing factors used in this analysis.

Table 3-1: Routing Factors

Factors	Unit of Measure
Length of new construction	Feet
Length of rebuild	Feet
Acres of new ROW	Acres
Length not paralleling existing road or transmission line	Feet
Residential proximity score	Score
Public facilities within 300 feet	Number
Cultural sites within 1,320 feet	Number
Rare species/species of special concern polygons crossed	Number
Streams and rivers crossed	Number
Wetland acres in ROW	Acres
Woodland acres in ROW	Acres
Cropland acres in ROW	Acres
Heavy angles	Number

The primary source of the data used in this analysis was 2015 color aerial imagery, supplemented with field reconnaissance of the overall study area and along each of the routes developed. Digital data, such as roads, parcels, and land use information were acquired from various agencies. Following is a detailed description of each of the factors considered for the route analysis.

Length of new construction was calculated to evaluate the amount of newly impacted land for each route. No length was calculated for that portion of a route that used any of the existing ROW along the 161 kV line being replaced. **Length of rebuild** was also calculated to evaluate the length of each route that used the existing ROW for the 161 kV line being replaced. Most routes used both new ROW and the existing 161 kV line ROW. Because constructing along existing ROW is generally considered less impacting than new construction, evaluating the length of existing ROW allowed the Project team to determine how much of a route could be constructed within existing ROW. Between these two factors, the overall route length was also captured. Length is a general indicator of the overall impacts of the Project and an indicator of construction costs. Typically, the longer the route, the more expensive it would be if all other factors were equal.

Acres of new ROW was calculated to reflect the idea that maximizing the use of existing ROW is preferable to acquiring all new ROW for the Project. For this criteria, the current ROW for the existing 161 kV was determined and subtracted from the new ROW anticipated for segments that followed along the corridor of the existing line. This allowed the Project team to determine how much land, along all routes evaluated, would be newly impacted. Using existing ROW generally requires less tree removal and less new easement acquisition.

Length not paralleling existing road or transmission line was calculated because paralleling an existing road or overhead electric corridor is generally considered preferable when compared to constructing in a new corridor. Co-locating a new route along existing transmission lines and roads can reduce impacts, while building a new route away from existing lines and roads can increase impacts; thus, length not along existing corridors was used in the impact analysis. For this criterion, any length of the routes that used the existing 161 kV ROW were not included. The length along the existing 161 kV ROW is not a parallel route, it is instead captured in the Length of Rebuild factor outlined above. There are several existing transmission lines within the study area other than the 161 kV being replaced; however, only two provided a feasible existing corridor for co-location. The first is the existing 115 kV line that exits the Stranger Creek Substation to the west before turning north, and the second is an existing 115 kV line that heads east out of the Northwest Leavenworth Substation. Both these lines provide adequate corridors for co-location, based on guidance from Westar regarding system reliability. Additionally,

undeveloped portions of roads in the study area provide the opportunity for co-location with the Project. It is generally desirable to follow roads where possible to maximize accessibility for construction and future maintenance and because roads represent an opportunity to keep linear facilities in common corridors. The use of common corridors for linear facilities also helps reduce visual impacts, though visibility of transmission lines does tend to be higher at road crossings.

The **residential proximity score** was derived for each route by first identifying residences located at varying distances from the proposed routes using aerial photography supplemented with field verification. Closer houses were given more consideration in the evaluation. The score was derived by multiplying the number of residences quantified for each route by the appropriate rating listed in Table 3-2.

Table 3-2: Residential Proximity Ratings

Distance to Route	Rating
0-100 feet	3
101-200 feet	2
201-300 feet	1

Public facilities within 300 feet were also quantified. Public facilities include cemeteries, churches and other religious facilities, schools, parks, and other sites used by the public. No public facilities were found to be within 300 feet of the centerline of any alternative segment.

Cultural resource sites within 1,320 feet (0.25 mile) of each segment were quantified based on a records search of known historic and archaeological sites maintained by the KHS. This factor was used as an index of the potential cultural impact of the proposed routes rather than an actual impact, because most of the area has not been surveyed and most of the known sites' eligibility for inclusion in the NRHP has not been determined. In most cases, further investigation is needed to determine whether listing would be warranted. Nine of the 20 Project segments would be within 0.25 mile of at least one known cultural resource site. Of the four listed NRHP sites within study area boundaries, none are within 0.25 mile of any Project route.

Rare species/species of special concern polygons crossed were counted and included in the evaluation to reflect the concern of wildlife agencies about the potential effects of the Project on native and protected species habitat. Data from the KBS and KDWPT identify the location of protected, rare, and special concern species within the study area. Ten segments between Stranger Creek Substation and the KCP&L Iatan interface/tap structure cross a rare or species of special concern polygon. Though none of these polygons represent federally or State-listed threatened or endangered species, this factor was included in

the analysis to provide some indication of the routes that could require additional permitting efforts for approval should habitat for threatened or endangered species be found within the ROW during the permitting phase of the Project.

Streams and rivers crossed were identified using digital National Hydrography Dataset data from the USGS. All streams in the study area are narrow enough that they could be spanned by the proposed Project (no poles would have to be placed within the water). Stream and river impacts are expected to be minimal, especially with the implementation of erosion and sedimentation control procedures specified in a Stormwater Pollution Prevention Plan, which would be prepared for this Project during the permitting phase.

Wetland acres in ROW was measured using National Wetland Inventory data. All wetland acres crossed by the proposed ROW were summed for each route. Only palustrine, forested, scrub/shrub, and emergent wetlands were quantified.

Other land use categories reflect the major land uses in the study area using data provided by the National Land Cover Database (NLCD). **Woodland acres in ROW** consists of forested areas within the ROW that would be cleared along each route and was quantified using all forested land use categories in NLCD data. **Cropland acres in ROW** consists of fields planted with row crops and identified in the NLCD data as cropland. Cropland was separated from other agricultural land for this analysis because impacts from the transmission structures tend to be greater for cultivated land than if the field were used for pasture or other passive agricultural operations.

Heavy angles represents the number of angles greater than 30 degrees that would be required for each route. Heavy angles require a larger, more visible structure and may include the use of large concrete foundations or other support features. These structures are more expensive and result in greater land disturbance during construction.

3.5.2 Weighting the Routing Factors

The above categories were considered to represent the potential impact of construction and operation of the Project within the study area. The level of public concern for the factors varied, as indicated by the ratings in the questionnaires. Westar and Burns & McDonnell staff assigned weights to each of the factors based on input from the public via the questionnaires, input from Westar staff and engineers, and experience with transmission line projects across the country. The weights associated with each routing factor, and the ranks resulting from the public input, are presented in Table 3-3. The names of the routing factors may vary slightly from the descriptions on the public questionnaire, but are the same in meaning.

Table 3-3: Factor Ranking and Weights

Factor	Public Rank	Weight
Residential proximity score	1	10
Length of rebuild	2	2
Acres of new ROW	2	8
Heavy angles > 30 degrees	--	7
Minimize visibility of the line	3	--
Woodland acres in ROW	4	6
Cultural sites within 1,320 feet	5	5
Rare species/species of concern polygons crossed	6	5
Cropland acres in ROW	7	4
Length of new construction	8	8
Public facilities within 300 feet	9	4
Minimize length through grassland or pasture	10	--
Length not paralleling existing road or transmission line	11	4
Streams and rivers crossed	12	2
Wetland acres in ROW	12	3
Improve reliable electric service	13	--
Maximize distance from businesses	14	--
Minimize length across center pivot irrigation systems	15	--
Maximize length along roads	16	4

The range of weights (1-10) was determined by the number of factors; the relative importance of each factor in relation to the others, based primarily on the public responses; and the need to differentiate among the routes. The weights are reversed from the public ranks in Table 3-3 because a higher weight places more significance on factors considered most important to the public.

The factor for heavy angles was not ranked by the public but was included in the evaluation of the routes. This factor was determined to warrant inclusion in the evaluation given the added cost, permitting time, and engineering requirements associated with heavy angles. Additionally, a visibility analysis was not run for the Project based on the existing geographical features in the study area, including wooded rolling hills and large bluffs that obscure the visibility of a transmission line. A large network of existing transmission lines also exists in the study area (Figure 1-1), thus, landowners with visibility over the topography are already likely affected by transmission lines in their view. Based on a combination of the rolling topography, densely wooded areas, and a large existing transmission network, it was determined that a visibility factor would not have resulted in a differentiator for the Project analysis. Overall,

proximity to residences was identified by the public as the most important factor, and thus, it received the highest weight in the analysis. Of the criteria evaluated, the public ranked streams/rivers crossed and wetlands crossed as the two least important factors, so they were assigned lower weights. While the USACE regulates wetlands and the Project may need to acquire a permit for crossing wetlands, the size and distribution of the wetlands were such in this study area that the overall impacts to wetlands should be relatively minor, and the permitting process should be relatively straight-forward.

3.5.3 Evaluation Process

The route network between Stranger Creek Substation and the KCP&L Iatan interface/tap structure consisted of 20 segments that could be combined to form 30 different routes (Figure 3-1; Appendix C, Figure C-1).

Once totals were summed for each of the routing factors for the 30 alternative routes, a score was calculated based on a route's proportional distribution between the minimum and maximum values for each criterion evaluated. This statistical Minimum-Maximum Method (Min-Max) reflects the variability among the routes for each factor, and transforms route data into relative scores. When a Min-Max analysis is performed, each evaluation criterion is compared against the minimum and maximum values for that criterion across all routes. This results in a score between 1 and 10 for each analysis criterion. The higher the score, the more indicative that the route values for that factor were greater and closer to the maximum value for that criterion. Each factor's scores are then summed to achieve a total Min-Max score for each route. A lower score indicates fewer impacts associated with that route (e.g., shorter), while a higher score indicates greater overall impacts (e.g., longer). The equation to calculate the Min-Max for a given factor and route is:

$$1 + 9\,x\,[\frac{factor\ value\ for\ a\ route - minimum\ value\ for\ a\ factor}{maximum\ value\ for\ a\ factor - minimum\ value\ for\ a\ factor}]$$

These "raw" Min-Max scores for each factor were next multiplied by the weights, developed using the public input from the questionnaires, and then summed across all factors for each route. This provides a total weighted Min-Max score for each route alternative. Table 3-4 shows the route data for the 30 Project routes evaluated, and the resultant weighted scores were sorted as shown in Table 3-5. The intermediate raw scores, as well as route data including house counts by distance are presented in Appendix F (Tables F-1 and F-2) for reference.

The Min-Max analysis allowed the routes to be screened and the lesser-impacting routes identified for further evaluation. The route selection process included this systematic analysis of the alternatives,

combined with an understanding of the circumstances in the study area and the non-quantifiable public input received. The weighted route scores ranged 335.4 points, from a low of 140.4 (Route 28) to a high of 475.8 (Route 27). Table 3-5 presents the weighted Min-Max scores for the routes, sorted from lowest to highest score. A lower score indicates fewer overall impacts, while a higher score typically indicates greater impacts.

The scores are not necessarily considered a definitive comparison of routes; rather, they are intended to provide an index of the relative overall impact associated with the alternatives. Because the Project only had 30 route alternatives, all routes were investigated individually, with particular focus on the top five routes (ranging in score from 140.4 to 261.7). The point of this methodology is to narrow the analysis to a few routes that could then be evaluated further using the route data to make a final recommendation for a preferred route. The following section provides a description of the general scoring features for the Project and the rationale for selecting the preferred route from these top ranking routes.

Table 3-4: Route Data

Route	Segments	Length of New Construction (feet)	Length of Rebuild (feet)	Acres of New ROW	Heavy Angles (no.)	Length Not Paralleling Existing Roads or Transmission Lines (feet)	Streams and Rivers Crossed (no.)	Wetland Acres in ROW	Woodland Acres in ROW	Cropland Acres in ROW	Rare Species/ Species of Concern Polygons Crossed (no.)	Residential Proximity Score	Public Facilities Within 300 Feet (no.)	Cultural Sites Within 1,320 Feet (no.)
1	1,4,6,8,13,15,17,18	23,060	52,990	107.2	9	46,390	18	3.0	51.1	144.8	12	5	0	8
2	1,4,6,8,13,15,17,19,20	35,710	40,840	142.3	9	46,890	19	4.1	38.7	161.4	12	4	0	12
3	1,4,6,8,13,16,20	51,850	26,540	188.1	8	43,470	18	5.8	42.3	158.2	12	7	0	15
4	1,4,7,10,11,14,17,18	61,000	23,210	226.9	10	48,660	16	4.0	68.1	121.5	12	5	0	8
5	1,4,7,10,11,14,17,19,20	73,650	11,060	262.0	10	49,160	17	5.2	55.7	138.0	12	4	0	12
6	1,4,7,10,12,14,17,18	57,510	23,210	214.9	10	48,530	15	4.0	49.8	144.1	12	9	0	8
7	1,4,7,10,12,14,17,19,20	70,170	11,060	250.0	10	49,030	16	5.1	37.3	160.6	12	8	0	12
8	1,4,7,9,13,15,17,18	47,150	29,970	182.2	10	52,030	18	2.7	61.6	119.0	12	6	0	10
9	1,4,7,9,13,15,17,19,20	59,800	17,820	217.3	10	52,540	19	3.8	49.1	135.5	12	5	0	14
10	1,4,7,9,13,16,20	75,940	3,520	263.0	9	49,110	18	5.5	52.7	132.4	12	8	0	17
11	2,3,4,6,8,13,15,17,18	20,370	54,310	98.2	9	52,760	18	3.0	51.7	133.8	12	5	0	8
12	2,3,4,6,8,13,15,17,19,20	33,020	42,160	133.3	9	53,260	19	4.1	39.2	150.3	12	4	0	12
13	2,3,4,6,8,13,16,20	49,170	27,870	179.1	8	49,840	18	5.8	42.8	147.2	12	7	0	15
14	2,3,4,7,10,11,14,17,18	58,310	24,530	217.9	10	55,030	16	4.0	68.7	110.4	12	5	0	8
15	2,3,4,7,10,11,14,17,19,20	70,970	12,380	253.0	10	55,530	17	5.2	56.3	126.9	12	4	0	12
16	2,3,4,7,10,12,14,17,18	54,820	24,530	205.9	10	54,900	15	4.0	50.3	133.0	12	9	0	8
17	2,3,4,7,10,12,14,17,19,20	67,480	12,380	241.0	10	55,400	16	5.1	37.9	149.6	12	8	0	12
18	2,3,4,7,9,13,15,17,18	44,460	31,290	173.2	10	58,400	18	2.7	62.1	108.0	12	6	0	10
19	2,3,4,7,9,13,15,17,19,20	57,110	19,140	208.3	10	58,910	19	3.8	49.7	124.5	12	5	0	14
20	2,3,4,7,9,13,16,20	73,250	4,840	254.0	9	55,480	18	5.5	53.3	121.3	12	8	0	17
21	2,5,6,7,10,11,14,17,18	50,500	32,550	192.8	11	62,650	18	3.7	75.3	109.5	12	7	0	8
22	2,5,6,7,10,11,14,17,19,20	63,150	20,400	227.9	11	63,150	19	4.9	62.9	126.0	12	6	0	12
23	2,5,6,7,10,12,14,17,18	47,010	32,550	180.8	11	62,510	17	3.7	56.9	132.1	12	11	0	8
24	2,5,6,7,10,12,14,17,19,20	59,660	20,400	215.9	11	63,020	18	4.8	44.5	148.6	12	10	0	12
25	2,5,6,7,9,13,15,17,18	36,640	39,310	148.1	11	66,020	20	2.4	68.7	107.0	12	8	0	10
26	2,5,6,7,9,13,15,17,19,20	49,300	27,160	183.2	11	66,530	21	3.5	56.3	123.5	12	7	0	14
27	2,5,6,7,9,13,16,20	65,440	12,860	228.9	10	63,100	20	5.2	59.9	120.4	12	10	0	17
28	2,5,8,13,15,17,18	0	62,340	30.5	6	48,850	16	2.7	40.5	129.3	12	3	0	8
29	2,5,8,13,15,17,19,20	12,650	50,190	65.6	6	49,360	17	3.8	28.0	145.8	12	2	0	12
30	2,5,8,13,16,20	28,800	35,890	111.3	5	45,930	16	5.5	31.6	142.7	12	5	0	15

