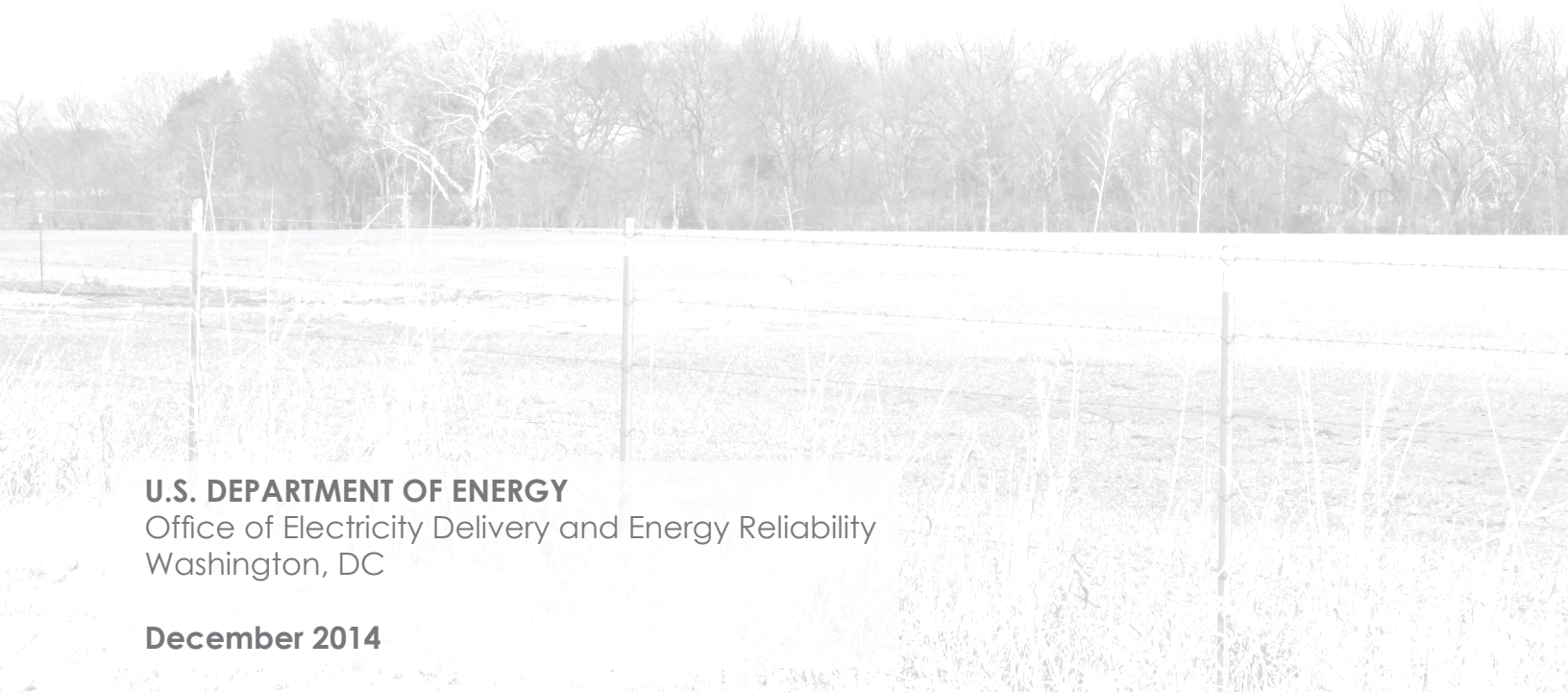
U.S. DEPARTMENT OF ENERGY

DOE/EIS-0486

Draft

PLAINS & EASTERN CLEAN LINE TRANSMISSION PROJECT

ENVIRONMENTAL IMPACT STATEMENT SUMMARY



U.S. DEPARTMENT OF ENERGY
Office of Electricity Delivery and Energy Reliability
Washington, DC

December 2014

COVER SHEET

RESPONSIBLE FEDERAL AGENCY: U.S. Department of Energy (DOE), Office of Electricity Delivery and Energy Reliability

COOPERATING AGENCIES: Natural Resources Conservation Service, Tennessee Valley Authority, U.S. Army Corps of Engineers, U.S. Bureau of Indian Affairs, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

TITLE: Plains & Eastern Clean Line Transmission Line Project Draft Environmental Impact Statement (EIS) (DOE/EIS-0486)

LOCATION: Texas, Oklahoma, Arkansas, and Tennessee: counties in Texas—Hansford, Ochiltree, and Sherman; counties in Oklahoma—Beaver, Cimarron, Creek, Garfield, Harper, Kingfisher, Lincoln, Logan, Major, Muskogee, Okmulgee, Payne, Sequoyah, Texas, and Woodward; counties in Arkansas—Cleburne, Conway, Crawford, Cross, Faulkner, Franklin, Jackson, Johnson, Mississippi, Poinsett, Pope, Van Buren, and White; and counties in Tennessee—Shelby and Tipton.

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ABSTRACT: In June 2010, DOE, acting through the Southwestern Power Administration and the Western Area Power Administration, both power marketing administrations within DOE, issued *Request for Proposals (RFP) for new or upgraded transmission line projects under Section 1222 of the Energy Policy Act of 2005* (EPAct; 42 United States Code [USC] 16421; 75 *Federal Register* 32940; June 10, 2010). In response to the RFP, Clean Line Energy

Partners LLC of Houston, Texas, the parent company of Plains and Eastern Clean Line LLC and Plains and Eastern Clean Line Oklahoma LLC (collectively referred to as Clean Line or the Applicant) submitted a proposal to DOE in July 2010 for the Plains & Eastern Clean Line Project. In August 2011, Clean Line modified the proposal. DOE is the lead federal agency for the preparation of this EIS (or Plains & Eastern EIS), which examines the potential environmental impacts from Clean Line's proposed Project (also referred to as the Applicant Proposed Project) and alternatives to it. DOE has prepared the EIS pursuant to NEPA (42 USC 4321 et seq.), the Council on Environmental Quality NEPA regulations (40 Code of Federal Regulations [CFR] Parts 1500 through 1508), and the DOE NEPA implementing regulations (10 CFR Part 1021). DOE's purpose and need for agency action is to implement Section 1222 of the EPAct. To that end, DOE needs to decide whether and under what conditions it would participate in the Applicant Proposed Project.

The Applicant Proposed Project would include an overhead ± 600-kilovolt (kV) high voltage direct current (HVDC) electric transmission system and associated facilities with the capacity to deliver approximately 3,500 megawatts primarily from renewable energy generation facilities in the Oklahoma and Texas Panhandle regions to load-serving entities in the Mid-South and Southeast United States via an interconnection with the Tennessee Valley Authority electrical grid in Tennessee. Major facilities associated with the Applicant Proposed Project consist of converter stations in Oklahoma and Tennessee; an approximate 720-mile, ± 600kV HVDC transmission line; an alternating current collection system; and access roads. Pursuant to NEPA, DOE has identified and analyzed potential environmental impacts for several reasonable alternatives in addition to the Applicant Proposed Project. These alternatives include an Arkansas converter station and alternative routes for the HVDC transmission line.

DOE invites comments on this Draft EIS during the 90-day comment period that begins with the publication of the Notice of Availability in the *Federal Register* by the U.S. Environmental Protection Agency. DOE also invites comments on the Section 106 process and the potential adverse impacts to historic properties from the Project as described in the EIS. The EIS website (http://www.plainsandeasterneis.com) provides information on public hearings to be held at several locations during the comment period. Comments on the Draft EIS may be made orally or in writing at a public hearing or may be sent to the mailing address listed below, by email to comments@PlainsandEasternEIS.com, or by fax at (303) 295-2818.

Plains & Eastern Clean Line EIS
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Denver, CO 80202

Written and oral comments will be given equal weight, and any comments submitted after the comment period ends will be considered to the extent practicable.

Contents

Tables

Figures Presented in Text

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Abbreviations and Acronyms

AC	Alternating Current
ACGIH	American Conference of Governmental Industrial Hygienists
BIA	Bureau of Indian Affairs
BMP	Best Management Practice
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
dBA	A-weighted dB scale
DC	Direct Current
DOE	U.S. Department of Energy
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
EPAct	Energy Policy Act of 2005
EPM	Environmental Protection Measure
ESA	Endangered Species Act
FAA	Federal Aviation Administration
HVDC	High-Voltage Direct Current
IEEE	Institute of Electrical and Electronic Engineers
ICNIRP	International Committee on Non-Ionizing Radiation Protection
kV	Kilovolt
kV/m	Kilovolt Per Meter
LEPC	Lesser Prairie-Chicken
LOS	Level of Service
MISO	Midcontinent Independent System Operator
MW	Megawatt
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSA	Noise Sensitive Area
PA	Programmatic Agreement
RFP	Request for Proposal
ROI	Region of Influence
ROW	Right-of-Way
SHPO	State Historic Preservation Office
Southwestern	Southwestern Power Administration
SPP	Southwest Power Pool
SPS	Southwestern Public Service
TVA	Tennessee Valley Authority

USACE	U.S. Army Corps of Engineers
USC	United States Code
USFS	U.S. Forest Service
USFWS	United States Fish and Wildlife Service
WDZ	Wind Development Zones
WMA	Wildlife Management Area

S.1. Introduction

In June 2010, the U.S. Department of Energy (DOE), acting through the Southwestern Power Administration (Southwestern) and the Western Area Power Administration, both power marketing administrations within DOE, issued *Request for Proposals (RFP) for new or upgraded transmission line projects under Section 1222 of the Energy Policy Act of 2005* (EPAct; 75 *Federal Register* 32940; June 10, 2010). In response to the RFP, Clean Line Energy Partners LLC of Houston, Texas, the parent company of Plains and Eastern Clean Line LLC and Plains & Eastern Clean Line Oklahoma LLC (collectively referred to as Clean Line or the Applicant in the Plains and Eastern Environmental Impact Statement [EIS]) submitted a proposal to DOE in July 2010 for the Plains & Eastern Clean Line Project. In August 2011, Clean Line modified the proposal. Figures S-1 and S-2a through S-2f show an overview of Clean Line's proposed Plains & Eastern Project (Applicant Proposed Project) and the counties crossed by the Applicant Proposed Project, respectively.

Prior to making a decision as to whether and under what conditions to participate in Clean Line's proposed Plains & Eastern Project (the Applicant Proposed Project), DOE must fully evaluate the potential environmental impacts of the Project. The EIS will inform that decision.

Commonly Used Terms

Throughout the Plains & Eastern EIS, the following terms are used to describe different elements of the proposal being evaluated.

Applicant Proposed Project—Based on Clean Line's modified proposal to DOE,[1] the basic elements include converter stations in Oklahoma and Tennessee, alternating current (AC) interconnections at each converter station, an AC collection system, and a high voltage direct current (HVDC) transmission line from the Oklahoma Panhandle to western Tennessee. The Applicant Proposed Project is described in detail in Section S.5.2.

Proposed Action—For DOE to participate, acting through the Administrator of Southwestern, in the Applicant Proposed Project in one or more of the following ways: designing, developing, constructing, operating, maintaining, or owning a new electric power transmission facility and related facilities located within certain states in which Southwestern operates, namely Oklahoma, Arkansas, and possibly Texas,[2] but not Tennessee.

Applicant Proposed Route—The single 1,000-foot-wide route alternative defined by Clean Line to connect the converter station in the Oklahoma Panhandle to the converter station in western Tennessee. The analyses of impacts are typically based on a representative 200-foot-wide right-of-way (ROW) within the 1,000-foot corridor. The Applicant Proposed Route is described in detail in Section S.5.3.2.

DOE Alternatives—Pursuant to the National Environmental Policy Act (NEPA), DOE has identified and analyzed potential environmental impacts for several reasonable alternatives in addition to the Applicant Proposed Project. These alternatives include an Arkansas converter station and alternative routes for the HVDC transmission line. In each instance, these alternatives have been discussed and evaluated with Clean Line for feasibility. The DOE Alternatives are described in detail in Section S.5.3.3.

The Project—A broad term that generically refers to elements of the Applicant Proposed Project and/or DOE Alternatives when differentiation between the two is not necessary. The term also refers to whatever combination of Project elements would be built if a decision is made by DOE to participate with Clean Line.

[1] In response to DOE's *Request for Proposals for New or Upgraded Transmission Line Projects under Section 1222 of the Energy Policy Act of 2005.*

[2] Depending on AC collection system routes implemented (some of which are in Texas).

S.2. Department of Energy's Purpose and Need

DOE is the lead federal agency for the preparation of the Plains & Eastern EIS. DOE has prepared the EIS pursuant to NEPA, the Council on Environmental Quality (CEQ) NEPA regulations (40 Code of Federal Regulations [CFR] Parts 1500 through 1508), and the DOE NEPA implementing regulations (10 CFR Part 1021). DOE's purpose and need for agency action is to implement Section 1222 of the EPAct. To that end, DOE needs to decide whether and under what conditions it would participate in the Applicant Proposed Project.

S.2.1 Section 1222 of the EPAct

Section 1222 of the EPAct, in relevant part, authorizes the Secretary of Energy, acting through and in consultation with the Administrator of Southwestern (provided the Secretary determines that certain statutory requirements have been met), to participate with other entities in designing, developing, constructing, operating, maintaining, or owning new electric power transmission facilities and related facilities located within any state in which Southwestern operates. Southwestern is one of four power marketing administrations that operate within DOE. Southwestern is chartered to market and deliver power to rural electric cooperatives and municipal utilities, including Arkansas, Oklahoma, and Texas, with a preference to public bodies and cooperatives.

Clean Line's July 2010 proposal to DOE included two high-voltage direct current (HVDC) lines, each rated at 3,500 megawatts (MW), and which together would have had the capacity to deliver 7,000MW of electricity. In August 2011, Clean Line modified its proposal to a single HVDC line with the capacity to deliver 3,500MW. DOE concluded that Clean Line's modified proposal complied with and was responsive to the RFP.

The purpose of the EIS is to evaluate the potential environmental impacts from the Applicant Proposed Project and several reasonable alternatives that also meet the purpose and need of the agency action to implement Section 1222 of the EPAct and a "No Action" alternative. Environmental impacts are one of several factors that DOE will consider when deciding whether to participate in the Applicant Proposed Project.

This Plains & Eastern EIS analyzes the potential environmental impacts of the entire Project. This ensures that any decision by DOE or another agency is fully informed. DOE may decide to participate in any or all of the states in which Southwestern operates; namely Oklahoma, Arkansas, and Texas. However, DOE would not participate in the Project in Tennessee because that state is outside Southwestern's operational area. Other agencies, federal or state, may have jurisdiction over parts of the Project that are located in Tennessee. Some of these agencies could include, but not be limited to, Tennessee Valley Authority (TVA), U.S. Army Corps of Engineers (USACE), and Tennessee state agencies.

