# United States Department of the Interior
# Bureau of Land Management

**Preliminary Environmental Assessment**

**DOI-BLM-CO-S000-2013-0001**

**November 3, 2015**

# Tri-State Montrose-Nucla-Cahone Transmission Line Improvement Project

***Location:*** Montrose, CO to Cahone, CO

***Applicant/Address:*** *Tri-State Generation and Transmission Association, Inc.*
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**POD Appendices:**

## LIST OF ACRONYMS

| | |
|---|---|
| 4WD | Four-Wheel Drive |
| AADTC | Average Annual Daily Traffic Counts |
| A.D. | Anno Domini |
| ACEC | Area of Critical Environmental Concern |
| ACSR | Aluminum Conductor Steel Reinforced |
| AF | Acre-Feet |
| APE | Area of Potential Effect |
| APLIC | Avian Power Line Interaction Committee |
| ATV | All-Terrain vehicle |
| B.P. | Before Present |
| BA | Biological Assessment |
| BCC | Birds of Conservation Concern |
| BLM | Bureau of Land Management |
| BMP | Best Management Practices |
| CDA | Colorado Department of Agriculture |
| CDOT | Colorado Department of Transportation |
| CDPHE | Colorado Department of Public Health and Environment |
| CDRMS | Colorado Division of Reclamation, Mining, and Safety |
| CEA | Cumulative Effect Areas |
| CEQ | Council on Environmental Quality |
| CNHP | Colorado Natural Heritage Program |
| COGCC | Colorado Oil and Gas Conservation Commission |
| CPCN | Certificate of Public Convenience and Necessity |
| CPUC | Colorado Public Utilities Commission |
| CPW | Colorado Parks and Wildlife |
| dBA | Decibels |
| DN | Decision Notice |
| DOE | Department of Energy |
| DR | Decision Record |
| EA | Environmental Assessment |
| EHV | Extra High Voltage |
| EIS | Environmental Impact Statement |
| EMF | Electro-Magnetic Field |
| EO | Executive Orders |
| EPA | Environmental Protection Agency |
| EPM | Environmental Protection Measures |
| ESA | Endangered Species Act |
| FAA | Federal Aviation Administration |
| FAQ | Frequently Asked Question |
| FR | Federal Register |
| FLPMA | Federal Land Policy and Management Act |
| FONSI | Finding of no Significant Impact |
| FS | Forest Service |
| GMU | Game Management Unit |
| GMUG NF | Grand Mesa, Uncompahgre, and Gunnison National Forest |
| GuSG | Gunnison Sage-Grouse |
| HRFA | High-Return Forest Activities |
| HE | Habitat Effectiveness |
| IDT | Interdisciplinary Team |
| ILBT | Interagency Lynx Biology Team |

| | |
|---|---|
| IM | Instructional Memorandum |
| kcmil | Thousands of circular mils |
| KOP | Key Observation Point |
| kV | Kilovolt |
| LAU | Lynx Analysis Unit |
| LCAS | Lynx Conservation Assessment and Strategy |
| LMP | Land Management Plan |
| LRMP | Land and Resource Management Plan |
| LUP | Land Use Plan |
| LWC | Lands with Wilderness Characteristics |
| MBTA | Migratory Bird Treaty Act |
| MIS | Management Indicator Species |
| MNC | Montrose-Nucla-Cahone |
| MOA | Memorandum of Agreement |
| MOU | Memorandum of Understanding |
| NEPA | National Environmental Policy Act |
| NERC | North American Energy Reliability Council |
| NESC | National Electrical Safety Code |
| NF | National Forest |
| NFS | National Forest System |
| NFSR | National Forest System Road |
| NHPA | National Historic Preservation Act |
| NPDES | National Pollutant Discharge Elimination System |
| NPS | National Park Service |
| NRCS | Natural Resource Conservation Service |
| NTP | Notice to Proceed |
| NWI | National Wetlands Inventory |
| NWP | Nationwide Permits |
| OHV | Off-Highway Vehicle |
| ORV | Outstandingly Remarkable Values |
| PBA | Programmatic Biological Assessment |
| PBO | Programmatic Biological Opinion |
| PFYC | Potential Fossil Yield Classification |
| POD | Plan of Development |
| PVC | Polyvinyl Chloride |
| RCP | Rangewide Conservation Plan |
| RCRA | Resource Conservation Recovery Act |
| RD | Ranger District |
| RFA | Reasonably Foreseeable Action |
| RMP | Resource Management Plan |
| ROW | Right-of-Way |
| RSC | Rangewide Steering Committee |
| SMPA | San Miguel Power Administration |
| SHPO | State Historic Preservation Office |
| SIO | Scenic Integrity Objective |
| SJNF | San Juan National Forest |
| SMS | Scenery Management System |
| SOC | State Species of Concern |
| SOPA | Schedule of Proposed Action |
| SRMA | Special Recreation Management Area |
| SS | Sensitive Species |