Table 3-5: Weighted and Sorted Min-Max Scores

		Weights	8	2	8	7	4	2	3	6	4	5	10	4	5	Total
Rank	Route	Segments	Length of New Construction	Length of Rebuild	Acres of New ROW	Heavy Angles	Length Not Paralleling Existing Roads or Transmission Lines	Streams and Rivers Crossed	Wetland Acres in ROW	Woodland Acres in ROW	Cropland Acres in ROW	Rare Species/ Species of Concern Polygons Crossed	Residential Proximity Score	Public Facilities Within 300 Feet	Cultural Sites Within 1,320 Feet	
1	28	2,5,8,13,15,17,18	8.0	20.0	8.0	17.5	12.4	5.0	5.5	20.2	18.8	0.0	20.0	0.0	5.0	140.4
2	29	2,5,8,13,15,17,19,20	20.0	16.3	18.9	17.5	13.2	8.0	14.4	6.0	29.7	0.0	10.0	0.0	25.0	178.9
3	30	2,5,8,13,16,20	35.3	11.9	33.0	7.0	7.8	5.0	27.6	10.1	27.6	0.0	40.0	0.0	40.0	245.4
4	11	2,3,4,6,8,13,15,17,18	27.3	17.5	29.0	49.0	18.5	11.0	8.0	33.0	21.7	0.0	40.0	0.0	5.0	260.0
5	1	1,4,6,8,13,15,17,18	29.9	17.1	31.8	49.0	8.6	11.0	8.0	32.4	29.1	0.0	40.0	0.0	5.0	261.7
6	12	2,3,4,6,8,13,15,17,19,20	39.3	13.8	39.8	49.0	19.3	14.0	16.8	18.8	32.7	0.0	30.0	0.0	25.0	298.6
7	2	1,4,6,8,13,15,17,19,20	41.9	13.4	42.6	49.0	9.3	14.0	16.8	18.2	40.0	0.0	30.0	0.0	25.0	300.2
8	18	2,3,4,7,9,13,15,17,18	50.2	10.5	52.2	59.5	27.3	11.0	5.4	45.0	4.6	0.0	50.0	0.0	15.0	330.7
9	8	1,4,7,9,13,15,17,18	52.7	10.1	55.0	59.5	17.4	11.0	5.4	44.3	12.0	0.0	50.0	0.0	15.0	332.4
10	14	2,3,4,7,10,11,14,17,18	63.3	8.4	66.0	59.5	22.0	5.0	16.2	52.5	6.3	0.0	40.0	0.0	5.0	344.3
11	4	1,4,7,10,11,14,17,18	65.8	8.0	68.8	59.5	12.1	5.0	16.2	51.8	13.6	0.0	40.0	0.0	5.0	345.9
12	13	2,3,4,6,8,13,16,20	54.6	9.5	54.0	38.5	13.9	11.0	30.0	22.9	30.6	0.0	60.0	0.0	40.0	365.0
13	3	1,4,6,8,13,16,20	57.2	9.1	56.8	38.5	4.0	11.0	30.0	22.3	37.9	0.0	60.0	0.0	40.0	366.7
14	16	2,3,4,7,10,12,14,17,18	60.0	8.4	62.3	59.5	21.8	2.0	16.0	31.5	21.3	0.0	80.0	0.0	5.0	367.8
15	19	2,3,4,7,9,13,15,17,19,20	62.2	6.8	63.1	59.5	28.1	14.0	14.3	30.8	15.6	0.0	40.0	0.0	35.0	369.2
16	6	1,4,7,10,12,14,17,18	62.5	8.0	65.1	59.5	11.9	2.0	16.0	30.8	28.6	0.0	80.0	0.0	5.0	369.4
17	25	2,5,6,7,9,13,15,17,18	42.7	13.0	44.4	70.0	39.2	17.0	3.0	52.5	4.0	0.0	70.0	0.0	15.0	370.8
18	9	1,4,7,9,13,15,17,19,20	64.7	6.4	65.8	59.5	18.2	14.0	14.3	30.1	22.9	0.0	40.0	0.0	35.0	370.9
19	15	2,3,4,7,10,11,14,17,19,20	75.3	4.7	76.9	59.5	22.8	8.0	25.1	38.3	17.2	0.0	30.0	0.0	25.0	382.8
20	21	2,5,6,7,10,11,14,17,18	55.9	10.9	58.3	70.0	33.9	11.0	13.8	60.0	5.6	0.0	60.0	0.0	5.0	384.4
21	5	1,4,7,10,11,14,17,19,20	77.8	4.3	79.7	59.5	12.9	8.0	25.1	37.6	24.5	0.0	30.0	0.0	25.0	384.5
22	17	2,3,4,7,10,12,14,17,19,20	72.0	4.7	73.2	59.5	22.6	5.0	24.8	17.3	32.2	0.0	70.0	0.0	25.0	406.3
23	23	2,5,6,7,10,12,14,17,18	52.6	10.9	54.5	70.0	33.7	8.0	13.5	39.0	20.6	0.0	100.0	0.0	5.0	407.9
24	7	1,4,7,10,12,14,17,19,20	74.5	4.3	76.0	59.5	12.7	5.0	24.8	16.6	39.5	0.0	70.0	0.0	25.0	408.0
25	26	2,5,6,7,9,13,15,17,19,20	54.7	9.2	55.3	70.0	40.0	20.0	11.9	38.3	14.9	0.0	60.0	0.0	35.0	409.3
26	22	2,5,6,7,10,11,14,17,19,20	67.9	7.2	69.1	70.0	34.7	14.0	22.6	45.8	16.6	0.0	50.0	0.0	25.0	422.9
27	20	2,3,4,7,9,13,16,20	77.5	2.4	77.2	49.0	22.8	11.0	27.5	34.9	13.5	0.0	70.0	0.0	50.0	435.7
28	10	1,4,7,9,13,16,20	80.0	2.0	80.0	49.0	12.8	11.0	27.5	34.2	20.8	0.0	70.0	0.0	50.0	437.3
29	24	2,5,6,7,10,12,14,17,19,20	64.6	7.2	65.4	70.0	34.5	11.0	22.4	24.8	31.5	0.0	90.0	0.0	25.0	446.4
30	27	2,5,6,7,9,13,16,20	70.0	4.9	69.4	59.5	34.7	17.0	25.0	42.4	12.9	0.0	90.0	0.0	50.0	475.8

3.5.4 Selection of the Preferred Route

All of the top five routes would substantially follow the existing 161 kV transmission line being replaced through the Project. The first route to deviate considerably from the existing corridor is ranked 10th with a Min-Max score 203.9 points higher than the top ranked route. The top ranking routes differed only in a few segment options along the existing line. Route 28 scored 140.4 and was the top ranking route of the 30 that were evaluated. It is comprised of Segments 2, 5, 8, 13, 15, 17, and 18. The second highest ranking route scored 178.9 and only differed from the top route by using Segments 19 and 20 instead of Segment 18 into the KCP&L Iatan interface/tap structure. Likewise, the top five ranked routes ranged in scores from 140.5 to 261.7 and only differed in the areas around Stranger Creek Substation and the KCP&L Iatan interface/tap structure. Routes that deviated considerably from the existing 161 kV alignment and used Segments 7, 9, 10, 11, and 12, tended to rank lower than the rebuild routes, suggesting greater impacts.

After a careful review of all the route data, the top ranking route (Route 28) was selected as the preferred option. This route follows the existing 161 kV transmission line corridor being replaced through the Project for its entire length. A detailed map showing the preferred route is shown below (Figure 3-2) and overlaid on an USGS topography map background in Appendix C (Figure C-2).

Because of the generally anticipated lower impacts of rebuilding a transmission line in the same corridor, and acquiring only the extra ROW required, Route 28 scored substantially better in the analysis than any other route. The difference between the first and second ranked routes was 38.6 points, and the difference between the first and third ranked route was 105 points (Table 3-5). Additionally, when examining the raw route data, Route 28 had:

- The lowest number of cultural sites within 0.25 mile of all routes considered
- The second lowest residential proximity score, with no homes within 200 feet and only 3 between 201 and 300 feet
- The third lowest acreage of wetlands within Project ROW
- The second lowest number of streams and rivers crossed
- The second lowest number of heavy angles
- The least amount of new ROW required.

Route 28 was below the mean impacts for 12 of the 13 factors evaluated. The only criterion where the preferred route was found to be above average impact was length of rebuild, which was preferred by the public.

Atchison County
Missouri River
Platte County
Missouri
Iatan Interface/Tap Structure
FORT LEAVENWORTH
NW Leavenworth
Kansas
Leavenworth County
Stranger Creek
Leavenworth
7
45
73
192
92
18
17
15
13
8
5
2

Path: Z:\Clients\TND\WestarEnr\91475_StrangerCreek\Studies\GeospatialDataFiles\ArcDocs\ReportFigures\Figure3-2_PreferredRoute.mxd ebrenna 8/10/2016

NORTH

0 2,500 5,000

Feet

Legend

- Existing Substation
- Interface/Tap Structure
- Study Area
- Preferred Route
- Segment Endpoint
- Existing 115 kV
- Existing 161 kV
- Existing 345 kV
- WRP Land
- DOD Land
- NWI Wetland
- Railroad
- Municipality
- County Boundary
- State Boundary

Kansas

Locator Map

Figure 3-2
Westar Energy
Stranger Creek to Iatan
345 kV Transmission Line Project

Preferred Route

Source: USDA NAIP; NHD; NWI; Energy Velocity; ESRI; FAA; Westar Energy; Burns & McDonnell

Issued: 8/10/2016

Though Route 28 only had the absolute lowest impact in 3 of the 13 analysis criteria (including length of new construction) when compared across all 30 routes, it was well below the mean impact for 12 of the 13. The consistently low impacts across evaluated criteria caused Route 28 to rank well above the other routes in terms of engineering, social, and environmental impacts. In addition to the quantitative data, over 79 percent of public questionnaires received about the Project during and after the June 9, 2016, open house noted a preference for constructing the Project along the existing 161 kV transmission line corridor. Public preference coupled with the results from the analysis data were the major factors that contributed to the selection of Route 28 as the preferred route for the Project.

A summary of public involvement and questionnaire responses can be found in Chapter 5.0.

4.0 AGENCY COMMENTS

Burns & McDonnell contacted agencies by letter to gather their input on potential constraints within the area and to determine what permits, clearances, and approvals would be required for the Project. Following is a description of the letters sent and a summary of the responses received by the agencies.

Burns & McDonnell sent letters and a Project study area map in early May 2016 to the following Federal, State, and local agencies and other interested parties:

- USFWS
- USACE
- NRCS
- FAA
- EPA
- SHPO at the KHS
- KDWPT
- KDA
- KDHE
- KDOT
- KBS
- TNC
- Leavenworth County Public Works Department
- Leavenworth County Planning and Zoning Department
- City of Leavenworth Public Works Department
- Leavenworth City Planner

Letters requested agency input and comments on resources or concerns (i.e., natural, archaeological, and/or threatened and endangered species, where appropriate) within the study area. The agencies were also asked to provide information on Federal, State, or local permits and clearances that may be required to construct the Project. In addition to government agencies, TNC was also asked for input and comments on the Project. No responses were received from the EPA, NRCS, KDOT, or any representative of Leavenworth County or the City of Leavenworth.

A summary of the responses received is provided below. A copy of all agency correspondence received is in Appendix D.

4.1 U.S. Fish and Wildlife Service

USFWS discussed the possible presence of four federally listed species in the study area: the pallid sturgeon, northern long-eared bat, Mead's milkweed, and western prairie fringed orchid. For the pallid sturgeon, USFWS anticipated no impact to the species as long as the Project did not impact the Missouri River channel configuration in any way. For avoiding impacts to the northern long-eared bat, USFWS requested that caution be taken during routing and construction to avoid habitat. This habitat includes forested areas with trees greater than 3 inches diameter at breast height. The USFWS states that, if northern long-eared bat habitat is encountered along the preferred route, a presence/absence survey will be required to formally determine that the Project will have no impact. The survey must be completed between May 15 and August 15, which is pupping season for the species. Mead's milkweed and western prairie fringed orchid are located in unplowed native tallgrass prairie, and USFWS requested the Project avoid those areas as well. Formal consultation with the USFWS may be required during permitting, depending on the final approved route and surveys of potential habitat located along the route.

The USFWS indicated a concern about an electrocution threat to migratory birds from electrical lines and recommended that care be taken to avoid impacts to migratory birds during nesting season, in accordance with the Migratory Bird Treaty Act. Nesting season is between April 1 and July 15 in the State of Kansas for most migratory birds, though some birds nest outside of that period. USFWS also requested that care be taken during construction to avoid the transfer of invasive species throughout the study area. Recommendations in the USFWS response were provided to assist in minimizing potential adverse impacts resulting from the Project. If Project plans change, USFWS must be notified for another review. Westar will reach out to USFWS if any changes are made to the Project or if any habitat is encountered during construction.

4.2 U.S. Army Corps of Engineers

The USACE has authority over waters of the U.S., including navigable waterways. The Missouri River is considered a navigable waterway, but is not being crossed by the Project. In its comment letter, the USACE discussed that, based on a review of the study area, it is unlikely that the Project would require a Section 10 permit. USACE stated that Department of the Army permit authorization may be required if wetland areas are trenched or damaged, or if fill and dredge material are discharged into any water of the U.S. or wetland. Additionally, a visibility analysis was not run for the Project based on the existing geographical features in the study area, including wooded rolling hills and large bluffs that made visibility difficult. A large network of existing transmission lines also exists in the study area (Figure 1-1), making it likely that landowners with visibility over the topography are already affected by transmission lines in

their view. Based on a combination of the rolling topography, densely wooded areas, and a large existing transmission network, it was determined that a visibility factor would not have resulted in a differentiator for the Project analysis. Westar will coordinate as necessary with USACE following selection of a preferred alignment.

4.3 Federal Aviation Administration

In its response, the FAA noted that the Project may require notice and airspace review under the Federal Aviation Regulation Part 77, Objects Affecting Navigable Airspace. FAA recommended use of its "Notice Criteria Tool," found online, to determine if the Project would require formal filing. The FAA mentioned that structure points along the route should be checked at approximately 1 mile intervals, as well as any temporary construction equipment that may exceed the FAA height criteria. Once filing status is determined, the FAA recommended a 120-day notification time period to accommodate its review. Westar will use the "Notice Criteria Tool" to identify any formal filings once a final route is selected.

4.4 State Historic Preservation Office

The Kansas SHPO recommended a professional archeologist conduct background research of the study area to identify potential survey areas. The archaeologist could then meet with SHPO staff to discuss findings and potential route conflicts. Of particular concern was the area along the Missouri River where a large number of archaeological sites, as well as some of the oldest standing structures in the state (some of which are listed on the NRHP), are located. It was recommended that historical structures be avoided as well as any undisturbed areas that could possess good archaeological potential. The Kansas SHPO commented that Section 106 of the National Historic Preservation Act could apply to the Project if any Federal funding, permitting, or other Federal connection were involved.

Burns & McDonnell archaeological staff investigated the cultural records in and around the Project study area. Based on that review, four NRHP sites were found to be within study area boundaries, but none were crossed by Project alternative alignments. Westar will coordinate with the SHPO as necessary following identification and engineering of the preferred route. Should any cultural issues arise during construction, Westar will consult with the Kansas SHPO to determine a solution.

4.5 Kansas Department of Wildlife, Parks and Tourism

KDWPT requested a figure showing the section, township, and ranges for the Project study area. That figure was created and sent on May 6, 2016. KDWPT used that information to review the study area for potential impacts to current State-listed threatened or endangered species, species of concern, species in need of conservation, and public recreation areas under KDWPT authority. The KDWPT review

identified the Missouri River as habitat for nine State-listed aquatic species, and other areas within the study area as habitat for two State-listed bird species. If any of these species were to be affected, special authorizations from KDWPT would be required. KDWPT also noted the presence of two snake species (redbelly snake [*Storeria occipitomaculata*] and smooth earth snake [*Virginia valeriae elegans*]) within Leavenworth County that are not State-listed but are in need of conservation due to habitat fragmentation. KDWPT recommended that the Project avoid oak dominated woodlands as well as native tallgrass prairie.

KDWPT stated that less valuable habitat within the study area includes cropland, grazed land, developed land, and existing ROWs, and that placement of the Project within one of these areas would be preferred. The response letter ended with a list of recommendations for the Project, including the avoidance of wetlands, native vegetation, timberland, and encroachment in floodplains. KDWPT also recommended the use of existing corridors, replanting of disturbed grasslands with native forbs and grasses, and installation of perch guards on poles with repeat avian mortality events. It was also noted that no KDWPT managed lands are present within study area boundaries.

Should any impacts to KDWPT protected species or habitat be identified along the preferred route during Project engineering, Westar will consult with the KDWPT to perform surveys and obtain the necessary permits.

4.6 Kansas Department of Agriculture

KDA sent an Agency Review Transmittal form granting clearance for the Project with no comment. It also mailed a response letter that noted that the Project would likely not require any KDA permitting as long as no construction activities occur in the floodplain or floodway of the Missouri River or any stream courses encountered. KDA mentioned that, if the Project did involve construction in a floodplain, permitting may be required. KDA noted that the Project will likely use an existing appropriation of water. If that is not the case, a permit would be required. Should any impacts to floodplains be identified as part of the Project, Westar will obtain any necessary permits from KDA.

4.7 Kansas Department of Health and Environment

KDHE had no objections to the Project and recommended that clearance be granted. The KDHE Bureau of Environmental Remediation did a review of the study area and found no contaminated dry cleaner sites within the study area. The KDHE Bureau of Environmental Regulation noted that there were five known Federal facilities near the study area. These included sewage treatment lagoons, artillery firing ranges, and landfills all associated with Fort Leavenworth just east of the study area. KDHE Bureau of Water stated that a National Pollutant Discharge Elimination System (NPDES) permit application for storm

water runoff resulting from construction activities would be required if the construction activity disturbed greater than or equal to 1 acre of land. KDHE indicated that this permit would need to be obtained by Westar prior to construction. Westar will seek to obtain a NPDES permit prior to starting construction.

4.8 Kansas Biological Survey

KBS reviewed the KNHI database for records of State- and federally listed threatened, endangered, and special concern species within the study area. This review found that two federally listed species are known to occur within Leavenworth County, Mead's milkweed and western prairie fringed orchid. KBS recommended that any native prairie crossed by the Project should be surveyed for these two plant species. KBS also indicated that most of Kansas has not been surveyed, and the absence of records should not be interpreted as an indication that other rare species do not occur in the study area.

Because the preferred route will maximize the use of existing ROW, no impact to native prairies are anticipated. Should any impacts to protected species or habitat be identified along the preferred route during Project engineering, however, Westar will consult with the KBS to avoid impacts.

4.9 The Nature Conservancy

During its review, TNC noted the presence of two federally listed plant species (Mead's milkweed and western prairie fringed orchid) within the vicinity of the Project, as well as several Species of Greatest Conservation Need and Species in Need of Conservation. Because of the assumed presence of these species, TNC recommended that the Project avoid crossing native prairie and grasslands. TNC also recommended the use of existing transmission line corridors, specifically the 161 kV line being replaced by this Project. The use of an existing corridor as opposed to an entirely new alignment would avoid further habitat fragmentation, according to TNC. Cropland and cool season grasslands were also recommended as possible routing options due to their reduced habitat value when compared to native tallgrass prairie or woodlands.

The preferred route would utilize an existing corridor and minimize habitat fragmentation. Westar will coordinate with KDWPT and USFWS as needed once a final route is selected.

5.0 SUMMARY OF PUBLIC COMMENTS

This section is a summary of the responses received from the public via the open house questionnaires and additional comments sent to Westar following the public open house.