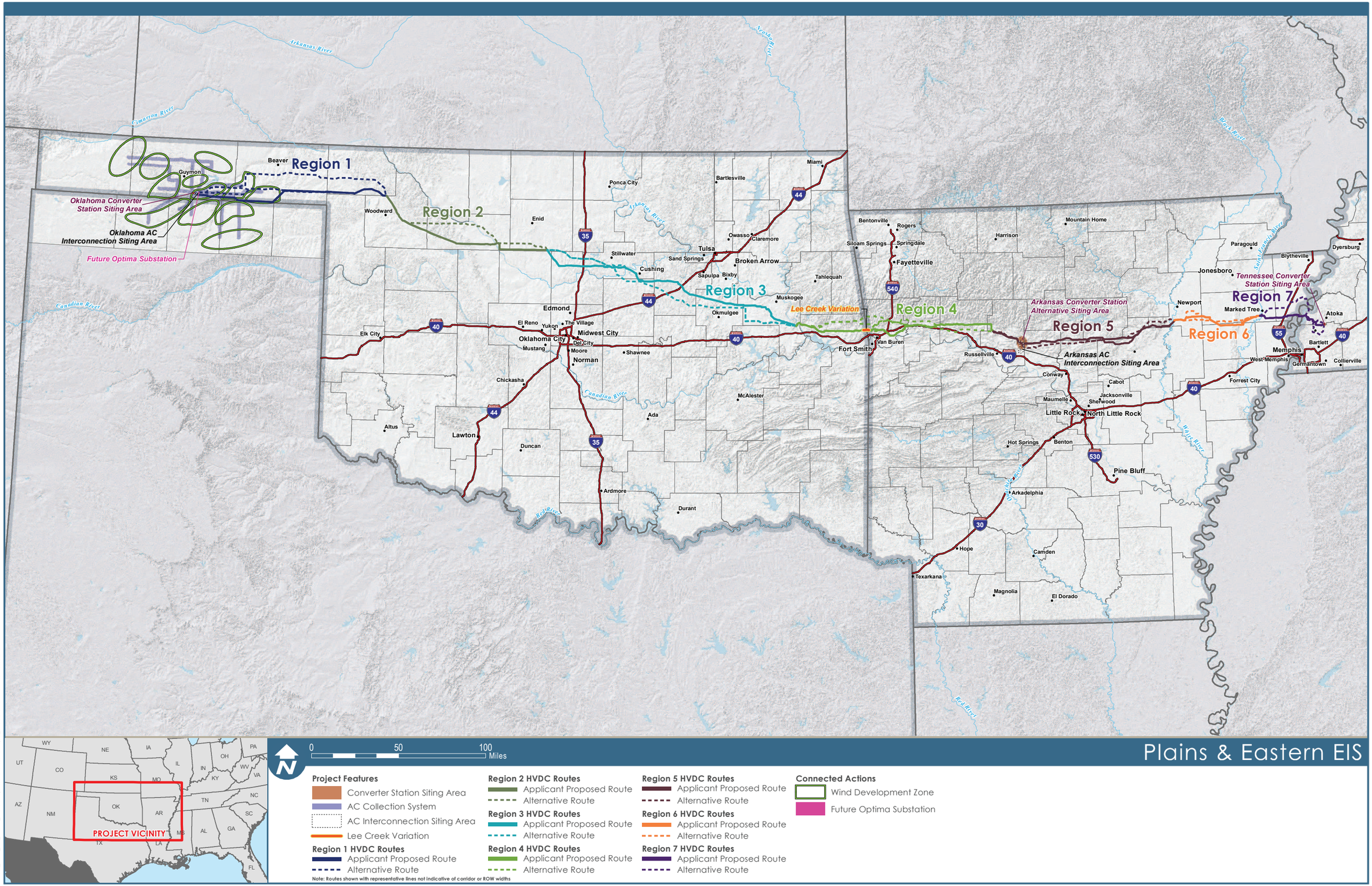


Figure S-1: Project Overview

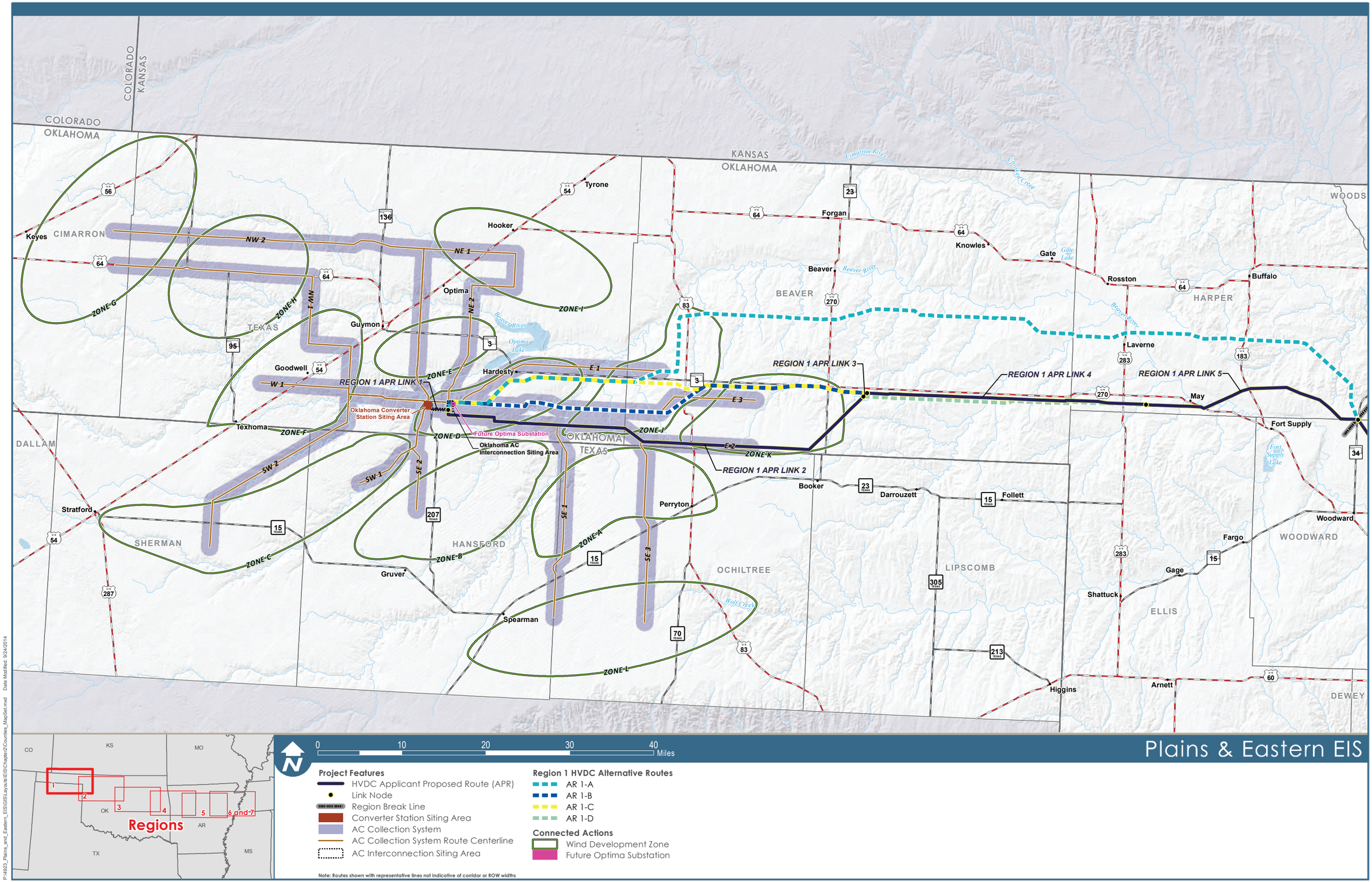


Figure S-2a: Counties Crossed by Project Features—Oklahoma Panhandle

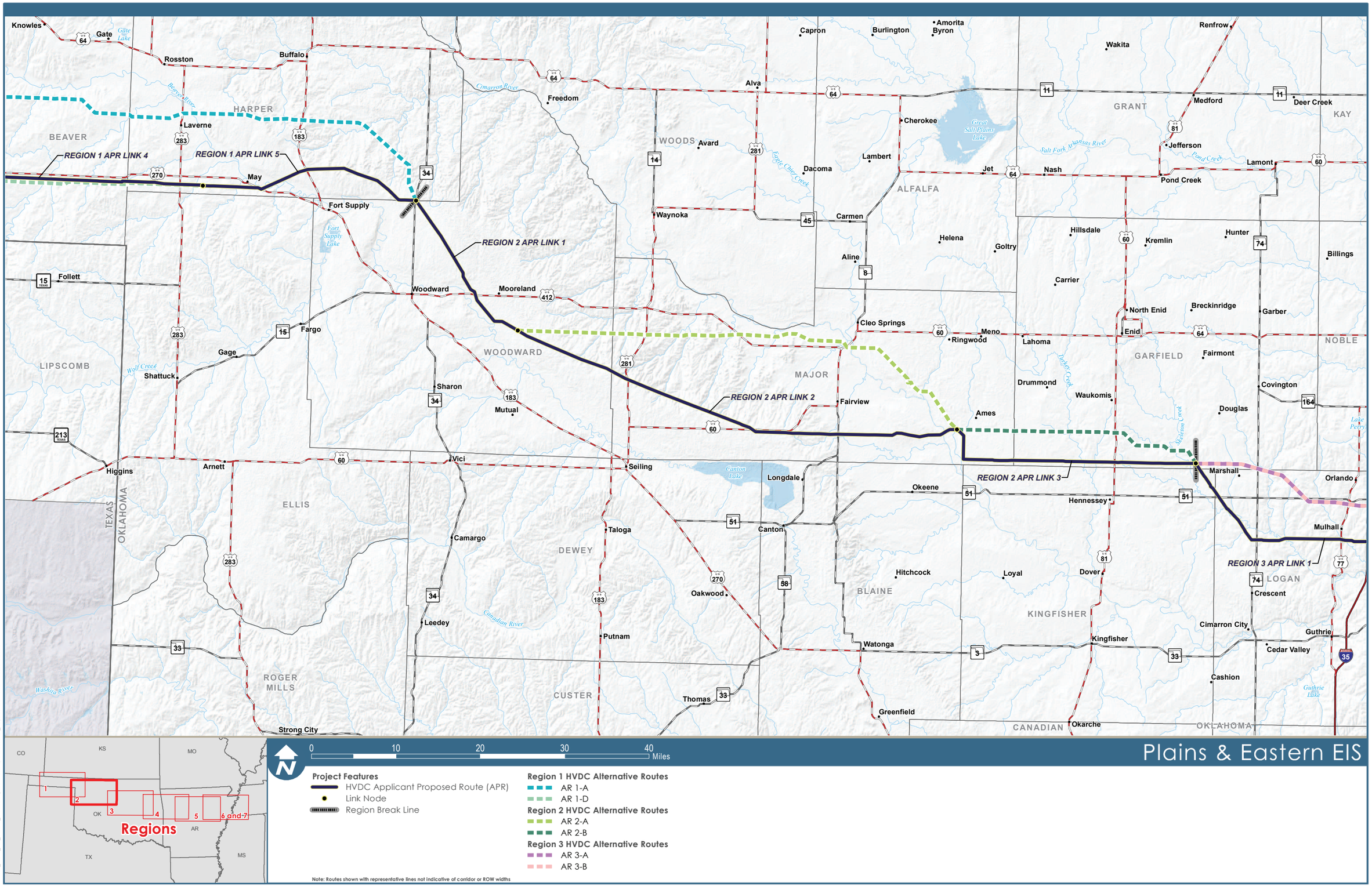


Figure S-2b: Counties Crossed by Project Features—Oklahoma Central Great Plains

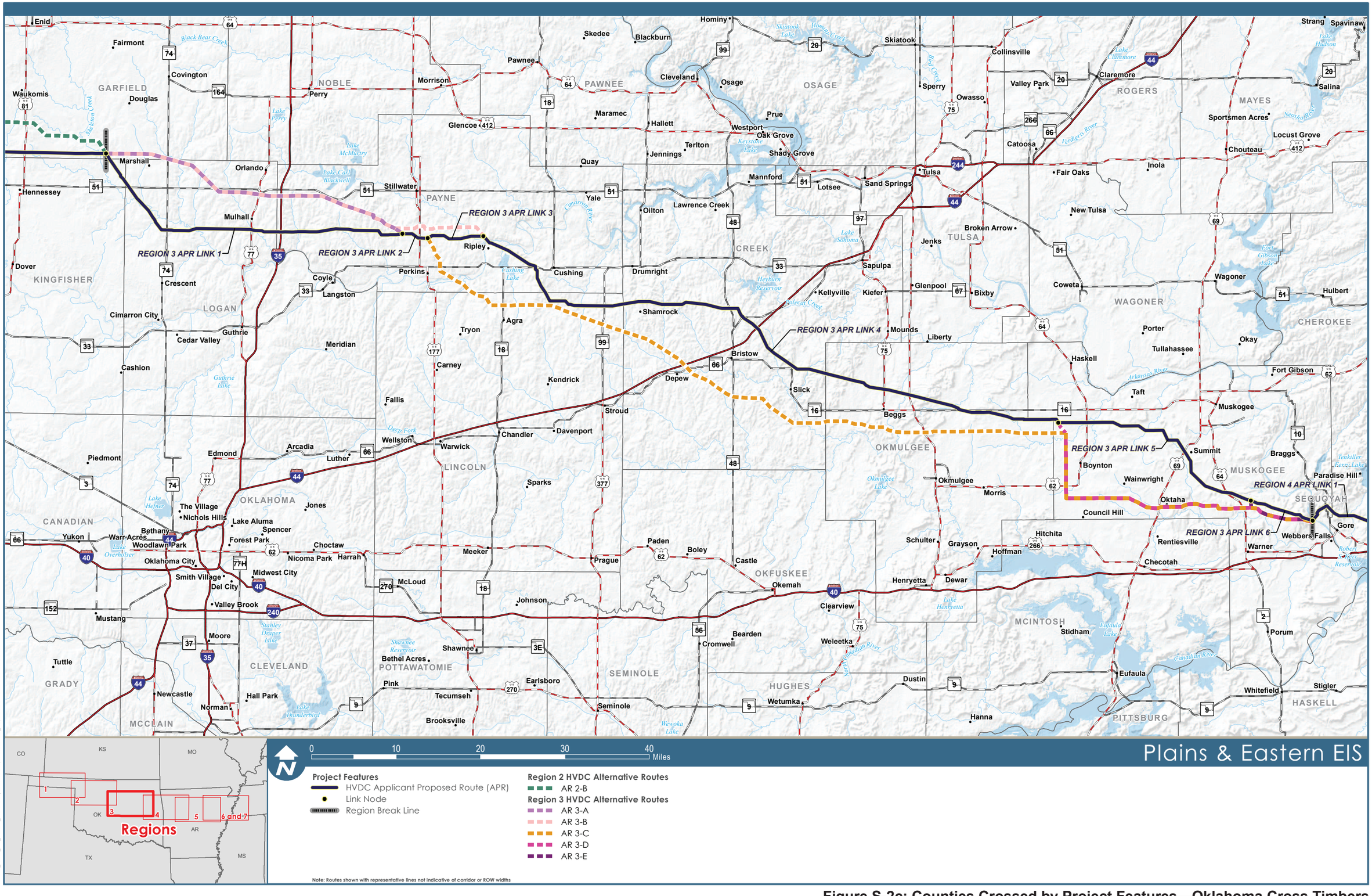


Figure S-2c: Counties Crossed by Project Features—Oklahoma Cross Timbers

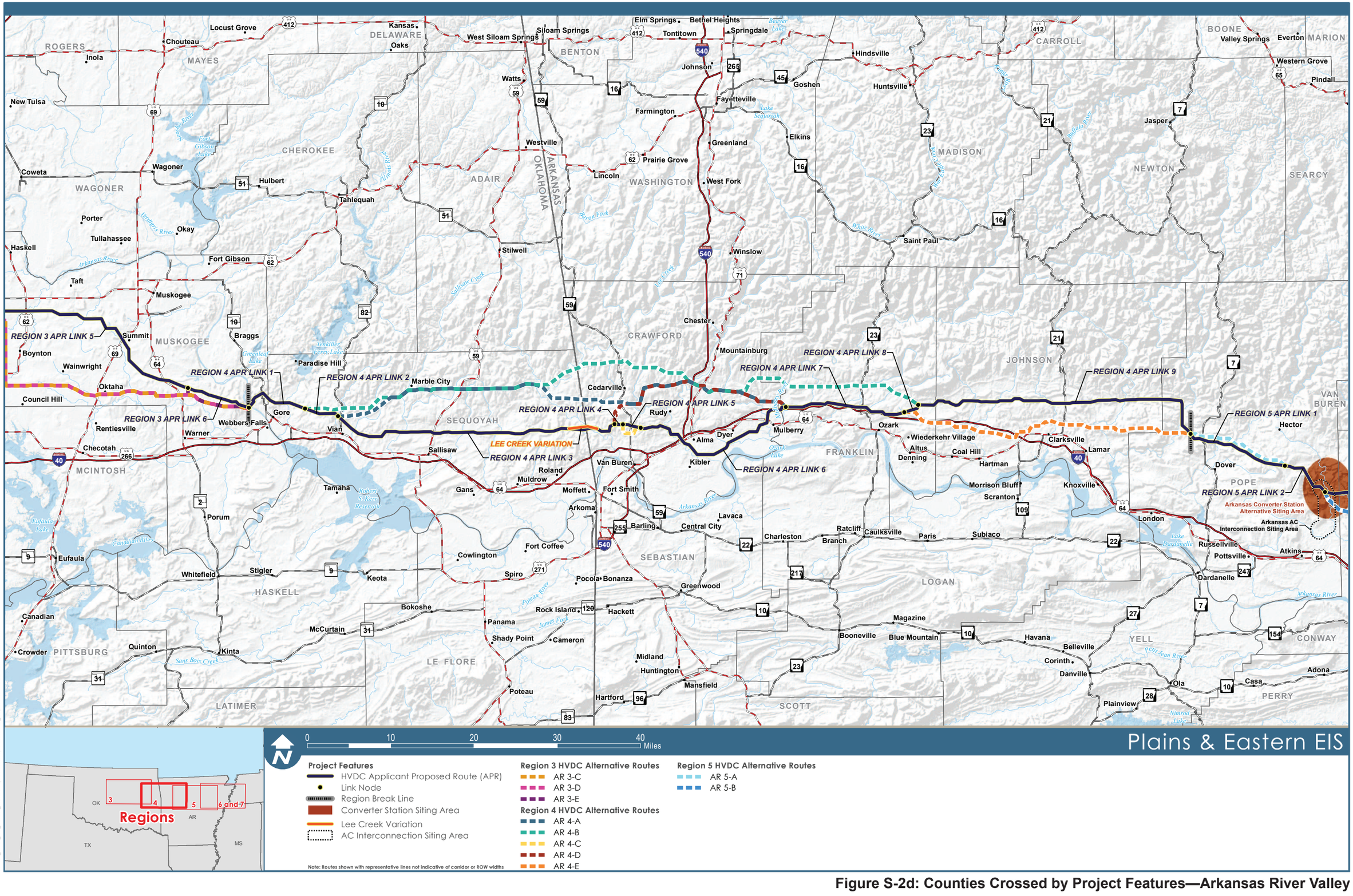


Figure S-2d: Counties Crossed by Project Features—Arkansas River Valley

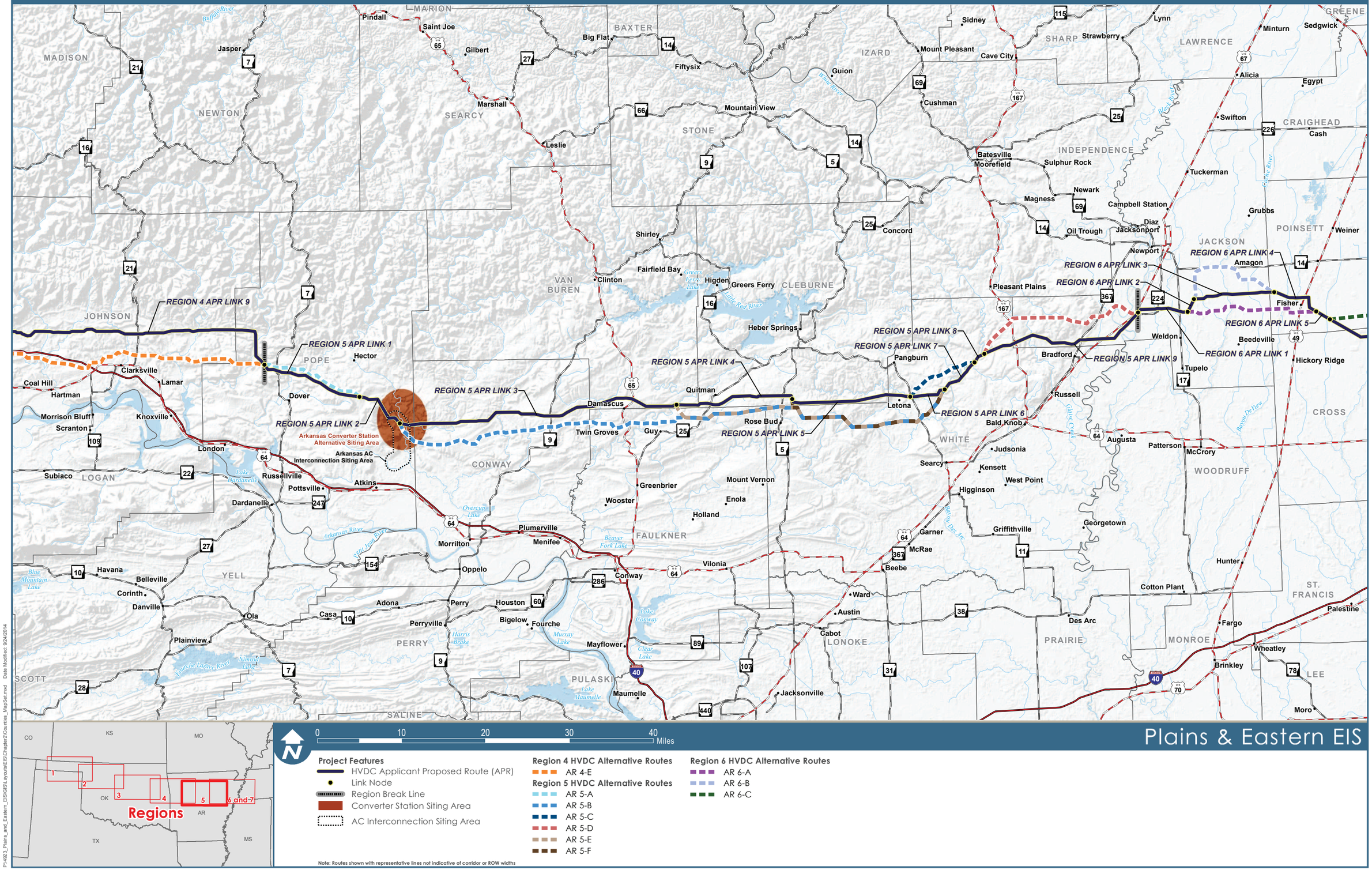


Figure S-2e: Counties Crossed by Project Features—Central Arkansas

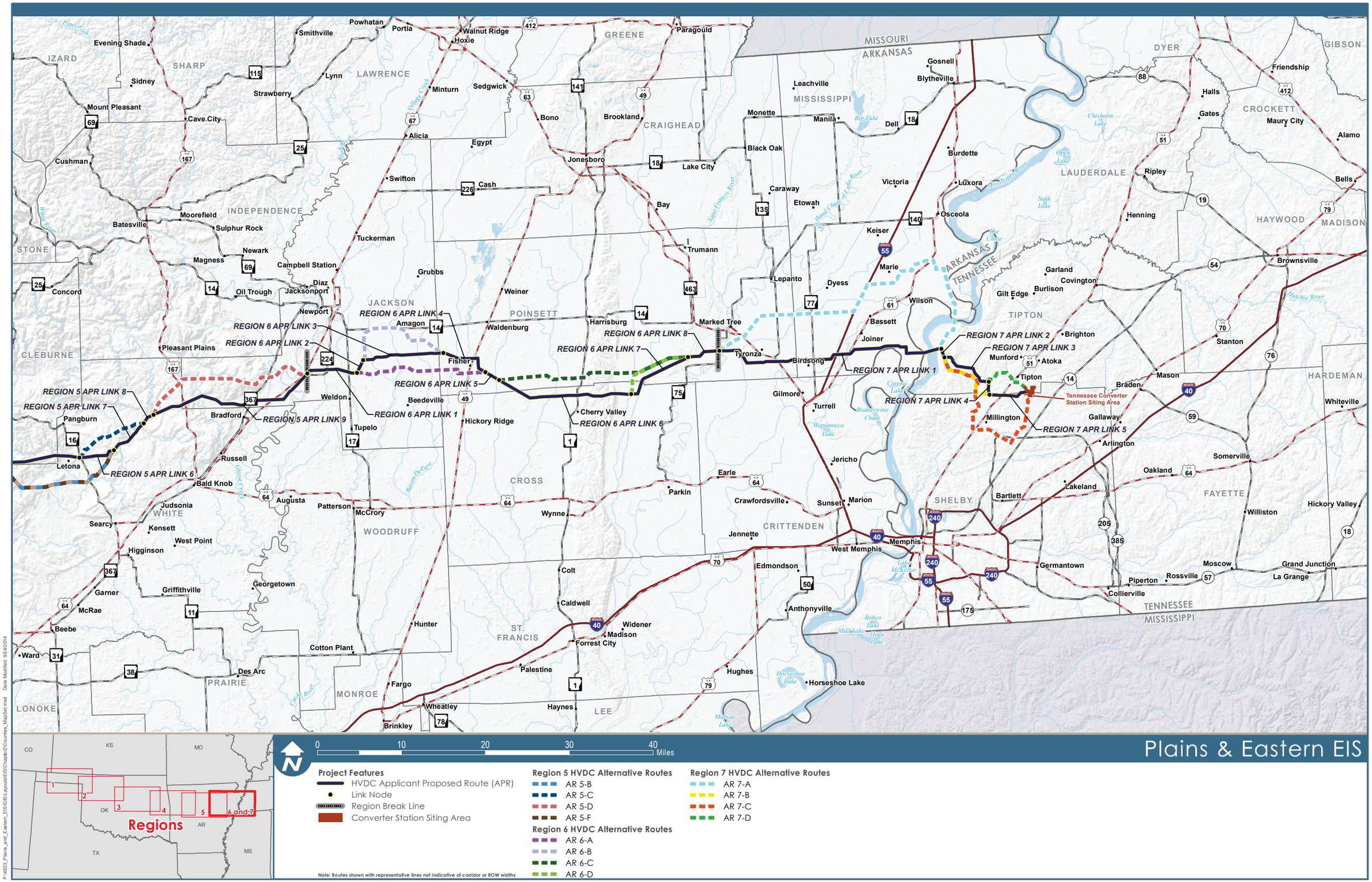


Figure S-2f: Counties Crossed by Project Features—Cache River, Crowley's Ridge Area, and St. Francis Channel and Arkansas Mississippi River Delta and Tennessee

S.3. Clean Line's Goals and Objectives

In response to the DOE *Request for Proposals for New or Upgraded Transmission Line Projects under Section 1222 of the Energy Policy Act of 2005*, Clean Line prepared a proposal (submitted in July 2010 and updated in August 2011) to develop new transmission facilities to be located in Oklahoma, Arkansas, Tennessee, and possibly Texas. According to Clean Line's initial proposal, "The Plains and Eastern Clean Line is necessary to accommodate the actual and projected increase in demand for additional electric transmission capacity to deliver renewable energy from western SPP [Southwest Power Pool] to load centers in the southeastern United States." Further, Clean Line's stated objectives for development of the Applicant Proposed Project include:

- Improving public access to renewable energy at a competitive cost by facilitating the transfer of available wind energy in the Oklahoma and Texas Panhandle regions to areas with increasing demands
- Providing an efficient and reliable interconnection between the SPP and TVA that facilitates the transfer of 3,500MW of wind-generated electricity and is consistent with applicable transmission system plans
- Assisting in satisfying the growing customer demand for renewable energy
- Providing safe, efficient and reliable transmission infrastructure consistent with prudent utility practice

S.4. Interagency Coordination and Public Participation

S.4.1 Interagency Coordination

DOE is the lead agency for the preparation of the Plains & Eastern EIS. As lead agency, DOE retains overall responsibility for the NEPA process including the Draft and Final EIS and DOE's Record of Decision (ROD), if any. DOE's responsibilities include determining the purpose and need for DOE's agency action, identifying for analysis the range of reasonable alternatives to its Proposed Action, identifying potential environmental impacts of the Proposed Action and reasonable alternatives, identifying its preferred alternative, and determining appropriate mitigation measures.

DOE is also the lead agency for consultation required under Section 106 of the National Historic Preservation Act (NHPA), 16 United States Code (USC) 470 et seq. DOE is using the NEPA process and documentation required for the Plains & Eastern EIS to comply with Section 106 of the NHPA in lieu of the procedures set forth in Sections 800.3 through 800.6 of the NHPA. This approach is consistent with the recommendations set forth in the NHPA implementing regulations that Section 106 compliance should be coordinated with actions taken to meet NEPA requirements (36 CFR 800.8(a)(1)). Additional information regarding compliance with Section 106 of the NHPA is provided in Section 3.9.

Several other agencies are participating as cooperating agencies in preparation of the Plains & Eastern EIS as described in 40 CFR 1501.6. These cooperating agencies have also participated, along with other federal and state agencies, in routing and siting activities related to their jurisdiction, authority, or expertise. Also, DOE has invited federal, state, tribal government, and local agencies with jurisdiction by law and/or with special expertise applicable to the Proposed Action to consult under Section 106 of the NHPA pursuant to 36 CFR 800.2(c)

The following sections provide information regarding each cooperating agency and its responsibilities, and the basis for participation as a cooperating agency.

S.4.1.1 Bureau of Indian Affairs

The Bureau of Indian Affairs (BIA) is a bureau within the Department of the Interior responsible for the administration and management of land held in trust for American Indians and federally recognized Tribes. The BIA has jurisdiction by law and/or has special expertise in 25 CFR Part 169, Rights-of-Way over Indian Lands and the potential impacts to traditional cultural properties (NHPA Section 101(d)(6)).

S.4.1.2 Natural Resources Conservation Service

The Natural Resources Conservation Service (NRCS) is a federal agency within the Department of Agriculture whose mission is to provide national leadership in the conservation of soil, water, and related natural resources. The NRCS provides balanced technical assistance and cooperative conservation programs to landowners and land managers throughout the United States. NRCS has jurisdiction by law and/or has special expertise in the following areas:

- Farmland Protection Policy Act (7 USC § 4201 et seq.; 7 CFR Part 658)
- Watershed Protection and Flood Prevention Act, Public Law 83-566, as amended (16 USC 1001–1009)
- Wetland Reserve Program (16 USC § 3837 et seq.)
- Grassland Reserve Program (16 USC §§ 3838N-3838q.)
- Healthy Forests Restoration Act of 2003, Public Law 108–148 (16 USC § 6501 et seq.)
- The 1996 U.S. Farm Bill, Public Law 104–127 (110 Stat. 888–1197)

S.4.1.3 Tennessee Valley Authority

TVA is a federally owned corporation that provides electricity to about 9 million people in parts of seven southeastern states. TVA has jurisdiction by law by virtue of the approvals that would need to be obtained from TVA before interconnecting the Project to the transmission system TVA operates in the Tennessee Valley region.

TVA's purpose and need for agency action is to respond to Clean Line's request to interconnect the Project to the TVA transmission system. In response to the interconnection request, TVA conducted studies that indicate certain upgrades are needed to the TVA transmission system to maintain system reliability. TVA therefore has the additional purpose and need of making the upgrades to its transmission system that would be necessary to interconnect with the Project while maintaining reliable service to its customers.

S.4.1.4 U.S. Army Corps of Engineers

The USACE is a federal agency within the Department of Defense and has jurisdiction by law and/or has special expertise in the following areas:

- Section 404 of the Clean Water Act (33 USC § 1344)
- Section 10 of the Rivers and Harbors Appropriation Act of 1899 (33 USC § 403)

Authorization from the USACE is required for project features that cross over, through, or under navigable waters as defined under Section 10 of the Rivers and Harbors Appropriation Act of 1899. Authorization from the USACE is also required for any activity that would result in discharges of dredged or fill material into waters of the United States as defined in Section 404 of the Clean Water Act. If granted, the USACE authorization would be issued in the form of a permit verification.

In addition to responsibilities identified above, the USACE may also be responsible for approving work that might affect federal projects as required by 33 USC § 408. These include federal projects such as the levees found along the Mississippi River and could include work within 1,500 feet outward from the toe of either side of the levee.[3]

Permits and permit verifications from the USACE would be necessary for portions of the Applicant Proposed Project, (including areas within the state of Tennessee). As a cooperating agency, the USACE will review the route alternatives contained in the Plains & Eastern EIS. The USACE may consider the routing alternatives in Tennessee as presented in the EIS when making its permit decisions and will use the analysis contained in the EIS to inform all of its permit decisions for the Project.

S.4.1.5 U.S. Environmental Protection Agency

The U.S. Environmental Protection Agency (EPA) is a federal agency that was created in 1970 for the purpose of protecting human health and the environment. EPA has 10 regional offices, each of which is responsible for execution of their program. Region 4 (Southeast) includes the state of Tennessee. Region 6 (South-Central) includes the other states potentially involved in the Project (Arkansas, Oklahoma, and Texas). The EPA (Regions 4 and 6) has jurisdiction by law and/or has special expertise in the following areas:

- Environmental laws
- Executive Orders dealing with environmental review of actions
- NEPA assessment and procedures

In addition, under Section 309 of the Clean Air Act, the EPA is required to review and publicly comment on the environmental effects of major federal actions, including actions that are the subject of EIS documents. If the EPA determines that the action is environmentally unsatisfactory (per the Section 309 criteria), it is required by Section 309 to refer the matter to the CEQ.

S.4.1.6 U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service (USFWS) is a bureau within the Department of the Interior whose mission is to conserve, protect, and enhance fish, wildlife, and plants and their natural habitats for the continuing benefit of the American people. USFWS has jurisdiction by law and/or has special expertise in the following areas:

- Endangered Species Act (16 USC § 1531 et seq.)
- Migratory Bird Treaty Act (16 USC § 703 et seq.)
- Bald and Golden Eagle Protection Act (16 USC § 668 et seq.)
- The National Wildlife Refuge System Administration Act of 1966 (16 USC §§ 668dd–68ee)
- Executive Order 13186 and DOE and USFWS Memorandum of Understanding[4]

[3] The toe of a levee is the outer edge of the levee base where the levee meets the existing grade.

[4] Memorandum of Understanding Between the United States Department of Energy and the United States Fish and Wildlife Service Regarding Implementation of Executive Order 13186, "Responsibilities of Federal Agencies to Protect Migratory Birds." 2013. <http://energy.gov/sites/prod/files/2013/10/f3/Final%20DOE-FWS%20Migratory%20Bird%20MOU.pdf>.

S.4.2 Public Participation

In accordance with the NEPA process, public participation formally began as part of public scoping, which started with DOE's publication of the Notice of Intent on December 21, 2012. The public scoping period continued for 90 days through March 21, 2013. DOE held 13 public scoping meetings in communities along the proposed and alternative routes and held five interagency meetings during the scoping period. The purpose of scoping was for DOE to request and receive comments on the scope of the EIS from the public, agencies, tribes, and other interested parties. At the public scoping and agency meetings, DOE presented large-scale maps (42 inches by 60 inches) of the potential project area to gather input on the potential transmission line routing.

DOE received 664 scoping comment documents, many of which included multiple scoping comments. DOE reviewed all scoping comments and published a Scoping Summary Report (presented as Appendix E of the EIS). The scoping comments assisted DOE in defining the scope of the analysis and alternatives included in the Plains & Eastern EIS. For example, in response to scoping comments, DOE analyzed the potential impacts of an alternative with a proposed converter station in Arkansas, which would facilitate the delivery of up to 500MW of electricity to the state.