| | |
|---|---|
| ST | State Threatened |
| SUA | Special Use Authorization |
| SWA | State Wildlife Area |
| SWDO | Southwest District Office |
| SWMP | Storm Water Management Plan |
| TVMP | Transmission Vegetation Management Plan |
| TRFO | Tres Rio Field Office |
| UFO | Uncompahgre Field Office |
| USACE | United States Army Corps of Engineers |
| USAID | United States Agency for International Development |
| USDA | United Stated Department of Agriculture |
| USFS | United States Forest Service |
| USFWS | United States Fish and Wildlife Service |
| USGS | United State Geological Survey |
| VMS | Visual Management System |
| VQO | Visual Quality Objective |
| VRM | Visual Resource Management |
| WECC | Western Electricity Coordinating Council |
| WWEC | Westwide Energy Corridor |
| WSRA | Wild and Scenic River Act |
| WSA | Wilderness Study Area |

# Tri-State Montrose-Nucla-Cahone Transmission Line Improvement Project

# Preliminary Environmental Assessment

**(*DOI-BLM-CO-S000-2013-0001*)**

## 1 PURPOSE AND NEED

### 1.1 Introduction

This Preliminary Environmental Assessment (EA) has been prepared to disclose and analyze the environmental effects of the Tri-State Montrose-Nucla-Cahone (MNC) Transmission Line Improvement Project (proposed project) as proposed by Tri-State Generation and Transmission Association, Inc. (Tri-State; Applicant). The proposed project is for a right-of-way (ROW) grant amendment to existing Bureau of Land Management (BLM) ROW grants COC-66840 (existing 115-kilovolt [kV] transmission line) and COC-063427 (existing optical ground wire for 911 and internet services), and for a new special use authorization (SUA) from the United States Forest Service (USFS). The proposal is to improve the existing MNC 115-kV transmission line to operate at 230-kV. The EA is a site-specific analysis of potential effects that could result with the implementation of a Proposed Action, Alternatives to the Proposed Action, or No Action. The project includes 124 miles total of authorized, maintained access roads, including an estimated 6 miles of new access road, 117 miles of other roads such as county roads, and 80 miles of transmission line crossing both public and National Forest System (NFS) land and state, county, and private lands. BLM is the lead agency and is preparing the document with the following cooperating agencies: USFS; Colorado Energy Office; and Montrose, San Miguel, and Dolores counties. The EA assists the BLM and cooperating agencies in project planning, in ensuring compliance with the National Environmental Policy Act (NEPA), and in making a determination as to whether any "significant" effects could result from the analyzed actions. "Significance" is defined by NEPA and is found in regulation 40 CFR 1508.27.

An EA provides analysis for determining whether to prepare an Environmental Impact Statement (EIS) or a statement of "Finding of No Significant Impact" (FONSI). If the decision maker (BLM/USFS) determines that this project has "significant" effects following the analysis in the EA, then an EIS will be prepared for the project. Alternatively, a "mitigated Finding of No Significant Impact" may follow an EA. With a "mitigated FONSI," agencies may rely on mitigation to reduce a proposal's environmental effects and avoid preparation of a more detailed EIS. If no significant effects are identified, a BLM Decision Record (DR) and a USFS Decision Notice (DN) will be signed for the EA describing the decision. The decision can be an alternative as described or a combination of alternatives. A BLM DR and the USFS DN, including a FONSI, document the rationale for why implementation of the selected alternative would not result in "significant" environmental effects beyond those already addressed in the Land and Resource Management Plan (LRMP) EISs:

- Bureau of Land Management (BLM). 1985. San Juan-San Miguel Resource Management Plan and Final Environmental Impact Statement (December 1984). Montrose District, CO.
- Bureau of Land Management (BLM). 1989. Uncompahgre Basin Resource Management Plan and Record of Decision. Montrose District, CO. Uncompahgre Basin Resource Areas. (Uncompahgre Basin Resource Management Plan EIS, September 1988).
- Grand Mesa, Uncompahgre, and Gunnison National Forests (GMUG NF). 1991. Final Environmental Impact Statement for Grand Mesa, Uncompahgre, and Gunnison National Forests Land and Resource Management Plan, Amended 1991 (GMUG LRMP, as Amended, 1991). Delta, Colorado (USFS 1991).
- USFS and BLM. 2013, 2014. Final San Juan National Forest (SJNF) and Tres Rios Field Office (TRFO) Land and Resource Management Plan/Final EIS (USFS and BLM 2013; USFS 2013; BLM 2015).