On June 9, 2016, Westar held an open house meeting for the Project at Leavenworth Senior High School along 10th Avenue in Leavenworth, Kansas. Open house participants were provided with questionnaires and asked to respond to six questions relating to the Project and provide any additional comments. Some participants completed the questionnaire and returned it at the open house, while others completed the questionnaire at home and mailed it to Westar offices. Some respondents did not complete all questions, so the summary of various responses may not always equal the total number of questionnaires that were received.

A total of 67 questionnaires were received from the open house: 36 were collected at the June 9th meeting and another 31 were mailed in to Westar following the meeting and before the June 24, 2016 deadline. A summary of the responses by question is provided below.

5.1 Question 1

Question 1 asked respondents if they thought the need for the Project had been adequately explained. Respondents marked “yes” 39 times, “no” 4 times, and “uncertain” 13 times, a 58 percent positive response. Many of those that answered as uncertain indicated that they wanted more information about why multiple alternatives were presented at the meeting instead of a single option utilizing the same corridor as the existing 161 kV line, wanted more specific information about the Project and need, or did not attend the meeting. Six respondents did not provide a response to Question 1.

5.2 Question 2

Question 2 asked respondents to rate 16 different routing factors in terms of importance from 1 to 5, with 1 as the least important and 5 as the most important. The responses are shown in Table 5-1. For example, 55 people marked that maximizing distance from residences was most important, and 3 people indicated that it was the least important factor.

Table 5-1: Routing Factor Responses

Routing Factor	Responses					
	Least Important	Somewhat Important			Most Important	
	1	2	3	4	5	Total
a. Maximize distance from residences	3	0	3	3	55	64
b. Maximize distance from businesses	18	4	12	7	21	62
c. Maximize distance from public facilities (e.g., parks, schools, churches, cemeteries)	11	3	13	11	24	62
d. Maximize the distance the new transmission line follows the existing line route that it is replacing	10	3	2	3	45	63
e. Maximize length along existing transmission lines	13	1	7	10	28	59
f. Maximize length along roads	14	4	13	9	18	58
g. Improve reliable electric service	7	7	12	9	23	58
h. Minimize length through wetlands and number of stream / river crossings	12	7	13	5	25	62
i. Minimize length across tilled agricultural land	7	6	11	10	27	61
j. Minimize length across center pivot irrigation systems	14	10	10	5	21	60
k. Minimize loss of trees	8	4	11	6	35	64
l. Minimize visibility of the line	8	6	5	6	38	63
m. Minimize total length of line (reducing the total cost)	10	5	10	10	26	61
n. Minimize length through grassland or pasture	12	5	11	8	27	63
o. Minimize impacts to archaeological and historic sites	7	6	9	8	34	64
p. Minimize distance through sensitive habitat areas	10	6	7	9	31	63

The ratings for each factor were then weighted according to their rank and summed. The results are sorted from most important to least important in Table 5-2. When reviewing the questionnaire responses for Question 2, the Project team found that some respondents may have misunderstand the 1 to 5 scale. For example, certain respondents rated routing factor D at a 1 (least important), but added written comments in the questionnaire stating a preference for rebuilding along the existing 161 kV line corridor, which would suggest the factor should have been rated a higher number such as 4 or 5. The small number of these responses did not skew the results, however, because factor D still ranked as the second highest priority for respondents overall. The top three rated factors were: maximizing distance from residences,

maximizing the distance that the Project follows the existing 161 kV line that it is replacing, and minimizing visibility of the line. The least important factors were: maximizing length along roads, minimizing length across center pivot irrigation, and maximizing distance from businesses. This summation was used to help identify the weights used in the route analysis.

Table 5-2: Summation of Ranking

Routing Factor	Least Important	Somewhat Important			Most Important	Total
	1	2	3	4	5	
a. Maximize distance from residences	3	0	9	12	275	299
d. Maximize the distance the new transmission line follows the existing line route that it is replacing	10	6	6	12	225	259
l. Minimize visibility of the line	8	12	15	24	190	249
k. Minimize loss of trees	8	8	33	24	175	248
o. Minimize impacts to archaeological and historic sites	7	12	27	32	170	248
p. Minimize distance through sensitive habitat areas	10	12	21	36	155	234
i. Minimize length across tilled agricultural land	7	12	33	40	135	227
n. Minimize length through grassland or pasture	12	10	33	32	135	222
c. Maximize distance from public facilities (e.g., parks, schools, churches, cemeteries)	11	6	39	44	120	220
m. Minimize total length of line (reducing the total cost)	10	10	30	40	130	220
e. Maximize length along existing transmission lines	13	2	21	40	140	216
h. Minimize length through wetlands and number of stream / river crossings	12	14	39	20	125	210
g. Improve reliable electric service	7	14	36	36	115	208
b. Maximize distance from businesses	18	8	36	28	105	195
j. Minimize length across center pivot irrigation systems	14	20	30	20	105	189
f. Maximize length along roads	14	8	39	36	90	187

5.3 Question 3

Respondents were asked to comment further on any of the 16 route factors provided in Question 2, or identify other factors that they thought should be considered. The most common remarks left by respondents included suggestions to utilize the existing 161 kV line corridor being replaced with this

project, comments on the cost effectiveness and reduced landowner impact of rebuilding the existing line, and other remarks specific to the respondent's property or personal concerns, such as timber from trees harvested during construction and possible damage to fences. The majority of the respondents did not provide a response to Question 3.

5.4 Question 4

Attendees were asked to comment on specific route segments and list their concerns or suggestions for that particular segment. A summary of the responses is described below. Segments that were not mentioned by questionnaire respondents in Question 4 are Segments 1, 2, 3, 5, 8, and 15. Segments 6, 11, 12, and 16 received the highest volume of comments. Remarks were left for 14 of the 20 Project segments, though some commented on a particular segment near their property only to suggest that the Project follow the existing 161 kV line being replaced. Ten of the 61 total comments left about individual segments specifically requested that Westar follow the existing 161 kV corridor.

Several remarks were left on Question 4 from landowners with property along the existing 115 kV transmission line being paralleled by Project Segments 1, 4, 7, 10, and 11. Specific comments were left for paralleled Segments 4, 7, 10, and 11. Comments on these segments focused on the 250-foot wide easement corridor that would be required if the Project were constructed parallel to the existing 115 kV line's ROW, claiming that combining the existing 100-foot wide easement and a new 150-foot wide easement would result in excessive width. Landowners along these segments also commented that they already had a transmission line on their property and did not want another one. Property value and health concerns were mentioned, as well as comments about the added fragmentation of property crossed by these lines. Several landowners along these segments also suggested constructing the Project as an exact rebuild of the existing 161 kV line. Comments specific to Segment 11 mentioned that a property managed by the Leavenworth County Fish and Game Development Association would be affected if the Project were constructed along that alignment.

Segment 6 and Segment 9 are connector segments between the western routes and the rebuild routes. These two segments received comments mainly related to residential proximity and how the proposed alignments would divide properties. One group of landowners also mentioned their intentions to start a Community Supported Agriculture (CSA) operation on their property in the coming years, and commented on their concerns about losing land that had been set aside for CSA gardens to a Project easement. Landowners along these two segments also suggested building the new line along the existing 161 kV line corridor, and noted concerns about losing investments they had put into their land if either Segment 6 or Segment 9 were selected for the Project.

Segments 12 and 14 connect segments paralleling the existing 115 kV line along the western boundary of the study area to the segments along the existing 161 kV line. Landowners along these segments made several comments about the condition of Mount Olivet Road, a portion of which is paralleled by Segment 12. These comments focused on the fact that the road has major drainage problems and is currently closed for construction, and it is unknown when it will be opened again. Landowners commented that Project construction and access along Mount Olivet Road would be very difficult under the current conditions. These landowners also suggested constructing the Project along the existing 161 kV line corridor. Property value and health concerns were also mentioned by landowners along Segments 12 and 14.

Only 5 of the 61 total comments left by landowners in Question 4 concerned segments along the existing 161 kV transmission line being replaced through this Project. Those comments related to Segments 13, 17, and 18. No comments were left concerning Segments 2, 5, 8, or 15, which comprise the remainder of the preferred route. Several comments from property owners along Segments 13, 17, and 18 mentioned concerns about the extra easement required for a 345 kV line versus the 161 kV line easement that is currently there. Other comments mentioned concerns about property and crop damages during construction, as well as pole placement locations of the new transmission line. Two landowners suggested using a different route further east and removing the existing 161 kV infrastructure from its current location.

Segments 16, 19, and 20 are alternatives to the existing 161 kV line route as it enters the KCP&L Iatan interface/tap structure near the northeast corner of the study area. Comments from landowners concerning these segments focused on aesthetics, residential proximity, and property values. Several landowners along Segment 16 mentioned the existing 115 kV line that this segment parallels for approximately 1 mile, saying that they already had an easement on their property and did not want another. Landowners along the 161 kV line corridor left comments suggesting use of Segments 16, 19, and 20 rather than Segments 17 and 18. Seven comments indicated that constructing Segments 16, 19, and 20 would adversely affect the view from their property and damage the natural aesthetics.

5.5 Question 5

Respondents were asked to indicate which of the following applies to their situation: the potential line is near their home (48 respondents, 72 percent); the potential line is near their farm or business (40 respondents, 60 percent); they are not affected by the potential route (4 respondents, 6 percent); or they are affected in another way (5 respondents, 6 percent). No respondents left this question blank. Several respondents indicated that the Project was near both their home and their farm or business.

5.6 Question 6

Respondents were asked if they thought the open house format and information provided was helpful to their understanding of the Project. Of the 67 questionnaires that were received, 56 respondents indicated that the open house format was helpful (84 percent); 2 said it was not helpful (3 percent); and 9 left the question blank (13 percent). A total of 56 respondents indicated that the information provided was helpful (84 percent); 1 said it was not helpful (1 percent); and 10 left the question blank (15 percent). A total of 57 respondents thought that the Westar staff was helpful (85 percent); 1 said the Westar Staff was not helpful (1 percent); and 9 respondents left the question blank (14 percent). Many respondents that indicated that the open house format, information, and staff were not helpful indicated that they would have preferred more than one meeting and more detailed and finalized Project information.

5.7 Contact Information

The final portion of the questionnaire asked respondents to provide their contact information so that Westar staff could follow up with them should they request additional information. Some respondents chose to provide their contact information, and some did not.

5.8 Additional Comments

At the end of the questionnaire, attendees were provided extra space to express concerns or make additional comments. A total of 27 additional comments were received. Ten of these comments specifically requested utilizing the existing 161 kV transmission line corridor for the Project. Approximately 80 percent of the 67 questionnaires received stated a preference for constructing the Project along the existing 161 kV line corridor and acquiring only the extra easement required for a 345 kV line as opposed to entirely new ROW across the study area.

Additional comments left under this section of the questionnaire ranged from general to specific. General comments included well wishes for the Project, appreciation towards open house staff, and hope that Westar can find an economically smart and helpful solution in Leavenworth County. Other comments focused on concerns for specific locations, personal concerns associated with the Project and their property, and questions directed towards Westar staff. Examples of locational comments include concerns for the County managed property along Segment 11 and the aesthetic value of the view from homes along Segment 16. Landowners who mentioned their personal property concerns discussed issues such as not wanting to see their land fragmented by a transmission line, concerns about how the Project might affect a CSA business plan, concerns about an excessively wide easement in areas where the Project was proposed to parallel an existing 115 kV line, and concerns about health, tree loss, and property value. Specific questions addressed to Westar staff included comments on the maps presented at the public

meeting, requests for contact about pole placement before construction starts, and specific easement questions.

6.0 REFERENCES

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APPENDIX A - SOILS WITHIN THE STUDY AREA

Westar Energy - Stranger Creek to Iatan 345-kV Transmission Line Project
Types and Characteristics of Soils in the Study Area

Map Unit Symbol	Soil Map Unit	Hydrologic Soil Group	Farmland Classification
7050	Kennebec silt loam, occasionally flooded	C	All areas are prime farmland
7051	Kennebec silt loam, frequently flooded	B	Not prime farmland
7061	Muscotah silty clay loam, occasionally flooded	C	All areas are prime farmland
7087	Sarpy-Haynie complex, occasionally flooded	A	Farmland of statewide importance
7120	Eudora complex, rarely flooded, overwash	B	All areas are prime farmland
7211	Bremer silty clay loam, rarely flooded	C/D	Prime farmland if drained
7234	Elmont silt loam, 3 to 7 percent slopes, eroded	C	All areas are prime farmland
7236	Elmont silt loam, 7 to 12 percent slopes, eroded	C	All areas are prime farmland
7250	Gosport-Sogn complex, 7 to 35 percent slopes	D	Not prime farmland
7254	Grundy silty clay loam, 3 to 7 percent slopes, eroded	C/D	All areas are prime farmland
7285	Ladoga silt loam, 3 to 8 percent slopes	C	All areas are prime farmland
7290	Marshall silt loam, 2 to 5 percent slopes	C	All areas are prime farmland
7291	Marshall silt loam, 5 to 9 percent slopes	C	All areas are prime farmland
7292	Marshall silt loam, 9 to 15 percent slopes	C	Farmland of statewide importance
7301	Martin silty clay loam, 1 to 3 percent slopes	D	Farmland of statewide importance
7302	Martin silty clay loam, 3 to 7 percent slopes	D	Farmland of statewide importance
7303	Martin silty clay loam, 3 to 7 percent slopes, eroded	D	Farmland of statewide importance
7305	Martin silty clay loam, 7 to 12 percent slopes, eroded	D	Not prime farmland
7431	Morrill clay loam, 7 to 12 percent slopes, eroded	C	All areas are prime farmland
7460	Oska silty clay loam, 3 to 6 percent slopes	D	Farmland of statewide importance
7461	Oska silty clay loam, 3 to 8 percent slopes, eroded	D	Farmland of statewide importance
7501	Pawnee clay loam, 4 to 8 percent slopes, eroded	D	Farmland of statewide importance
7506	Pawnee clay loam, 1 to 4 percent slopes, eroded	D	Farmland of statewide importance
7508	Pawnee clay loam, 8 to 12 percent slopes, eroded	D	Farmland of statewide importance
7540	Sharpsburg silty clay loam, 1 to 4 percent slopes	C	All areas are prime farmland
7542	Sharpsburg silty clay loam, 4 to 8 percent slopes, eroded	C	All areas are prime farmland
7550	Rosendale-Bendena silty clay loams, 3 to 40 percent slopes	D	Not prime farmland
7555	Sarcoxie silty clay loam, 1 to 4 percent slopes	C	All areas are prime farmland
7575	Shelby clay loam, 4 to 8 percent slopes, eroded	C	Not prime farmland
7576	Shelby clay loam, 8 to 12 percent slopes, eroded	C	Not prime farmland
7589	Shelby loam, 3 to 7 percent slopes	C	All areas are prime farmland
7590	Shelby loam, 7 to 12 percent slopes	C	Farmland of statewide importance
7591	Shelby-Pawnee complex, 3 to 7 percent slopes	C	Farmland of statewide importance
7592	Shelby-Pawnee complex, 3 to 7 percent slopes, eroded	C	Farmland of statewide importance
7659	Vinland-Sibleyville complex, 5 to 12 percent slopes	D	Not prime farmland
7741	Haynie silt loam, occasionally flooded	B	All areas are prime farmland
7743	Haynie-Onawa complex, occasionally flooded	B	Prime farmland if drained
7760	Onawa and Waldron silty clay loams, occasionally flooded	D	Prime farmland if drained
7764	Onawa soils, occasionally flooded, overwash	D	Prime farmland if drained
7765	Onawet silty clay loam, depressional, frequently flooded	D	Not prime farmland
7790	Wathena-Haynie complex, occasionally flooded	A	Farmland of statewide importance
7850	Judson silt loam, 0 to 1 percent slopes	B	All areas are prime farmland
7906	Armster clay loam, 3 to 8 percent slopes, eroded	D	Farmland of statewide importance
7907	Armster clay loam, 8 to 12 percent slopes, eroded	D	Farmland of statewide importance
7950	Gosport complex, 10 to 30 percent slopes	D	Not prime farmland
7955	Knox silt loam, 7 to 12 percent slopes	B	Farmland of statewide importance
7956	Knox silt loam, 12 to 18 percent slopes	B	Farmland of statewide importance
7957	Knox complex, 18 to 30 percent slopes	B	Not prime farmland
7958	Knox silty clay loam, 7 to 12 percent slopes, eroded	B	Farmland of statewide importance
7959	Knox-Gosport complex, 10 to 30 percent slopes	B	Not prime farmland
7970	Palermo silty clay loam, 18 to 30 percent slopes	B	Not prime farmland
7971	Palermo-Knox complex, 10 to 18 percent slopes	B	Farmland of statewide importance

APPENDIX B – COUNTY THREATENED AND ENDANGERED SPECIES INFORMATION

Kansas
Department of Wildlife, Parks and Tourism

Print This Page | Back to Site

Leavenworth County

Threatened and Endangered (T&E) Species

Critical

MUCKET MUSSEL *Actinonaias ligamentina*
State: Endangered **Federal:** N/A **Critical Habitat:** Yes

STURGEON CHUB *Macrhybopsis gelida*
State: Threatened **Federal:** Candidate **Critical Habitat:** Yes

SHOAL CHUB *Macrhybopsis hyostoma*
State: Threatened **Federal:** N/A **Critical Habitat:** Yes

PALLID STURGEON *Scaphirhynchus albus*
State: Endangered **Federal:** Endangered **Critical Habitat:** Yes

SICKLEFIN CHUB *Macrhybopsis meeki*
State: Endangered **Federal:** Candidate **Critical Habitat:** Yes

WESTERN SILVERY MINNOW *Hybognathus argyritis*
State: Threatened **Federal:** N/A **Critical Habitat:** Yes

PLAINS MINNOW *Hybognathus placitus*
State: Threatened **Federal:** N/A **Critical Habitat:** Yes