The public expressed concerns regarding potential impacts to agricultural operations and equipment, impacts to visual resources that include views from residences or recreation areas, the potential use of eminent domain, Project routing near residential areas, potential impacts to property values, and potential health and safety issues associated with electrical and magnetic fields. Other topics identified by federal agencies and Indian Tribes include potential impacts to the lesser prairie-chicken and other species, crossings of large rivers, and potential impacts to cultural resources.

EPA will publish a Notice of Availability in the *Federal Register* announcing the comment period for this Draft EIS. DOE will publish a separate Notice of Availability for this Draft EIS in the *Federal Register,* which will include the locations, dates, and times of the public hearings regarding this Draft EIS and identify the methods for submitting comments during the 90-day public comment period. This information can also be obtained from the Project's EIS website (http://www.plainsandeasterneis.com). DOE is hosting 15 public hearings in Texas, Oklahoma, Arkansas, and Tennessee to receive comments on the Draft Plains & Eastern EIS. These comments, as well as comments submitted by other methods, will be addressed in the Final EIS.

S.5. Project Description and Alternatives

S.5.1 DOE Proposed Action

DOE's Proposed Action is to participate, acting through the Administrator of Southwestern, in the Applicant Proposed Project in one or more of the following ways: designing, developing, constructing, operating, maintaining, or owning a new electric power transmission facility and related facilities located within certain states in which Southwestern operates: namely Oklahoma, Arkansas and possibly Texas.

S.5.2 Applicant Proposed Project Description

The Applicant Proposed Project would include an overhead ± 600 kilovolt (kV) HVDC electric transmission system and associated facilities with the capacity to deliver approximately 3,500MW, primarily from renewable energy generation facilities in the Oklahoma and Texas Panhandle regions, to load-serving entities in the Mid-South and Southeast United States via an interconnection with TVA in Tennessee.

Major facilities associated with the Applicant Proposed Project consist of converter stations in Oklahoma and Tennessee, an approximate 720-mile, ± 600kV HVDC transmission line, an AC collection system, and access roads. The following sections summarize the Applicant Proposed Project's major facilities and improvements.

S.5.2.1 Converter Stations and Other Terminal Facilities

The Applicant Proposed Project includes two AC/direct current (DC) converter stations, one at each end of the transmission line. The Applicant proposes to locate a converter station in Texas County, Oklahoma, and a converter station in either Shelby County or Tipton County, Tennessee.[5] At each converter station, AC transmission lines would be required to connect to the existing grid. These AC transmission lines would include:

- One double-circuit 345kV AC transmission line connecting to the future Xcel Energy/Southwestern Public Service Co. Optima Substation in Oklahoma
- 500kV AC transmission lines connecting to the TVA Shelby Substation in Tennessee

An additional converter station in Arkansas is also being evaluated as part of the DOE Alternatives. Information on this alternative is provided in Section S.5.3.3.

A converter station would be similar to a typical AC substation, but with additional equipment to convert between AC and DC. Ancillary facilities such as communications equipment and cooling equipment would be required at each converter station. In addition, AC transmission lines would connect each converter station to the existing grid. Each converter station would include:

- DC switchyard
- DC smoothing reactors
- DC filters
- Transformers
- Valve halls (which contain the power electronics for converting AC to DC and vice versa)
- AC switchyard
- AC filter banks
- AC circuit breakers and disconnect switches

A typical converter station may require 45 to 60 acres. The AC switchyard would occupy the largest area of the electrical facility within the converter station footprint. There could be up to two buildings (valve halls) to house the power electronic equipment used in AC/DC conversion, each approximately 200 feet long by 75 feet wide and 60 to 85 feet tall.

The western terminus of the Project would interconnect to the existing transmission system operated by the SPP in Texas County, Oklahoma. The eastern terminus would interconnect to the existing transmission system operated by TVA at the existing Shelby Substation, located in Shelby County, Tennessee, which sits adjacent to the Tipton County line.

[5] The eastern converter station would be located either in Shelby County or Tipton County, and the AC interconnection would be located at the existing Shelby substation in Shelby County.

S.5.2.2 HVDC Transmission Line

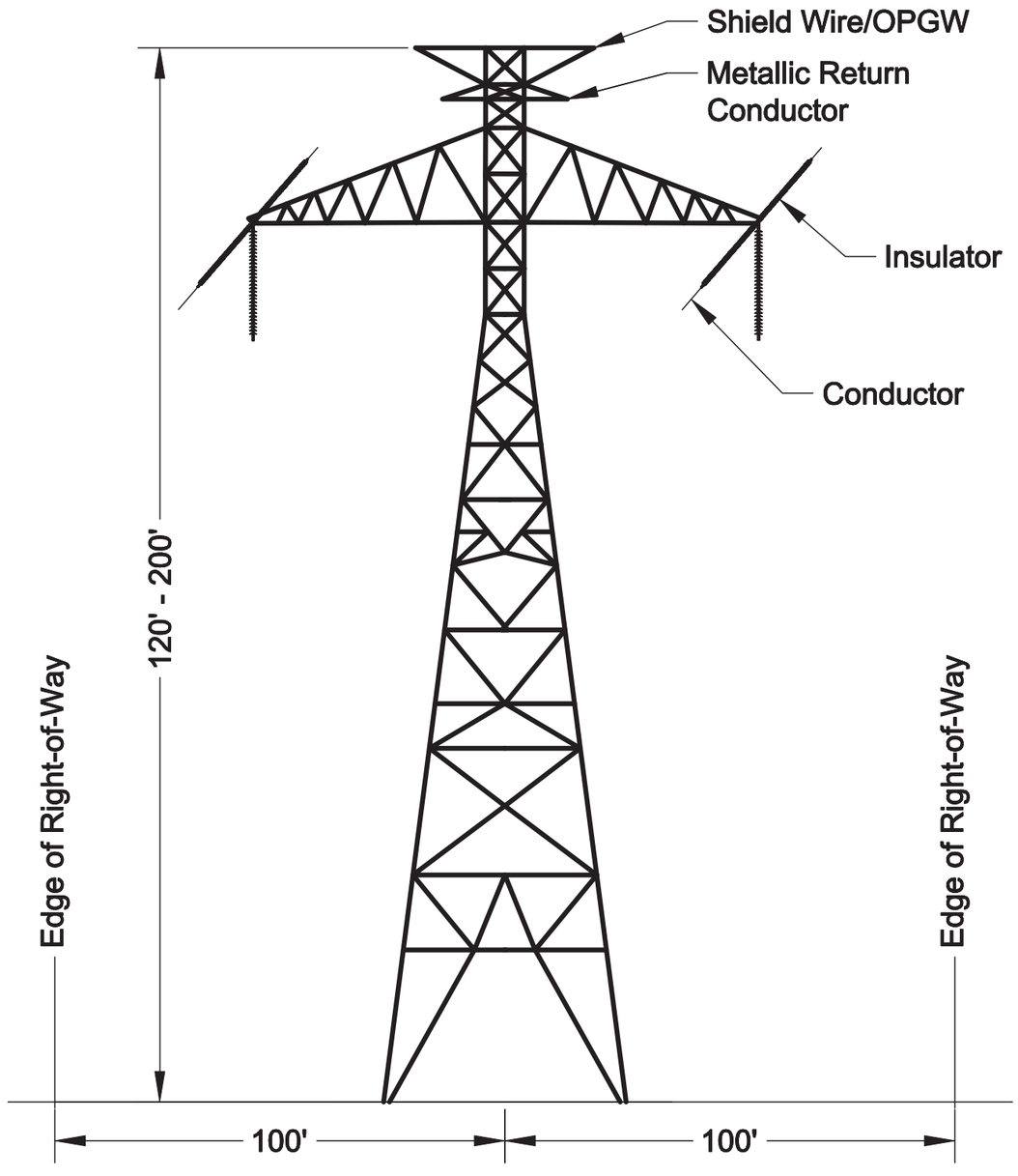
The Applicant Proposed Project would transmit energy from the Oklahoma converter station to the Tennessee converter station via an approximate 720 mile ± 600kV HVDC overhead electric transmission line. As part of its Applicant Proposed Project, Clean Line proposed one route for the HVDC transmission line. As required by NEPA, DOE has identified and analyzed other reasonable alternative routes (see Section S.5.3.3). To simplify and organize the analysis of impacts from the HVDC transmission line, DOE has divided the 720-mile-long transmission line into seven sequential regions, numbered Region 1 to Region 7 from west to east, and describes impacts from the Applicant Proposed Project by region. The regions potentially affected by the HVDC Applicant Proposed Route (and the counties included in each region) are listed in Table S-1 and depicted on Figures S-2a through S-2f. HVDC transmission facilities, which are described in more detail in Appendix F of the EIS, include:

- ROW easements for the transmission line, with a typical width of approximately 150 to 200 feet
- Tubular and lattice steel structures used to support the transmission line
- Electrical conductor (transmission line) and metallic return
- Communications/control and protection facilities (optical ground wire and fiber optic regeneration sites).

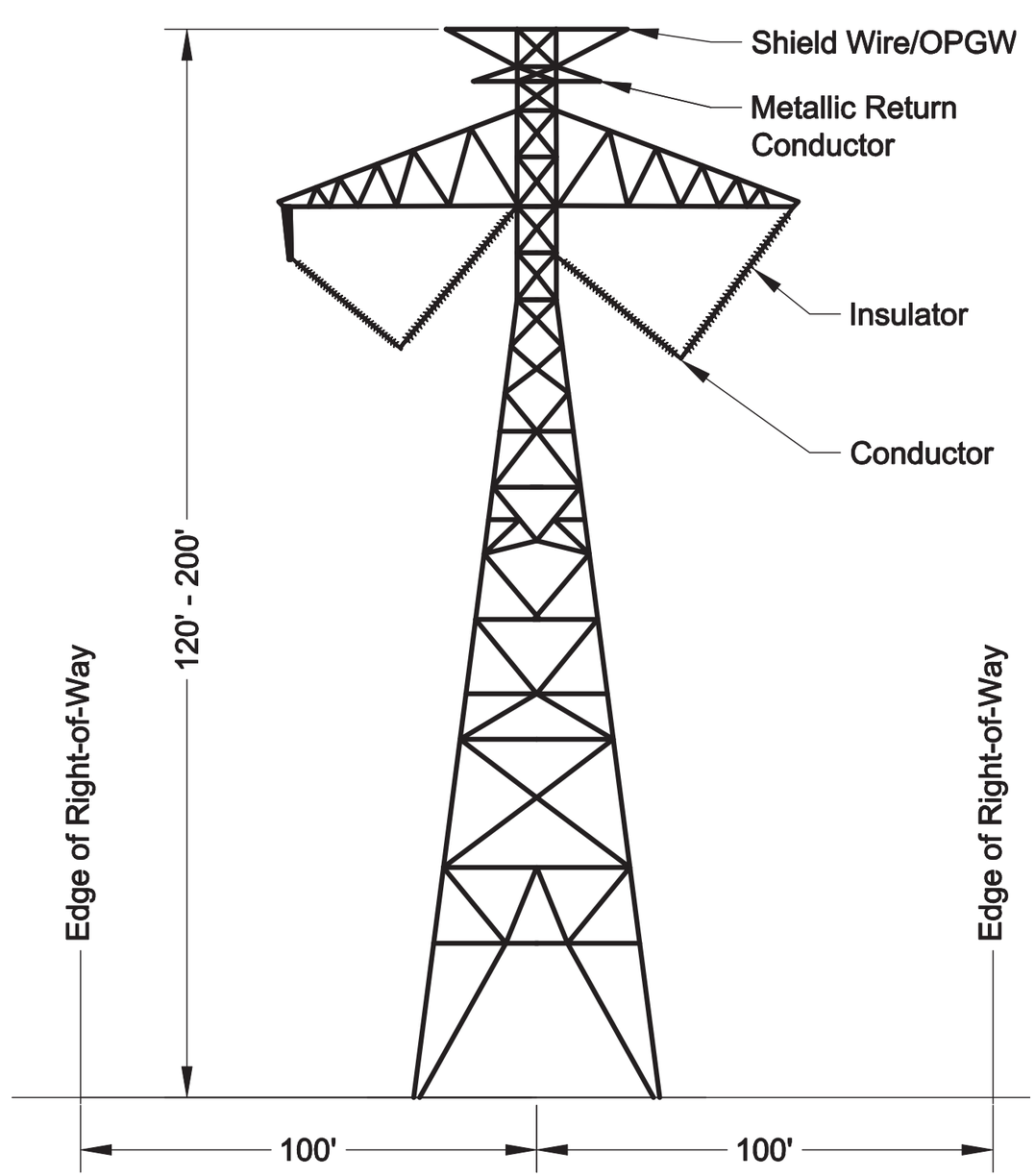
Table S-1:
Counties Potentially Affected by the Applicant Proposed Route

Feature	Length (Miles)	State	Counties
Region 1 (Oklahoma Panhandle)	115.9	Oklahoma	Texas, Beaver, Harper, and Woodward
Region 2 (Oklahoma Central Great Plains)	106.2	Oklahoma	Woodward, Major, and Garfield
Region 3 (Oklahoma Cross Timbers)	162.1	Oklahoma	Garfield, Kingfisher, Logan, Payne, Lincoln, Creek, Okmulgee, and Muskogee
Region 4 (Arkansas River Valley)	126.7	Oklahoma and Arkansas	Muskogee and Sequoyah counties, Oklahoma, and Crawford, Franklin, Johnson, and Pope counties, Arkansas
Region 5 (Central Arkansas)	113.2	Arkansas	Pope, Conway, Van Buren, Cleburne, White, and Jackson
Region 6 (Cache River, Crowley's Ridge Area, and St. Francis Channel)	54.5	Arkansas	Jackson, Cross, and Poinsett
Region 7 (Arkansas Mississippi River Delta and Tennessee)	42.9	Arkansas and Tennessee	Poinsett and Mississippi counties, Arkansas, and Tipton and Shelby counties, Tennessee
Total Length of the Applicant Proposed Route	721.5		

The structures used to support the HVDC transmission line would be constructed of either tubular or lattice steel and would typically range in height from 120 to 200 feet. Structure heights, span lengths, and vertical clearance would be determined in accordance with the code requirements, the Applicant's design criteria, and applicable standards and laws. The Applicant may use taller structures in circumstances where additional clearances and/or longer spans are required. The typical lattice and monopole structures are depicted in Figures S-3 through S-5.

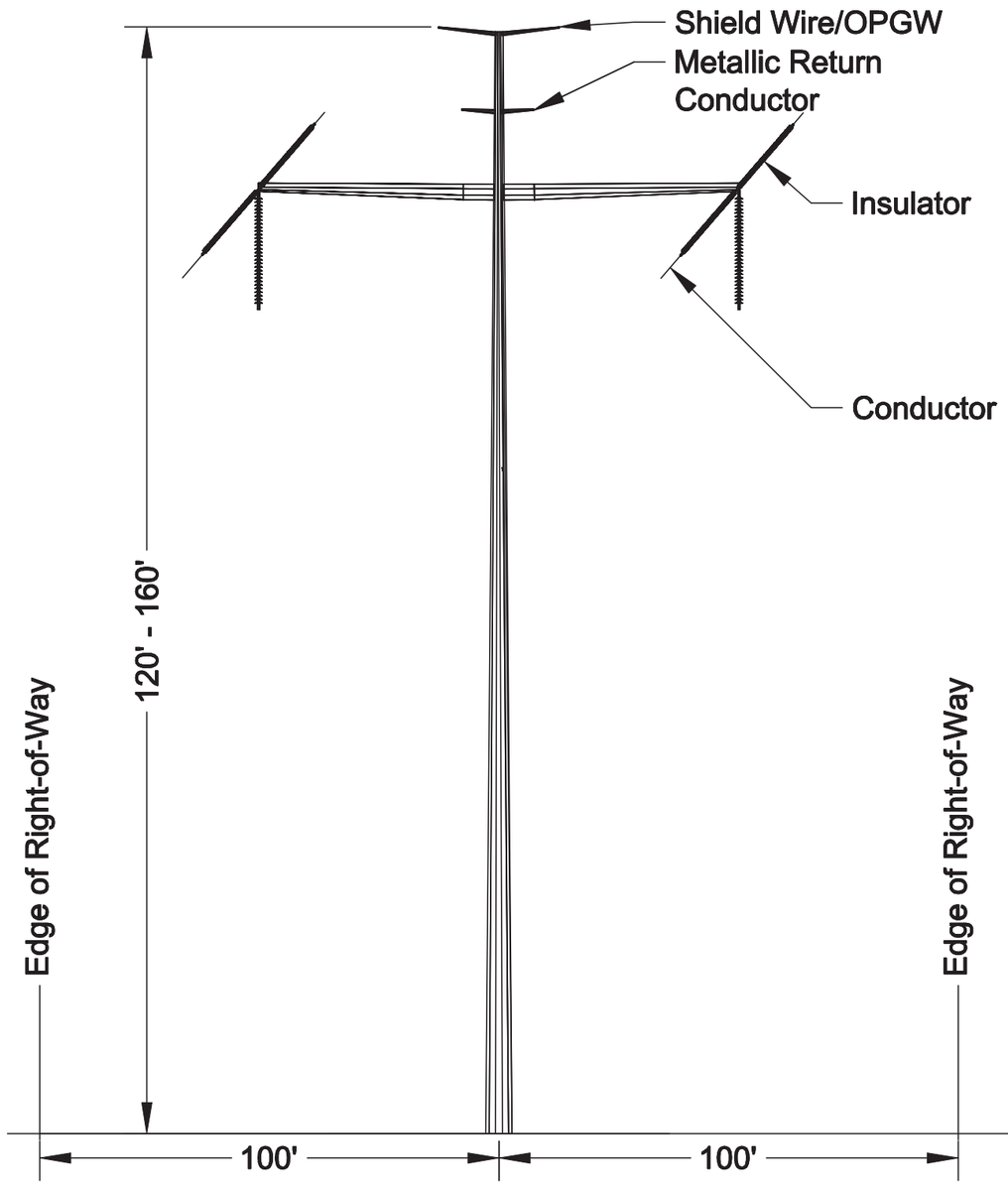


600kV Lattice Deadend

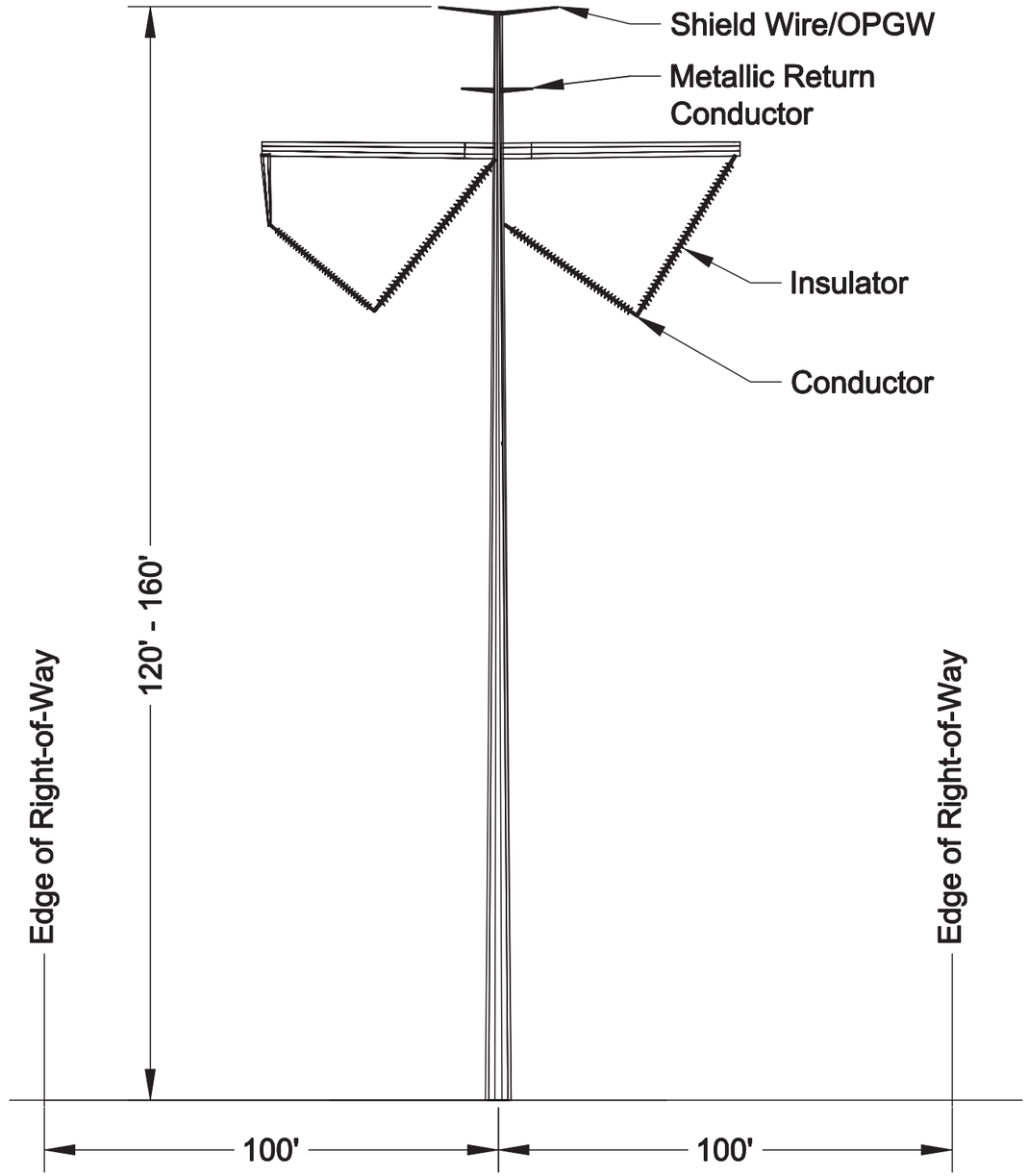


600kV Lattice Running Angle

Figure S-3: 600kV Lattice Deadend and Running Angle

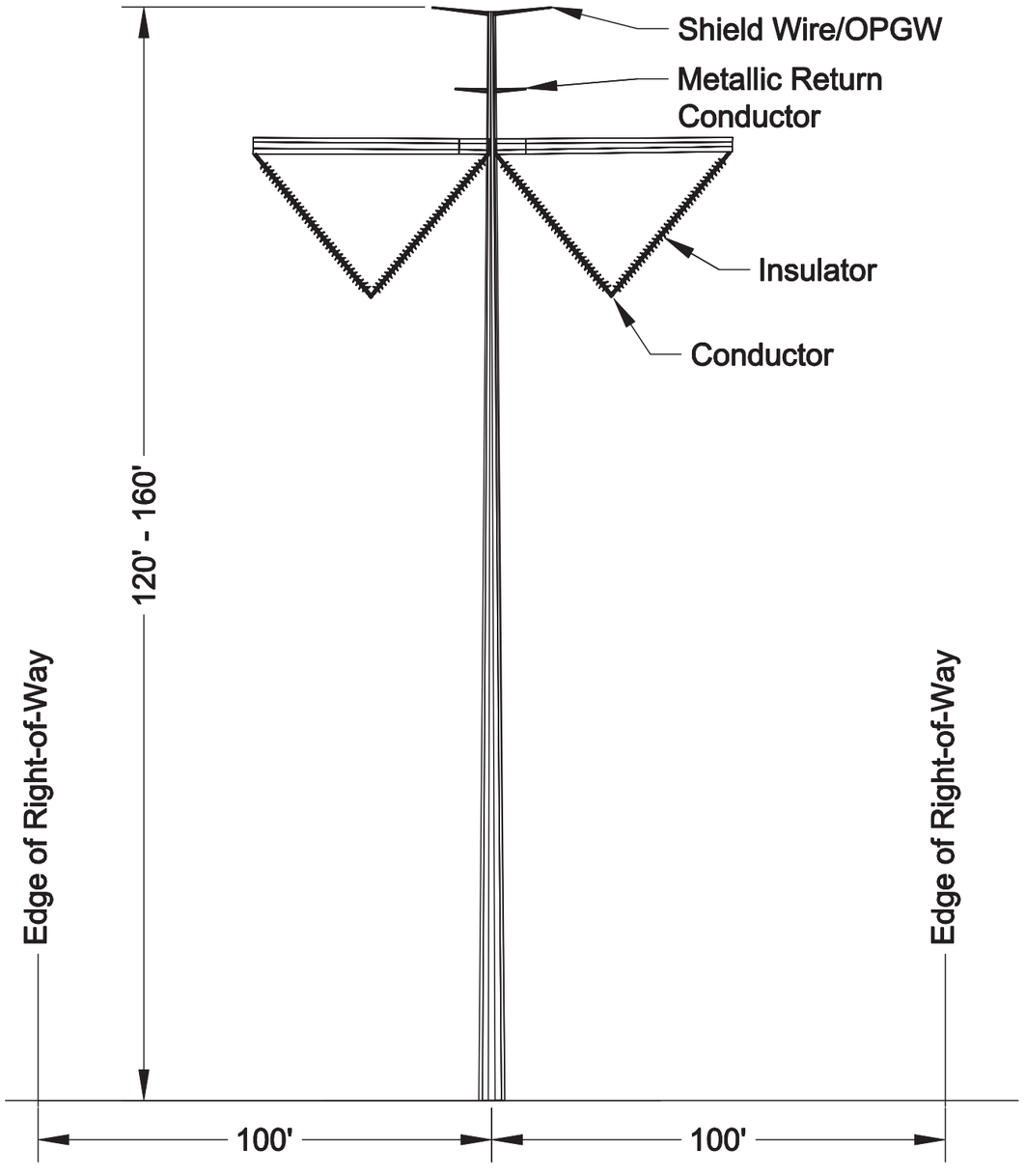


600kV Monopole Deadend



600kV Monopole Running Angle

Figure S-4: 600kV Monopole Deadend and Running Angle



600kV Monopole Tangent

Figure S-5: 600kV Monopole Tangent

S.5.2.3 AC Collection System

In addition to the HVDC transmission line, the Applicant Proposed Project would also include construction and operation of AC collection system transmission lines to collect energy from generation resources in the Texas and Oklahoma Panhandle regions. The collection system would consist of four to six AC transmission lines up to 345kV from the Oklahoma converter station to points in the Oklahoma or Texas Panhandle to facilitate efficient interconnection of wind energy generation. The interconnection points with this wind energy generation would likely be within a 40-mile radius from the Oklahoma Converter Station Siting Area. Components of the AC collection system include:

- ROW easements for the transmission line, with a typical width of 150 to 200 feet
- Tubular or lattice steel structures used to support the transmission line
- Electrical conductor
- Communications/control and protection facilities (optical ground wire and fiber optic regeneration sites)

The Applicant expects that future wind energy generation facilities (wind farms) would connect to the AC collection system by way of a number of possible configurations. The Applicant based the 40-mile radius on preliminary studies of engineering constraints and wind resource data, industry knowledge, and economic feasibility. These configurations could range in size from a direct tap, a bus ring, or even a small substation (about 2 to 5 acres in size) with transformer and switching equipment. The type and size of these AC connections is unknown at this time; the final design of these facilities would depend on a number of factors including their location, the number of connections, and the nameplate capacity and voltage of generation facilities.