In addition, actions analyzed in this EA are tiered to EA, "115-kV Transmission Line Montrose Substation to Cahone Substation Federal Access Right-of-Way and Transmission Line Maintenance Environmental Assessment" (CO-800-2006-087) (BLM 2006), completed as part of the existing 115-kV ROW grant. The 2006 EA addressed ongoing maintenance and improvements to existing transmission line access roads, most of which would be used for construction of new transmission lines under the Action Alternatives. Continued maintenance and repairs of the existing access roads would also be needed under the No Action Alternative for maintenance of the transmission line. Tri-State is authorized under the 2006 EA to maintain about 118 miles of existing access roads. The current EA includes the additional access roads that would be needed to implement alternative actions.

This section presents the purpose and need of the proposed project, as well as the relevant issues, i.e., those elements of the environment that could be affected by the implementation of the proposed project. In order to meet the purpose and need of the proposed project in a way that addresses the identified issues, the agencies developed and considered a range of Action Alternatives. These alternatives are presented in Section 2. The potential environmental effects resulting from the implementation of each alternative considered in detail are analyzed in Section 4 for each of the identified issues.

## 1.2 Background

Tri-State is a wholesale electric power producer/supplier that serves 44 rural electric cooperatives and public power districts in Colorado, New Mexico, Wyoming, and Nebraska. Tri-State's transmission system in southwestern Colorado relies on a number of 115-kV circuits, including the existing MNC transmission line. Tri-State has submitted applications to the BLM and the USFS (collectively referred to as the agencies), for authorizations to improve the existing MNC 115-kV transmission line to a 230-kV transmission line, and to operate and maintain the new 230-kV transmission line and optical ground wire, referred to as "fiber optic cable" throughout the EA (BLM ROW grant COC 063427; see Section 2.3.7.3).

The existing 115-kV system extends approximately 80 miles from the Montrose substation west of Montrose, Colorado, to the Nucla substation at the Nucla Power Plant, to the Cahone substation near Dove Creek, Colorado (see Figure 1). The existing line crosses 34.7 miles of BLM-managed land (18.6 miles on Uncompahgre Field Office [UFO]-managed lands and 16.1 miles on TRFO-managed lands) and 22.7 miles of NFS land (14.6 miles on GMUG NF and 8.1

miles on SJNF), with the balance (22.6 miles) on state and private land. Tri-State proposes to use the existing 115-kV 100-foot ROW for the upgrade to the greatest extent possible. The new 230-kV transmission line would require an additional 50 feet of ROW clearing (in forested areas) for a total ROW corridor width of 150 feet.

Tri-State currently uses about 241 miles of existing access roads, not counting state highways, for periodic maintenance and inspection of the existing 115-kV transmission line. About 67 miles of these roads are down-line access roads located under the existing 115-kV line that Tri-State maintains.