FLATHEAD CHUB *Platygobio gracilis*
State: Threatened **Federal:** N/A **Critical Habitat:** Yes

SILVER CHUB *Macrhybopsis storeriana*
State: Endangered **Federal:** N/A **Critical Habitat:** Yes

LEAST TERN *Sterna antillarum*
State: Endangered **Federal:** Endangered **Critical Habitat:** Yes

Non-Critical

SNOWY PLOVER *Charadrius alexandrinus*
State: Threatened **Federal:** N/A **Critical Habitat:** No

EASTERN SPOTTED SKUNK *Spilogale putorius*
State: Threatened **Federal:** N/A **Critical Habitat:** No

AMERICAN BURYING BEETLE *Nicrophorus americanus*
State: Endangered **Federal:** Endangered **Critical Habitat:** No

PIPING PLOVER *Charadrius melodus*
State: Threatened **Federal:** Threatened **Critical Habitat:** Yes

Species In Need of Conservation (SINC)

Critical

SMOOTH EARTH SNAKE *Virginia valeriae*
State: SINC **Federal:** N/A **Critical Habitat:** Yes

REDBELLY SNAKE *Storeria occipitomaculata*
State: SINC **Federal:** N/A **Critical Habitat:** Yes

SILVERBAND SHINER *Notropis shumardi*
State: SINC **Federal:** N/A **Critical Habitat:** Yes

CHESTNUT LAMPREY *Ichthyomyzon castaneus*
State: SINC **Federal:** N/A **Critical Habitat:** Yes

Non-Critical

River Shiner *Notropis blennius*
State: SINC **Federal:** N/A **Critical Habitat:** No

Southern Bog Lemming *Synaptomys cooperi*
State: SINC **Federal:** N/A **Critical Habitat:** No

Black Tern *Chlidonias niger*
State: SINC **Federal:** N/A **Critical Habitat:** No

Short-eared Owl *Asio flammeus*
State: SINC **Federal:** N/A **Critical Habitat:** No

Golden Eagle *Aquila chrysaetos*
State: SINC **Federal:** N/A **Critical Habitat:** No

Highfin Carpsucker *Carpiodes velifer*
State: SINC **Federal:** N/A **Critical Habitat:** No

Timber Rattlesnake *Crotalus horridus*
State: SINC **Federal:** N/A **Critical Habitat:** No

Southern Flying Squirrel *Glaucomys volans*
State: SINC **Federal:** N/A **Critical Habitat:** No

Blue Sucker *Cycleptus elongatus*
State: SINC **Federal:** N/A **Critical Habitat:** No

Eastern Hognose Snake *Heterodon platirhinos*
State: SINC **Federal:** N/A **Critical Habitat:** No

Bobolink *Dolichonyx oryzivorus*
State: SINC **Federal:** N/A **Critical Habitat:** No

Henslow's Sparrow *Ammodramus henslowii*
State: SINC **Federal:** N/A **Critical Habitat:** No

Yellow-throated Warbler *Setophaga dominica*
State: SINC **Federal:** N/A **Critical Habitat:** No

Cerulean Warbler *Setophaga cerulean*
State: SINC **Federal:** N/A **Critical Habitat:** No

Brassy Minnow *Hybognathus hankinsoni*
State: SINC **Federal:** N/A **Critical Habitat:** No

Eastern Whip-poor-will *Antrostomas vociferus*
State: SINC **Federal:** N/A **Critical Habitat:** No

APPENDIX C – DETAILED ROUTE MAPS

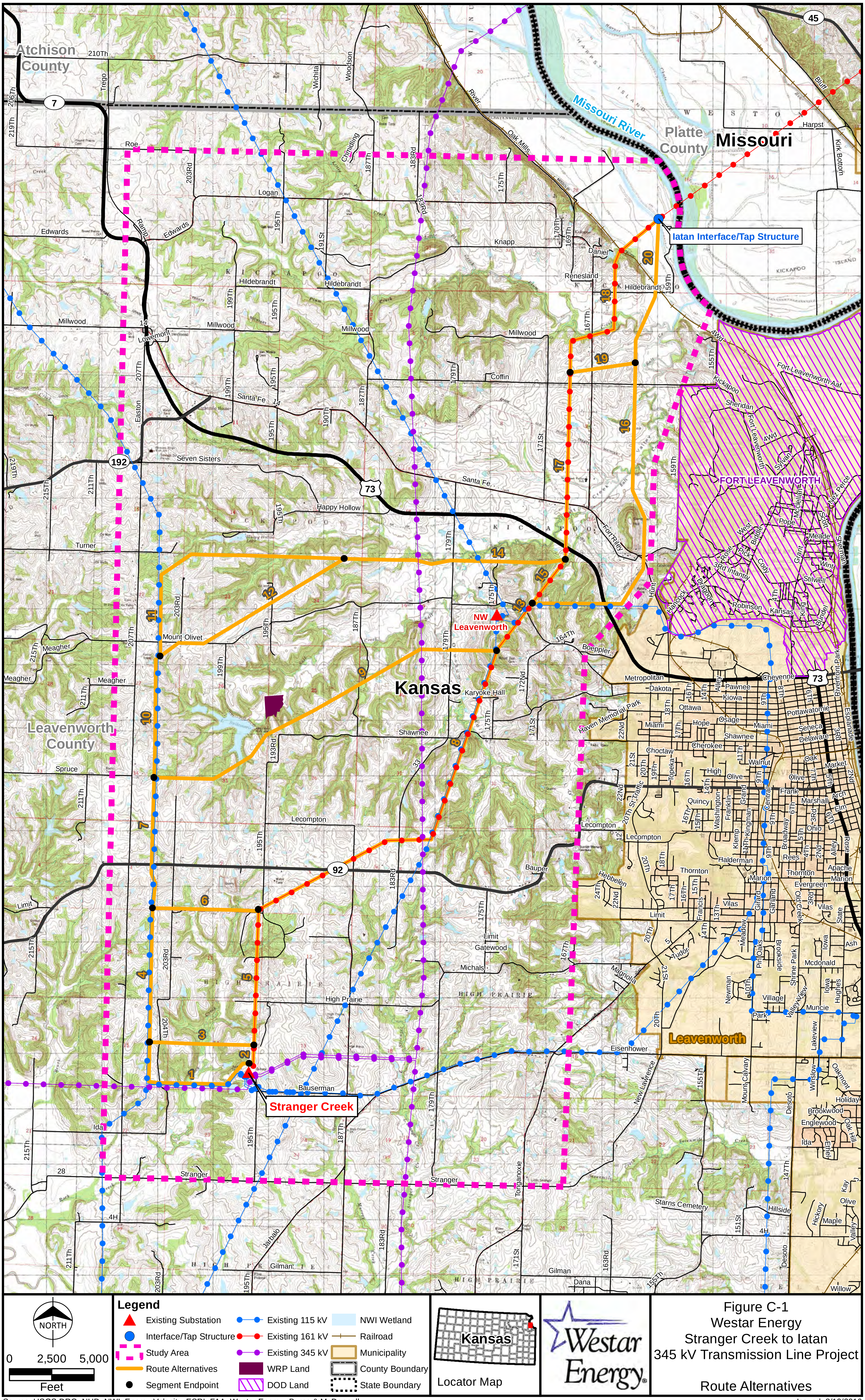

Figure C-1
Westar Energy
Stranger Creek to Iatan
345 kV Transmission Line Project

Route Alternatives

Source: USGS DRG; NHD; NWI; Energy Velocity; ESRI; FAA; Westar Energy; Burns & McDonnell

Issued: 8/10/2016

Path: Z:\Clients\TND\WestarEnr\91475_StrangerCreek\Studies\Geospatial\DataFiles\ArcDocs\ReportFigures\FigureC-1_RouteAlternatives.mxd ebrenna 8/10/2016

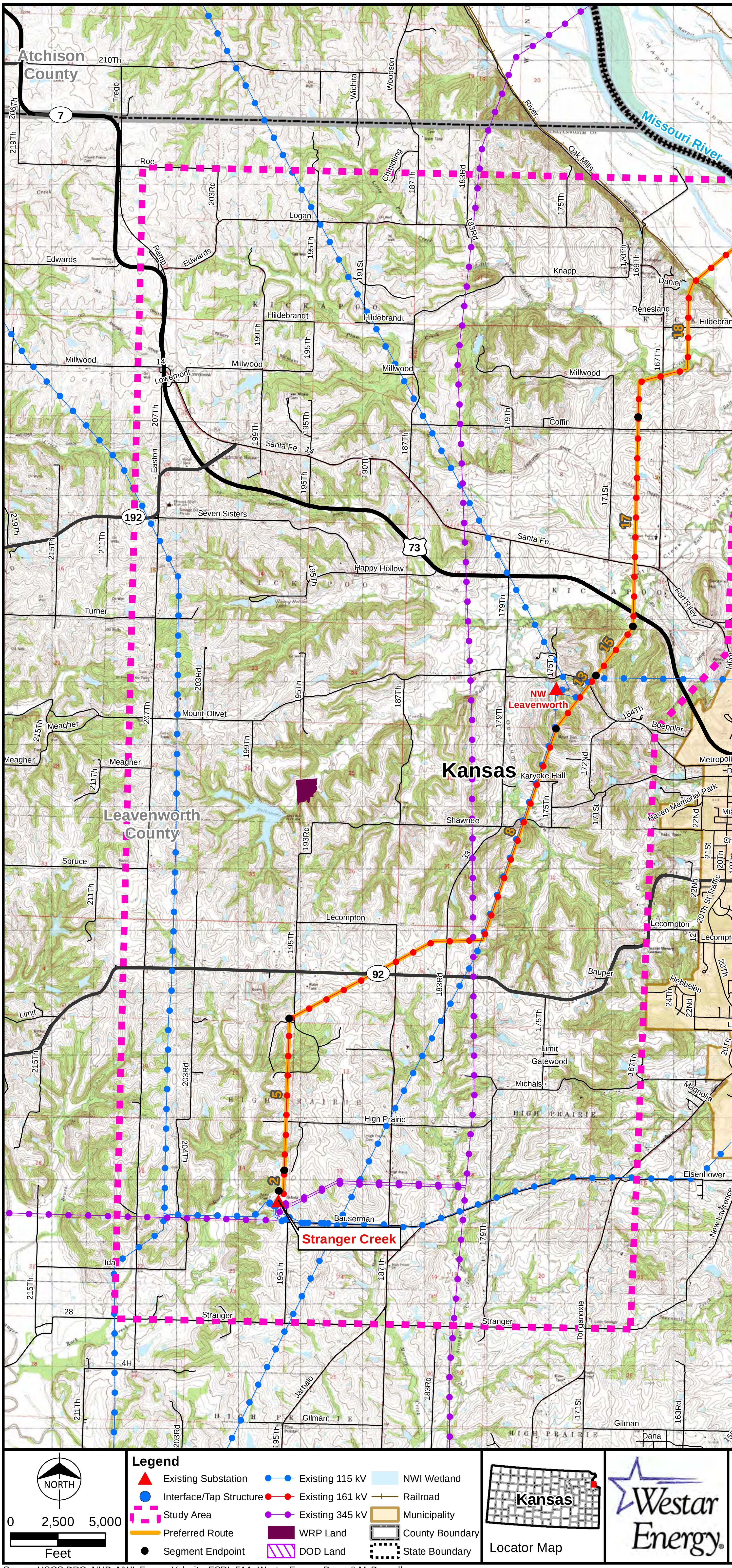

Figure C-2
Westar Energy
Stranger Creek to Iatan
345 kV Transmission Line Project

Preferred Route

Source: USGS DRG; NHD; NWI; Energy Velocity; ESRI; FAA; Westar Energy; Burns & McDonnell

Issued: 8/10/2016

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APPENDIX D – AGENCY CORRESPONDANCE

May 4, 2016

«Title» «First» «Last»
«Position»
«Agency»
«Address»
«City», «State» «Zip_Code»

Request for Information: Stranger Creek to Iatan Transmission Line Project
Leavenworth County, Kansas
Burns & McDonnell Project number: 91475

Dear «Title» «Last»,

Burns & McDonnell has been retained by Westar Energy to conduct a routing study to rebuild an existing 161-kV overhead transmission line that is located between the existing Stranger Creek Substation approximately 4 miles west of Leavenworth, Kansas and the existing Iatan Substation located approximately 3.5 miles northwest of Weston, Missouri. The new transmission line will be designed and constructed as 345-kV. Westar Energy will own the Kansas portion of the project, while Kansas City Power and Light (KCP&L) will own the Missouri portion. The objective of the study is to identify a route for the new 345 kV transmission line that will replace the existing 161 kV transmission line. Your input will assist us with the completion of this effort.

The proposed project area is located in Leavenworth County in Kansas. The new transmission line would be approximately 15 miles in length, and would require a total right-of-way width of 150 feet. Please refer to the enclosed map for the location and additional details of the project area.

Input from your agency regarding human, cultural, and natural resources in the study area, specifically state or federally-listed threatened or endangered species, planned development areas, airports, and state lands, will assist us in the route selection and environmental documentation necessary for the project. In addition, please identify any federal, state, or local permits/clearances that may be required to construct this project.

We appreciate your assistance. If you have any questions or require additional technical information, please contact Ellen Brenna at ebrenna@burnsmcd.com or by phone at (816) 447-9948. Otherwise, we would appreciate if you could provide written comments to Ellen Brenna, Burns & McDonnell, 9400 Ward Parkway, Kansas City, MO 64114. We would appreciate receipt of comments by June 3, 2016. Thank you for your time and assistance.

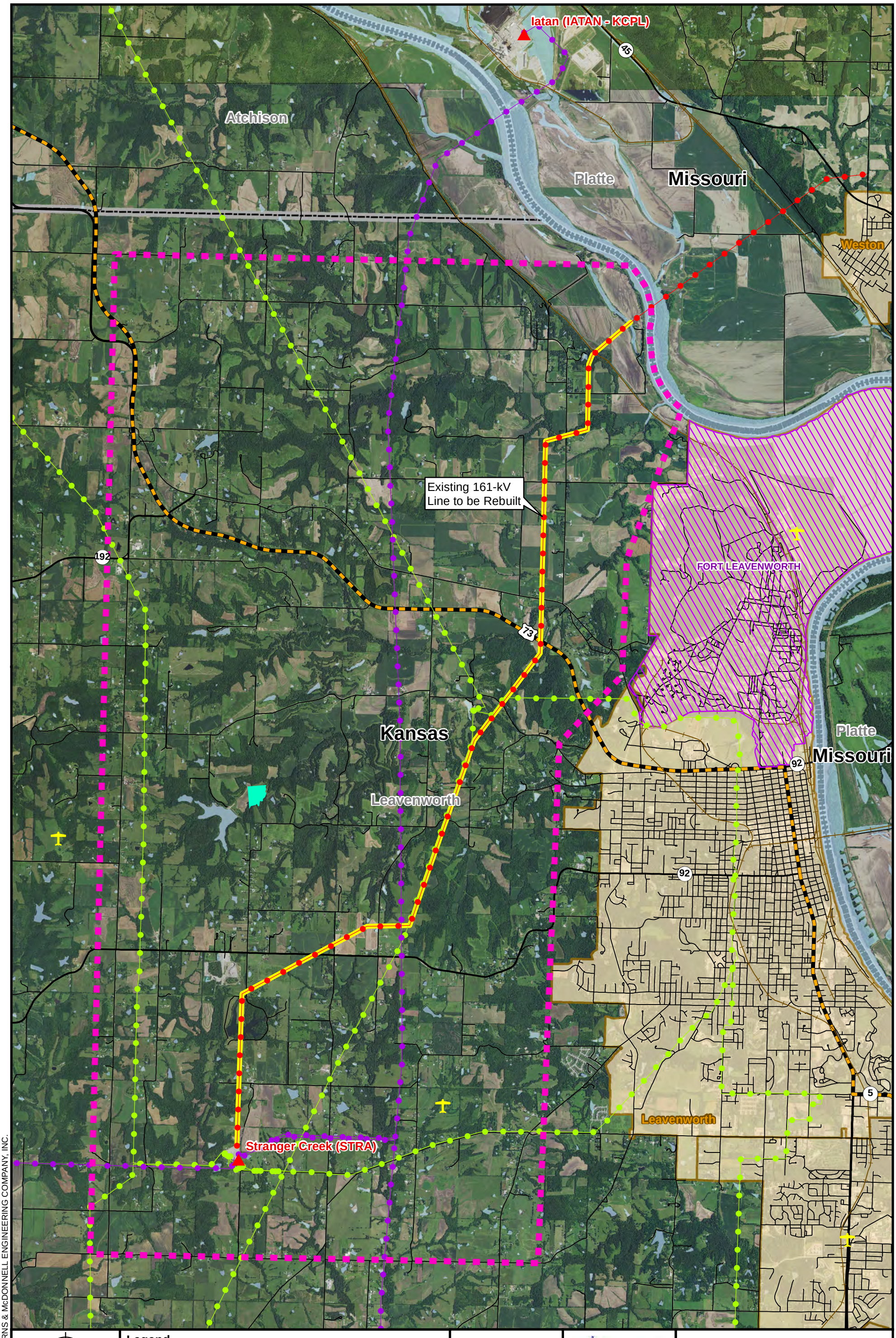
Sincerely,

Jamie L. Precht

Jamie L. Precht, Project Manager

Enclosure: Study Area Figure
CC: David Peck, Westar Energy
Eric Johnson, Westar Energy

9400 Ward Parkway \ Kansas City, MO 64114
816-333-9400 \ 816-333-3690 \ burnsmcd.com



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Source: USDA NAIP; NHD; NWI; Energy Velocity; ESRI; FAA; Westar Energy; Burns & McDonnell

Issued: 5/4/2016

Westar Energy - Stranger Creek to Iatan 345-kV Transmission Line Project
Agency Contact List