Figure S-6 depicts the siting area for the AC collection system in the Oklahoma and Texas panhandles. The EIS refers to possible locations of the AC collector lines as the AC collection system routes. These routes do not represent alternatives for DOE selection. Rather, future development of AC transmission lines within these possible routes would be driven by the locations of wind farms that may be constructed in the future to connect to the Project. Of the 13 possible routes identified and analyzed, the Applicant anticipates that only 4 to 6 of these routes would be developed. The counties crossed by the AC collection system routes are listed in Table S-2.

Table S-2:
Counties Potentially Crossed by the AC Collection System Routes

Route	Length (Miles)	State	Counties
E-1	29.0	Oklahoma	Texas and Beaver
E-2	40.0	Oklahoma	Texas and Beaver
E-3	40.1	Oklahoma	Texas and Beaver
NE-1	29.9	Oklahoma	Texas
NE-2	26.2	Oklahoma	Texas
NW-1	51.9	Oklahoma	Texas and Cimarron
NW-2	56.0	Oklahoma	Texas and Cimarron
SE-1	40.2	Oklahoma	Texas
		Texas	Hansford and Ochiltree
SE-2	13.3	Oklahoma	Texas
		Texas	Hansford
SE-3	49.0	Oklahoma	Texas and Beaver
		Texas	Ochiltree

Table S-2:
Counties Potentially Crossed by the AC Collection System Routes

Route	Length (Miles)	State	Counties
SW-1	13.3	Oklahoma	Texas
		Texas	Hansford
SW-2	37.0	Oklahoma	Texas
		Texas	Hansford and Sherman
W-1	20.8	Oklahoma	Texas

S.5.2.4 Access Roads

Access roads would be necessary for the Project. The Applicant would use existing access roads, improve existing roads where necessary, and build new roads where required to access facilities, transmission ROWs, structures, fiber optic regeneration sites and work areas during construction and operations and maintenance. The Applicant does not anticipate the need for a permanent access road along the entire length of transmission line ROWs. The Applicant would use existing roads to the extent practicable and would locate access roads between structures in active agricultural areas along fence lines or field lines where practicable to minimize impacts. Where existing roads are not available, the Applicant would construct new roads. Paving of roads would be limited to approach aprons at intersections with existing paved roads and all-weather access roads to converter stations, unless otherwise required by jurisdictional authorities.

Site conditions, engineering design, construction requirements, adopted environmental protection measures (EPMs) and relevant permits would govern the specific locations of proposed new and existing access roads.

S.5.2.5 Easements and Property Rights

Prior to construction, the Applicant or DOE, if it elects to participate in the Project, would acquire property interests from owners of land along the path of the Project. These interests could take the form of a temporary easement to allow for access roads and storage yards that will be needed during construction. They could also take the form of longer term easements or fee estates (i.e., full ownership) for siting transmission line towers, converter stations, and other facilities.

Any property interests in land needed for the Project would be acquired through a negotiated sale or eminent domain proceedings, land owners would be compensated for their property interests. According to the Applicant's expressed intent, the first step would be for the Applicant to offer compensation to landowners in exchange for easements or other property interests needed for the Project. If the Applicant is unable to acquire the necessary property interests from a landowner through a negotiated agreement, DOE may choose to acquire those property interests through a negotiated agreement for compensation. Where a negotiated agreement is not possible, DOE may in appropriate circumstances exercise the federal government's eminent domain authority to acquire the interests. Consistent with the Constitution of the United States and other applicable law, the landowner would be paid just compensation for the real estate interest. Real estate acquisition by federal entities, such as DOE, is governed by the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646) (42 USC 4601 et seq.). DOE must also comply with 49 CFR Part 24, Subpart B, "Real Property Acquisition," the government-wide regulation that implements Public Law 91-646.

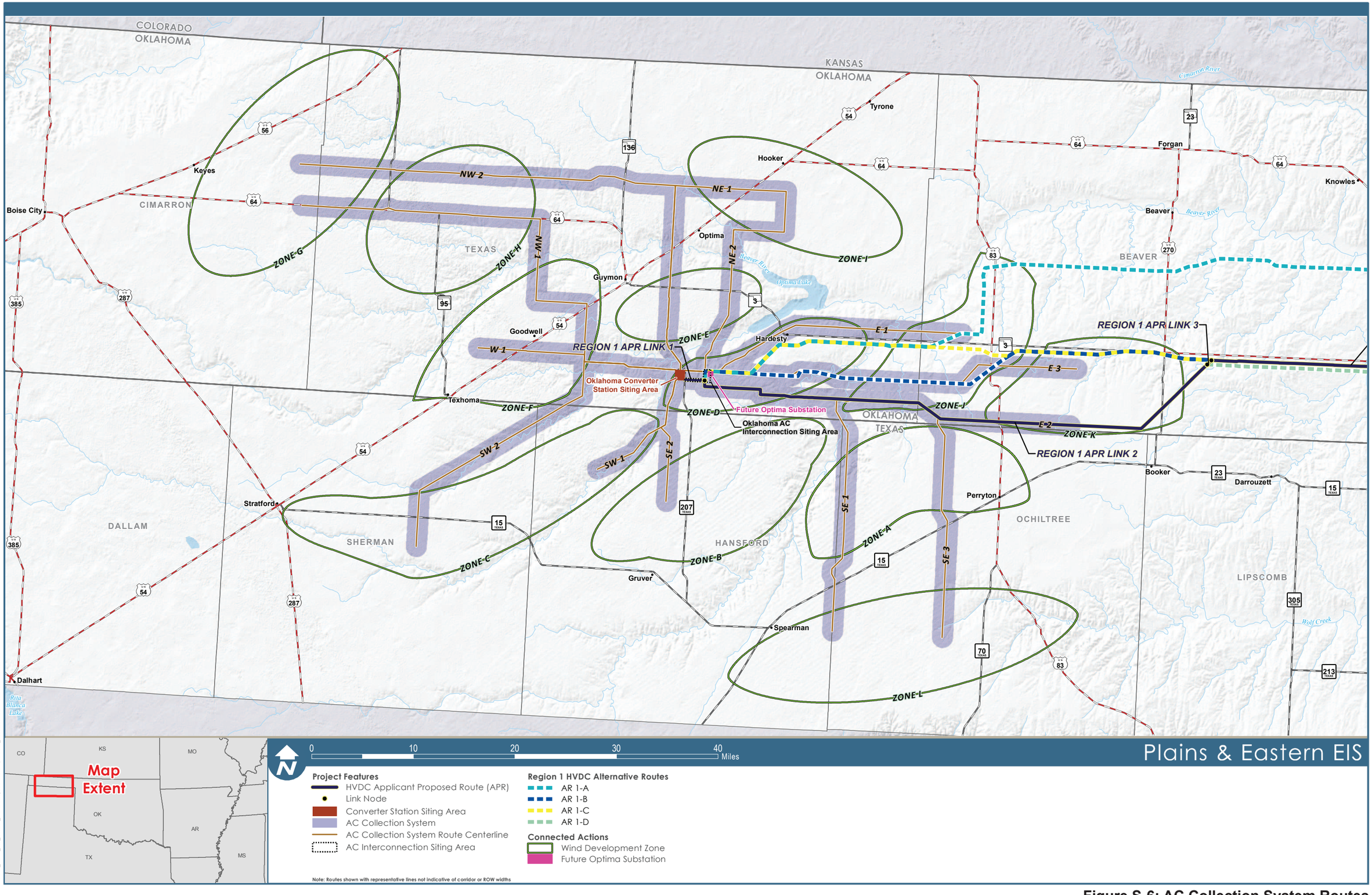


Figure S-6: AC Collection System Routes

S.5.2.6 Project Construction

Construction activities would be subject to measures/requirements imposed as part of federal, state, or local permits and authorizations. The construction of a typical converter station would include:

- Land surveying and staking
- Pre-construction surveys for biological and cultural resources
- Clearing and grubbing, grading, and construction of all-weather access roads
- Fencing
- Compaction and foundation installation
- Installation of underground electrical raceways and grounds
- Steel-structure erection and area lighting
- Installation of insulators, bus bar, and high-voltage equipment
- Installation of control and protection equipment
- Placement of final crushed-rock surface
- Installation of security systems, including cameras
- Testing and electrical energization

Construction activities for the HVDC and AC transmission lines would typically include the following activities:

- Preparation of multi-use construction yards
- Pre-construction surveys for biological and cultural resources
- Preparation of the ROW
- Clearing and grading
- Foundation excavation and installation
- Structure assembly and erection
- Conductor stringing
- Grounding
- Cleanup and site restoration

Figure S-7 illustrates these activities and the typical transmission construction sequence.

The duration of construction is expected to be approximately 36 to 42 months for the entire Project, including the time from initiation of clearing and grading through clean up and restoration. The actual construction duration would depend on a number of factors such as weather and availability of labor. The Applicant would most likely divide the Project into five segments with multiple contractors working concurrently on different portions of the route. Construction may be active on any or all segments at any given time and activities may occur in parallel with other segments or be staggered. The Applicant would stage construction on each segment from multi-use construction yards located at regular intervals (approximately every 25 miles) along the route.

Project-wide, the workforce would reach a peak of approximately 1,700 workers. The average workforce across the Applicant Proposed Project would be approximately 965 people.

Temporary construction areas would be required to support construction. Temporary multi-use construction yards and fly yards (landing areas for helicopters used during construction) would be used for staging construction personnel and equipment, and for storage of materials to support construction activities. Tensioning and pulling sites

and wire-splicing sites would also be staged at 2- to 3-mile intervals along the Project ROW. Typically, temporary construction areas would be sited outside the ROW at regular intervals and at convenient distances from the facilities being constructed for the Project.

S.5.2.7 Operations and Maintenance

All transmission lines would be inspected regularly or as necessary using fixed-wing aircraft, helicopters, ground vehicles, all-terrain vehicles, and/or personnel on foot. The frequency of inspections and maintenance would meet or exceed standards, such as those specified by the National Electrical Safety Code and North American Electric Reliability Corporation. Applicable federal, state, and local permits would be obtained prior to conducting maintenance.

The ROW would be maintained during operation in accordance with a project-specific Transmission Vegetation Management Plan developed by the Applicant for the Project, consistent with rules developed by the North American Electric Reliability Corporation. In most areas, accepted standard utility practices consistent with the Transmission Vegetation Management Plan, such as tree-trimming, tree removal, and/or brush removal, would be utilized to maintain vegetation within the ROW. In addition, vegetation clearing practices may vary based on dominant plant communities.

The Applicant expects that operations and maintenance of the Project would require 72 to 87 full-time workers. This would include up to 15 workers at each of the converter stations and a total of 42 workers in Oklahoma and Arkansas for the HVDC transmission line.

S.5.2.8 Decommissioning

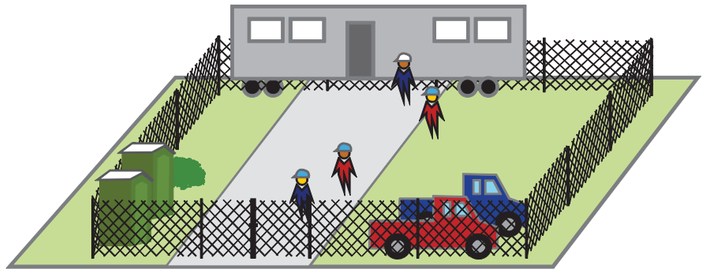
A transmission system lifetime can exceed 80 years with proper maintenance. At the end of the service life of the Project, conductors, insulators, and structures could be dismantled and removed. The converter stations and regeneration stations, if not needed for other existing transmission line projects, could also be dismantled and removed. The station structures would be disassembled and either used at another station or sold for scrap. Access roads that have a sole purpose of providing maintenance crews access to the transmission lines could be decommissioned following removal of the structures and lines, or could be decommissioned with the lines in service if determined to no longer be necessary. The Applicant would consult with landowners to assess whether access roads may be useful to them and the Applicant may elect to leave the access roads in place. A Decommissioning Plan would be developed prior to decommissioning and would follow appropriate governing requirements at that time.

S.5.3 Alternatives

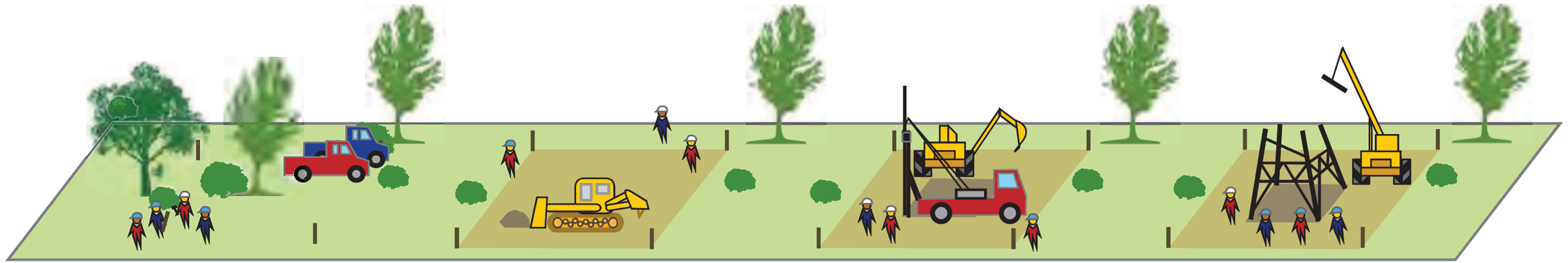
In the EIS, DOE analyzes the potential environmental impacts of the Proposed Action, the range of reasonable alternatives, and a No Action Alternative. In addition, in Section 5.3.4, DOE describes other alternatives that were identified during the EIS scoping process that DOE considered but eliminated from detailed analysis.

S.5.3.1 No Action Alternative

This EIS analyzes a No Action Alternative, under which DOE would not participate with the Applicant in the Project. Under the No Action Alternative, DOE assumes for analytical purposes that the Project would not proceed and none of the potential environmental effects associated with the Project would occur.



Preparation of Multi-use Construction Yards

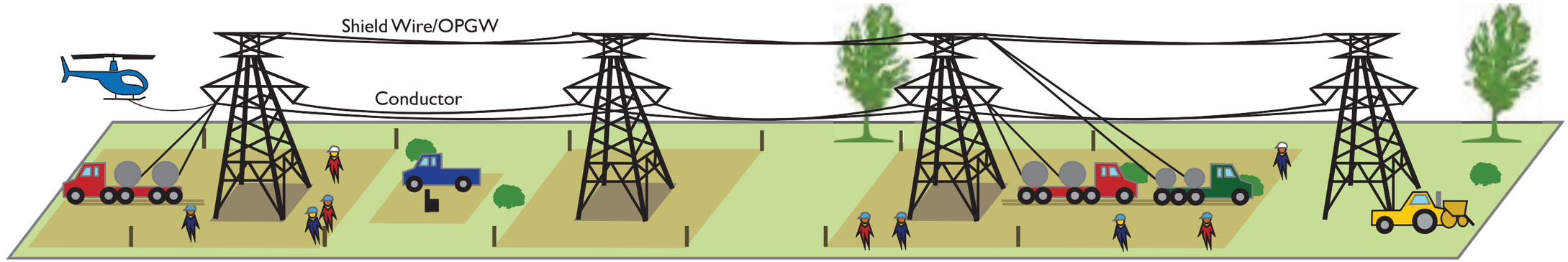


Preparation of the Right-of-Way

Clearing and Grading

Foundation Excavation and Installation

Structure Assembly and Erection



Tensioning Site

Wire-Splicing

Pulling Site

Conductor Stringing

Cleanup and Site Reclamation

Figure S-7: HVDC Transmission Line Construction Sequence

S.5.3.2 Applicant Proposed Route

As indicated in Section S.5.2.2, the Applicant has identified a specific route for the HVDC transmission line from the Oklahoma Panhandle Region to interconnect with TVA's electrical system in western Tennessee. For purposes of analysis, the Applicant Proposed Route is described below in terms of seven regions, which were based on geographic similarities and common node points along the route (where the Applicant Proposed Route and HVDC alternative routes converge). Within each region, the Applicant Proposed Route is divided into links. These links represent sections of the Applicant Proposed Route between points where alternative routes intersect with it. The alternative routes (described in Section S.5.3.3.2) diverge from the Applicant Proposed Route and provide an alternative to the corresponding links of the Applicant Proposed Route. The links are labeled on the figures of the Applicant Proposed Route (Figures S-2a through S-2f).

S.5.3.2.1 Region 1 (Oklahoma Panhandle)

Region 1 includes primarily grassland/herbaceous land cover. Region 1 begins at the converter station site in Texas County, Oklahoma, and continues east through Texas, Beaver, Harper, and Woodward counties approximately 116 miles to the area north of Woodward, Oklahoma. The Applicant Proposed Route in Region 1 is shown on Figure S-2a.

The AC collection system is located within Region 1 and within a 40-mile radius centered on the Oklahoma Converter Station Siting Area including Cimarron, Beaver, Texas, Ochiltree, Hansford, and Sherman counties. To facilitate efficient interconnection of wind generated electricity, it is expected that the Applicant would construct four to six AC collection transmission lines of up to 345kV from the Oklahoma converter station to points in the Oklahoma and Texas Panhandle regions. The location of the AC collection system routes will be driven by future wind energy development. The AC collection system is shown on Figures S-1 and S-2a.

S.5.3.2.2 Region 2 (Oklahoma Central Great Plains)

Region 2 includes primarily grassland/herbaceous and cultivated crop land covers. Region 2 begins north of Woodward, Oklahoma, and continues southeast through Woodward, Major, and Garfield counties, Oklahoma, for approximately 106 miles to end approximately 16 miles southeast of Enid, Oklahoma. The Applicant Proposed Route in Region 2 is shown in Figure S-2b.

S.5.3.2.3 Region 3 (Oklahoma Cross Timbers)

Region 3 includes primarily grassland/herbaceous, deciduous forest, and pasture/hay land covers. Region 3 begins southeast of Enid, Oklahoma, and continues southeast through Garfield, Kingfisher, Logan, Payne, Lincoln, Creek, Okmulgee, and Muskogee counties for approximately 162 miles and ends north of Webbers Falls, Oklahoma, at the Arkansas River. The eastern portion of Region 3 from Stillwater to the region's terminal point on the eastern end has more residential development than the other portions of Region 3. The Applicant Proposed Route in Region 3 is shown in Figure S-2c.

S.5.3.2.4 Region 4 (Arkansas River Valley)

Region 4 includes primarily pasture/hay and deciduous forest land covers. Region 4 begins north of Webbers Falls in Muskogee County, Oklahoma, and continues east though Muskogee and Sequoyah counties in Oklahoma, and Crawford, Franklin, Johnson, and Pope counties in Arkansas, for approximately 127 miles, and ends north of Russellville, Arkansas. The Applicant Proposed Route in Region 4 is shown in Figure S-2d.

The Applicant Proposed Route includes the Lee Creek Variation, which refers to a route variation near the Oklahoma-Arkansas state line. It was developed by the Applicant to avoid a buffer zone around the Lee Creek Reservoir. It begins in Sequoyah County, Oklahoma, at a point approximately 1.9 miles west of the state line, where it proceeds east-northeast for approximately 2 miles, then east-southeast, ending in Crawford County, Arkansas, approximately 1.5 miles east of the state line, where it rejoins the Applicant Proposed Route.

S.5.3.2.5 Region 5 (Central Arkansas)

Region 5 includes primarily pasture/hay, deciduous forest, and evergreen forest land covers. Region 5 begins north of Russellville, in Pope County, Arkansas, and continues east through Pope, Conway, Van Buren, Faulkner, Cleburne, White, and Jackson counties in Arkansas and ends southwest of Newport, in Jackson County, Arkansas, for 113 miles. The Applicant Proposed Route in Region 5 is shown in Figure S-2e.

S.5.3.2.6 Region 6 (Cache River, Crowley's Ridge Area, and St. Francis Channel)

With the exception of the Crowley's Ridge area, Region 6 primarily includes cultivated crop land covers. Region 6 begins southwest of Newport in Jackson County, Arkansas, and continues northeast through Jackson, Cross, and Poinsett counties in Arkansas, for approximately 55 miles and ends south of Marked Tree Arkansas. Crowley's Ridge consists mostly of hardwood forest. The Applicant Proposed Route in Region 6 is shown in Figure S-2f.

S.5.3.2.7 Region 7 (Arkansas Mississippi River Delta and Tennessee)

Region 7 includes primarily cultivated crop land covers. Region 7 begins south of Marked Tree, in Poinsett County, Arkansas, and continues east and southeast through Poinsett and Mississippi counties in Arkansas, across the Mississippi River and into Tipton and Shelby counties in Tennessee, for approximately 43 miles, ending near the Tipton-Shelby county line south of Tipton, Tennessee. The Applicant Proposed Route in Region 7 is shown in Figure S-2f.

S.5.3.3 DOE Alternatives

The DOE Alternatives evaluated in the EIS include an intermediate AC/DC converter station in Arkansas and HVDC route alternatives in each region.

S.5.3.3.1 Arkansas Converter Station

During the scoping period, DOE received comments from stakeholders in Arkansas who were concerned that the state would endure impacts from the Project without receiving any of the benefits (e.g., ability to accept increased amounts of renewable energy, tax revenues from property and ad valorum taxes associated with new facilities, and increased number of jobs). Based on these comments, DOE requested that Clean Line evaluate the feasibility of an alternative that would add a converter station in Arkansas. The Arkansas converter station would be an intermediate converter station; it would not replace the Oklahoma or Tennessee converter stations. Based on the Applicant's feasibility evaluation, an Arkansas converter station could be sited in either Pope or Conway County, Arkansas. This alternative converter station would be similar to the Oklahoma and Tennessee converter stations except that it would likely require a smaller land area, encompassing approximately 40 to 50 acres. Based on preliminary design and studies, it would be capable of interconnecting 500MW. With the implementation of this alternative, the delivery capability of the Project would be increased to 4,000MW.

The interconnection for the Arkansas Converter Station would include an approximate 6-mile 500kV AC transmission line to an interconnection point along the existing Arkansas Nuclear One-Pleasant Hill 500kV AC transmission line by way of a direct tap or small switchyard.

S.5.3.3.2 HVDC Alternative Routes

DOE developed alternative routes for analysis (this route development process is described in Appendix G of the EIS). These alternative routes were discussed and evaluated with Clean Line for feasibility. Eventual selection of a route alignment for the HVDC transmission line could either follow the Applicant Proposed Route for the entire length or could bypass specific links of the Applicant Proposed Route by selecting specific alternative routes. The alternative routes diverge from the Applicant Proposed Route and provide an alternative to the corresponding links of the Applicant Proposed Route. The links are labeled on the figures of the Applicant Proposed Route (Figures S-2a through S-2f). The counties crossed by the alternative routes are provided in Table S-3 and are shown in Figures S-2a through S-2f. Table S-3 includes information about the links of the Applicant Proposed Route to illustrate their relationship to the alternative routes.