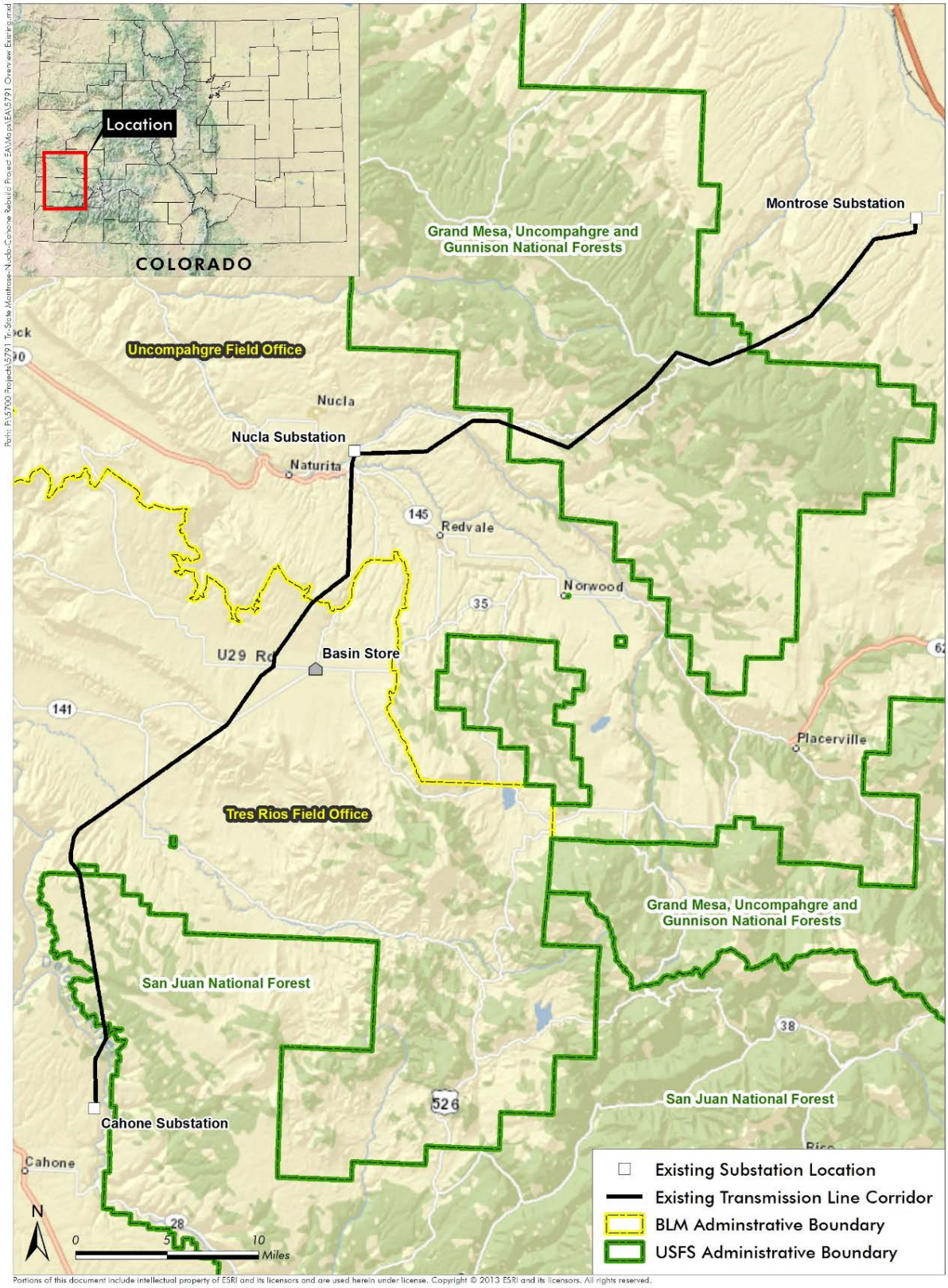


**Figure 1. Overview of Existing Transmission Line Corridor**

Tri-State is proposing the upgrade project to address aging infrastructure and system deficiencies as discussed below.

- Improved Transmission Line Efficiency: Energy lost as heat, known as $I^2R$ losses, can reduce transmission line efficiency. By updating the line and increasing the voltage, Tri-State's proposed project can reduce line losses and improve transmission system efficiency.
- Aging Infrastructure: The line, constructed with wooden poles in 1958, has exceeded its expected lifespan of 50 years. The aging infrastructure has required frequent and substantial maintenance and repair costs. Many of the wood pole structures have rot, woodpecker and insect damage, and large cracks. Many insulators and conductors have been damaged from vandalism (gunshot).
- Thermal Design Constraints: The existing transmission line was constructed to 115-kV with a 122 degree Fahrenheit ([F]; 50 degree Celsius[C]) design rating. Under certain system conditions, Tri-State is not able to utilize and dispatch existing generation resources because overloading conditions are occurring on the 115-kV system. In addition, the limited rating of the line due to its 122 degree F thermal design affects Tri-State's ability to serve future load growth for its cooperative members in southwestern Colorado. The North American Energy Reliability Corporation (NERC) and the Western Electricity Coordinating Council (WECC) define a *constraint* as a limitation on one or more transmission elements that may be reached during contingency, emergency, or normal operating conditions. Generally, these limits occur when transmission equipment reaches its thermal rating or when voltage levels at substations served from the transmission equipment decline below minimum accepted levels. Loadings on the existing MNC 115-kV transmission line are now reaching the maximum thermal rating, or constraint, of the line.