Agency	Office	Position	Title	First	Last	Address	City	State	Zip_Code	Phone
Federal										
Environmental Protection Agency	Region 7	Regional Administrator	Mr.	Mark	Hague	11201 Renner Boulevard	Lenexa	KS	66219	913.551.7006
U.S. Fish and Wildlife Service	Kansas Ecological Services Field Office	Field Supervisor	Mr.	Jason	Luginbill	2609 Anderson Avenue	Manhattan	KS	66502	785-539-3474
The Nature Conservancy	Kansas Chapter	Conservation Projects Coordinator	Mr.	Jim	Hays	943 SE 120th St	Leon	KS	67074	785-233-4400
U.S. Army Corps of Engineers	Kansas State Regulatory Office	Kansas State Program Manager	Mr.	Thomas	Schumann	2710 NE Shady Creek Access Road	El Dorado	KS	67042	316-322-8247
Natural Resource Conservation Service	NRCS Kansas State Office	State Conservationist	Mr.	Eric	Banks	760 South Broadway	Salina	KS	67401	785-823-4565
Natural Resource Conservation Service	NRCS Kansas Administrative Area 4	Assistant State Conservationist	Mr.	Troy	Munsch	3705 Miller Parkway, Suite B	Manhattan	KS	66503	785.776.7582
Federal Aviation Administration	FAA Central Region	Regional Administrator	Mr.	Joe	Miniace	901 Locust St	Kansas City	MO	64106	816-329-3050
State										
Kansas Department of Agriculture	Division of Water Resources	Chief Engineer and Director	Mr.	David	Barfield	1320 Research Park Dr.	Manhattan	KS	66502	785-564-6640
Kanas Department of Agriculture	Division of Conservation	Executive Director, Division of Conservation	Mr.	Rob	Reschke	1320 Research Park Dr.	Manhattan	KS	66502	785-564-6620
Kansas Historical Society	State Historic Preservation Office	State Historic Preservation Officer	Ms.	Jennie	Chinn	6425 Southwest 6th Ave	Topeka	KS	66615	785-272-8681 Ext. 205
Kansas Department of Health and Environment	Division of Environment	Director, Division of Environment	Mr.	John	Mitchell	1000 SW Jackson, Suite 400	Topeka	KS	66612	785-296-1535
Kansas Biological Survey	Kansas Natural Heritage Inventory	Information Manager, Natural Heritage Inventory	Ms.	Jennifer M.	Delisle	Higuchi Hall 2101 Constant Ave	Lawrence	KS	66047	785-864-1500
Kansas Biological Survey	Kansas Natural Heritage Inventory	Senior Scientist, Natural Heritage Inventory	Dr.	Kelly	Kindscher	Higuchi Hall 2101 Constant Ave	Lawrence	KS	66047	785-864-1529
Kansas Department of Wildlife, Parks, and Tourism	Ecological Services	Section Chief	Mr.	Chris	Berens	512 SE 25th Ave	Pratt	KS	67124	
Kansas Department of Wildlife, Parks, and Tourism	Region 2					300 SW Wanamaker Road	Topeka	KS	66606	785-273-6740
Kansas Department of Transportation	District One	District One Engineer	Mr.	Mike	Stringer	121 SW 21st St	Topeka	KS	66612	785-296-3881
County and City										
Leavenworth County	Public Works	Deputy Director, Engineering	Mr.	David	Lutgen	300 Walnut St, Suite 007	Leavenworth	KS	66048	913.684.0470
Leavenworth County	Planning and Zoning Department	Director	Mr.	Jeff	Sajiv	300 Walnut St, Suite 030	Leavenworth	KS	66048	913.684.0465
City of Leavenworth	Public Works	Director	Mr.	Michael	McDonald	100 N 5th St	Leavenworth	KS	66048	913.684.0375
City of Leavenworth	Planning and Zoning Department	City Planner	Ms.	Julie	Hurley	100 N 5th St	Leavenworth	KS	66048	913.680.2626

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Kansas Ecological Services Office
2609 Anderson Avenue
Manhattan, Kansas 66503-6172

May 17, 2016

Jamie L. Precht
Project Manager
Burns & McDonnell
9400 Ward Parkway
Kansas City, MO 64114

RE: Stranger Creek to Iatan Project; BMcD #91475 06E21000-2016-CPA-0638

Dear Mr. Precht;

This responds to your May 4, 2016 letter requesting Fish and Wildlife Service review and input to a proposal by Westar Energy to construct 15 miles of new 345-kV transmission line between the Stranger Creek Substation and the Iatan Substation, in Leavenworth County, Kansas. The following comments are provided for your consideration.

In accordance with section 7 of the Endangered Species Act, we have determined that the federally-listed pallid sturgeon, northern long-eared bat, Mead's milkweed and western prairie fringed orchid may occur in suitable habitat in Leavenworth County. The pallid sturgeon occurs in the Missouri River and could be affected by any impacts to the channel configuration. The Service recently published a special section 4(d) rule that specifies the types of activities that may be exempt from take prohibitions for the northern long-eared bat. Please refer to the website www.fws.gov/midwest/endangered/mammals/nleb/ for more specific information, including a link to the 4(d) rule itself. The Mead's milkweed and western prairie fringed orchid occur in unplowed native tallgrass prairie.

Because electrical distribution lines are known to pose the threat of electrocution to large birds of prey which use the poles, crossarms, and wires as perching sites, I recommend incorporation of the latest APLIC guidelines (http://www.aplic.org/) into the design and construction of the proposed facilities.

Please consider the applicability of this project to the Migratory Bird Treaty Act, which prohibits the taking of migratory birds, eggs, young, and/or active nests. Bird nests may be encountered in prairies, wetlands, stream and woodland habitats, as well as on bridges and other structures. While the provisions of MBTA are applicable year-round, most migratory bird nesting activity in Kansas occurs April 1 to July 15. Keep in mind that some migratory birds are known to nest outside these dates, so a field assessment may be necessary. If any project activity appears likely to impact nesting birds, I recommend a survey to determine the

presence of active nests. Our office should be contacted immediately for further guidance if a survey identifies the existence of one or more active bird nests that you believe cannot be avoided temporally or spatially by the planned activities.

Invasive species have been identified as a major factor in the decline of native flora and fauna and impact aquatic resources. Information on aquatic invasive species in Kansas can be found on KDWPT website http://kdwpt.state.ks.us/Fishing/Aquatic-Nuisance-Species/. I recommend the following proactive measures to prevent the inadvertent spread of exotic and invasive species:

All equipment brought on site will be thoroughly washed to remove dirt, seeds, and plant parts. Any equipment that has been in any body of water within the past 30 days will be thoroughly cleaned with hot water greater than 140° F (typically the temperature found at commercial car washes) and dried for a minimum of five days before being used at this project site. In addition, before transporting equipment from the project site all visible mud, plants and fish and animal parts will be removed, all water will be eliminated, and the equipment will be thoroughly cleaned. Anything that came in contact with water will be cleaned and dried following this procedure.

The recommendations provided in this letter are to assist you and your client in minimizing adverse impacts resulting from this project. Should project plans be modified outside the existing alignment, please provide this office with the changes for further review. Thank you for this opportunity to provide comments.

Sincerely,

Jason Luginbill
Field Supervisor

cc: KDWPT, Pratt, KS (Ecological Services)

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, KANSAS CITY DISTRICT
635 FEDERAL BUILDING
601 E. 12TH STREET
KANSAS CITY, MISSOURI 64106-2824

March 25, 2016

Regulatory Branch
(NWK-2016-665)

Ms. Jamie L. Precht
Burns and McDonnell
9400 Ward Parkway
Kansas City, Missouri 64114

Dear Ms. Precht:

This is in reply to your letter dated May 4, 2016 regarding information pertinent to the Stranger Creek to Iatan Transmission Line. Please reference your project # 91475. The proposed work involves a routing study and the rehabilitation of an overhead 161 kV power transmission line. The project is located between substations near Leavenworth, Kansas and Iatan, Missouri.

The Corps of Engineers has jurisdiction over all waters of the United States. Discharges of dredged or fill material in waters of the United States, including wetlands, require prior authorization from the Corps under Section 404 of the Clean Water Act (Title 33 United States Code Section1344) and Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403). The implementing regulations for these Acts are found at 33 C.F.R. 320-332.

Should the proposed improvements require work to modify the existing powerline over the Missouri River and/or the discharge of dredged or fill material in any other waters of the United States, including wetlands, a Department of the Army (DA) permit will be required. However, if the proposed improvements do not require the discharge of dredged or fill material in any waters of the United States, including wetlands, a DA permit will not be required.

Federal regulations require that a DA permit be issued by the Corps of Engineers prior to the initiation of any construction on the portion of a proposed activity which is within the Corps' regulatory jurisdiction.

We are interested in your thoughts and opinions concerning your experience with the Kansas City District, Corps of Engineers Regulatory Program. Please feel free to complete our Customer Service Survey form on our website at: http://corpsmapu.usace.army.mil/cm_apex/f?p=regulatory_survey. You may also call and request a paper copy of the survey which you may complete and return to us by mail or fax.

If you have any questions concerning this matter, please feel free to contact Mr. Brian Donahue at (816) 389-3703. Please reference Regulatory File No. NWK-2016-665 in all comments and/or inquiries relating to this project.

Brenna, Ellen

From: scott.tener@faa.gov
Sent: Friday, May 06, 2016 12:51 PM
To: Brenna, Ellen
Subject: Request for Information: Stranger Creek to Iatan Transmission Line Project; B&McD Project 91475

Ellen,

We received your letter dated May 4, 2916 regarding the subject project.

Airspace Considerations
The project may require formal notice and review for airspace considerations under Federal Aviation Regulation (FAR) Part 77, Objects Affecting Navigable Airspace. To determine if you need to file with FAA, go to http://oeaaa.faa.gov and click on the "Notice Criteria Tool" found at the left-hand side of the page.

Several items may need to be checked such as any towers, objects, and temporary construction equipment (e.g. cranes) that exceed the notice criteria. Multiple locations will need to be checked because of the length of the route. We recommend checking the route at 1 mile intervals and at increases in elevation.

Please let me know if you have any questions,

Scott Tener, P.E.
Environmental Specialist

FAA Central Region Airports Division
901 Locust St., Room 364
Kansas City, Missouri 64106-2325
T 816.329.2639 | F 816.329.2611
http://www.faa.gov/airports/central/

6425 SW 6th Avenue
Topeka, KS 66615

phone: 785-272-8681
fax: 785-272-8682
cultural_resources@kshs.org

Kansas Historical Society

Sam Brownback, Governor
Jennie Chinn, Executive Director

KSR&C No. 16-05-095

May 13, 2015

Jamie Precht
Project Manager
Burns & McDonnell
9400 Ward Parkway
Kansas City, MO 64114-3319

RE: Transmission Line Routing Study
Stranger Creek to Iatan
Leavenworth County

Dear Mr. Precht:

The Kansas State Historic Preservation Office has received your letter dated May 4, 2016. Our small staff lacks the resources to research such a large study area, so all we can offer at this point are a few general observations. We note that the proposed study area encompasses a large area to the west of Leavenworth and Fort Leavenworth, ultimately crossing the Missouri River. In general, the areas adjacent to the Missouri contain large numbers of recorded archeological sites, and that is certainly the case here. In addition, some of the earliest standing structures in the state are present, some listed in the National Register of Historic Places. We therefore recommend that a professional archeologist (such as those employed by your firm) conduct a file search at the Kansas State Historical Society of the study area. Upon completing the site file search, the archeologist should arrange a meeting with the Historic Preservation Office staff to discuss the results of the search and the areas determined to be of high and moderate potential for containing cultural resources. At that time, we can provide assistance regarding selection of a route for the proposed transmission line and with delineation of any potential survey areas.

Since this project will likely require only state and/or county level permits our agency has no legal authority to compel the project's developer to fund either background research or an archeological survey. However, given the potential impact to cultural resources so close to the Missouri River, we strongly encourage that course of action If any federal funds are to be used or if any federal permits (such as a Section 404 permit from the Corps of Engineers) might ultimately be required, then Section 106 of the National Historic Preservation Act will apply.

Any archeologist meeting the Minimum Professional Qualifications of this office as outlined in *The State Historic Preservation Officer's Guide For Archeological Survey, Assessment, and Reports* (SHPO's Guide), is eligible to perform the requested work. A list of archeological contractors (including your firm) meeting these standards is available from our web site at: http://www.kshs.org/p/archeological-consultants/14593.

This information is provided at your request to assist you in identifying historic properties, as specified in 36 CFR 800 for Section 106 consultation procedures. If you have questions or need additional information regarding these comments, please contact Tim Weston at 785-272-8681 (ext. 214) or Patrick Zollner at 785-272-8681 ext. 217. Please refer to the Kansas Review & Compliance number (KSR&C#) above on all future correspondence relating to this project.

Sincerely,

Jennie Chinn, Executive Director and
State Historic Preservation Officer

Timothy Weston for

Patrick Zollner
Deputy SHPO

Brenna, Ellen

From: Eddy, Zac <zac.eddy@ksoutdoors.com>
Sent: Tuesday, May 24, 2016 3:39 PM
To: Brenna, Ellen
Cc: Pamela.Tennison-Rindt@westarenergy.com; Eric Ryan Johnson
Subject: KDWPT Review - Stranger Creek to Iatan Transmission Line Siting Study - KDWPT Track #20160524

Follow Up Flag: Follow up
Flag Status: Flagged

Dear Ms. Brenna,

We have reviewed the information for the siting study associated with the proposed upgrade and replacement of the 161 kV transmission line from Iatan to Stranger Creek in Leavenworth County, Kansas (multiple sections in T07S-R21E, T08S-R21E, T08S-R22E, T09S-R21E, and T09S-R22E). The project will replace the existing transmission line between those locations with a larger 345 kV line. The siting study area was reviewed for potential impacts to critical wildlife habitats, current state-listed threatened or endangered species and species in need of conservation, as well as Kansas Department of Wildlife, Parks, and Tourism managed areas for which this agency has administrative authority.

A complete listing of all the state-identified imperiled wildlife species which have the potential to occur in Leavenworth County can be found at: http://ksoutdoors.com/Services/Threatened-and-Endangered-Wildlife/List-of-all-Kansas-Counties/Leavenworth. In short, Leavenworth County contains designated critical habitat for 11 threatened or endangered animals. Of those, 9 are aquatic species, and the other two are bird species. The main stem of the Missouri River provides the habitat our Department has labeled as "critical" for all 11 species. As such, degradation of water quality within the River or its tributaries has the potential to adversely impact those species.

Leavenworth County also provides very important habitat for Redbelly Snakes (*Storeria occipitomaculata*) and Smooth Earth Snakes (*Virginia valeriae elegans*). Though those species were recently downlisted to "species in need of conservation", their populations continue to be imperiled by habitat loss and fragmentation. For that reason, we ask Westar to avoid placing the line through mature stands of native oak-dominated forests or oak-hickory forests to the maximum extent practicable. Similarly, while designated critical habitat has not be assigned in Leavenworth County for the following species, there is the potential for Eastern Spotted Skunks (*Spilogale putorius*) and American Burying Beetles (*Nicrophorus americanus*) to inhabit the project area. Native habitats including woodlands and tallgrass prairie are highly valuable to those species, so those landcover types should also be avoided as much as possible.

Less valuable habitat types are annually cropped fields, non-native hayed/grazed grasslands, previously developed areas, and existing right-of-ways. Those areas would be our preferred areas for transmission line development. Native prairies, woodlands, wetlands, and streams have the most value for local wildlife. Impacts to those habitats should be minimized. We also suggest considering the following points when designing the new transmission line route to minimize risk for avian avoidance, collisions, and electrocution as well as other potential impacts to wildlife or habitat:

- **Avoid or minimize the removal of native upland or riparian hardwood timber and vegetation when moving or constructing new power lines**.
- **Strictly follow the road right-of-way.**

- **Avoid/Minimize impacts to existing wetlands, springs or areas that pond water (e.g. filling).**

- **Avoid instream and stream bank disturbances including stabilizing the banks with foreign materials (e.g. riprap).**

- **Avoid encroachment or development in floodplains.**

- **Restore dry stream crossings to the original substrate configuration and composition.**

- **Replant grassland disturbances with native grasses and forbs, we recommend NRCS practice 643 - Rare and Declining Habitat.**

- **Implement and maintain standard erosion control Best Management Practices during all aspects of construction by installing sediment barriers (wattles, filter logs, rock check ditches, mulching, or any combination of these) across the entire construction area to prevent sediment and spoil from entering aquatic systems. Barriers should be maintained at high functioning capacity until construction is completed and vegetation is established. For more information on erosion BMPs go to:http://www.kdheks.gov/stormwater/#construct.**

- **Consult the Avian Power Line Interaction Committee Marking Guidelines for mitigating avian collisions by marking the power line appropriately.**

- **Install perch guards on poles with repeat avian mortality.**

- **Track all avian mortality and mitigate accordingly.**

Without reviewing a finalized route proposal, we cannot assess the degree to which this project might impacted state-listed wildlife species. However, there are no KDWPT managed lands in the study area. Efforts to avoid of native habitats will minimize the likelihood that this project will need an Action Permit issued for our Department.

Thank you for the opportunity to provide these comments and recommendations. We request that as route proposals come together we might have another chance to offer input to help eliminate undue risk to wildlife. Please let me know if you have any questions or concerns about the preceding information.

Please direct all review materials electronically to ess@ksoutdoors.com *to streamline the review process for all parties.*

Thank you.

--

Zac Eddy
Ecologist - Ecological Services Section
Kansas Dept. of Wildlife, Parks, & Tourism
512 SE 25th Ave.
Pratt, KS 67124
620-672-0788 (office)
620-388-0043 (cell)
zac.eddy@ksoutdoors.com

"A true conservationist is a man who knows that the world is not given by his fathers, but borrowed from his children." - John Audubon

PRINT SAVE RESET

1320 Research Park Drive
Manhattan, Kansas 66502
(785) 564-6700

Kansas
Department of Agriculture
agriculture.ks.gov

900 SW Jackson, Room 456
Topeka, Kansas 66612
(785) 296-3556

Jackie McClaskey, Secretary

Governor Sam Brownback

AGENCY REVIEW TRANSMITTAL FORM

Date: 5-17-16

Project Title: Stranger Creek to Iatan Transmission Line Project

Contact: Jamie Precht, Project Manager

Return To: Burns & McDonnell

Phone: 816-333-9400 **Email:** jprecht@burnsmcd.com

AGENCY REVIEW COMMENTS

Comments: Any work in a designated floodplain may require a permit from the Division of Water Resources. Surplus excavated material shall be disposed out of the floodplain in a manner that will not obstruct the channel or act as a levee.