Table S-3:
Counties Potentially Affected by HVDC Alternative Routes

Feature	Length (Miles)	State	Counties
Region 1 (Oklahoma Panhandle)			
Link 1 of the Applicant Proposed Route (no corresponding HVDC alternative route)	1.91	Oklahoma	Texas
HVDC Alternative Route 1-A	123.3	Oklahoma	Texas, Beaver, Harper, and Woodward
Corresponding Links (2, 3, 4, 5) of the Applicant Proposed Route	114.0	Oklahoma	Texas, Beaver, Harper, and Woodward
HVDC Alternative Route 1-B	52.1	Oklahoma	Texas and Beaver
Corresponding Links (2, 3) of the Applicant Proposed Route	54.0	Oklahoma	Texas and Beaver
HVDC Alternative Route 1-C	52.2	Oklahoma	Texas and Beaver
Corresponding Links (2, 3) of the Applicant Proposed Route	54.0	Oklahoma	Texas and Beaver
HVDC Alternative Route 1-D	33.6	Oklahoma	Beaver and Harper
Corresponding Links (3, 4) of the Applicant Proposed Route	33.7	Oklahoma	Beaver and Harper
Region 2 (Oklahoma Central Great Plains)			
Link 1 of the Applicant Proposed Route (no corresponding HVDC alternative route)	20.32	Oklahoma	Woodward
HVDC Alternative Route 2-A	57.3	Oklahoma	Woodward and Major
Corresponding Link (2) of the Applicant Proposed Route	54.6	Oklahoma	Woodward and Major
HVDC Alternative Route 2-B	29.9	Oklahoma	Major and Garfield
Corresponding Link (3) of the Applicant Proposed Route	31.3	Oklahoma	Major and Garfield
Region 3 (Oklahoma Cross Timbers)			
HVDC Alternative Route 3-A	37.7	Oklahoma	Garfield, Logan, and Payne
Corresponding Link (1) of the Applicant Proposed Route	40.1	Oklahoma	Garfield, Kingfisher, Logan, and Payne
HVDC Alternative Route 3-B	47.9	Oklahoma	Garfield, Logan, and Payne

Table S-3:
Counties Potentially Affected by HVDC Alternative Routes

Feature	Length (Miles)	State	Counties
Corresponding Links (1, 2, 3) of the Applicant Proposed Route	50.1	Oklahoma	Garfield, Kingfisher, Logan, and Payne
HVDC Alternative Route 3-C	121.9	Oklahoma	Payne, Lincoln, Creek, Okmulgee, and Muskogee
Corresponding Links (3, 4, 5, 6) of the Applicant Proposed Route	118.9	Oklahoma	Payne, Lincoln, Creek, Okmulgee, and Muskogee
HVDC Alternative Route 3-D	39.4	Oklahoma	Muskogee
Corresponding Links (5, 6) of the Applicant Proposed Route	35.2	Oklahoma	Muskogee
HVDC Alternative Route 3-E	8.5	Oklahoma	Muskogee
Corresponding Links (6) of the Applicant Proposed Route	7.8	Oklahoma	Muskogee
Region 4 (Arkansas River Valley)			
Link 1 of the Applicant Proposed Route (no corresponding HVDC alternative route)	8.31	Oklahoma	Muskogee
HVDC Alternative Route 4-A	58.6	Oklahoma and Arkansas	Sequoyah County, Oklahoma, and Crawford and Franklin counties, Arkansas
Corresponding Links (3, 4, 5, 6) of the Applicant Proposed Route	60.6	Oklahoma and Arkansas	Sequoyah County, Oklahoma, and Crawford and Franklin counties, Arkansas
HVDC Alternative Route 4-B	78.9	Oklahoma and Arkansas	Sequoyah County, Oklahoma, and Crawford and Franklin counties, Arkansas
Corresponding Links (2, 3, 4, 5, 6, 7, 8) of the Applicant Proposed Route	81.5	Oklahoma and Arkansas	Sequoyah County, Oklahoma, and Crawford and Franklin counties, Arkansas
HVDC Alternative Route 4-C	3.4	Arkansas	Crawford
Corresponding Link (5) of the Applicant Proposed Route	2.2	Arkansas	Crawford
HVDC Alternative Route 4-D	25.4	Arkansas	Crawford and Franklin
Corresponding Links (4, 5, 6) of the Applicant Proposed Route	25.4	Arkansas	Crawford and Franklin
HVDC Alternative Route 4-E	36.9	Arkansas	Franklin, Johnson, and Pope
Corresponding Links (8, 9) of the Applicant Proposed Route	38.9	Arkansas	Franklin, Johnson, and Pope
Region 5 (Central Arkansas)			
HVDC Alternative Route 5-A	12.7	Arkansas	Pope
Corresponding Link (1) of the Applicant Proposed Route	12.3	Arkansas	Pope
Link 2 of the Applicant Proposed Route (no corresponding HVDC alternative route)	6.45	Arkansas	Pope
HVDC Alternative Route 5-B	71.2	Arkansas	Pope, Conway, Faulkner, White
Corresponding Links (3, 4, 5, 6) of the Applicant Proposed Route	67.4	Arkansas	Pope, Conway, Van Buren, Cleburne and White
HVDC Alternative Route 5-C	9.2	Arkansas	White
Corresponding Links (6, 7) of the Applicant Proposed Route	9.4	Arkansas	White
HVDC Alternative Route 5-D	21.7	Arkansas	White and Jackson
Corresponding Link (9) of the Applicant Proposed Route	20.5	Arkansas	White and Jackson

Table S-3:
Counties Potentially Affected by HVDC Alternative Routes

Feature	Length (Miles)	State	Counties
Link 8 of the Applicant Proposed Route (no corresponding HVDC alternative route)	1.61	Arkansas	White
HVDC Alternative Route 5-E	36.4	Arkansas	Van Buren, Faulkner, and White
Corresponding Links (4, 5, 6) of the Applicant Proposed Route	33.3	Arkansas	Van Buren, Cleburne, and White
HVDC Alternative Route 5-F	22.4	Arkansas	Cleburne and White
Corresponding Links (5, 6) of the Applicant Proposed Route	18.8	Arkansas	Cleburne and White
Region 6 (Cache River, Crowley's Ridge Area, and St. Francis Channel)			
Link 1 of the Applicant Proposed Route (no corresponding HVDC alternative route)	6.12	Arkansas	Jackson
HVDC Alternative Route 6-A	16.2	Arkansas	Jackson and Poinsett
Corresponding Links (2, 3, 4) of the Applicant Proposed Route	17.7	Arkansas	Jackson and Poinsett
HVDC Alternative Route 6-B	14.1	Arkansas	Jackson and Poinsett
Corresponding Link (3) of the Applicant Proposed Route	9.7	Arkansas	Jackson and Poinsett
Link 5 of the Applicant Proposed Route (no corresponding HVDC alternative route)	1.87	Arkansas	Poinsett
HVDC Alternative Route 6-C	23.2	Arkansas	Poinsett
Corresponding Links (6, 7) of the Applicant Proposed Route	24.9	Arkansas	Poinsett and Cross
HVDC Alternative Route 6-D	9.2	Arkansas	Cross and Poinsett
Corresponding Link (7) of the Applicant Proposed Route	8.6	Arkansas	Cross and Poinsett
Link 8 of the Applicant Proposed Route (no corresponding HVDC alternative route)	3.91	Arkansas	Poinsett
Region 7 (Arkansas Mississippi River Delta and Tennessee)			
HVDC Alternative Route 7-A	43.2	Arkansas and Tennessee	Poinsett and Mississippi counties, Arkansas, and Tipton County, Tennessee
Corresponding Link (1) of the Proposed Route	28.7	Arkansas and Tennessee	Poinsett and Mississippi counties, Arkansas, and Tipton County, Tennessee
Link 2 of the Applicant Proposed Route (no corresponding HVDC alternative route)	1.08	Tennessee	Tipton
HVDC Alternative Route 7-B	8.6	Tennessee	Tipton and Shelby
Corresponding Links (3, 4) of the Applicant Proposed Route	8.3	Tennessee	Tipton and Shelby
HVDC Alternative Route 7-C	23.8	Tennessee	Tipton and Shelby
Corresponding Links (3, 4, 5) of the Applicant Proposed Route	13.2	Tennessee	Tipton and Shelby
HVDC Alternative Route 7-D	6.2	Tennessee	Tipton and Shelby
Corresponding Links (4, 5) of the Applicant Proposed Route	6.6	Tennessee	Tipton and Shelby

As presented in Section S.5.5 (and further explained in Section 2.14), DOE has identified HVDC Alternative Route 4-B as a non-preferred alternative.

The description of structures, access roads, easement and property rights, construction, and operations and maintenance discussed in Section S.5.2 for the Applicant Proposed Project would be equally applicable to the DOE Alternatives. Impacts of the DOE Alternatives could nonetheless vary due to differences in affected environment and the scale of the alternatives compared to the Applicant Proposed Project. The impacts, and variations of impacts from the Applicant Proposed Project, are described in Chapter 3 of the EIS and summarized in Section S.6.1.

S.5.3.4 Alternatives Considered but Eliminated from Detailed Analysis

DOE considered several additional potential alternatives, in part based on public scoping comments, but eliminated them from detailed analysis as discussed below.

S.5.3.4.1 Alternative Transmission Line Routes

During the iterative planning and siting process for the HVDC transmission line, a number of route alternatives were proposed and studied. These alternatives were evaluated for their feasibility and ultimately eliminated from further study and consideration based on route-specific factors and public scoping comments. Route alternatives that were studied and eliminated and the rationales for their elimination are discussed in the DOE Alternatives Development Report; excerpts of which are included as Appendix G of the EIS.

S.5.3.4.2 Underground HVDC Transmission Line

During public scoping, some commenters suggested that the transmission line be installed underground for either the entire length or for discrete segments to minimize visual impacts associated with construction and operations and maintenance. To date, underground cable technology is not commercially available at the very high voltage and capacity levels (i.e., +/- 600kV and 3,500-4,000MW) planned for the Project. The highest achieved cable ratings for undergrounding HVDC, thus far, are ±500kV at about 2,000MW (KCC 2013[6]). While there is research underway for underground, high-voltage transmission cable technology that could conceivably be applied to the voltage and capacity levels of the Project, this research has yet to produce commercially available, proven technology, and DOE does not foresee that such technology will become available within the time frame for construction of the Project.

In addition, based on current understanding, even if such technology were to become available, other constraints would make it infeasible to install a conductor (i.e., a transmission line) of this voltage and capacity underground. Such conductors cannot be directly buried. They must be mechanically protected by being installed within a buried duct bank, conduit, or tunnel. Frequent access points would be required from the surface to allow for splicing, monitoring, and maintenance. Heat dissipation from the underground conductors would be a significant challenge to the installation. Also, the large insulation requirements would result in extreme weights for an underground conductor relative to an overhead conductor, so only short segments could be installed at any one time, significantly increasing the cost and time required for completing the construction. The diagnosis and repair of outages could be time-

[6] KCC (Kansas Corporation Commission). 2013. "Excerpt of the direct testimony of Dr. Wayne Galli P.E., Clean Line Energy Executive Vice President–Technical and Transmission Service (Ph.D., Electrical Engineering), before the Kansas Corporation Commission regarding the viability of buried transmission lines." Docket No.13-GBEE-803-MIS (pp 7-8), June 28. <http://estar.kcc.ks.gov/estar/ViewFile.aspx/20130715113406.pdf?Id=467ae836-59a0-42ef-8136-835e99dc5ac7>

consuming, which would affect emergency response times, and could result in additional ground disturbance and excavation to locate and repair the problems.

Based on this analysis, DOE concluded that undergrounding all or portions of the Project is not a reasonable alternative and has eliminated it from further analysis.

S.5.3.4.3 Local Generation and Distribution

During public scoping, commenters suggested utilizing distributed generation as an alternative to the Project. Distributed generation involves the use of small-scale power generation technologies that are usually installed at or near the location of the load being served by the generated power. Distributed generation does not require long-range transmission lines. Distributed generation systems range in size from approximately 5 kilowatts to 10MW; in contrast, utility-scale generation ranges from 10MW to more than 1,000MW per site. Examples of distributed generation resource technologies include residential and roof-top photovoltaic, energy storage devices, microturbines, and fuel cells.

This alternative was eliminated from further analysis because Section 1222 of the EPAct does not authorize the Secretary of Energy to participate with other entities in distributed generation, and the alternative does not meet the DOE-issued RFP for new or upgraded transmission projects. As such, the alternative would not meet the purpose and need for agency action. DOE has established policies and programs related to distributed generation (http://www.energy.gov/eere/wipo/renewable-energy-distributed-generation-policies-and-programs).

S.5.3.4.4 Energy Conservation Programs

During public scoping, commenters suggested energy conservation programs as an alternative to the Project. Commenters suggested that mandatory conservation and demand response programs be used to eliminate the need for more generation and transmission. This alternative was eliminated from detailed consideration because Section 1222(b) of the EPAct does not authorize the Secretary of Energy to participate with other entities in energy conservation programs. As such, the alternative would not meet the purpose and need for agency action. Further, the alternative would not satisfy the eligibility criteria in the DOE-issued RFP for new or upgraded transmission projects. DOE has established policies and programs related to energy conservation programs (http://www.energy.gov/eere/efficiency).

S.5.4 Connected Actions

Connected actions are those that are “closely related” to the proposal. Actions are considered connected if they automatically trigger other actions that may require environmental impact statements, cannot or will not proceed unless other actions have been taken previously or simultaneously, or are interdependent parts of a larger action and depend on the larger action for their justification (40 CFR 1508.25). The potential environmental impacts resulting from the connected actions are analyzed in the EIS and summarized in Section 2.11.

S.5.4.1 Wind Energy Generation

The construction and operation of reasonably foreseeable wind power facilities are evaluated as connected actions in the Plains & Eastern EIS. Wind power facilities that would interconnect with the Project are anticipated to be located in parts of the Oklahoma Panhandle and Texas Panhandle within an approximately 40-mile radius of the western converter station. The Applicant based the 40-mile radius assumption on preliminary studies of engineering

constraints and wind resource data, industry knowledge, and economic feasibility. The Applicant anticipates that these wind generators would be the primary customers using the transmission capacity of the Plains & Eastern transmission line. To achieve full utilization of the 3,500MW delivery capacity of the Applicant Proposed Project, the Applicant anticipates actual wind farm build-out to be approximately 4,000MW. With the addition of the Arkansas converter station alternative, the Applicant anticipates the delivery capacity of the Project to increase to 4,000MW, and associated wind farm build-out to be approximately 4,550MW (Clean Line 2014[7]). An analysis of the wind resource in Oklahoma's Panhandle region by the National Renewable Energy Laboratory shows that large areas of wind resources with average annual wind speeds greater than 8 meters/second are prevalent in that part of the state.

Neither the Applicant nor DOE knows the exact location of wind power facilities that would be connected to the Project. However, it is reasonably foreseeable that future wind farms would be located in a reasonable proximity to the Project's Oklahoma converter station and in areas with high wind resource potential and suitable land use(s). This EIS provides an analysis of impacts from wind development within an area of approximately 40 miles of the western converter station. Where construction and operation of individual wind power facilities require permits or authorizations, site-specific environmental review, possibly including NEPA review, may be conducted prior to the construction and operation of individual wind farm projects.

S.5.4.2 Related Substation and Transmission Upgrades

In addition to the transmission lines and related facilities analyzed as part of the Project, the EIS also analyzes facility additions and upgrades to existing third-party transmission systems that would be required to enable the proposed Project to transmit power. The additions and upgrades in Oklahoma and Tennessee are evaluated as connected actions in the Plains & Eastern EIS. No transmission network upgrades would be required to accommodate the interconnection in Arkansas.

Oklahoma

The Applicant Proposed Project includes construction and operations and maintenance of a converter station in Texas County, Oklahoma. The Oklahoma converter station would be interconnected to the existing transmission system. This interconnection is necessary to enable the AC to DC conversion process within the Oklahoma converter station. The interconnection between the proposed Oklahoma converter station and the Southwestern Public Service (SPS) system would be controlled to a nominal value of zero (0) MW, meaning that there would be no net energy exchange. Based on the SPS analysis completed to date, the Applicant expects that a new substation would be necessary to accommodate the interconnection due to space constraints at the existing 345kV Hitchland Substation. To alleviate these space constraints, SPS has proposed a new substation nearby, tentatively named "Optima." This new substation, which represents the connected action, would be located within a few miles of the Oklahoma converter station in Texas County, Oklahoma, within the area identified on Figure 2.1-3 in Appendix A of the EIS as the AC Interconnection Siting Area. Additional background and details are provided in Section 2.2.1.1.

Arkansas

A DOE Alternative would include construction and operations and maintenance of an intermediate converter station in Arkansas to enable injection and delivery of up to 500MW of power into the Arkansas electrical grid. Clean Line

[7] Clean Line Energy Partners LLC. 2014. *Wind Generation Technical Report for the Plains and Eastern Transmission Line Project*. Prepared by Clean Energy Partners LLC for the Department of Energy pursuant to 10 CFR 1021.215(b)(2). March 2014.

selected the Arkansas Nuclear One–Pleasant Hill 500kV Point of Interconnection. The Mid-Continent Independent System Operator (MISO) performed a feasibility study of the request and concluded in February 2014 that no network upgrades were required to accommodate the interconnection.[8] No connected actions would therefore be associated with substation or transmission upgrades in Arkansas.

Tennessee

The Applicant Proposed Project includes construction and operations and maintenance of a converter station in either Shelby or Tipton County, Tennessee to enable injection of up to 3,500MW of power into the Shelby Substation. TVA completed its Interconnection System Impact Study to determine whether any upgrades (or modifications) to its transmission system would be necessary to protect grid reliability while accommodating Clean Line's request for interconnection at 3,500MW TVA's Interconnection System Impact Study has identified the following connected actions as necessary to enable the injection of 3,500MW from the Plains & Eastern Clean Line: (a) upgrades to existing infrastructure and (b) construction of a new 500kV transmission line, approximately 37 miles long, in western Tennessee, including necessary modifications to existing substations on the terminal ends of the new line. Upgrades to existing infrastructure would include upgrading terminal equipment at three existing 500kV substations and three existing 161kV substations; making appropriate upgrades[9] to increase heights on 16 existing 161kV transmission lines to increase line ratings, and replacing the conductors on 8 existing 161kV transmission lines.

The total length of existing transmission lines that could require some degree of upgrade is approximately 350 miles; most of these lines are located in central and western Tennessee. However, the upgrades would likely not be necessary along the full length of each line; therefore, the total length of existing transmission lines requiring modification would be less than 350 miles. The detailed identification of the necessary upgrades to each transmission line and construction of a new transmission line (as discussed above) is the subject of an interconnection facilities study begun by TVA in 2014 and anticipated to be completed in mid-2016.

S.5.5 Agency Preferred Alternative

CEQ regulations at 40 CFR 1502.14(e) require an agency to identify its preferred alternative, if one exists, in the Draft EIS. At this point in the NEPA process, DOE does not have a preferred alternative. DOE has not identified a preference for whether to participate with Clean Line in some manner as prescribed by Section 1222 of the EPAct. As part of its deliberations, DOE will consider all of the alternatives analyzed in the Draft EIS and take into consideration the comparison of potential impacts for each resource area coupled with input received during the public comment period on the Draft EIS. DOE will identify its preference for whether to participate with Clean Line in the Project and its preferred alternatives for each of the Project elements (including route alternatives) in the Final EIS.

DOE analyzed HVDC Alternative Route 4-B, which would intersect the Ozark National Forest in Crawford County, Arkansas. The representative ROW for HVDC Alternative Route 4-B crosses the Ozark National Forest, while the Applicant Proposed Route and other alternative routes in Region 4 do not. (A small portion, 2.5 acres, of the representative ROW for the Applicant Proposed Route overlaps the Ozark National Forest; however, this could

[8] MISO (Mid-Continent Independent System Operator). 2014. *Feasibility Study*. February 10. MISO Project J319. <http://www.plainsandeasterncleanline.com/sites/plains_eastern/media/docs/GI-FeS-2014-FEB-J319-Report.pdf>

[9] Most upgrades to existing transmission lines would occur in central and western Tennessee.

potentially be avoided during final siting of the Project within the analyzed corridors.) After detailed analysis and discussion with the U.S. Forest Service (USFS), DOE has determined that HVDC Alternative 4-B is not preferred and has therefore identified the route as a non-preferred alternative. Details can be found in Section 2.14.

S.6. Potential Impacts

S.6.1 Direct and Indirect Impacts

The impacts analyzed in Chapter 3 of the Plains & Eastern EIS are summarized in the sections that follow. They include a summary of potential environmental impacts from construction and operations of the proposed converter stations, including the Arkansas converter station alternative, the AC collection system, AC interconnections, and the HVDC transmission line, including any specific difference in impacts between the Applicant Proposed Route and the HVDC alternative routes. Impacts from connected actions are also summarized below.

Impacts are presented in alphabetical order for the following resources: Agriculture; Air Quality and Climate Change; Electrical Environment; Environmental Justice; Geology, Paleontology, Minerals, and Soils; Groundwater; Health, Safety, and Intentional Destructive Acts; Historical and Cultural Resources; Land Use; Noise; Recreation; Socioeconomics; Special Status Wildlife, Fish, Aquatic Invertebrate, and Amphibian Species; Surface Water; Transportation; Vegetation Communities and Special Status Plant Species; Visual Resources; Wetlands, Floodplains, and Riparian Areas; and Wildlife, Fish, and Aquatic Invertebrates.

S.6.1.1 Analysis Methodology

The EIS defines the area potentially affected by the Project as the region of influence (ROI). The ROI extends beyond the physical dimensions of the HVDC and AC transmission ROWs and converter station footprints. The general ROI for the determination of potential direct and indirect impacts to most environmental resource areas includes the following:

- Oklahoma Converter Station Siting Area: An approximate 620-acre area in Texas County, Oklahoma, within which the Applicant proposes to site the Oklahoma converter station and associated AC switchyard (45 to 70 acres total) and access road(s).
- Oklahoma AC Interconnection Siting Area: An approximate 870-acre corridor within which the Applicant proposes to site an AC transmission interconnection route from the Oklahoma converter station to the future Optima Substation.
- AC Collection System: Thirteen 2-mile-wide corridors in Oklahoma (Beaver, Cimarron, and Texas counties) and Texas (Hansford, Ochiltree, and Sherman counties) within which the Applicant anticipates that the AC Collection System could be sited.
- Tennessee Converter Station Siting Area: An approximate 740-acre area located partially in Shelby County and partially Tipton County, Tennessee, within which the Applicant proposes to site the Tennessee converter station and associated AC switchyard (45 to 70 acres total), access road(s), and the AC transmission interconnection from the Tennessee converter station to the existing Shelby Substation.
- HVDC Applicant Proposed Route: A 1,000-foot-wide corridor within which the Applicant proposes to site the ROW for the HVDC transmission line between the Oklahoma converter station and the Tennessee converter station.

The ROI for the DOE Alternatives consist of the following:

- Arkansas Converter Station Alternative Siting Area: An approximate 20,000-acre siting area located partially in Pope County and partially in Conway County, Arkansas, within which the Arkansas converter station and associated AC switchyard (45 to 60 acres total) and access road(s) could be sited.
- Arkansas AC Interconnection Siting Area: A 2-mile-wide corridor within which one or more potential AC transmission line route(s) could be sited from the Arkansas converter station to an interconnection point(s) (5 acres) to an existing 500kV transmission line.
- HVDC Alternative Routes: A series of 1,000-foot-wide corridors which DOE has proposed as alternatives to the HVDC Applicant Proposed Route within which the ROW for the HVDC transmission line could be sited.

The ROI for connected actions are described below:

- Wind Energy Generation ROI: Twelve Wind Development Zones (WDZs) were identified by the Applicant within approximately 40-miles of the Oklahoma Converter Station Siting Area and within parts of the Oklahoma Panhandle and Texas Panhandle. These WDZs exhibit adequate wind resource and are areas within which future development of wind energy facilities could occur. Wind energy generation would likely occur within WDZs. The ROI for the 12 WDZs is approximately 1,385,000 acres in Oklahoma (Beaver, Cimarron, and Texas counties) and Texas (Hansford, Ochiltree, and Sherman counties).
- Optima Substation ROI: The future SPS Optima Substation would be constructed within approximately 160 acres of land and would be located within a few miles of the Oklahoma converter station in Texas County, Oklahoma. It would be partially located within the Oklahoma AC Interconnection Siting Area as shown on Figure 2.1-3 (located in Appendix A of the EIS).
- TVA Upgrade ROI: TVA's interconnection system impact study has identified the following as necessary to accommodate the Plains & Eastern Clean Line HVDC interconnection: (a) upgrades to existing infrastructure and (b) construction of a new 500kV transmission line, approximately 37 miles long, in western Tennessee, including necessary modifications to existing substations on the terminal ends of the new line. Upgrades to existing infrastructure would include upgrading terminal equipment at three existing 500kV substations and three existing 161kV substations; making appropriate upgrades to increase heights on 16 existing 161kV transmission lines to increase line ratings, and replacing the conductors on 8 existing 161kV transmission lines (as described in Section 2.5.2). At this stage in the planning process, a precise ROI has not been identified for the TVA upgrades.

These ROIs have been expanded or modified on a resource specific basis where appropriate as described in certain resource area sections below. Resources where the ROIs have been expanded or modified include these resources: Air Quality and Climate Change, Environmental Justice, Groundwater, Surface Water, Special Status Wildlife, Fish, Aquatic Invertebrate, and Amphibian Species, Socioeconomics, Transportation, and Visual Resources. For example, the ROI for examination of socioeconomic impacts (Section 3.13) of the Project was expanded to encompass counties surrounding the Project components so that impacts on economic conditions, agriculture, housing, and community services could be evaluated.

The analyses of impacts for the HVDC Applicant Proposed Route, AC collection system, and HVDC alternative routes are based on a representative 200-foot wide ROW (100 feet on either side of a representative centerline). Quantitative data regarding the resources that would be directly intersected by the representative 200-foot-wide

ROW are used as a representative example of potential impacts from a ROW that could be sited within the given ROI. The resources that could be affected by the Project vary throughout the 1,000-foot corridor where the actual ROW could be located. The representative ROW does not necessarily reflect where particular resources are most or least concentrated, or an average. For example, the representative ROW avoids many homes and environmental resources, and so moving the ROW within the 1,000-foot corridor could result in environmental impacts different from those described for the representative ROW.

The siting of a transmission line ROW and the converter stations would require detailed engineering that considers existing conditions; compliance with federal, state, and local permits and authorizations; and incorporation of all EPMs adopted by the Applicant. The potential impacts presented in the EIS would serve as one source informing the siting of the HVDC and AC transmission line ROWs and converter stations. Further, the siting of the four to six ROWs for the AC transmission lines that would be part of the AC collection system would also depend on the final locations of the wind generation projects. Those locations would not be known until after completion of the EIS process (including issuance of the ROD) and closer to the time of construction of the Project.