  If Tri-State were to lose a line or major transformer in the southwestern portion of the state due to mechanical failure or an unexpected natural event, it could drastically reduce Tri-State's load-serving capability in southwestern Colorado. Tri-State plans for these types of events as part of their process to ensure reliable electric service to the local area and the region. In addition, any failure of infrastructure in Durango would affect Tri-State's ability to serve loads in southwestern Colorado.

- Uncertainty with Nucla Generating Station (Nucla station): The future of the Nucla station is uncertain. Tri-State evaluated and planned the proposed project under two scenarios: the

*NERC's mission is to ensure the reliability of the North American bulk power system. NERC is the electric reliability organization certified by the Federal Energy Regulatory Commission to establish and enforce reliability standards for the bulk power system. NERC's responsibility is to enforce reliability standards; assess adequacy annually via a 10-year forecast, and summer and winter forecasts; monitor the bulk power system and educate, train, and certify industry personnel.*

*WECC is the Regional Entity responsible for coordinating and promoting Bulk Electric System reliability in the Western Interconnection.*

station remaining in operation and the station eventually being taken out of service. If the Nucla station remains in service, the proposed project is needed for the reasons listed above and would not change in scope. Should the Nucla station be retired, construction of the proposed project will be critical to the reliable operation of Tri-State's transmission system.

The proposed project has been designed to address contingencies and system constraints associated with both outcomes. The existing electricity generation resources throughout the region are adequate to meet near-term moderate increases in demand; however, improvements of transmission facilities such as MNC are required in southwestern Colorado to ensure those resources can be reliably delivered as loads increase.

- Ability to Serve Future Load Growth: *Load* is defined as the sum of power that a group of customers demand on the network. Loads in southwestern Colorado are projected to increase in the future. In order to accommodate future load growth in the region, Tri-State has incorporated future needs into the design of this proposed project. The existing system is incapable of serving future loads, because of its 122 degree F line limitation. Studies of the performance, reliability, and load-serving capabilities of the line and the overall performance of the electrical grid in southwestern Colorado resulted in Tri-State's conclusion that improving the MNC line to 230-kV would address existing system constraints and future power needs in the region.
- Regional Transmission Benefits (TOT 2A): The load levels in southwestern Colorado have a substantial effect on the transfer capability of a regional transmission path known as TOT 2A. TOT 2A is a high voltage transmission path that runs from Colorado to northern New Mexico. TOT 2A is a WECC-recognized path with a defined transfer limit. The allocation of the limited transfer capability of TOT 2A is divided between Western Area Power Administration, Xcel Energy, and Tri-State. According to NERC/WECC standards, fines may apply if operating limits for TOT 2A are violated. By increasing the load-serving capability of the transmission system in southwestern Colorado, the proposed project helps mitigate the negative effects of increasing load on the transfer capability of TOT 2A.

The 230-kV improvement has been proposed by Tri-State to address the needs described above. Tri-State prepared a Plan of Development (POD), referred to hereafter as the Draft POD until final design is complete, describing detailed plans (proposed action) for upgrading the existing transmission line (See Appendix D: Draft Plan of Development). The POD is Tri-State's detailed description of the process for constructing, maintaining, and operating the line. The POD would be updated and finalized in a Final POD during the NEPA process. Improving the MNC line supports larger regional goals within the overall system in southwestern Colorado. Strengthening the electrical grid would require system improvements, and the MNC improvement is a piece of this greater objective. It is not feasible for utilities operating in southwestern Colorado to improve and build multiple lines at one time in one region due to operational constraints, costs, and schedule.

### 1.3 Need for the Proposed Action

Tri-State holds a valid BLM ROW grant for the entire existing transmission line on both BLM and USFS land, issued in 2007 under the "Service First" initiative (BLM 2007a). While Service First encourages the sharing of resources, each agency must issue their own authorization for the

Proposed Action. The BLM's need for the Proposed Action is to respond to a request from Tri-State, as required under Title V of the Federal Land Policy and Management Act (FLPMA) of 1976, (43 U.S.C. 1761), as amended, to amend their ROW for this proposed project on public land. The USFS is responding to a request for a new SUA, which is a legal document (e.g., a permit). An SUA allows occupancy, use, rights, or privileges on NFS lands for a specific use of land for a specific period of time. The USFS has primary responsibility to issue SUAs on NFS lands under the FLPMA. The BLM and the USFS would determine whether or not to issue authorizations with terms and conditions for the construction, maintenance, and operation of a 230-kV transmission line and fiber optic cable.