RECOMMENDED ACTION COMMENTS

- [X] Clearance of the project should be granted.
- [ ] Clearance of the project should not be granted.
- [ ] Clearance of the project should be delayed until the issues or questions have been clarified.
- [ ] Request a State Process Recommendation in concurrence with above comments.
- [ ] Clearance of the project should not be Delayed but the Applicant should (in the final application) address or clarify the questions or concerns.
- [ ] Request the opportunity to review the final application prior to submission to the federal funding agency.

Robert Reschke, Executive Director
Division of Conservation

1320 Research Park Drive
Manhattan, Kansas 66502
(785) 564-6700

Kansas
Department of Agriculture
agriculture.ks.gov

123 Landon Building
Topeka, Kansas 66612
(785) 123-4567

Jackie McClaskey, Secretary

Governor Sam Brownback

ELLEN BRENNA
BURNS & MCDONNELL
9400 WARD PARKWAY
KANSAS CITY MO 64114
Email: ebrenna@burnsmcd.com

May 17, 2016

RE: Stranger Creek to Iatan Transmission Line Project (#91475)

Ms. Brenna:

This correspondence will acknowledge receipt of the environmental review request for the Stranger Creek to Iatan transmission line project.

Review of this project reveals several FEMA mapped floodplains in the area. Utility poles are exempt from the requirement to obtain a permit from the Division of Water Resources if the offset from the stream bank meets or exceeds the following table and are not located in a FEMA mapped floodway.

Pole Diameter (FT)	**Bank Offset (FT)**
3 or less	Exempt
4	20
5	25
6	30
7	35
8	40
9	45
10	50
11	55
12	60
13	65
14	70
15	75
More than 15	Permit Required

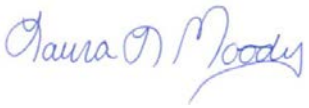
Additionally, stream crossings with a drainage area of more than 1 square mile will require a stream obstruction permit. For any questions regarding floodways and/or stream permits, please contact Janelle Phillips, P.E., (785) 564-6656.

Based on the documentation provided and assuming that this project will be using water from an existing appropriation of water, no further permitting for the use of water should be necessary from this agency. Please note, however, and as a

matter of information, K.S.A. 82a-728 states in part that a permit from the Division of Water Resources is required prior to use of water for any purpose, except for domestic use. Also, by law, the violation of any condition or limitation under an existing water right is not allowed. Therefore, if the proposed project will result in a change in type of use, or cause the use of water in excess of the quantity or rate now authorized, or if you have no prior authorization to use water at the site of the proposed project, you or your supplier of water must first obtain authorization from the Chief Engineer, Division of Water Resources. If you have additional questions regarding the need for a permit, please contact Brent Turney at (785) 564-6645.

Thank you for the opportunity to review this project.

Sincerely,



Laura L Moody
Supervisor Data Management
Environmental Reviews
Kansas Department of Agriculture
Division of Water Resources
(785) 564-6674
laura.moody@kda.ks.gov
http://agriculture.ks.gov/dwr

Division Environment
1000 SW Jackson, Ste 400
Topeka, KS 66610

Kansas

Phone: 785.296.1535
Fax: 785.296.8464
jmitchell@kdheks.gov
www.kdheks.gov

Susan Mosier, MD, Secretary | Department of Health & Environment | Sam Brownback, Governor

Comments by: KDHE | Transmittal Date: May 20, 2016

This form provides notification and the opportunity for your agency to review and comments on this proposed project as required by Executive Order 12372. Review Agency, please complete Parts II and III as appropriate and return to the contact person listed below. Your prompt response will be appreciated.

Return To: Ellen Brenna
Burns & McDonald
9400 Ward Parkway
Kansas City, MO 64114

PART I **REVIEW AGENCIES/COMMISSION**

___Aging	___Education	___State Forester
___Agriculture	___Geological Survey, KS	___Transportation
___Biological Survey	_X_Health & Environment	___Water Office, KS
___Conservation Commission	___Historical Society	___Wildlife & Parks
___Corporation Commission	___Social & Rehabilitation	___Commerce

PART II **AGENCY REVIEW COMMENTS**

COMMENTS: (Attach additional sheet if necessary) Stranger Creek to Iatan Transmission Line Project Leavenworth County, KS
Burns & McDonald Project number: 91475
Please see the enclosed comments submitted by Kevin Moon and Mandi Chace, Bureau of Environmental Remediation.
Don Carlson, Bureau of Water offer comments for this project.

PART III
RECOMMENDED ACTION COMMENTS:

_X_Clearance of the project should be granted.

___Clearance of the project should not be granted.

___Clearance of the project should be delayed until the issues or questions above have been clarified.

___Request a State Process Recommendation in concurrence with the above comments

___ Clearance of the project should not be delayed but the Applicant should (in the final application) address and clarify the question or concerns indicated above.

___Request the opportunity to review final application prior to submission to the federal funding agency.

DIVISIONS/ AGENCY/ COMMISSION

John W. Mitchell

John W. Mitchell, Director
Division of Environment

JWM/df

Bureau of Environmental Remediation
Curtis State Office Building
1000 SW Jackson St., Suite 410
Topeka, KS 66612-1367

phone: 785-296-8025
fax: 785-296-4823
kmoon@kdheks.gov
www.kdheks.gov

Susan Mosier, MD, Secretary

Department of Health and Environment

Sam Brownback, Governor

MEMORANDUM

TO: Donna Fisher

FROM: Kevin Moon

DATE: May 13, 2016

RE: Intergovernmental Agency Review requested by Burns and McDonnell for a Transmission Line Project in Leavenworth County, Kansas

---

The Kansas Department of Health and Environment Bureau of Environmental Remediation (KDHE/BER), Assessment and Restoration Section, Response and Remediation Unit, has no identified, contaminated Dry Cleaner or Superfund sites within the vicinity of the proposed project.

Staff members or representatives of Burns and McDonnell or Westar Energy are welcome to come and view the KDHE/BER files in accordance with the Kansas Open Records Act. Please contact me at 785-296-8025 or kmoon@kdheks.gov if you have any questions.

Bureau of Environmental Remediation
Curtis State Office Building
1000 SW Jackson St., Suite 410
Topeka, KS 66612-1367

Kansas

Phone: 785-291-3249
Fax: 785-296-7030
mchace@kdheks.gov
www.kdheks.gov

Susan Mosier, MD, Secretary | Department of Health & Environment | Sam Brownback, Governor

MEMORANDUM

TO: Donna Fisher

CC: File: Ft. Leavenworth FTL-19 Sewage Treatment Lagoon (C4-052-71504)
File: Ft. Leavenworth FTL-66 5th Artillery Rd. Firing (C4-052-71551)
File: Ft. Leavenworth FTL-58 Skeet Range, Active (C4-052-71543)
File: Ft. Leavenworth FTL-03 Inactive Demolition Landfill, Wint (C4-052-71482)
File: Ft. Leavenworth FTL-04 Inactive Sanitary Landfill, Hanco (C4-052-71483)

FROM: Mandi Chace

DATE: May 6, 2016

RE: Environmental Audit requested by Jamie Precht, Burns and McDonnell, for a Westar Energy transmission line project in rural Leavenworth County, Kansas.

The Kansas Department of Health and Environment/Bureau of Environmental Remediation (KDHE/BER), Remedial Section has located five (5) known Federal Facility sites near the area in question:

Ft. Leavenworth FTL-19 Sewage Treatment Lagoon (C4-052-71504)
Ft. Leavenworth FTL-66 5th Artillery Rd. Firing (C4-052-71551)
Ft. Leavenworth FTL-58 Skeet Range, Active (C4-052-71543)
Ft. Leavenworth FTL-03 Inactive Demolition Landfill, Wint (C4-052-71482)
Ft. Leavenworth FTL-04 Inactive Sanitary Landfill, Hanco (C4-052-71483)

The proposed project is within a one-mile radius of a known Formerly Used Defense Site(s). KDHE/BER lists all known sites within the one-mile radius of the proposed project as a precaution. The Burns and McDonnell staff members are welcome to view KDHE/BER files in accordance with the Kansas Open Records Act. If you should have any questions please contact Mandi Chace at (785) 291-3249, or at mchace@kdheks.gov.

Division of Environment
Curtis State Office Building
1000 SW Jackson St., Suite 400
Topeka, KS 66612-1367

Kansas

Phone: 785-296-1535
Fax: 785-296-8464
www.kdheks.gov

Susan Mosier, MD, Secretary | Department of Health & Environment | Sam Brownback, Governor

May 20, 2016

Ellen Brenna
Burns & McDonnell
9400 Ward Parkway
Kansas City, MO 64114

Re: Stranger Creek to Iatan Transmission Line Project in Leavenworth County, Kansas
BMcD Project Number 91475

Dear Ms. Brenna:

Please see the enclosed comments submitted by Don Carlson, Bureau of Water.

I have no objection to the proposal but offer the following comment for review and consideration:

Any construction activity which disturbs 1 acre or more is required to file a National Pollutant Discharge Elimination System (NPDES) permit application for stormwater runoff resulting from construction activities. The project owner (the party responsible for the project) must obtain authorization from KDHE to discharge stormwater runoff associated with construction activities prior to commencing construction. The Kansas construction stormwater general permit, a Notice of Intent (application form), a frequently asked questions file and supplemental materials are on-line on the KDHE Stormwater Program webpage at www.kdhe.state.ks.us/stormwater. Answers to questions regarding or additional information concerning construction stormwater permitting requirements can be obtained by calling (785) 296-5549.

Sincerely,

Donna Fisher
Director's Office

DC/df

The University of Kansas

Kansas Biological Survey

Ms. Ellen Brenna
Burns & McDonnell
9400 Ward Parkway
Kansas City, MO 64114-3319

May 24, 2016

RE: Request for information
Transmission Line Project (Stranger Creek to Iatan)
Project number: 91475

Dear Ms. Brenna;

I have reviewed the Kansas Natural Heritage Inventory database for records of state and federal threatened, endangered, and special concern species at the referenced site. I am providing you with an ESRI shapefile showing locations of rare animals, plants, and natural habitats in the project area. These data are for your internal use only and should not be distributed to any other person or agency. The data should not be displayed in maps or documents distributed outside your company.

Please consult the Kansas Natural Resource Planner for additional information to assist in your planning process. This mapping application is a partnership between the Kansas Biological Survey's KARS program and the Kansas Dept. of Wildlife, Parks and Tourism and can be found at this URL: http://kars.ku.edu/maps/naturalresourceplanner/.

Most of Kansas has not been surveyed for rare species and their habitats; absence of records should not be interpreted as an indication that rare species or natural habitats do not occur in any particular area. For a list of protected animal species known or likely to occur in Leavenworth County please go to http://kdwpt.state.ks.us/Services/Threatened-and-Endangered-Wildlife.

Two federally protected plant species, Mead's milkweed (*Asclepias meadii*) and Western prairie fringed orchid (*Platanthera praeclara*), occur in Leavenworth County. Any native prairie that will be impacted by this project should be surveyed for these species.

Thank you for providing the Kansas Biological Survey with the opportunity to comment on this proposed project. Please give me a call at 785-864-1538 if I can be of further assistance. Please note that it is unnecessary to send your requests for information to Kelly Kindscher in our office. Dr. Kindscher does not handle project reviews.

Sincerely,

Jennifer M. Delisle
Information Manager
Kansas Natural Heritage Inventory

The Nature Conservancy
Protecting nature. Preserving life.™

Jim Hays
943 SE 120th St.
Leon, KS 67074

jim_hays@ tnc.org
cell: [620]388-4613
nature.org/Kansas

June 2, 2016

Ms. Ellen Brenna
Burns & McDonnell
9400 Ward Parkway
Kansas City, Mo. 64114
Re: BMcD Project number: 91475

Dear Ms. Brenna,

Thank you for the opportunity to provide comments on a routing study to rebuild an existing 161 kV overhead transmission line between Stranger Creek Substation, west of Leavenworth, KS, and Iatan Substation, in Missouri. The new transmission line will be constructed as a 345 kV line and replace the 161 kV line.

Replacing the line on the existing alignment or paralleling other existing lines or roadways between the two substations would be preferred over development of a totally new alignment. This would minimize fragmentation of intact native vegetation and reduce biodiversity impacts to plant and wildlife species of concern. An alignment located primarily in cropland or cool season grassland would lessen biodiversity impacts, as well.

The Nature Conservancy does not usually suggest an alignment that has not been proposed in a project. However, we would recommend avoiding areas of native vegetation such as; native warm season grasslands, riparian woodlands, wooded hillsides, and wetlands. There are several species of wildlife, identified as Species of Greatest Conservation Need and Species in Need of Conservation, and two flowering plants classified as Federally Threatened; known to be present in the near vicinity of the planned transmission line project.

The Conservancy appreciates the opportunity to provide comments on this project. Please feel free to contact me with any questions you may have regarding them.

Sincerely,

Jim Hays
Conservation Projects Coordinator
The Nature Conservancy, Kansas Chapter

APPENDIX E – PUBLIC INVOLVEMENT MATERIALS

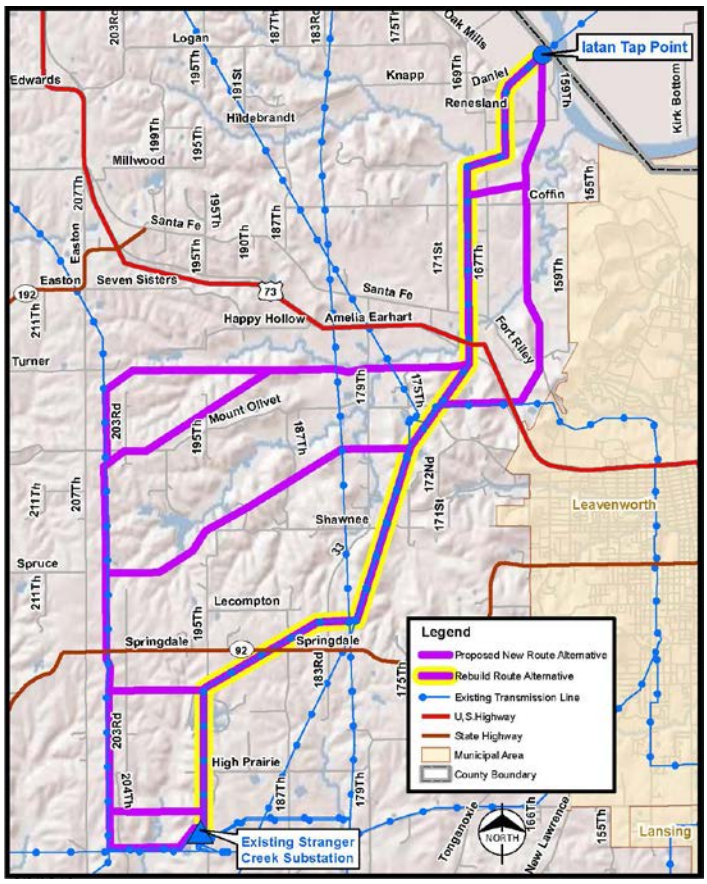
LEAVENWORTH TRANSMISSION PROJECT OPEN HOUSE

Westar Energy
Taking energy to heart.

Project Overview

In the past few years, the need for access to low cost energy has increased in northeast Kansas. Recent studies of the transmission system have identified the need to replace an existing power line connecting a substation west of Lansing to one northwest of Weston, Missouri, at Iatan Generation Station. The new replacement line between these two substations will allow better access to low cost energy sources and also keep energy in your area and northeast Kansas reliable.

The map at right shows the *potential* routes for the new power line in purple; the existing line that will be replaced is highlighted in yellow. This is a $28-million-dollar investment in the Leavenworth area.



Project Benefits

- Provide additional access to lower cost energy sources
- Improve power grid reliability overall
- Enable economic growth
- Strengthen the regional transmission grid

Project Timeline

Summer 2016 → **Winter 2018**

Open house to gather public feedback on potential routes	KCC determines final route	Surveying, soil boring/sampling, line engineering	Construction and right-of-way preparation work; install gates, culverts, remove vegetation	Construction scheduled to be complete no later than Dec 2018	Right of way restoration work complete

June 2016

LEAVENWORTH TRANSMISSION PROJECT OPEN HOUSE

Westar Energy
Taking energy to heart.

About the Line

The route must be determined before engineers can determine the correct structure types to use, but the structures will likely be:

- Steel poles
- Between 120 and 160 feet tall
- Spacing between each pole will be around 800 feet

Route Selection

Potential routes were developed by defining routes that would minimize adverse impacts to residents, their land and the natural environment while providing a technically viable and cost-effective route. Input received from residents in the area will help us determine which of these routes should be selected as the preferred route. The siting study report that includes the preferred route and all the feedback from stakeholders will be submitted to the KCC. The KCC uses a 120-day process to determine the final route for this project which Westar must follow. Their process includes opportunities for public input.

Keeping You Informed

Thank you for your interest in the project. Martha Long is available to help you as your dedicated Westar representative for this project. You may reach her at 785-575-1989 or Martha.Long@westarenergy.com.

More project information and updates are available at www.westarenergy.com/LeavenworthTransmission.

June 2016

Westar Energy®
Taking energy to heart.

Which route is the best?

A QUICK OVERVIEW ON HOW LANDOWNERS AND WESTAR WORK TOGETHER TO DETERMINE THE BEST ROUTE FOR A PROJECT.