For the purpose of all analyses for the EIS, it is assumed that the Applicant would conduct each phase of the Project in compliance with applicable federal, state and local laws, regulations and permits related to construction, operations and maintenance, and decommissioning of the Project. Appendix C of the EIS presents an overview of potential federal and state permits and consultation that could be required for construction of the Project. Local permits and approvals would also be required for the Project.

The Applicant has developed general and resource-specific EPMs to avoid or minimize effects to environmental resources during construction, operations and maintenance, and/or decommissioning of the Project. The resource-specific EPMs include measures to protect land use; soils and agriculture; fish, vegetation, and wildlife; and waters, wetlands, and floodplains. The complete list of EPMs is presented in Appendix F of the EIS. The EPMs would be made binding through the Record of Decision and terms of participation agreements between DOE and the Applicant. The EPMs would be implemented through a combination of environmental-related plans; compliance with federal, state, and local environmental regulations; and permitting requirements. The specific environmental-related plans that the Applicant has identified and described in Appendix F include:

- Transportation and Traffic Management Plan
- Blasting Plan
- Restoration Plan
- Spill Prevention, Control and Countermeasures Plan
- Stormwater Pollution Prevention Plan
- Transmission Vegetation Management Plan
- Avian Protection Plan
- Construction Security Plan
- Cultural Resources Management Planning Documents including Historic Properties Treatment Plan and Unanticipated Discoveries Plan

In some resource sections, DOE has identified best management practices (BMPs) that could further avoid or minimize potential adverse impacts.

S.6.1.2 Agricultural Resources

Construction could affect livestock grazing by temporarily reducing forage and displacing livestock in the ROW. Yields from cropland and pasture/hay could be temporarily affected in the construction areas. Potential temporary impacts to center-pivot irrigation could occur, primarily in Regions 1, 2, 6, and 7, during construction. Also during construction, access roads, temporary work areas, and other graded areas could temporarily disrupt the slope and flow patterns of water on flood-irrigated fields. Transmission structures may interfere with farming equipment and aerial crop spraying, which may reduce crop yields.

Maintenance of the Project facilities may occasionally disrupt agricultural activities and production on a localized basis. Potential indirect impacts to agricultural production from interference with aerial applications of fertilizer, insecticide, and herbicide could occur. Unavoidable adverse impacts could occur if agricultural structures would not be avoided by the Applicant Proposed Route or HVDC alternative routes.

Most of the land within the AC and HVDC transmission line ROWs could return to previous uses after construction. Land uses that would not be permitted in the ROW include buildings or structures, changes to grading and land contours, and some restrictions for infrastructure such as fences and irrigation lines. Maintenance activities may cause temporary impacts within the ROW such as damage to crops.

Agricultural land cover represents 24 percent of the Arkansas Converter Station Alternative Siting Area, 80 percent of the land cover in the Tennessee Converter Station Siting Area, and 95 percent in the Oklahoma Converter Station Siting Area.

S.6.1.3 Air Quality and Climate Change

Potential impacts to air quality from the Project include both temporary impacts during construction and long-term impacts during operations and maintenance. Temporary construction impacts and long-term impacts to air quality would be similar for the Applicant Proposed Project and the DOE Alternatives.

Temporary construction impacts to air quality include emissions of greenhouse gases and criteria pollutants from the use of construction equipment. Emissions for constructing each of the converter stations are estimated to be approximately the same because the converter station sizes and construction processes are similar. Similarly, air quality emissions, and short-term impacts from construction, would also be elevated during construction of HVDC transmission lines and AC transmission lines throughout the ROI. Because the emissions would be temporary and are for mobile equipment spread out over wide distances, they would only result in minor temporary impacts on air quality in the vicinity of construction activities. Emissions of greenhouse gases would be long term but small compared to other existing sources of these emissions. During operations and maintenance, when construction is complete, emissions would be limited to those from maintenance vehicles and impacts to air quality would be minor.

S.6.1.4 Electrical Environment

Potential electrical environment impacts from the Project include impacts during the operations and maintenance phase (i.e., no electrical effect impacts would occur during construction or decommissioning of the Project). Long-term electrical impacts include electric fields, magnetic fields, audible noise, and radio and television interference. Electrical effects are primarily determined by line configuration and operational parameters, and are therefore generally the same irrespective of route location (locations with higher elevation will increase certain electrical

effects). People are exposed to numerous sources of magnetic fields on a daily basis from sources like power lines, but also from electric devices in home and office environments. The research available on the health impacts of magnetic field exposure is not definitive, and no conclusions regarding the health impacts can be drawn based on what is presently known about the health impacts of magnetic fields.

The consensus of non-regulatory organizations indicates that public exposure to DC electric fields should be limited to 5 kilovolts per meter (kV/m) (according to organizations such as the Institute of Electrical and Electronic Engineers [IEEE]) and occupational exposure should be limited to 20 to 25kV/m (according to organizations such as the American Conference of Governmental Industrial Hygienists [ACGIH] and the International Committee on Non-Ionizing Radiation Protection [ICNIRP]). For the HVDC transmission line, calculated DC electric fields would be below these public exposure guidelines at the ROW edge where the total ROW width is 200 feet. In some areas, final siting of the ROW within the analyzed corridor could result in ROW widths as narrow as 150 feet based on site-specific conditions (e.g., terrain, proximity of adjacent utilities, avoidance of sensitive areas). In those locations, calculated DC electric fields would be lower than public exposure guidelines (of 5kV/m) at the edge of the ROW except in two circumstances where they would be as high as 6.6kVm. These two configurations are monopole structures in standard operating conditions and lattice structures in infrequent operating conditions (such as when a main conductor bundle is de-energized for repair or maintenance as described in more detail in Section 3.4). Generally, the Applicant expects to use lattice structures for longer spans in open and wooded terrain and monopole structures for spans that are shorter in length. Looking at the occupational guidelines, calculated DC electric fields within the ROW would be lower than 20kV/m, except during infrequent operating conditions (described previously) for either monopole or lattice structures, where they would be as high as 24.3kV/m.

Calculated DC magnetic fields would be below exposure guidelines (established by non-regulatory organizations such as the IEEE, U.S. Food and Drug Administration, ACGIH, and ICNIRP) within the ROW for all configurations. Calculated audible noise would be below the EPA outdoor activity noise guideline (applicable to outdoor residential areas, farms, and other outdoor areas where people spend time) within the ROW for all configurations if the ROW width is 200 feet. Where the ROW width is 150 feet, which would be determined based on site-specific conditions and be more likely in areas with steep or uneven terrain and/or nearby adjacent utilities or sensitive areas, audible noise guidelines (55 decibels on the A-weighted scale [dbA] or 55 on the frequency-dependent rating scale) could reach levels of up to 56.4 dBA at ROW edges for standard monopole or lattice structures. For reference, falling rain generates 41 to 63 dBA. Calculated radio and TV noise would be below Federal Communications Commission and IEEE exposure guidelines. Because the design configurations are the same for the Applicant Proposed Route and HVDC alternative routes, and because the populations within the representative ROW are similar, no differences in impacts are expected.

For the Oklahoma converter station interconnection transmission lines, calculated AC electric fields would be below exposure guidelines (established by non-regulatory organizations such as the IEEE, ACGIH, and ICNIRP) within the ROW. However, for one of the three possible AC transmission line configurations (i.e., the double circuit Danube configuration), calculated electric fields would be above exposure guidelines for workers with implanted medical devices in the ROW and at the ROW edges. As described in detail in Section 3.4, while a variety of electronic devices are known to affect the operation of pacemakers and other implanted medical devices, transmission lines have not been reported as a significant source to produce functional disturbances to these devices. The consequences of brief reversible pacemaker malfunction are mostly benign (typically the implanted device will resume a normal mode of operation if the patient moves away from the source of the interference). An exception

would be an individual who has a sensitive pacer and depends on it completely for maintaining all cardiac rhythms. For such an individual, a malfunction that compromised pacemaker output or prevented the unit from reverting to the fixed pacing mode, even brief periods of interference, could be life-threatening. The precise coincidence of events (i.e., pacer model, field characteristics, biological need for full function pacing, and occupation involving work under transmission lines) would generally appear to be a rare event. Calculated AC magnetic fields would be below exposure guidelines (established by non-regulatory organizations such as the IEEE, ACGIH, and ICNIRP) within the ROW for all configurations. Calculated audible noise would be below exposure guidelines within the ROW for two of three possible configuration types (the other configuration type—double circuit monopole—is slightly higher than the public guideline). Calculated radio noise would be below guidelines at which reception quality may be less than satisfactory during fair but not rainy weather conditions. While it is difficult to determine whether the TV noise level produced by a transmission line would cause unacceptable interference, new digital broadcast system technology would provide better coverage and immunity to transmission line noise than analog television signals.

For the Tennessee converter station interconnection transmission lines, calculated AC electric fields would be below exposure guidelines within the ROW. For the lattice configuration, calculated electric fields would be below exposure guidelines for workers with implanted medical devices if the ROW width is 200 feet (if the ROW width is 150 feet, which would be determined based on site-specific conditions and be more likely in areas with steep or uneven terrain and/or nearby adjacent utilities or sensitive areas, then guidelines could be exceeded slightly). Calculated AC magnetic fields would be below exposure guidelines within the ROW for all configurations. Calculated audible noise would be above exposure guidelines at the ROW edges for all configurations. Calculated radio and TV noise would be below guidelines at which reception quality may be less than satisfactory.

For the AC collection system transmission lines, calculated AC electric fields would be below exposure guidelines within the ROW. For the lattice configuration, calculated electric fields would be below exposure guidelines for workers with implanted medical devices if the ROW width is 200 feet (if the ROW width is 150 feet, which would be determined based on site-specific conditions and be more likely in areas with steep or uneven terrain and/or nearby adjacent utilities or sensitive areas, then guidelines could be exceeded slightly). Calculated AC magnetic fields would be below exposure guidelines within the ROW for all configurations. Calculated audible noise would be below exposure guidelines within the ROW for all configurations. Calculated radio and TV noise would be below guidelines at which reception quality may be less than satisfactory.

For the Arkansas converter station interconnection transmission lines, calculated AC electric fields would be below public guidelines within the ROW. However, for the lattice configuration, calculated electric fields within the ROW would be above the transmission line ROW guidelines. For all configurations, calculated electric fields would exceed exposure guidelines for workers with implanted medical devices within the ROW. Calculated AC magnetic fields would be below exposure guidelines within the ROW for all configurations. Calculated audible noise would be at or above exposure guidelines within the ROW for all configurations. Calculated radio and TV noise would be below guidelines at which reception quality may be less than satisfactory.

S.6.1.5 Environmental Justice

Environmental justice impacts can result if the proposed activities cause disproportionately high and adverse human health or environmental effects to minority and/or low-income populations. Impacts to low-income and/or minority populations from resource areas analyzed in the EIS were reviewed. While impacts from the majority of the resource

areas can be measured by proximity to the Project, special attention is given to the effects on human health in local communities.

In areas where minority and/or low-income populations were identified, any impacts would affect all populations in the ROI equally. No long-term significant impacts were discernable to agricultural resources; air quality and climate change; electrical environment; geology, paleontology, soils, and minerals; groundwater; health, safety, and intentional destructive acts; historic and cultural resources; land use; and noise. No long-term impacts are anticipated to any low-income or minority populations.

S.6.1.6 Geology, Paleontology, Minerals, and Soils

Long-term impacts from the Project include potential restriction of access to mineral resources, access and potential loss of productivity for disturbed soils, and commitment of soils (including soils designated prime farmlands) to a utility use (primarily for access roads, converter stations, and transmission line pole structures). Seismicity, landslides, subsidence, or soil liquefaction also could damage Project infrastructure during both construction and operations and maintenance; seismic impacts could cause interruption of power during operations. Clearing, grading, excavation, and other construction activities could increase soil erosion. Construction vehicles and equipment could cause soil compaction, particularly in soils with characteristics inherently susceptible to compaction. Inadvertent spills of fuel, lubricants, antifreeze, or herbicides could contaminate soils; and excavation could uncover previously unknown areas of contaminated soils. Construction impacts to soil resources would be similar to those of the Application Proposed, but acres of designated farmland and soil limitations would vary by route alternatives.

Seismic hazards are low except in the eastern portion of the ROI in Region 5 and in Regions 6 and 7 near the New Madrid Seismic Zone. Areas of high to very high soil liquefaction potential occur in Regions 4, 5, 6, and 7. Subsidence from karst (landscape formed from the dissolution of soluble rocks) is a possible geologic hazard of concern within the Oklahoma Converter Station Siting Area, the AC collection system routes, and the HVDC transmission line in Regions 1, 2, 4, and 5. Areas of high susceptibility for landslides are present in Regions 4, 5, and 7. Few differences in impacts related to geology and soils were noted between the HVDC alternative routes and the corresponding links of the Application Proposed Route because of the regional nature of many underlying factors (such as seismic features, geologic formations, and broad soil types).

The representative ROWs for HVDC Alternative Routes 1-A, 1-C, 2-A, 2-B, 4-A, 4-C, 4-D, 5-B, 5-C, 5-D, 5-E, 5-F, and 7-C would cross more karst (for Regions 1, 2, and 4) and/or shallow bedrock, and HVDC Alternative Routes 1-C, 4-E, 5-A, 7-B, and 7-D would cross less karst (for Region 1) and/or shallow bedrock than the corresponding links of the Applicant Proposed Route. The presence of karst and potential need for blasting in areas of shallow bedrock would require the use of EPMs and appropriate engineering design to reduce the potential for impacts.

The representative ROWs for HVDC Alternative Routes 4-A, 4-D, and 4-E would contain fewer potential shale gas deposits (and therefore have less potential for impact), and HVDC Alternative Routes 4-C, 5-B, 5-C, 5-D, 5-E, and 5-F would contain more potential shale gas deposits than the corresponding links of the Applicant Proposed Route. The representative ROWs for HVDC Alternative Routes 4-A, 4-D, 5-B, 5-C, and 5-E would contain fewer oil and gas wells (and therefore have less potential for impact), and HVDC Alternative Route 4-C, 4-E, and 5-F would contain more oil and gas wells than the corresponding links of the Applicant Proposed Route.

HVDC Alternative Routes 4-C, 4-E, 7-B, and 7-C would be slightly more susceptible to liquefaction, and HVDC Alternative Routes 4-D, 5-B, and 6-C would be less susceptible to liquefaction than the corresponding links of the Applicant Proposed Route. HVDC Alternative Routes 4-D, 5-D, 7-A, 7-B, 7-C, and 7-D would be slightly more susceptible to landslides, and HVDC Alternative Route 4-E would be slightly less susceptible to landslides than the corresponding links of the Applicant Proposed Route.

Applicant EPMs and appropriate engineering design would minimize potential impacts related to geologic hazards, soils and farmland, fossils, and mineral resources. The NRCS would require a farmland conversion assessment, or Form AD-1006, to be submitted for evaluation for all areas of the Project that would permanently impact designated farmland. Once the exact locations of Project components have been determined, the farmland conversion assessment would be completed by the NRCS.

S.6.1.7 Groundwater

Potential impacts to groundwater from the Project would be experienced primarily during construction phases. Typical construction impacts include:

- Potential for Groundwater Contamination—Contamination could occur as a result of the accidental release of hazardous substances, primarily fuels and lubricants, which would be used for construction equipment and be present in construction staging or storage yards. Compliance with permit requirements and implementation of EPMs, including spill prevention and response planning, would minimize the potential for groundwater contamination.
- Changes to Infiltration Rates—Soils disturbed and loosened during construction could represent areas of increased precipitation infiltration, possibly increasing local groundwater recharge rates over the short term. After construction, impermeable facility surfaces would represent areas of decreased infiltration rates over the long term. The area of impermeable surfaces resulting from the Project would be small. In accordance with the Applicant's EPMs, soils would be returned to pre-activity conditions, therefore resulting in *de minimis* long-term impacts to infiltration rates.
- Effects on Water Availability—Water demands to support the Project could come from groundwater resources (more likely in areas where total water use is typically from groundwater sources such as Regions 1, 2, and 6) and result in less groundwater being available for other uses. Water demand associated with the Project is not expected to have noticeable effects on groundwater resources beyond those resulting from existing water usage.
- Physical Damage to Well Systems—Well system damage could occur as a result of direct impacts from equipment traffic or during excavations, and could also occur at locations more remote from construction if blasting was used at excavation sites. The Applicant's EPMs would minimize these occurrences and require repairs of any damages and, in the case of any damage, arrange for temporary water supply, if necessary. Pre-construction planning, working with property owners to identify well system locations, and adjusting construction sites to avoid well systems are among the actions that would be taken to minimize the potential for damaging well systems.

Although there are differences in the amount of groundwater used between regions and in the numbers of wells within the representative ROWs for the Applicant Proposed Route and each of the HVDC alternative routes, groundwater use for the Project would be small relative to the perennial yield, and differences in groundwater use between alternatives would not be a substantial factor in a decision among the alternatives.

Potential impacts to groundwater during operations and maintenance of the Project would be very minor. The quantities of hazardous materials present (primarily fuels and lubricants in maintenance vehicles and equipment) would be much less than during construction, and water demands of facilities would be limited to that required to support the small number of employees required for operations and maintenance activities.

S.6.1.8 Health, Safety, and Intentional Destructive Acts

As a general matter, construction and operational activities for large infrastructure projects, such as a transmission line and associated facilities can pose hazards that affect worker and public health and safety. In addition, natural events, external events or accidents (e.g., aircraft mishaps or fires) or intentional destructive acts or mischief could impact such infrastructure and have related effects on the health and safety of construction workers and the public.

The Project may involve the transportation and handling of hazardous materials. Management (i.e., transportation, storage, handling, use, and disposal) of such hazardous materials during the construction and operations and maintenance phases must be undertaken in a manner to avoid or minimize health and safety impacts to workers and nearby members of the public. The implementation of EPMs associated with management of hazardous materials would keep risks to a minimum.

The AC and HVDC transmission lines, converter stations, and associated facilities could be susceptible to natural events such as extreme weather. Natural events may occur on a relatively frequent basis, although events severe enough to result in worker and public health and safety issues, structural damage, or downed lines and conductors are less likely than less severe natural events. Airports and associated air traffic in the vicinity of the components of the Project have the potential to result in impacts to workers, aircraft occupants, and Project components if an aircraft were to collide with a structure or transmission lines, especially with regard to potential aerial spraying activities in the ROI. Impacts from an aircraft crash could result in major injury or death—both to aircraft occupants and people on the ground. Although it is not possible to predict whether events involving intentional destructive acts or mischief would occur, or the nature of such events if they did occur, DOE has considered the potential for these events and the health and safety impacts that could result. The impacts of intentional destructive acts on structures or other equipment could range from no noticeable effect to loss of electrical service to some service areas for a period of time.

Based on national accident statistics for the construction and operational utility industries, the estimated construction workforce of 965 workers for the Applicant Proposed Project would experience 125 non-fatal recordable incidents during the 42-month construction period. Using the average construction workforce of 965 workers, it is estimated that there would be approximately 0.3 fatalities during the 42-month construction phase. It is likely that no fatalities would occur. During the assumed 80-year operational period of the Applicant Proposed Project, the average operations workforce of approximately 72 individuals would experience 2.0 non-fatal recordable incidents annually. Using the average operations workforce of 72 workers, it is estimated that there would be approximately 0.002 fatalities annually during the operational phase. It is likely that no fatalities would occur.

The construction and operational impacts of the HVDC route alternatives would be roughly equivalent to those of the Applicant Proposed Project. Construction and operation of the Arkansas converter station would increase the potential workforce and resultant health and safety impacts by about 10 percent above the Applicant Proposed Project.

S.6.1.9 Historic and Cultural Resources

Potential impacts to historic and cultural resources from the Project would be experienced primarily during the construction phase. Potential construction impacts to belowground (archaeological) resources could occur as a result of ground disturbances at site locations. If ground disturbance resulted in physical impacts to historic properties eligible for listing in the National Register of Historic Places (NRHP), such impacts could constitute an adverse effect under 36 CFR 800.5(a)(1), and therefore, would require consultation with consulting parties to attempt to avoid, minimize, or mitigate adverse effects. DOE intends to implement a Programmatic Agreement (PA) to resolve such effects. Ground disturbance impacts to archeological resources are unlikely to occur during operations, maintenance, and decommissioning because the most intensive ground disturbances typically occur in the construction phase of a transmission line project.

Potential impacts to aboveground historic and cultural resources such as buildings and structures would most likely be limited to visual alterations to the historical setting of the resource. Such alterations would be introduced during construction of the Project through the erection of transmission structures, stringing of conductors, and construction of converter stations. Once built, the Project facilities are not likely to be substantially altered through routine operations and maintenance. Decommissioning of Project facilities would be in accordance with the Project decommissioning plan. Potential Project impacts to aboveground historic and cultural resources would be long-term for the life of the Project but would be largely or entirely reversible through removal of Project elements following decommissioning. Construction could also cause temporary impacts to historic and cultural resources through the generation of dust and noise (relevant for above-ground resources), and vibration (relevant for both above-ground and below-ground resources), but such effects would be transient in nature.

As of October 2014, DOE is consulting with the State Historic Preservation Officers (SHPOs) of Arkansas, Oklahoma, Tennessee, and Texas; various Tribal Historic Preservation Officers and other American Indian representatives; and the Applicant with the intent of developing a PA whose purpose is to define processes by which Section 106 of the National Historic Preservation Act of 1966, as amended, will be implemented. The PA would address DOE's and federal agencies' obligations under NHPA Section 106, including consultation with Indian Tribes that may attach religious and cultural significance to historic properties that may be affected by the undertaking related to the Project and with the SHPOs of Arkansas, Oklahoma, Tennessee, and Texas, resource identification and evaluation, assessment of effects, and resolution of effects, including avoidance, where practicable, and mitigation. Compliance with the PA and related plans would minimize unavoidable and adverse impacts to historic and cultural resources, particularly those eligible for the NRHP. Should it be determined that unavoidable impacts would result in adverse effects to a historic or cultural property, the PA would provide appropriate measures to mitigate the effects.

Available information about the locations and characteristics of historic and cultural resources indicates that archaeological sites, historic buildings and structures, and related resources are present at various locations in and adjacent to the Project. Project-specific cultural resources surveys will be conducted in the future by the Applicant's contractors. DOE intends to establish the timing and protocols for cultural resources surveys in the PA.

HVDC Alternative Routes 1-A, 4-E, 5-B, and 7-C have a greater potential to contain historic and cultural resources than the corresponding links of the Applicant Proposed Route. The potential for HVDC Alternative Routes 3-C, 3-D, or 5-C to contain historic and cultural resources is similar to that of the corresponding links of the Applicant Proposed Route, except that the alternative routes have the potential for Project impacts associated with one or two NRHP-

listed properties each. HVDC Alternative Routes 5-D and 7-A have a higher potential for construction-related impacts to archaeological resources than the corresponding Applicant Proposed Routes because of differences in land cover. Under a PA, avoidance, where practicable, would be preferred. Alternatively, minimization or mitigation of impacts to historic and cultural resources would be required.

S.6.1.10 Land Use

Land use impacts consist primarily of the conversion of existing land uses (primarily rangeland, cropland, and pasture/hay) to a utility use. Typical temporary impacts during construction include the use of some areas for temporary work areas and loss of access to areas in or adjacent to work areas. Yields from cropland, pasture/hay, and timberlands could potentially also be temporarily affected in the construction areas. There are 28 structures within the representative ROW for the Applicant Proposed Route, including 18 agricultural structures, 2 industrial structures (oil/gas infrastructure), 2 commercial structures, 2 residential structures, 2 abandoned structures, and 2 other structures (use unknown). HVDC alternative routes with fewer structures than the corresponding links of the Applicant Proposed Route include HVDC Alternative Routes 2-B (one less agricultural structure), 6-C (three less agricultural structures), 7-A (one less structure [use unknown]), and 7-D (two less agricultural structures). All other HVDC alternative routes contain more structures within the representative ROW than the corresponding links of the Applicant Proposed Route. These structures would have to be permanently removed if the Project features could not avoid them.

Long-term impacts from the Project include the conversion of land to a utility use, primarily for access roads, the converter stations, and transmission line pole structure locations.

Most of the land within the AC and HVDC transmission ROWs could return to previous uses after construction, although uses incompatible with the operation of the transmission line, such as tall trees for timber, would be removed permanently from the ROW. Land uses that would not be permitted in the ROW include buildings or structures, changes to grading and land contours, and some restrictions for infrastructure such as fences and irrigation lines. Maintenance activities may cause temporary impacts within the ROW such as damage to crops.

The major differences in potential land use impacts between the Applicant Proposed Project and the DOE Alternatives include the Arkansas Converter Station Alternative and the different HVDC alternative routes in Region 4 and Region 6. Although the exact location of the Arkansas Converter Station Alternative has not yet been determined, the siting area itself is composed primarily of evergreen forest and deciduous forest. Construction of this converter station would convert up to approximately 50 acres of undeveloped land to a utility use.

The representative ROW for HVDC Alternative Route 4-D does not cross any state land, whereas the representative ROW for the corresponding Applicant Proposed Route Link 6 crosses approximately 6 acres of state wildlife management areas (WMAs) (see Figure S-2d). The representative ROW for HVDC Alternative Routes 6-C and 6-D does not include any natural areas or recreational land compared to the corresponding link of the Applicant Proposed Route (Link 7; see Figure S-2d), which includes approximately 0.5 acre of the Singer Forest Natural Area within the St. Francis Sunken Lands WMA.