Routing a transmission line is a lengthy process, and for those along the selected route, the beginning of a relationship that will last for decades. We realize this can be a challenging process, and we want to be a good neighbor. To that end, we seek feedback from local property owners early in the process to determine the final route for the transmission line.

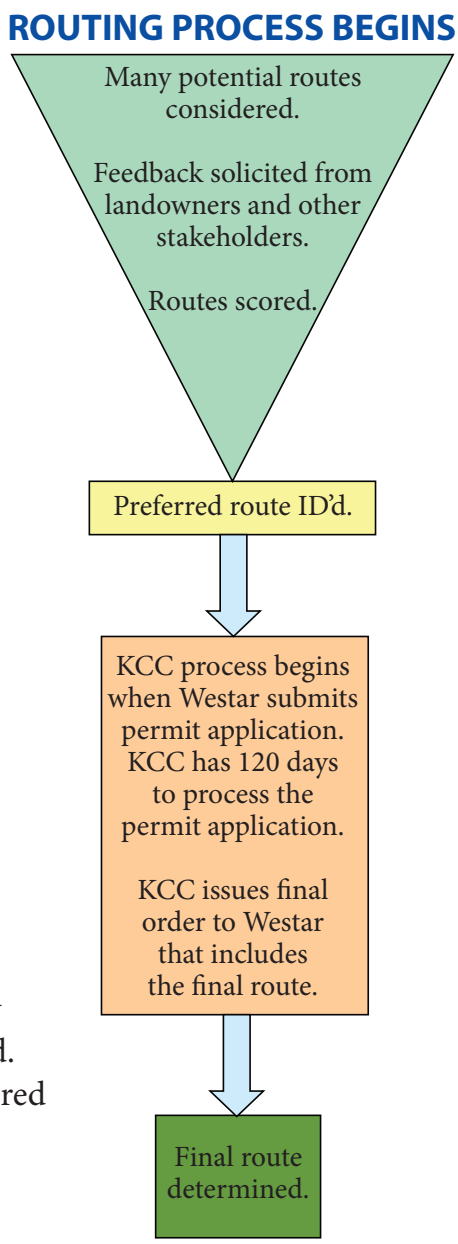
HERE IS A SUMMARY OF THAT PROCESS:

Using aerial photos, public records and visits to the area, we identify potential routes the transmission line could follow.

Westar identifies property owners along the potential routes and invites them to open houses about the project. These open houses give property owners a chance to learn about the project and Westar an opportunity to learn more about how the routes may impact property owners. We ask property owners for feedback in person and through questionnaires. Often property owner feedback will result in some adjustment to the routes. This information is used to apply scores to each of the potential routes. The route with the highest score is called the preferred route.

At this stage the regulatory process begins. Westar submits a filing with the Kansas Corporation Commission identifying the preferred route in the siting study. During the KCC process, landowners along the route will be notified and given information about how they can participate in the KCC's decision making process. Public comments may be submitted in writing and at least one public hearing will be conducted. The KCC staff and engineers also evaluate the siting study and the preferred route. They will make a recommendation to the KCC Commissioners who will approve, request modifications or deny Westar's application.

Once a route is selected, we notify property owners and begin working with them to obtain easements for the transmission line.



May 25, 2016

Name
Address
City, State, Zip

Dear Property Owner,

In the past few years, the need for energy has increased in northeast Kansas. Recent studies of the transmission system have identified the need to replace a power line that connects a substation west of Lansing with one near Iatan Generation Station northwest of Weston, Missouri. The rebuilt line between these two substations will help keep electricity in your area and northeast Kansas reliable and affordable.

We understand replacing the line along its current route may seem like the obvious location, but we don't want to presume we understand how you or your neighbors view that choice. Many things, such as land use, have changed since the original line was built. For these reasons, we have decided to take a look at alternate routes, too, and solicit feedback from you and your neighbors.

Because you live along the existing route or one of the potential new routes, we would like to visit with you about this project. The enclosed map shows the *potential* routes for the new power line in purple and the existing line that needs to be replaced in yellow overlaying blue. We want you to help us determine which route is best. Please join us for an open house to discuss the *potential* routes for the new power line.

- **Who is invited?** Landowners and residents along the potential routes and the existing route are receiving this letter of invitation. Anyone may attend.

- **When and where is the open house?** 5 to 8 p.m., June 9th, at the Leavenworth High School, 2012 10th Ave, Leavenworth. Come and go during that time at your convenience.

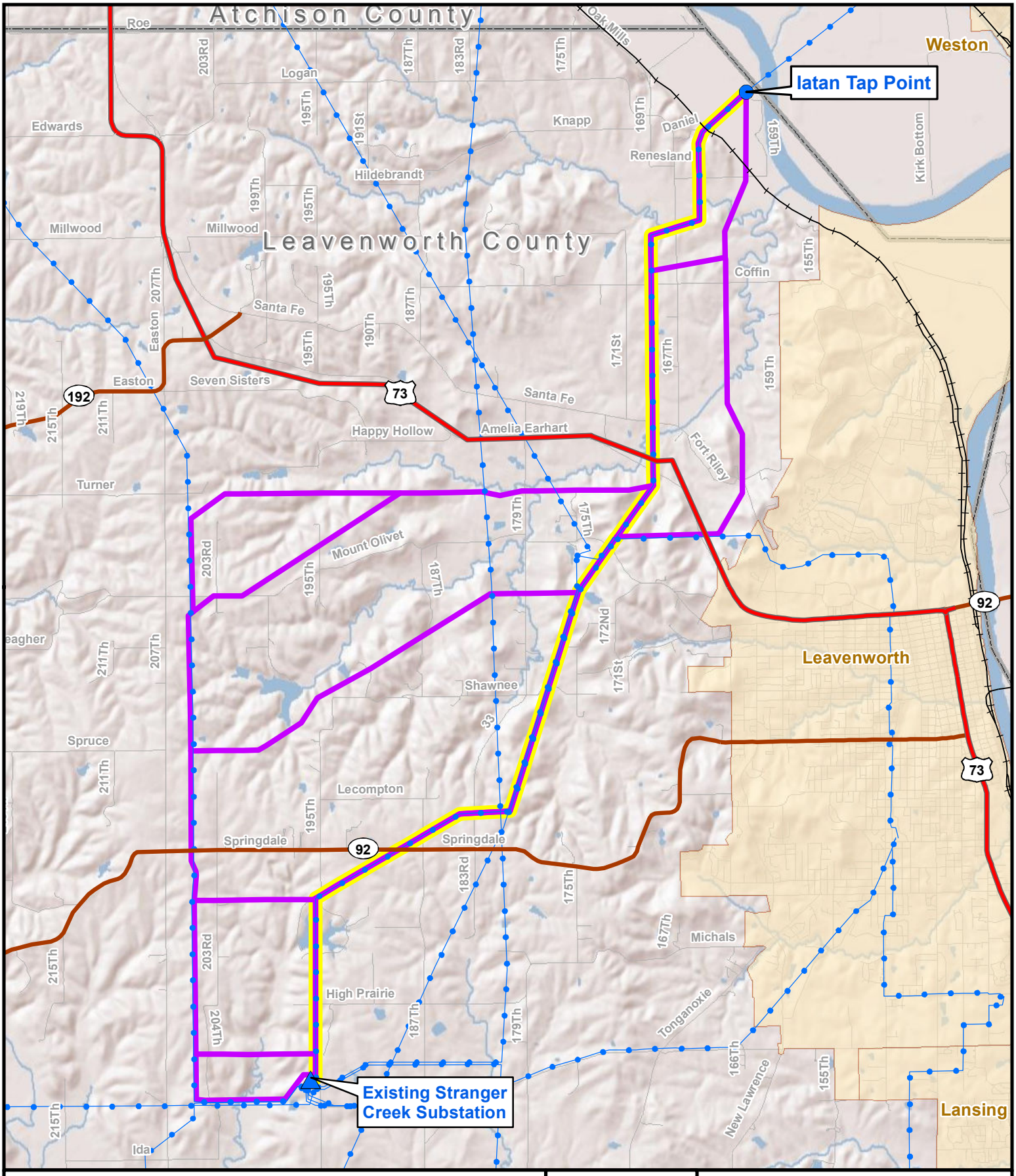
Your attendance is important to us. Here are a few reasons why:

- Help us determine the preferred route from those shown on the map
- Complete a survey about how routes are evaluated
- Learn about the logistics and benefits of the project
- Learn about the process to determine the final route
- Learn how the project could affect your land
- Share your concerns and questions

We look forward to meeting with you at the open house. If you have any questions prior to our open house, please contact Martha Long at 785-575-1989 or Martha.Long@westarenergy.com.

Sincerely,

Kelly Harrison, Vice President - Transmission



Source: ESRI, Westar Energy, Burns & McDonnell Engineering Commpany, Inc.

Issued: 5/11/2016

Westar Energy Stranger Creek to Iatan Transmission Project
QUESTIONNAIRE

This questionnaire is designed to help identify issues related to the proposed routes. Your answers will assist the study team in understanding public interests and concerns, and will allow the team to incorporate this information in the route selection process. Please complete this questionnaire **after** you have reviewed the information presented at the open house today. Thank you for your input.

PROJECT NEED

1. Do you believe the need to replace the existing transmission line has been explained adequately?
   _____Yes _____No _____Uncertain

   If "No" or "uncertain," what additional information would be helpful to you?

   _____

   _____

LINE ROUTING CONSIDERATIONS

2. The routing of a transmission line involves many considerations. Please circle the number corresponding to the level of importance of that factor to you.

		Not Important	……	Somewhat Important	……	Most Important
a)	Maximize distance from residences	1	2	3	4	5
b)	Maximize distance from businesses	1	2	3	4	5
c)	Maximize distance from public facilities (e.g., parks, schools, churches, cemeteries)	1	2	3	4	5
d)	Maximize the distance the new transmission line follows the existing line route that it is replacing	1	2	3	4	5
e)	Maximize length along other existing transmission lines in the area	1	2	3	4	5
f)	Maximize length along roads	1	2	3	4	5
g)	Improve reliable electric service	1	2	3	4	5
h)	Minimize length through wetlands and number of stream / river crossings	1	2	3	4	5
i)	Minimize length across tilled agricultural land	1	2	3	4	5
j)	Minimize length across center pivot irrigation systems	1	2	3	4	5
k)	Minimize loss of trees	1	2	3	4	5
l)	Minimize visibility of the line	1	2	3	4	5
m)	Minimize total length of line (reducing the total cost)	1	2	3	4	5
n)	Minimize length through grassland or pasture	1	2	3	4	5
o)	Minimize impacts to archaeological and historic sites	1	2	3	4	5
p)	Minimize distance through sensitive habitat areas	1	2	3	4	5

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3. If you would like to comment further on any of the above factors, or identify any other factors or issues that you feel should be considered, please use the space below or a separate page to describe your comments.

_____

_____

4. If you have a concern with, or a suggestion for, a particular transmission line route(s) shown on the display of potential routes, please indicate the route segment number and describe your concern or suggestion.

Segment No.	**Concern**
_____	_____
_____	_____
_____	_____

ADDITIONAL INFORMATION

5. Which of the following applies to you?

_____a. Potential line route is near my home.

_____b. Potential line route is near my farm or business.

_____c. Not affected by potential route.

_____d. Other, please specify _____

6. Do you believe the public open house format and the information provided was helpful for your understanding of the project?

Open house format:	_____helpful	_____ not helpful
Information provided:	_____helpful	_____ not helpful
Westar staff:	_____helpful	_____ not helpful

How can we improve this format to better inform you and hear your concerns?

_____

_____

7. If you would like to know the results of this routing study, please enter your name and address below. (Names and addresses are considered confidential.)

Name: _____Phone: _____

Address: _____

_____

ADDITIONAL COMMENTS OR QUESTIONS

_____

_____

_____

We encourage you to fill out and submit your questionnaire at the meeting. If you take the questionnaire with you, please mail completed questionnaires before June 24, 2016 to:

Martha Long
818 S Kansas Avenue
PO Box 889
Topeka, KS 66601

Open House: June 9, 2016

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APPENDIX F – ROUTE ANALYSIS DATA

Westar Energy - Stranger Creek to Iatan 345-kV Transmission Line Project

Table F-1: Raw Min/Max Scores

Route	Segments	Length of New Construction	Length of Rebuild	Acres of New ROW	Heavy Angles	Length Not Paralleling Existing Roads or Transmission Lines	Streams and Rivers Crossed	Wetland Acres in ROW	Woodland Acres in ROW	Cropland Acres in ROW	Rare Species/ Species of Concern Polygons Crossed	Residential Proximity Score	Public Facilities Within 300 Feet	Cultural Sites Within 1320 Feet	Total
1	1,4,6,8,13,15,17,18	3.7	8.6	4.0	7.0	2.1	5.5	2.7	5.4	7.3	0.0	4.0	0.0	1.0	51.2
2	1,4,6,8,13,15,17,19,20	5.2	6.7	5.3	7.0	2.3	7.0	5.6	3.0	10.0	0.0	3.0	0.0	5.0	60.2
3	1,4,6,8,13,16,20	7.1	4.5	7.1	5.5	1.0	5.5	10.0	3.7	9.5	0.0	6.0	0.0	8.0	68.0
4	1,4,7,10,11,14,17,18	8.2	4.0	8.6	8.5	3.0	2.5	5.4	8.6	3.4	0.0	4.0	0.0	1.0	57.3
5	1,4,7,10,11,14,17,19,20	9.7	2.2	10.0	8.5	3.2	4.0	8.4	6.3	6.1	0.0	3.0	0.0	5.0	66.3
6	1,4,7,10,12,14,17,18	7.8	4.0	8.1	8.5	3.0	1.0	5.3	5.1	7.1	0.0	8.0	0.0	1.0	59.0
7	1,4,7,10,12,14,17,19,20	9.3	2.2	9.5	8.5	3.2	2.5	8.3	2.8	9.9	0.0	7.0	0.0	5.0	68.1
8	1,4,7,9,13,15,17,18	6.6	5.0	6.9	8.5	4.3	5.5	1.8	7.4	3.0	0.0	5.0	0.0	3.0	57.0
9	1,4,7,9,13,15,17,19,20	8.1	3.2	8.2	8.5	4.5	7.0	4.8	5.0	5.7	0.0	4.0	0.0	7.0	66.1
10	1,4,7,9,13,16,20	10.0	1.0	10.0	7.0	3.2	5.5	9.2	5.7	5.2	0.0	7.0	0.0	10.0	73.8
11	2,3,4,6,8,13,15,17,18	3.4	8.8	3.6	7.0	4.6	5.5	2.7	5.5	5.4	0.0	4.0	0.0	1.0	51.5
12	2,3,4,6,8,13,15,17,19,20	4.9	6.9	5.0	7.0	4.8	7.0	5.6	3.1	8.2	0.0	3.0	0.0	5.0	60.5
13	2,3,4,6,8,13,16,20	6.8	4.7	6.8	5.5	3.5	5.5	10.0	3.8	7.6	0.0	6.0	0.0	8.0	68.3
14	2,3,4,7,10,11,14,17,18	7.9	4.2	8.3	8.5	5.5	2.5	5.4	8.7	1.6	0.0	4.0	0.0	1.0	57.6
15	2,3,4,7,10,11,14,17,19,20	9.4	2.4	9.6	8.5	5.7	4.0	8.4	6.4	4.3	0.0	3.0	0.0	5.0	66.6
16	2,3,4,7,10,12,14,17,18	7.5	4.2	7.8	8.5	5.5	1.0	5.3	5.2	5.3	0.0	8.0	0.0	1.0	59.3
17	2,3,4,7,10,12,14,17,19,20	9.0	2.4	9.1	8.5	5.7	2.5	8.3	2.9	8.0	0.0	7.0	0.0	5.0	68.4
18	2,3,4,7,9,13,15,17,18	6.3	5.2	6.5	8.5	6.8	5.5	1.8	7.5	1.2	0.0	5.0	0.0	3.0	57.3
19	2,3,4,7,9,13,15,17,19,20	7.8	3.4	7.9	8.5	7.0	7.0	4.8	5.1	3.9	0.0	4.0	0.0	7.0	66.4
20	2,3,4,7,9,13,16,20	9.7	1.2	9.7	7.0	5.7	5.5	9.2	5.8	3.4	0.0	7.0	0.0	10.0	74.1
21	2,5,6,7,10,11,14,17,18	7.0	5.4	7.3	10.0	8.5	5.5	4.6	10.0	1.4	0.0	6.0	0.0	1.0	66.7
22	2,5,6,7,10,11,14,17,19,20	8.5	3.6	8.6	10.0	8.7	7.0	7.5	7.6	4.1	0.0	5.0	0.0	5.0	75.7
23	2,5,6,7,10,12,14,17,18	6.6	5.4	6.8	10.0	8.4	4.0	4.5	6.5	5.2	0.0	10.0	0.0	1.0	68.4
24	2,5,6,7,10,12,14,17,19,20	8.1	3.6	8.2	10.0	8.6	5.5	7.5	4.1	7.9	0.0	9.0	0.0	5.0	77.4
25	2,5,6,7,9,13,15,17,18	5.3	6.5	5.6	10.0	9.8	8.5	1.0	8.7	1.0	0.0	7.0	0.0	3.0	66.4
26	2,5,6,7,9,13,15,17,19,20	6.8	4.6	6.9	10.0	10.0	10.0	4.0	6.4	3.7	0.0	6.0	0.0	7.0	75.4
27	2,5,6,7,9,13,16,20	8.8	2.4	8.7	8.5	8.7	8.5	8.3	7.1	3.2	0.0	9.0	0.0	10.0	83.2
28	2,5,8,13,15,17,18	1.0	10.0	1.0	2.5	3.1	2.5	1.8	3.4	4.7	0.0	2.0	0.0	1.0	33.0
29	2,5,8,13,15,17,19,20	2.5	8.1	2.4	2.5	3.3	4.0	4.8	1.0	7.4	0.0	1.0	0.0	5.0	42.0
30	2,5,8,13,16,20	4.4	6.0	4.1	1.0	2.0	2.5	9.2	1.7	6.9	0.0	4.0	0.0	8.0	49.7

Min	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	0.0	1.0
Average	6.9	4.7	7.0	7.7	5.2	5.0	5.9	5.5	5.4	0.0	5.4	0.0	4.6
Max	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	0.0	10.0	0.0	10.0
Std Dev	2.3	2.3	2.3	2.3	2.5	2.2	2.7	2.2	2.6	0.0	2.2	0.0	3.0

Westar Energy - Stranger Creek to Iatan 345-kV Transmission Line Project
Table F-2: Route Data Including House Counts

Route	Segments	Length of New Construction (ft)	Length of Rebuild (ft)	Acres of New ROW	Heavy Angles (no.)	Length Not Paralleling Existing Roads or Transmission Line (ft)	Streams and Rivers Crossed (no.)	Wetland Acres in ROW	Woodland Acres in ROW	Cropland Acres in ROW	Rare Species/ Species of Concern Polygons Crossed (no.)	Residences Within 0-100 Feet (no.)	Residences Within 101-200 Feet (no.)	Residences Within 201-300 Feet (no.)	Residential Proximity Score	Public Facilities Within 300 Feet (no.)	Cultural Sites Within 1320 Feet (no.)
1	1,4,6,8,13,15,17,18	23,060	52,990	107.2	9	46,390	18	3.0	51.1	144.8	12	0	1	3	5	0	8
2	1,4,6,8,13,15,17,19,20	35,710	40,840	142.3	9	46,890	19	4.1	38.7	161.4	12	0	1	2	4	0	12
3	1,4,6,8,13,16,20	51,850	26,540	188.1	8	43,470	18	5.8	42.3	158.2	12	0	2	3	7	0	15
4	1,4,7,10,11,14,17,18	61,000	23,210	226.9	10	48,660	16	4.0	68.1	121.5	12	0	0	5	5	0	8
5	1,4,7,10,11,14,17,19,20	73,650	11,060	262.0	10	49,160	17	5.2	55.7	138.0	12	0	0	4	4	0	12
6	1,4,7,10,12,14,17,18	57,510	23,210	214.9	10	48,530	15	4.0	49.8	144.1	12	0	2	5	9	0	8
7	1,4,7,10,12,14,17,19,20	70,170	11,060	250.0	10	49,030	16	5.1	37.3	160.6	12	0	2	4	8	0	12
8	1,4,7,9,13,15,17,18	47,150	29,970	182.2	10	52,030	18	2.7	61.6	119.0	12	0	0	6	6	0	10
9	1,4,7,9,13,15,17,19,20	59,800	17,820	217.3	10	52,540	19	3.8	49.1	135.5	12	0	0	5	5	0	14
10	1,4,7,9,13,16,20	75,940	3,520	263.0	9	49,110	18	5.5	52.7	132.4	12	0	1	6	8	0	17
11	2,3,4,6,8,13,15,17,18	20,370	54,310	98.2	9	52,760	18	3.0	51.7	133.8	12	0	1	3	5	0	8
12	2,3,4,6,8,13,15,17,19,20	33,020	42,160	133.3	9	53,260	19	4.1	39.2	150.3	12	0	1	2	4	0	12
13	2,3,4,6,8,13,16,20	49,170	27,870	179.1	8	49,840	18	5.8	42.8	147.2	12	0	2	3	7	0	15
14	2,3,4,7,10,11,14,17,18	58,310	24,530	217.9	10	55,030	16	4.0	68.7	110.4	12	0	0	5	5	0	8
15	2,3,4,7,10,11,14,17,19,20	70,970	12,380	253.0	10	55,530	17	5.2	56.3	126.9	12	0	0	4	4	0	12
16	2,3,4,7,10,12,14,17,18	54,820	24,530	205.9	10	54,900	15	4.0	50.3	133.0	12	0	2	5	9	0	8
17	2,3,4,7,10,12,14,17,19,20	67,480	12,380	241.0	10	55,400	16	5.1	37.9	149.6	12	0	2	4	8	0	12
18	2,3,4,7,9,13,15,17,18	44,460	31,290	173.2	10	58,400	18	2.7	62.1	108.0	12	0	0	6	6	0	10
19	2,3,4,7,9,13,15,17,19,20	57,110	19,140	208.3	10	58,910	19	3.8	49.7	124.5	12	0	0	5	5	0	14
20	2,3,4,7,9,13,16,20	73,250	4,840	254.0	9	55,480	18	5.5	53.3	121.3	12	0	1	6	8	0	17
21	2,5,6,7,10,11,14,17,18	50,500	32,550	192.8	11	62,650	18	3.7	75.3	109.5	12	0	1	5	7	0	8
22	2,5,6,7,10,11,14,17,19,20	63,150	20,400	227.9	11	63,150	19	4.9	62.9	126.0	12	0	1	4	6	0	12
23	2,5,6,7,10,12,14,17,18	47,010	32,550	180.8	11	62,510	17	3.7	56.9	132.1	12	0	3	5	11	0	8
24	2,5,6,7,10,12,14,17,19,20	59,660	20,400	215.9	11	63,020	18	4.8	44.5	148.6	12	0	3	4	10	0	12
25	2,5,6,7,9,13,15,17,18	36,640	39,310	148.1	11	66,020	20	2.4	68.7	107.0	12	0	1	6	8	0	10
26	2,5,6,7,9,13,15,17,19,20	49,300	27,160	183.2	11	66,530	21	3.5	56.3	123.5	12	0	1	5	7	0	14
27	2,5,6,7,9,13,16,20	65,440	12,860	228.9	10	63,100	20	5.2	59.9	120.4	12	0	2	6	10	0	17
28	2,5,8,13,15,17,18	0	62,340	30.5	6	48,850	16	2.7	40.5	129.3	12	0	0	3	3	0	8
29	2,5,8,13,15,17,19,20	12,650	50,190	65.6	6	49,360	17	3.8	28.0	145.8	12	0	0	2	2	0	12
30	2,5,8,13,16,20	28,800	35,890	111.3	5	45,930	16	5.5	31.6	142.7	12	0	1	3	5	0	15

Max	75,940	62,340	263.0	11	66,530	21	5.8	75.3	161.4	12	0	3	6	11	0	17
Average	49,930	27,580	186.8	9.4	54,220	17.7	4.2	51.4	133.5	12	0	1	4.3	6.4	0	11.6
Min	0	3,520	30.5	5	43,470	15	2.4	28.0	107.0	12	0	0	2	2	0	8
St. Dev	19,040	14,850	59.4	1.5	6,530	1.5	1.0	11.6	15.6	0	0	0.9	1.3	2.2	0	3.0

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BEFORE THE STATE CORPORATION COMMISSION

OF THE STATE OF KANSAS

DIRECT TESTIMONY

OF

Mohammad H. Awad

WESTAR ENERGY

DOCKET NO.

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. Mohammad H. Awad, 818 South Kansas Avenue, Topeka, Kansas 66612.

Q. BY WHOM AND IN WHAT CAPACITY ARE YOU EMPLOYED?

A. I am employed by Westar Energy, Inc. (Westar) as Director, Regulatory Compliance.

Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL EXPERIENCE.

A. I hold a B.S. in Computer engineering from University of Balamand (Lebanon), M.S. in Electrical Engineering from Oklahoma State University and an M.B.A from Wichita State University. I joined Westar in 2005 as a Customer Service Representative and then transitioned to a Customer Service System Analyst. In 2007, I

become an engineer in the Transmission Planning group. I was promoted to Manager, Transmission Planning in 2010 where I was responsible for developing short-term and long-term transmission construction projects to ensure reliability of the transmission grid and the compliance with NERC Reliability Standards. In November, 2014, I worked in Human Resources as a Business Partner. I began my current position as Director, Regulatory Compliance in November, 2015. In this role, I direct a staff that is responsible for Westar's FERC Compliance and formula rates.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. I will describe the cost recovery mechanism by which Westar expects to receive revenue for its proposed project.

Q. PLEASE DESCRIBE HOW THE SOUTHWEST POWER POOL (SPP) TARIFF COMPENSATES TRANSMISSION OWNERS FOR THEIR TRANSMISSION FACILITIES.

A. First, each Transmission Owner (TO) that has facilities under the SPP Open Access Transmission Tariff (OATT) must apply to the Federal Energy Regulatory Commission (FERC) to establish a revenue requirement. SPP takes these approved values and incorporates them into Attachment H of its OATT for revenue requirements. SPP then charges its transmission customers based upon these approved values. For example, transmission customers that have retail or wholesale load attached to Westar's transmission

system are in the Westar pricing zone. Westar is also required to purchase transmission service from SPP to serve its retail customers.

Q. **HOW DOES A TRANSMISSION OWNER UPDATE ITS REVENUE REQUIREMENT?**

A. FERC allows a TO a choice in how it updates its revenue requirement. The TO may file a traditional rate case or implement a transmission formula rate. Beginning in 2005, Westar received approval from FERC to implement a formula rate approach in setting its transmission revenue requirements. The formula is designed to update Westar's revenue requirements annually. Use of the formula rate reduces the lag between completion of major projects and their inclusion in rates. Conversely, reductions in costs are also reflected in transmission rates to customers on a timelier basis.

Q. **PLEASE EXPLAIN HOW THESE COSTS ARE RECOVERED THROUGH THE SPP OATT.**

A. There are 19 pricing zones in the SPP, but only 18 zones will be affected by this project. The Integrated System (Zone 19) is only responsible for projects after October 1, 2015. Each zone is defined by the primary TO that owns the transmission facilities in that zone. The transmission rates paid by a customer are based upon Schedules 7, 8, 9, and 11 of the SPP OATT which are calculated based upon the revenue requirements stated in Attachment H to the OATT. The specific charges to a transmission customer are

determined based on the type of service and the location where the power is delivered or "sunk." The transmission rate charged to transmission customers consist of four components: 1) Existing Zonal Revenue Requirements; 2) Base Plan Zonal Revenue Requirements, 3) Base Plan Regional Revenue Requirements, and 4) Direct Assigned costs. SPP determines the charges to each customer based upon the customer's transmission reservations and issues a bill to each customer. SPP then collects the revenue from each customer and distributes the money among the TOs pursuant to the terms of Attachment L of the OATT.

Q. **PLEASE DESCRIBE THE FOUR COMPONENTS THAT MAKE UP THE SPP TRANSMISSION RATES IN MORE DETAIL.**

A. For new or upgraded transmission facilities (transmission upgrades) required to meet new service requests from customers, the underlying premise for cost recovery in the SPP OATT is to directly assign the costs related to those transmission upgrades to the customer requiring the transmission upgrades.

Under certain circumstances, a customer may qualify for those costs to be rolled into the SPP OATT rates in accordance with the rules as described in Attachments J, Z1, and other areas of the SPP OATT (Base Plan Funding). In addition, any transmission upgrades that are required to meet various reliability criteria, or are identified has having regional benefits through the SPP study

process (Attachment O) are also Base Plan Funded. The method of recovering the transmission costs which qualify for Base Plan Funding is described in Attachment J of the SPP OATT. The costs associated with Base Plan Funded Projects are allocated between costs collected from the customers in the zone where the upgrade is built (or host zone) and all customers in the SPP. Only facilities built after December 31, 2005, are qualified to be Base Plan Funded. A facility directed to be built by SPP between December 31, 2005, and June 19, 2010, has its costs allocated 33% to the entire SPP region and the remaining 67% allocated to the host zone.

Effective June 19, 2010, FERC authorized a change in the way that SPP allocates Base Plan Funded projects. FERC approved the use of a Highway/Byway cost allocation method. The revised cost allocation method allocates costs between customers across the entire SPP region and the customers in the host zone where the project was built based upon the nominal operating voltage of the project. The nominal operating voltage is the voltage SPP has directed the Network Upgrade to be built at. For projects SPP authorized to be built after June 19, 2010, with a nominal operating voltage at or above 300 kV are recovered 100% from the SPP region. Projects with a nominal operating voltage between 100 kV and 300 kV are recovered 33% regional and 67% from the host zone.

Projects with nominal operating voltages below 100 kV are recovered 100% from the host zone's customers.

The first category, Existing Zonal Revenue Requirements, refers to the Revenue Requirements related to transmission facilities that were in service or required to be in service prior to December 31, 2005, or were required to be in service prior to joining the SPP if the TO joined after December 31, 2005. Any costs associated with these facilities are collected from service that sinks in the pricing zone where those facilities are located. The second category refers to the Base Plan Funded costs assigned to the host zone.

The third category includes those Base Plan Funded regional costs which are recovered from all customers taking transmission service under the SPP OATT. The total amount of Base Plan Funded regional revenue requirements is listed in Table 2 of Attachment H. These costs are allocated to each zone based on the load-ratio share of the zone in comparison to the SPP region.

The final category is direct assigned costs. These costs are charged directly to a customer if the total project cost of the Base Plan upgrades allocated to the customer exceeds certain limits in the SPP OATT or if the requested transmission service does not qualify for Base Plan Funding.

Q. **WHICH COST RECOVERY METHOD WILL APPLY TO THE STRANGER TO IATAN PROJECT?**

A. The Stranger to Iatan project is a base plan funded project. The notification to construct was issued after the approval of the change in Base Plan Funding cost allocation by FERC. Since the transmission line will be built and operated at 345 kV, the costs associated with the project will be allocated regionally.

Q. WHAT PERCENTAGE OF THE COSTS FOR THE STRANGER TO IATAN PROJECT WILL BE ALLOCATED TO KANSAS CUSTOMERS?

A. Approximately 18% of the costs of the Stranger to Iatan project will be allocated to all the pricing zones in Kansas based upon the 2015 zonal peak demands (Exhibit MA-1). This amount will be added to the rates that SPP charges to Westar and other utilities in Kansas for transmission service. Specifically, 11.12% of the project cost will be allocated to customers in the Westar pricing zone. A spreadsheet showing this calculation is attached as Exhibit MA-2.

Q. **HOW WILL THE COSTS RELATED TO THE STRANGER TO IATAN PROJECT AFFECT THE RATES PAID BY WESTAR'S RETAIL CUSTOMERS?**

A. For Westar's retail customers, the amount paid by Westar to SPP for transmission service is recovered through the transmission delivery charge (TDC). Westar estimates that its portion of the proposed project will cost approximately $28 million and will be in service in 2017. The cost to customers will be the highest the first year the

project is in service and will decline over time. For the average residential customer using 1000 kWh per month, the impact would be $.36 per year in 2017 and decline by approximately 2.5% per year thereafter due to depreciation. A spreadsheet showing the calculation of the initial cost to customers is attached hereto as Exhibit MA-2. These calculations do not take into account any benefits or other cost reductions that may be produced by having the transmission facilities built.

Q. THANK YOU.

Regional and Zonal Transmission System Peak Loads (MW)
Calendar Year 2015

Zone	Total Peak Load (MW)[1]	12 Month Avg. Peak Load (MW)[1]	Load Ratio Share	% KS Load[2]	KS Alloc
CSWS (AEP)	98,413.00	8,201.08	22.8906%	0.0%	0.00%
EDE	10,838.00	903.17	2.5209%	5.0%	0.13%
GMO	17,561.89	1,463.49	4.0849%	0.0%	0.00%
GRDA	8,230.00	685.83	1.9143%	0.0%	0.00%
KCPL	34,815.70	2,901.31	8.0980%	45.0%	3.64%
LES	8,811.00	734.25	2.0494%	0.0%	0.00%
MKEC	6,065.40	505.45	1.4108%	100.0%	1.41%
MIDW	3,805.39	317.12	0.8851%	100.0%	0.89%
NPPD	28,212.75	2,351.06	6.5622%	0.0%	0.00%
OKGE	62,310.30	5,192.53	14.4932%	0.0%	0.00%
OPPD	22,320.41	1,860.03	5.1917%	0.0%	0.00%
SECI	4,146.40	345.53	0.9644%	100.0%	0.96%
SPRM	6,326.00	527.17	1.4714%	0.0%	0.00%
SPS	54,226.00	4,518.83	12.6128%	0.0%	0.00%
WFEC	16,050.00	1,337.50	3.7332%	0.0%	0.00%
Westar	47,795.00	3,982.92	11.1170%	100.0%	11.12%
Total		35,827.27	100.0000%		18.15%

Regional (100% * Kansas Allocation)	18.15%
Total Kansas Allocation of Costs	18.15%

Notes:

[1] 2015 load data based on zones 1-18 from SPP RRR file effective 08/01/2016

[2] % KS Load based on 2014 data

Exhibit MA-2
Estimated Cost Impact on Retail Energy Cost

Estimated Cost[1]	$	28,010,000.00	
2015 NPCC[2]		15.35%	
First Year ATRR[3]	$	4,299,478.98	
Regional Allocation[4]		11.12%	
Westar's Retail LRS[5]		83.41%	
Regional ATRR[6]	$	4,299,478.98	
Total Westar Zonal Alloc.[7]	$	477,973.08	11.12%
2015 Residential Energy kWh[8]		6,364,440,000	
2015 Residential Cost Allocation[9]		47.51%	
Cost per 1000 kWh/mo[10]		0.030	
Cost per Year[11]	$	0.36	

Notes:

[1] Estimated Cost of Westar's portion of the Stranger to Iatan line
[2] NPCC = Net Plant Carrying Charge as calculated in the 2015 Transmission Formula Rate
[3] Annual Transmission Revenue Requirement (ATRR) = Estimated Cost * 2015 NPCC
[4] From Exhibit JAL-1, Regional Allocation of costs to Westar's Zone
[5] From Westar's 2016 TDC filing
[6] First Year ATRR * 100%
[7] Regional ATRR * Regional Allocation
[8] From Westar's 2015 FERC Form 1 (Westar Energy, Inc and Kansas Gas and Electric Company)
[9] From Westar's 2016 TDC filing
[10] Total Westar Zonal Alloc. * Westar's Retail LRS * 2015 Residential Cost Allocation / 2015 Residential Energy kWh * 1000
[11] Cost per 1000 KWh/mo * 12