The number of residences within the representative ROW does not vary substantially between the Applicant Proposed Route and the corresponding links of the HVDC alternative routes, and residences could be avoided during final Project siting. In Region 1, HVDC Alternative Route 1-D is the only alignment with residences in the

representative ROW (three); Region 2 has none; the number of residences range from none to two in Region 3, from none (Applicant Proposed Route) to 8 (HVDC Alternative Route 4-B) in Region 4, from none (Applicant Proposed Route) to three (HVDC Alternative Routes 5-B and 5-E) in Region 5, and from none to one in Regions 6 and 7.

Applicant EPMs would minimize potential land use impacts include minimizing clearing vegetation within the ROW; working with landowners and operators to ensure that access is maintained as needed to existing operations (e.g., to oil/gas wells, private lands, agricultural areas, pastures, hunting leases); coordinating with landowners to site access roads and temporary work areas to avoid and/or minimize impacts to existing operations and structures; and making reasonable efforts, consistent with design criteria, to accommodate requests from individual landowners to adjust the siting of the ROW on their properties.

S.6.1.11 Noise

Temporary construction noise impacts include elevated sound levels at noise sensitive areas (NSAs) such as residences or schools for short periods of time. Locations of residences and schools are shown in Figure 1.02 located in Appendix A of the EIS. The only two schools within the ROI are within AC Collection System Route E-1, located within the town of Hardesty. Construction of converter stations is estimated to take no more than 12 months, during which time sound levels may be elevated at some NSAs. Similarly, sound levels would be elevated during construction of the HVDC transmission lines and AC transmission lines, although construction of these Project features would move relatively rapidly along a given ROW; elevated sound levels would last only a few days or weeks in a given area. Because the elevation in sound levels would be temporary and are associated with mobile equipment spread out over wide distances, they would only result in minor temporary impacts to NSAs in the vicinity of construction activities.

Long-term noise impacts include those from operation of the Project's converter stations and transmission lines. Converter stations include operational sound sources such as converter transformers and filter reactors; however, the acoustic modeling of the converter stations indicates that the setback distance to the nearest NSAs is sufficient to mitigate any impact. Sound from operation of the HVDC transmission lines and AC transmission lines results from corona affects, which can result in audible noise. Corona noise is greatest on HVDC transmission lines when the conductors are dry and is greatest on AC transmission when conductors are wet; however, corona noise is generally lower on HVDC transmission lines in fair weather than on AC transmission lines in foul weather. Impacts to NSAs were assessed under each transmission line type's highest noise emission condition and it was found that there are four NSAs expected to exceed federal guidelines for the Applicant Proposed Project. Two of these NSAs are near the Applicant Proposed Route in Region 3 and two are near the AC collection system (AC Collection System Routes E-3 and NE-2).

Temporary construction noise impacts for the DOE Alternatives would be of similar character to those for the Applicant Proposed Route, lasting no more than 12-months for construction of the converter station and several days to weeks for construction of the transmission lines. Although the exact location of the Arkansas Converter Station Alternative has not yet been determined, analysis showed that the predicted converter station sound level at the nearest NSA is below the federal guideline, indicating no operational noise impacts. Operational noise impacts from the HVDC alternative routes are variable by region, depending on the route. The largest number of NSAs for any alternative route within each region is four for Region 1, three for Region 3, ten for Region 4, three for Region 5, one for Region 6, and one for Region 7.

Applicant EPMs would minimize potential noise impacts and include maximizing the distance between stationary construction equipment and NSAs to the extent possible and maintaining construction equipment to ensure it is operating properly. In addition to the Applicant's EPMs, DOE has identified one BMP to address unavoidable noise impacts from the Project, which would involve the use of a communications program. Noise complaints from construction and/or operation of the Project would be handled as part of this communications program.

S.6.1.12 Recreation

Typical temporary impacts to recreation during construction include the use of some recreational areas for temporary work areas and loss of access to recreation areas in or adjacent to work areas. Direct short-term impacts may include noise, visual disturbance, restricted access, and diminished quality of recreational impacts that are crossed by the ROW.

Most of the land within the HVDC and AC transmission line ROWs could return to previous uses after construction. Recreation uses would be permitted in the ROW; however; buildings or structures, and some restrictions for infrastructure such as fences would not be permitted. Maintenance activities may cause temporary impacts within the ROW such as restricted access.

Applicant EPMs that would avoid or minimize potential recreation impacts include installing new and maintaining existing access controls; minimizing noise around sensitive noise receptors (such as recreational areas); minimizing the frequency and duration of road closures; making reasonable efforts to accommodate requests from individual landowners to adjust the siting of the ROW on their properties; identifying environmentally sensitive vegetation (e.g., wetlands, protected plant species, riparian areas, large contiguous tracts of native prairie) and avoiding and/or minimizing impacts to these areas; and identify, avoiding, and/or minimizing adverse effects to wetlands and waterbodies.

The major differences in potential recreation impacts between the Applicant Proposed Project and the DOE Alternatives include the Arkansas Converter Station Alternative and the different HVDC alternative routes in Regions 3, 4, and 5. Although the exact location of the Arkansas Converter Station Alternative has not yet been determined, the siting area itself could potentially impact the Cherokee WMA and the Rainey WMA.

Applicant Proposed Route Link 1 in Region 3 would not cross Lake Carl Blackwell (managed by Oklahoma State University), while corresponding HVDC Alternative Routes 3-A and 3-B could impact approximately 23 acres of the Lake. The Applicant Proposed Route Link 6 could potentially impact 4 acres of the Webbers Falls Lock and Dam Reservoir lands, while the corresponding HVDC alternative routes in Region 3 could potentially impact 1 acre of the Webbers Falls Lock and Dam Reservoir lands. The Applicant Proposed Route in Region 4 could potentially impact 2 acres of the Ozark Lake WMA and 4 acres of the Frog Bayou WMA, while the corresponding HVDC alternative routes in Region 4 would not. Applicant Proposed Route Link 1 in Region 4 could potentially impact 17 acres of the Webbers Falls Lock and Dam Reservoir lands. There is no HVDC alternative route to this link of the Applicant Proposed Route. HVDC Alternative Route 4-B could impact approximately 230 acres of the Ozark National Forest, while the Applicant Proposed Routes in Region 4 would only potentially impact approximately 2 acres. The Applicant Proposed Route in Region 5 could potentially impact 77 acres of the Cherokee WMA, while the alternative routes in Region 5 would not. The representative ROW for HVDC Alternative Routes 6-C and 6-D does not include any natural areas or recreational land compared to the corresponding link of the Applicant Proposed Route, which includes approximately 0.5 acre of the Singer Forest Natural Area within the St. Francis Sunken Lands WMA.

S.6.1.13 Socioeconomics

Potential socioeconomic impacts from the Project include temporary construction-related impacts, as well as permanent impacts during Project operation. Construction of the Project would generate regional economic activity through Project-related expenditures on materials and supplies. The Project would also employ construction workers who would spend much of their income locally and support jobs and incomes elsewhere in the economy. Approximately 26 percent of the construction workforce is expected to be hired locally (i.e., workers who normally reside within daily commuting distance of their job site), with the remaining 74 percent temporarily relocating to communities along the ROI for the duration of their employment. Operation of the Project would have similar, but smaller regional economic benefits.

Workers and family members temporarily relocating to the ROI during construction are expected to require hotel or motel rooms and rental housing (apartments, houses, or mobile homes) or provide their own housing in the form of RVs or pop-up trailers. Adequate temporary housing exists in or near most of the ROI. There is, however, a potential shortage of temporary housing and RV spaces in Region 1 that would be further exacerbated if the construction schedules for the Oklahoma converter station, AC collection system, and HVDC transmission line were to overlap. This availability could be further reduced by other outside activities in the ROI such as other construction projects, community-sponsored events, and hunting and other recreational activities, as well as connected actions, specifically the development of wind generation facilities and the future Optima Substation. The Applicant proposes to prepare and implement a workforce housing strategy designed to minimize potential impacts to housing availability.

Some short-term adverse impacts on residential property values (and marketability) might occur on an individual basis as a result of the Project. However, these impacts would be highly variable and individualized and difficult to predict.

Minor short-term increases in demand from construction workers and family members temporarily relocating to local communities within the ROI are not expected to affect the levels of service provided by existing law and fire personnel, health care and medical facilities, or educational facilities. Minor increases in population resulting from operations and maintenance of the Project are also not expected to affect the provision of community services.

Construction of the Project would generate sales, use, and lodging tax revenues during the construction period, with an estimated 90 percent of total construction costs expected to be for materials subject to sales and use tax. Local spending by construction workers would also generate sales and lodging tax revenues. Operation of Project facilities would generate ad valorem or property tax revenues in the counties where they would be located. Operation-related expenditures would generate sales and use tax revenues.

Components of the DOE Alternatives include the additional converter station in Arkansas and a number of HVDC alternative routes. Construction and operation of the Arkansas Converter Station Alternative would result in socioeconomic impacts similar to those identified for the other converter stations evaluated as part of the socioeconomic impact analysis. Substituting one or more of the HVDC alternative routes for the corresponding link of Applicant Proposed Route is not expected to substantially affect the findings of the socioeconomic analysis.

S.6.1.14 Special Status Wildlife and Fish, Aquatic Invertebrate, and Amphibian Species

S.6.1.14.1 Special Status Terrestrial Wildlife

Fourteen special status (federally protected) terrestrial wildlife species could potentially be affected by the Project: five mammals, eight birds, and one insect. Because the Project extends across several ecoregions, the special status wildlife species also vary across the Project. Potential impacts to special status wildlife species during project construction include mortality and injury of individuals from vegetation clearing, collisions with vehicles, potential exposure to hazardous materials (e.g., accidental spills and herbicides), wildfires, increased predation rates; disturbance from suitable habitats or disruption of normal behaviors; and habitat loss or degradation (both temporary and permanent loss/degradation of habitat). Potential impacts to special status wildlife species during Project operation include mortality of individual birds from collisions with transmission lines and electrocution risks, habitat degradation and loss from the fragmentation of habitats, invasive and weedy species, and avoidance of habitats near project structures and roads; and temporary disturbance during maintenance activities.

The Applicant has developed EPMs to avoid or minimize impacts to special status wildlife species. These measures include, but are not limited to, restoring disturbed habitats, proper use of chemicals and herbicides, scheduling of construction activities to minimize impacts to specific species, controlling invasive and weedy plant species, and commitment by the Applicant to work with applicable state and federal agencies on additional protective measures that may be needed.

Mortality from collisions with transmission lines is a potential risk to the whooping crane in Regions 1, 2, and 3. The potential impact is from operations, not just construction. The Project crosses the primary whooping crane corridor in Region 2 where the potential collision risk would be the greatest of the three project regions. Potential disturbance and fragmentation of suitable lesser prairie-chicken (LEPC) habitat and avoidance of suitable habitat near project structures are potential impacts to the LEPC in Regions 1 and the western part of Region 2. These impacts could reduce LEPC productivity. Suitable habitat for the interior least tern may be found along rivers and shorelines and potential impacts to this species could occur near the crossings of the Cimarron River in Region 3, Arkansas River in Region 4, and the Mississippi River in Region 7. Golden and bald eagles are both at risk for mortalities from collisions with transmission lines. Both eagle species could be impacted by disturbances of nesting and roosting sites if located near construction sites. However, disturbances impacts could be avoided or minimized by timing of construction activity. Golden eagles are most common in Regions 1 and 2, while bald eagles are more common in Regions 3 through 7 where rivers and lakes provide preferred habitats. Potential impacts to several special status bird species such as the piping plover, Sprague's pipit, and red knot are expected to be minimal or none because the species' breeding habitat does not occur in the ROI or the species is an uncommon migrant in the Project area.

Four special status mammal species potentially occur in the Project ROI. These bat species occur in Regions 3 through 7. The gray bat and Ozark big-eared bat use caves throughout the year for roosting and hibernation. Because the Project would not impact known caves, impacts to both species are expected to be minimal. The northern long-eared bat and Indiana bat use caves for hibernation and trees for summer roosting (e.g., maternity colonies). Both species could be potentially impacted if the transmission line ROW contains bat roost trees that are removed during construction in Regions 4 through 7. The Florida panther is considered extirpated (locally extinct) in Arkansas and would not be impacted.

The American burying beetle is found in Region 3 and 4 and could be at risk of mortality during vegetation clearing along the ROW. Avoiding soil disturbance and leaving roots in the ground during vegetation clearing could minimize potential impacts.

Most of the HVDC alternative routes (except for HVDC Alternative Routes 1-A, 1-B, 2-A, 3-C, and 4-D) would have similar construction and operational impacts to special status wildlife species compared to the Applicant Proposed Route. HVDC Alternative Routes 1-A and 1-B could potentially impact higher quality LEPC habitat mapped as focal areas or connectivity habitat than the Applicant Proposed Route. HVDC Alternative Route 2-A is parallel to the Cimarron River for a portion of the route and could potentially impact interior least terns during construction more than the Applicant Proposed Route. HVDC Alternative Route 3-C has slightly more forested land and therefore could potentially affect the American burying beetle more than the Applicant Proposed Route during construction. The larger area of forested land along HVDC Alternative Route 3-C increases the potential for impacts to the special status bat species (e.g., disturbances to or loss of roost trees) compared to the Applicant Proposed Route. HVDC Alternative 4-D contains more forested areas compared to the Applicant Proposed Route, thereby increasing the potential for impact to special status bat species (e.g., disturbances to or loss of roost trees).

DOE and the Applicant are preparing a Biological Assessment of potential impacts on special status species protected under the Endangered Species Act (ESA) as part of the Section 7 consultation between DOE and the USFWS. The Section 7 consultation review is a parallel but separate process conducted pursuant to the requirements of ESA and the applicable implementing regulations. Through this process, additional protective measures may be identified and adopted to avoid or minimize impacts to special status species.

S.6.1.14.2 Special Status Fish, Aquatic Invertebrate, and Amphibian Species

Seventeen listed, proposed or candidate fish, aquatic invertebrate, and amphibian species could potentially be affected by the Project: 5 fish and 10 aquatic invertebrate species and 1 amphibian. Because the Project crosses or runs parallel to multiple waterbodies (e.g., perennial, intermittent), the special status fish and aquatic invertebrate species also vary across the Project. Potential impacts to special status fish, aquatic invertebrates, and amphibian species during project construction include mortality and injury of individuals (e.g., via crushing during crossing construction, sedimentation, potential exposure to hazardous materials, blasting); disturbance from suitable aquatic habitats or disruption of normal behaviors; aquatic habitat loss or degradation (both temporary and permanent loss/degradation of aquatic habitat); and introduction of non-native aquatic plants and animals. Potential impacts to special status fish, aquatic invertebrates, and amphibian species during Project operations and maintenance include mortality and injury of individual fish and aquatic invertebrates from sedimentation and potential exposure to hazardous materials (e.g., oils, fuels, herbicides); aquatic habitat degradation and loss from the presence of crossing structures, sedimentation, and non-native aquatic plants and animals; avoidance of aquatic habitats near Project structures and roads; and temporary disturbance during maintenance activities.

Populations of the Arkansas darter may exist in Regions 1 and 2, and populations of the Arkansas River shiner may exist in Regions 1, 2, and 3. Because the Project crosses or runs parallel to multiple waterbodies where these species may exist, potential impacts to the Arkansas darter and Arkansas River shiner in these regions could include mortality and injury; potential disturbance, avoidance, loss, or degradation of suitable aquatic habitat; and introduction of non-native aquatic plants and animals. The Project crosses or runs parallel to USFWS-designated

critical habitat for the Arkansas River shiner within the Cimarron River in Region 2, where potential impacts for the Arkansas River shiner would be the greatest of the three project regions. In Regions 4, 5, and 6, mortality and injury; potential disturbance, loss, or degradation of suitable aquatic habitat; and introduction of non-native aquatic plants and animals from crossing waterbodies are potential impacts to special status aquatic invertebrate species. Potential impacts to the yellowcheek darter and pallid sturgeon are expected to be minimal or non-existent, because either the species aquatic habitat does not occur in the ROI or the species aquatic habitat is not likely to be impacted.

The Applicant has developed EPMs to avoid or minimize impacts to special status fish and aquatic invertebrate species. These measures include, but are not limited to, restoring disturbed habitats, proper use of chemicals and herbicides, scheduling of construction activities, controlling invasive and weedy plant species, and commitments by the Applicant to work with applicable state and federal agencies regarding additional measures that may be needed.

Most of the HVDC alternative routes (except for HVDC Alternative Routes 2-A and 2-B) would have similar construction and operational impacts to special status fish and aquatic invertebrate species compared to the Applicant Proposed Route. HVDC Alternative Route 2-A and the corresponding Link 2 of the Applicant Proposed Route cross the Cimarron River at separate locations where USFWS-designated critical habitat exists, but HVDC Alternative Route 2-A is within the USFWS-designated critical habitat for more acres. Neither the HVDC Alternative Route 2-B nor the corresponding Link 3 of the Applicant Proposed Route cross the Cimarron River where USFWS-designated critical habitat exists, but HVDC Alternative Route 2-B is within the USFWS-designated critical habitat for fewer acres. The greater acreage within USFWS-designated critical habitat increases the potential impact risks to the federally threatened Arkansas River shiner and its critical habitat.

DOE and the Applicant are preparing a Biological Assessment of potential impacts on special status species protected under the ESA as part of the Section 7 consultation between DOE and the USFWS. The Section 7 consultation review is a parallel but separate process conducted pursuant to the requirements of ESA and the applicable implementing regulations. Through this process, additional protective measures may be identified and adopted to avoid or minimize impacts to special status species.

S.6.1.15 Surface Water

Potential impacts to surface water from the Project would be experienced primarily during construction phase. Typical construction impacts include:

- Potential for Surface Water Contamination—Contamination could occur as a result of the accidental release of hazardous substances, primarily fuels and lubricants, which would be used by construction equipment and be present in construction staging or storage yards. Permit compliance and implementation of EPMs, including spill prevention and response planning, would minimize the potential for surface water contamination.
- Changes to Runoff Rates—Soils disturbed and loosened during construction could represent areas of increased precipitation infiltration, possibly decreasing local runoff rates over the short term. Surfaces compacted during construction and impermeable facility surfaces remaining after construction would represent areas of increased runoff rates. The area of impermeable surfaces resulting from the Project would be small. In accordance with the Applicant's EPMs, soils would be returned to pre-activity conditions, therefore resulting in *de minimis* long-term impacts to runoff rates.
- Direct Impacts or Disturbances to Surface Water or Drainage Channels—Surface waters and drainage channels would be avoided as practicable in the placement of converter stations and transmission line facilities, with

transmission lines spanning such features as necessary. Access roads may not always have the same means of avoidance and would be most likely to involve disturbance of drainage features. Preplanning of the crossing methods would minimize the length of the drainage feature affected and enhance the ability to maintain flow characteristics.

- Effects on Water Availability—Water demands to support the Project could come from surface water resources (more likely in areas where total water use is typically from surface water sources such as Regions 3, 4, and 5) and result in less surface water being available for other uses. The Project's water demand is not expected to have noticeable effects on surface water resources beyond those resulting from existing water usage.

There are differences in the amount of surface water used between regions and in the numbers of surface water features within the representative ROWs for each of the HVDC transmission line routes in Region 3. Water demands from the Project are not expected to be a concern, primarily because the highest demand would occur during the short-term construction phase and regions with low surface water availability are areas where groundwater use already dominates. The specific locations of each structure or access road has not yet been determined, so the EIS does not identify which surface water features would be completely avoided or which could be affected by Project. Areas with the greatest amount of surface water in the ROW, such as Region 3, which has the most perennial streams, reservoirs, lakes, and ponds, would be the most likely to potentially impact surface waters. All of the HVDC transmission line routes in Region 3 have similar quantities of surface waters in the ROW.

Potential impacts to surface water during operations and maintenance of the Project would be very minor. The quantities of hazardous materials present (primarily fuels and lubricants in maintenance vehicles and equipment) would be much less than during construction, and water demands of facilities would be limited to that required to support the small number of employees required for operations and maintenance activities. Access roads that would be used during operations and maintenance would be maintained so that any surface water or drainage feature crossings would remain stable, minimizing the potential for ongoing impacts.

S.6.1.16 Transportation

Impacts to transportation consist primarily of temporary impacts to traffic and roadways during the construction phase of the Project. Typical impacts during construction include increased traffic from workers commuting to the construction sites, as well as increased traffic from the hauling of materials and equipment to the construction sites. Construction traffic also has the potential to impact bus and emergency routes for roadways near the construction areas. Temporary travel delays involving major roads (interstate highways, federal highways, and state highways) and railroads may also occur for HVDC or AC line installation at crossings. Construction activities that take place adjacent to major roadways also have the potential to cause temporary adverse impacts to traffic from vehicles entering and leaving the roadway and could involve lane closures. Roadway pavement or other infrastructure might be damaged by heavy vehicles delivering equipment and materials to construction areas. Transmission line tower structures and lines could become a hazard if they are located too close to airport operations or military airspace operating areas. River traffic may be controlled, in coordination with the USACE, during the short time required to span the conductor across the Arkansas and Mississippi rivers. River traffic would not be impacted during Project operation.

Long-term impacts to transportation resources from the Project are not expected because any increase in traffic during the operations and maintenance phase would be negligible. Roads would be returned to previous operating

conditions following construction. After construction, some roads may be improved better than previous operating conditions and will be left in their improved condition during operations and maintenance and decommissioning.

Project-related vehicle trips that include commuting and hauling of construction equipment and materials have the potential to decrease the level of service (LOS) from existing levels. There are six letter designations of LOS from A to F, with LOS-A (free traffic flow with little delay) representing the best roadway operating conditions and LOS F (roadway congestion with long delays) representing the worst operating conditions. The acceptable LOS for a roadway varies as defined by the federal, state, county, or local agency with jurisdiction over the roadway. According to American Association of State Highway and Transportation Officials, a LOS-C or better is considered acceptable on rural roadways. Within urban areas, LOS-D generally is considered the minimum acceptable LOS. Potential LOS decreases are predicted from LOS-A to LOS-B for a small number of roadway segments in Regions 1 and 2. Potential LOS decreases are predicted from LOS-A to LOS-B and from LOS-B to LOS-C for a small number of roadway segments in Regions 3 and 6. Under LOS-B and LOS-C, impacts to roadways would be minor and temporary during construction. Potential LOS decreases are predicted from LOS-A to LOS-B, from LOS-B to LOS-C and from LOS-C to LOS-D for a small number of roadway segments in Regions 4, 5, and 7. Although an LOS-D would result in a measurable decrease in roadway operations, the decrease would be temporary, and because the decrease is only one LOS level, a significant incremental impact is not expected in relation to existing conditions. Through the implementation of EPMs including the Transportation and Traffic Management Plan, effects to traffic would be avoided and minimized.

Although there are localized differences between the Applicant Proposed Route and the alternative routes such as the lengths in proximity to major roadways, proximity to airports, and the number of roadway and railroad crossings, none of these differences are considered to be substantial in terms of the overall transportation resources impacts from the Project.

Requirements including ROW permits, easements, and oversize and overweight vehicle permits; as well as Applicant EPMs (including the Transportation and Traffic Management Plan) would minimize potential transportation resources impacts. The Applicant would work with the USACE for crossing the Arkansas and Mississippi rivers and with airports and airfields in cases where they might trigger Federal Aviation Administration (FAA) review requirements.

S.6.1.17 Vegetation Communities and Special Status Plant Species

Vegetation resources across the Project's seven regions are quite diverse, varying from grasslands, to riparian forest and shrublands, to extensive agricultural lands, and finally to both deciduous and evergreen forests. Regions 1 and 2 are both dominated by grasslands and croplands. Grasslands, deciduous forest, and pasture/hay lands dominate Region 3. Regions 4 and 5 are predominantly pasture/hay lands and deciduous forest. Regions 6 and 7 are both dominated by croplands.

Potential Project impacts to vegetation resources may include both direct and indirect impacts. Construction may cause the direct impact of vegetation removal and the indirect impacts of reduction of plant vigor from mechanical damage, fragmentation, and the introduction of invasive species. Operations and maintenance of the Project would impact vegetation directly through mowing and pruning in the ROW and indirectly through herbicide applications that may impact non-target plant species.

Impacts to vegetation may also vary in duration from short-term to long-term, with some impacts potentially permanent in nature. Short-term impacts would be realized from mowing and pruning of vegetation in the ROW, with regrowth occurring between treatments. Removal of vegetation during construction may vary across the spectrum from short term to permanent. Short-term removals and mechanical damage to vegetation may occur in areas of temporary construction access roads, construction laydown areas, and tensioning areas. It is likely that vegetation impacts in croplands would be short term based on the seasonal replanting of these landscapes. Long-term to permanent impacts to vegetation would involve those areas of the ROW where vegetation is removed for new access roads, substations, converter stations, and transmission structural foundations. Long-term impacts are also expected through those portions of the ROW with forested land cover due to the need to minimize canopy height for line safety. Long-term impacts may also result from vegetation removal in the portions of the Project ROW dominated by shortgrass prairie due to the difficulty of revegetation in drier climatic conditions.

Potential impacts are very similar between the Applicant Proposed Route links and the corresponding HVDC alternative routes. The magnitude of impact to vegetation within the ROW shows little variation. However, there is one notable exception. Several of the HVDC alternative routes tend to have more potential for impacts to forested lands. Use of these routes would be significant both in terms of initial direct impact during construction and in the long-term operations and maintenance within forested portions of the ROW. The alternative routes with more forested acreage in the representative ROW than the corresponding Applicant Proposed Route links include HVDC Alternative Routes 1-A, 2-B, 3-D, 4-A, 4-B, 4-C, 4-D, 5-A, 5-D, 5-E, 5-F, and 6-D. Alternative routes with less forested acreage than the corresponding Applicant Proposed Route links include HVDC Alternative Routes 2-A, 3-A, 3-B, 3-C, 3-E, 4-E, 5-B, 5-C, 6-A, 6-B, 6-C, 7-A, 7-B, 7-C, and 7-D. (Alternatives Routes 1-B, 1-C, and 1-D and their associated APR links have no potential impact to forested lands.)

EPMs would be implemented to avoid and/or minimize potential impacts to vegetation resources. These EPMs include:

- Minimizing the clearing of vegetation within the ROW, consistent with a Transmission Vegetation Management Plan.
- Minimizing impacts to special status plant species or avoiding them altogether.
- Minimizing the spread of invasive species including noxious weeds.
- Follow the labeled instructions and any federal, state, and local regulations for herbicide application during construction and operations and maintenance.

S.6.1.18 Visual Resources

Visual impacts consist primarily of the introduction of facilities associated with converter stations and vertical structures (typically 120 to 200 feet in height) associated with the transmission line. Temporary impacts during construction include visual intrusion of construction vehicles, equipment, materials, and a work force in staging areas, along access roads and along new transmission line ROWs. The presence of equipment, materials, and work force would create short-term local contrast within the area in which construction activities are occurring. In regard to the transmission line, disturbance from construction activities would be transient and of short duration as activities progress along the transmission line route.

Long-term impacts from the Project include the intrusion of the converter station and associated structures and transmission structures, access roads, and cleared ROW that may introduce contrast into the surrounding landscape setting.

High impacts to sensitive viewers (viewers associated with residences, recreation areas, and travel routes) are expected to occur in the foreground (0 to 0.5 mile) distance zone where the Project introduces a high level of contrast to the existing landscape and is dominant within a view and highly noticeable by the casual observer. Impacts typically decrease when the Project is located in the middleground (0.5 to 3 miles) and background (3 miles or greater) distance zone where, given the distance of the sensitive viewer from the Project. Project components tend to be subordinate in the landscape and not readily apparent to the casual observer. Impacts are also reduced where the Project would be seen in the context of similar existing facilities (such as other high voltage transmission lines) or where the Project is obstructed by terrain and/or vegetation. Impacts to scenery are anticipated to be higher in Distinct landscapes (natural landscapes with little or no cultural modifications) or Common landscapes (occur frequently within a region with minor cultural modifications) that would be substantially altered by the Project (i.e., where similar facilities do not exist in the landscape). Impacts are anticipated to be lower in Common or Developed landscapes where similar features may be present. Regions 1, 2, and 6 are characterized primarily by flat croplands and grasslands with scattered vegetation. Sensitive viewers in these regions are anticipated to have greater visibility of the Project due to long viewing distances associated with an open landscape with panoramic views. In addition, the tall (typically 120 to 200 feet in height) vertical geometric structures of the Project components would result in strong contrast with the relatively flat landscape with the regions. Regions 3, 4, 5, and 7 are characterized by varying terrain ranging from gently rolling to hilly to rugged with a greater occurrence of dense wooded areas. Sensitive viewers in these regions are anticipated to have shorter viewing distances. Project components are more likely to be partially to completely screened by existing terrain and/or vegetation in all distance zones.

In assessing sensitive viewers (associated with residences) within 0.5 mile of Project components and the scenery crossed (landscapes categorized as Distinct, Common, Developed), the potential visual impacts are similar between the Applicant Proposed Route and the HVDC alternative routes. (For context, the number of residential structures within the 1,000-foot-wide corridor of the Applicant Proposed Route ranges from 32 and 33 in Regions 1 and 2, respectively, to 449 and 493 in Regions 5 and 4, respectively.) Where there are notable differences between the Applicant Proposed Route and the HVDC alternative routes, the Applicant Proposed Route is typically the option with the least visual impacts to sensitive viewers and scenery. Exceptions are HVDC Alternatives 6-C, 7-A, 7-C, and 7-D, which have an order of magnitude greater number of residents within 0.5 mile than the corresponding Applicant Proposed Route links.

In assessing sensitive viewers (associated with residences) within 0.5 mile of Project components and the scenery crossed (landscapes categorized as Distinct, Common, Developed), the potential visual impacts are similar between the Applicant Proposed Route and the HVDC alternative routes. (For context, the number of residential structures within the 1,000-foot-wide corridor of the Applicant Proposed Route ranges from 32 and 33 in Regions 1 and 2, respectively, to 449 and 493 in Regions 5 and 4, respectively.) Where there are notable differences between the Applicant Proposed Route and the HVDC alternative routes, the Applicant Proposed Route is typically the option with the least visual impacts to sensitive viewers and scenery. Exceptions are HVDC Alternatives 6-C, 7-A, 7-C, and 7-D, which have an order of magnitude greater number of residents within 0.5 mile than the corresponding Applicant Proposed Route links.

S.6.1.19 Wetlands, Floodplains, and Riparian Areas

Wetland resources include palustrine (depressional or ponded), lacustrine (lakes), and riverine types. Floodplains analysis included an evaluation of 100-year flood zones. Riparian areas are defined in the EIS as linear transitional areas between uplands and riverine ecosystems acting as important buffer strips between flowing surface waters and the surrounding upland landscapes. Riparian areas may be dominated by a variety of vegetation types, from herbaceous plants to shrubs, and also by gallery or streamside forests.

Potential impacts to wetlands, floodplains, and riparian areas from the Project would primarily occur during construction. Short-term impacts may include mechanical damage/crushing of vegetation from use of heavy machinery, compaction of soils, sedimentation and turbidity from construction activities, alteration of hydrology from access road construction and excavations for structure foundations, contamination from herbicide runoff and from accidental spills of hazardous substances. The potential long-term impacts to wetlands, floodplains, and riparian areas may include placement of fill at foundation footprint locations or for permanent access roads; long-term conversion of forested wetlands or riparian areas to shrubby or herbaceous cover types within the ROW; changes to hydrology from construction of permanent access roads or support structures, converter stations, and other ancillary infrastructure; and introduction of invasive species from construction equipment.

Potential impacts are similar between the Applicant Proposed Route and the corresponding HVDC alternative routes. Some differences are apparent, however. For wetland resources, all HVDC alternative routes for Regions 2 and 3 have potential to impact more wetland acreage than the corresponding Applicant Proposed Route links in those regions. For floodplain resources, all HVDC alternative routes for Regions 2 and 7 contain more floodplain acreage and greater potential for impacts within the 200-foot-wide representative ROW as compared to Applicant Proposed Route links in those regions.

The EPMs that would avoid and/or minimize potential impacts to wetlands, floodplains, and riparian resources include:

- Avoiding or minimizing construction of access roads in special interest waters.
- Identifying, avoiding, and/or minimizing adverse effects to wetlands and waterbodies, and avoiding placing structure foundations within the Ordinary High Water Mark of Waters of the United States.
- Establishing streamside management zones within 50 feet of intermittent and perennial streams and along bodies of open water where removal of low-lying vegetation is minimized.
- If used, selectively applying herbicides in streamside management zones.
- Constructing access roads to minimize disruption of natural drainage patterns including perennial, intermittent, and ephemeral streams.
- Avoiding constructing counterpoise or fiber optic cable trenches across waterbodies.
- Minimizing fill for access roads and structure foundations within 100-year floodplains to avoid adverse changes to the base flood elevation.

DOE, in consultation with the USACE, has identified the following BMPs to avoid or minimize impacts on wetlands, floodplains, and riparian areas:

- In addition to protection of intermittent and perennial streams, ephemeral streams would also be included in the Applicant's streamside management zones as described above under the EPMs.

- Limit, to the extent practicable, the amount of vegetation removed along streambanks and minimizing the disruption of natural drainage patterns.
- All permanent and temporary crossings of waterbodies would be suitably culverted, bridged, or otherwise designed and constructed to maintain low flows to sustain the movement of aquatic species. The crossings would also be constructed to withstand expected high flows. The crossings would not restrict or impede the passage of normal or high flows.
- Excavated trenches that are to be backfilled should separate the upper 12 inches of topsoil from the rest of the excavated material. The topsoil should be used as the final backfill.

S.6.1.20 Wildlife, Fish, and Aquatic Invertebrate Species

S.6.1.20.1 Wildlife

Potential construction-related impacts to wildlife species would include direct mortality or injury of individuals from vegetation clearing, collisions with vehicles, potential exposure to hazardous materials (e.g., accidental spills and pesticides), wildfires, or increased predation rates; disturbance from suitable habitats or disruption of normal behaviors; and habitat loss or degradation (both temporary and permanent loss/degradation of habitat). Potential impacts to wildlife species that could be experienced during the Project's operation include the fragmentation of habitats; isolation of sub-populations and loss of meta-population dynamics; degradation of habitat quality due to edge effects as well as invasive plant species; consolidation of predatory avian species along the line (e.g., raptors and corvids), and ongoing mortality of individual birds due to collision and electrocution risks.

The majority of the Project would pass through and impact habitat types that contain low vegetation, which would typically recover quickly and would not need to be permanently cleared or maintained during the Project's operation (e.g., grassland and cropland habitats). However, Regions 4 and 5, as well as Regions 3 and 7 to a lesser extent, would cross through and impact forested habitats. The Project would result in the permanent conversion of these forested habitats within the ROW to grasslands and/or shrublands (i.e., habitats that contain low vegetation types). This would constitute a permanent loss of forested habitats, as well as create a permanent edge effect along the Project's ROW in forested habitats. Where edge habitats do not already exist, this could change the species composition and use of these once forested areas (i.e., transitioning to an edge habitat community).

Most of the HVDC alternative routes (except for HVDC Alternative Routes 3-C, and 4-D) would have similar construction and operational impacts to wildlife compared to the Applicant Proposed Route. HVDC Alternatives 3-C and 4-D would impact slightly more forested areas compared to the Applicant Proposed Route, thereby increasing the extent of long-term impacts to forested habitat.

The Applicant has developed a list of EPMs intended to avoid and minimize impacts to wildlife resources. These measures include, but are not limited to, restoring disturbed habitats, proper use of chemicals and herbicides, scheduling of construction activities, controlling invasive plant species, and commitments by the Applicant to work with applicable state and federal agencies regarding additional measures that may be needed.

S.6.1.20.2 Fish and Aquatic Invertebrate Species

Potential construction-related impacts to fish and aquatic invertebrate species would include direct mortality and injury of individuals (e.g., via crushing during crossing construction, sedimentation, potential exposure to hazardous materials, blasting); disturbance from suitable aquatic habitats or disruption of normal behaviors; aquatic habitat loss

or degradation (both temporary and permanent loss/degradation of aquatic habitat); and introduction of non-native aquatic plants and animals. Potential impacts to fish and aquatic invertebrate species that could occur during the Project's operations and maintenance include mortality and injury of individual fish and aquatic invertebrates from sedimentation and potential exposure to hazardous materials (e.g., oils, fuels, herbicides); aquatic habitat degradation and loss from the presence of crossing structures, sedimentation, and non-native aquatic plants and animals; avoidance of aquatic habitats near project structures and roads; and temporary disturbance during maintenance activities.

The Project would cross or run parallel to multiple surface water features (e.g., perennial and intermittent streams, major waterbodies, and reservoirs, lakes, and ponds) within each region. There are over 185 fish and aquatic invertebrate species known to occur or have the potential to occur in these surface water features. Because the Project crosses or runs parallel to multiple surface water features that may provide suitable aquatic habitat, the potential occurrence of fish and aquatic invertebrate species varies greatly across the Project. Potential impacts to individual fish and aquatic invertebrate species or their aquatic habitat within a given region is dependent on specific locations of individual Project components (e.g., vegetation clearing, access roads, and road crossings).

Within Regions 4 and 5, as well as Regions 3 and 7 to a lesser extent, the Project would cross through and impact forested vegetation through clearing. These regions would likely have the most difficulty in avoiding potential disturbance, avoidance, loss, or degradation of suitable aquatic habitat for fish and aquatic invertebrate species. In addition, areas with the greatest amount of surface water and potential aquatic habitat in the ROW, such as Region 3, which has the most perennial streams, reservoirs, lakes, and ponds, would be the most likely to potentially impact surface waters that could provide habitat to fish and aquatic species.

The Applicant has developed EPMs to avoid or minimize impacts to fish and aquatic invertebrate species. These measures include, but are not limited to, restoring disturbed habitats, proper use of chemicals and herbicides, scheduling of construction activities, controlling invasive and weedy plant species, and commitments by the Applicant to work with applicable state and federal agencies regarding additional measures that may be needed. However, the analysis in the EIS found that a BMP could also be implemented as part of the Project. The BMP would ensure that the Applicant would identify, control, and minimize the spread of non-native invasive species and noxious weeds to the extent practicable, including ensuring that in-water equipment and vehicles are cleaned between waterbodies to minimize the chance of transferring non-native species between waterbodies.

There are differences in the amount of surface water features and potential aquatic habitat within the representative ROWs for each of the HVDC alternative routes. Most of the HVDC alternative routes (except for HVDC Alternative Routes 2-A and 4-E) would have similar construction and operational impacts to fish and aquatic invertebrate species and their potential habitat compared to the Applicant Proposed Route. HVDC Alternative Route 2-A would cross and run parallel to the Cimarron River, potentially directly and indirectly impacting fish and aquatic invertebrate species to a greater extent than the Applicant Proposed Route. Unlike the Applicant Proposed Route, HVDC Alternative Route 4-E would not parallel the Big Piney Creek, resulting in less direct and indirect impacts to fish and aquatic invertebrate species.

S.6.2 Summary of Impacts from Connected Actions

Potential connected actions associated with the project include the possible wind energy generation of up to 4,550MW of renewable energy and upgrades to the existing substation and transmission systems as a result of the interconnections in Oklahoma and Tennessee (Southwestern Power Pool and TVA).

S.6.2.1 Wind Energy Generation

Wind energy facilities that would likely interconnect with the Project are anticipated to be located in parts of the Oklahoma and Texas panhandle regions within an approximate 40-mile radius of the Oklahoma converter station. Approximately 2 percent of land within a wind energy facility would be disturbed during construction; primarily cropland and grasslands occur in these regions. Approximately 1 percent or less of the land for a wind energy facility would be converted to utility use for life of the facility. The type, duration, and magnitude of potential impacts associated with construction and operations of wind energy facilities depend on specific project details, such as location, timing, and construction methods (for example, blasting, road construction), as well as the measures implemented to minimize adverse impacts.

Potential impacts associated with the construction phase of this connected action could include: slight increases in temporary air emissions, noise, and disturbance of the viewshed; temporary housing shortage if construction were concurrent with Project construction in Region 1; increased jobs and associated tax revenues; short-term restricted use of agricultural land; soil compaction, erosion, and possible contamination from spills and/or sediment; disturbance of drainage features from construction of access roads; mowing or other vegetation removal in ROWs; introduction of invasive species from construction equipment; short-term displacement of species near construction activity; loss or modification of wildlife or fish habitats; animal mortality from vehicle collisions and/or water body crossings; and clearing of grassland habitats important for the LEPC, especially in eastern Texas County and western Beaver County (Oklahoma) and western Ochiltree County (Texas).

Potential impacts associated with the operations of this connected action could include: reduction in emissions of pollutants and greenhouse gases from the displacement of current fossil fuel power sources for electricity generation; increased jobs and county tax revenues; possible conflicts with airports and military airspace; increased collision risk for aircraft operations; annoyance from localized shadow flicker or blade glare; increased noise within 1,000 feet; visual impacts from tall, vertical wind turbines against primarily horizontal lines of surrounding landscape and flashing FAA-required lighting; changes to hydrology from permanent access roads construction; commitment of soils, and vegetation and habitat removal in infrastructure footprints; and increased risk for bird collisions with turbines, barotrauma of bat species, and behavioral avoidance by LEPC.

S.6.2.2 Related Substation and Transmission Upgrades

In Oklahoma, the future Optima Substation is anticipated to be constructed on 160 acres of currently undeveloped land. Any current agricultural uses of the site would be converted to a utility use. Impacts would occur primarily during construction of the substation because there would be few, if any environmental impacts associated with operations and maintenance of the substation.

In Tennessee, the required TVA upgrades could have impacts similar to the Project, but on a smaller scale, being restricted to an approximately 37-mile-long new 500kV AC transmission line in western Tennessee and upgrades to existing facilities. The potential impacts would be limited primarily to the construction phase of the required upgrades.

The upgrades to existing facilities would be unlikely to result in any substantial, adverse impacts since any additional land disturbance would not likely be required beyond the existing footprints of those facilities. The specific impacts of the new transmission line would be subject to environmental review once specific locations are identified.

S.6.3 Summary of Cumulative Impacts

The cumulative impacts analysis identified past, present, and reasonably future actions that could occur within the same time and place as the Project. This section identifies those cumulative impacts for both construction and operations and maintenance.

Impacts from Construction

Construction activities in the seven diverse regions of the Project could result in impacts to agricultural resources, changes to land uses, temporary land disturbance, increased traffic, increased air emissions, increased noise levels, intrusions into the visual landscape, and potential impacts to wildlife, fish and vegetation, including special status species. In most cases, the impacted areas would begin to return to their original state within months after construction activities have been completed. Cumulatively, other construction activities occurring in the same time and vicinity would have similar impacts on the specific ROIs within each region. Other past, present, and reasonably foreseeable actions identified for the seven regions that could occur within the same time and place of the Project include electrical transmission lines, roadway and bridge enhancements, new road construction, pipelines, wind farm developments, and two relatively large development projects in Region 7. Multiple activities occurring at the same time and vicinity would have greater impacts than just one action. If construction activities overlapped in the same area, then the construction-related impacts could be greater than for just the Project. However, with the exception of the converter stations, construction of the Project would not affect any one area for long (i.e., no more than a few weeks or months), so the short temporal overlap would limit cumulative impacts. The majority of the actions identified are transmission lines and road construction. Most of the road construction would occur on existing roadways; not disturbing new lands, and therefore would have only minor contributions to cumulative impacts from the Project. Overall, construction of the Project, when considered with past, present, and reasonably foreseeable actions, would result in the following cumulative impacts: short-term temporary disturbance of active agricultural lands and operations; possible restrictions on existing land uses; temporary soil and vegetation disturbance; increased risk of localized water quality impacts (spills or sedimentation); increased traffic; increased air emissions and noise levels; potential shortages in temporary housing (in Region 1); visual disruptions from construction equipment and land disturbance; and potential impacts to wildlife, fish, and vegetation, including special status species.

Impacts from Operations and Maintenance

After completion of construction, the majority of the Project-related impacts would be minimized. Those that would continue or increase would include electrical environment (electric fields, magnetic fields, audible noise, and radio and television interference) and visual resources. The Project individually would not be considered a strong source of magnetic fields. Other existing and proposed transmission lines that would be crossed by the Project would be an additional source of magnetic fields at the location of the crossing. People are exposed to numerous sources of magnetic fields on a daily basis from sources like power lines, but also from electric devices in home and office environments. The research available on the health impacts of magnetic field exposure are not definitive, and no conclusions regarding the health impacts can be drawn based on what is presently known about the health impacts of magnetic fields.

Long-term visual impacts from the Project include the intrusion of the converter station and associated structures and transmission structures, access roads, and cleared ROW that may introduce contrast into the surrounding landscape setting. The cumulative impacts would be of a similar nature in areas where additional transmission line actions have been identified (Regions 1, 2, and 3. Additionally, sensitive viewers in Regions 1, 2, and 6, which are characterized primarily by flat croplands and grasslands with scattered vegetation, are anticipated to have greater visibility of the Project given the long viewing distances associated with an open landscape with panoramic views. A new planned section of Highway 71 would cross Link 6 of the Region 4 Applicant Proposed Route and near the Alma Key Observation Point. The visual impacts of the new section of Highway 71 would be cumulative over the long-term with those of the Project.

Long-term visual impacts from the Project include the intrusion of the converter station and associated structures and transmission structures, access roads, and cleared ROW that may introduce contrast into the surrounding landscape setting. The cumulative impacts would be of a similar nature in areas where additional transmission line actions have been identified (Regions 1, 2, and 3). Additionally, sensitive viewers in Regions 1, 2, and 6, which are characterized primarily by flat croplands and grasslands with scattered vegetation, are anticipated to have greater visibility of the Project given the long viewing distances associated with an open landscape with panoramic views. A new planned section of Highway 71 would cross Link 6 of the Region 4 Applicant Proposed Route and near the Alma Key Observation Point. The visual impacts of the new section of Highway 71 would be cumulative over the long term with those of the Project.

S.7. Conclusions

CEQ (40 CFR 1502.12) requires that an EIS summary stress the following three elements: major conclusions, areas of controversy (including issues raised by agencies and the public), and issues to be resolved (including the choice among alternatives). Areas of controversy (topics of most concern) are described above under Section S.4.2, and major conclusions and issues to be resolved are described below.

S.7.1 Major Conclusions

DOE evaluated the potential direct, indirect, and cumulative impacts on 19 environmental resource areas that include features of the natural environment and matters of social, cultural, and economic concern. DOE evaluated impacts from the Applicant Proposed Project, DOE Alternatives, connected actions, and the No Action Alternative on each resource area. Altogether, DOE evaluated a total of three converter stations; 13 AC collection system routes (ranging in length from 13 to 56 miles each),[10] approximately 720 miles of HVDC transmission line for the Applicant Proposed Route and another approximately 1,125 miles of HVDC alternative routes,[11] access roads; temporary construction areas; 64 EPMs; and other features associated with the Project (such as ROWs, regeneration stations, and transmission structures). The analysis revealed temporary disturbance of active agricultural lands and operations; possible restrictions on existing land uses; temporary soil and vegetation disturbance; increased risk of localized

[10] The Project would include four to six AC collection lines of up to 345kV from the Oklahoma converter station to points in the Oklahoma and Texas panhandles.

[11] If DOE chooses to participate in the Project, the eventual selection of a route alignment for the HVDC transmission line could either follow the Applicant Proposed Route for the entire length or could bypass specific links of the Applicant Proposed Route by selecting specific alternative routes.

water quality impacts (spills or sedimentation); increased traffic; increased air emissions and noise levels; potential shortages in temporary housing (in Region 1); short-term construction disturbances to special status species' habitat; long-term increased electric fields, magnetic fields, audible noise, and potential radio and television interference within the ROW; and short- and long-term increased contrast with the surrounding landscape setting where the Project is visible. The analysis also revealed potential positive impacts to long-term air quality from a displacement of fossil-fuel use for electricity generation and increases in regional jobs and tax revenues as a result of the Project.

While the relative importance of specific environmental resource areas varies by individual (some members of the public or agencies value certain resources over others), the Plains & Eastern EIS did not identify widespread, major impacts as a result of construction or operations of the Project. Implementation of the environmental protection measures that the Applicant has included as an integral part of the Project would avoid or minimize the potential for major environmental effects to the affected resources.

DOE analyzed HVDC Alternative Route 4-B, which would intersect the Ozark National Forest in Crawford County, Arkansas. After detailed analysis, DOE, in consultation with the USFS, has determined that HVDC Alternative Route 4-B is a non-preferred alternative route for the Project. The primary reasons that HVDC Alternative Route 4-B is non-preferred are included in Section 2.14.

S.7.2 Issues to be Resolved

The Record of Decision (ROD) is the formal agency decision document for the EIS process. DOE's ROD would announce and explain DOE's decision pursuant to Section 1222 of the EPAct of 2005 on whether and under what conditions to participate in the Applicant Proposed Project and describe any conditions, such as mitigation commitments, that would need to be met. DOE may issue a ROD no sooner than 30 days after EPA's Notice of Availability of the Final EIS is published in the *Federal Register*. If substantial changes to the Project are necessary prior to its implementation, additional NEPA review would be required to identify and analyze potential environmental impacts.

DOE is using the NEPA process and documentation required for this Plains & Eastern EIS to comply with Section 106 of the National Historic Preservation Act (NHPA). DOE intends to develop a Programmatic Agreement (PA) pursuant to 36 CFR 800.14(b) to satisfy DOE's obligations under NHPA Section 106, including consultation with Indian Tribes that may attach religious and cultural significance to historic properties that may be affected by the undertaking related to the Project and with the SHPOs of Arkansas, Oklahoma, Tennessee, and Texas; resource identification and evaluation; assessment of effects; and resolution of effects; including avoidance, where practicable, and mitigation. In the event that the PA is not fully executed, DOE will comply with 36 CFR Part 800, Subpart B.

DOE and the Applicant are preparing a Biological Assessment of potential impacts on special status species protected under the Endangered Species Act (ESA) as part of the Section 7 consultation between DOE and the USFWS. The Section 7 consultation review is a parallel, but separate, process to NEPA, conducted pursuant to the requirements of ESA and the applicable implementing regulations. Through the Section 7 consultation process, additional protective measures may be identified and adopted to avoid and/or minimize impacts to special status species and their critical habitat.

The purpose of this Plains & Eastern EIS is to evaluate the potential environmental impacts from the Applicant Proposed Project, several reasonable alternatives, and a No Action Alternative. Information other than what is in the

EIS, such as financial feasibility of the Project, will be considered before DOE makes a decision on whether and under what conditions to participate in the Project under Section 1222 of the EPAct. The DOE Office of Electricity Delivery and Energy Reliability (OE) website (http://www.energy.gov/oe/services/electricity-policy-coordination-and-implementation/transmission-planning/section-1222-0) provides more information about this process.