The BLM is authorized to consider granting a ROW, and the USFS is authorized to issue permits, leases or easements to occupy, use, or traverse NFS lands for the proposed project, under Title V section 501 [43 U.S.C. 1761] of the FLPMA as amended. The Secretary of the Interior, with respect to public lands, and the Secretary of Agriculture, with respect to lands within the NFS (except in each case land designated as wilderness), "are authorized to grant, issue, or renew ROWs over, upon, under, or through such lands for systems for…generation, transmission, and distribution of electric energy, except that the applicant shall also comply with all applicable requirements of the Federal Energy Regulatory Commission under the Federal Power Act, including part I thereof." (41 Stat. 1063, 16 U.S.C. 791a-825r).

### 1.4 Purposes of the Proposed Action

As the designated lead federal agency, BLM Southwest District Office (SWDO) has determined that an EA is required before the agencies can render decisions on the proposed project. The USFS is a cooperating agency in the EA and would issue a separate decision to authorize work on NFS lands. The agencies' purpose of the action is to respond to Tri-State's applications for major utilities in a timely manner, in accordance with valid land and resource management plans allowing for such development (see Section 1.6), and to identify any permit conditions necessary for resource protection and public safety. The agencies' purpose is to respond in accordance with the following laws, Memorandum(s) of Understanding (MOU), and Executive Orders (EO):

- Title V of the Federal Land Policy Management Act of 1976, as amended (43 United States Code [U.S.C.] 1761), gives authority to both agencies to grant, amend, or renew authorizations for ROWs for electrical transmission lines.
- WWEC MOU, dated October 2009 and created under authority of the Energy Policy Act of 2005, requires federal agencies including the Department of Energy, Department of Agriculture, and Department of Interior, among others, to coordinate efforts in the siting and permitting process of electric transmission facilities on federal land.
- Section Two of EO 13212 requires agencies to expedite their review of energy-related permits or take other actions as necessary to accelerate the completion of such projects, while maintaining safety, public health, and environmental protections. Agencies shall take such action to the extent permitted by law and regulation, and where appropriate.

### 1.5 Decision to be Made

The BLM and USFS will decide whether to amend the existing ROWs to 1) approve the proposed upgrade project, 2) not approve the proposed upgrade project, or 3) approve the proposed upgrade project with modification and, if approved, under what terms and conditions.

If an Action Alternative is selected, the BLM and USFS would authorize the selected alternative with a ROW and SUA, respectively, for the construction, operation, and maintenance of the line, with conditions to include in the authorizations, and conditions to include in the Final POD.

## 1.6 Conformance with BLM and USFS Land Use Plan(s)

The following lists of plans manage the public lands for the following jurisdictions: SJNF, GMUG NF, BLM UFO, and BLM TRFO.

### *1.6.1 BLM San Juan / San Miguel Planning Area Resource Management Plan and Uncompahgre Basin Resource Management Plan*

The BLM UFO is managed by both the 1985 San Juan/San Miguel Planning Area Resource Management Plan (RMP) and the Uncompahgre Basin RMP completed in 1989 (BLM 1985 and 1989). A revised Uncompahgre Basin RMP is currently underway.

The 1989 RMP includes the following language pertaining to the project area and potentially relevant to the transmission line project (BLM 1989; p. 11):

- Major Utilities – Public lands will be open to development of major utilities. Stipulations and mitigating measures will be developed on a case-by-case basis.

The 1985 BLM San Juan/San Miguel Planning Area RMP includes the following Lands Program objective pertaining to the project area and potentially relevant to the transmission line project (BLM 1985; p. 20):

> *"In general, public land is available for utility and transportation corridor development, however, applicants will be encouraged to locate new facilities within existing corridors to the greatest extent possible. Public land within areas identified as unsuitable will not be available for utility and transportation corridors. Deviations from existing corridors may be permitted based on considering: types of and needs for the proposed facilities; conflicts with other resource values and uses, including potential values and uses; and availability of alternative routes and (or) mitigation measures." (BLM 1985)*

### *1.6.2 USFS Grand Mesa, Uncompahgre, and Gunnison National Forest Land and Resource Management Plan*

The GMUG LRMP, as Amended, 1991, allocates 4,535 acres to utility corridors and electronic sites, and stipulates the following (USFS 1991; page II-92):

> *"The designation of new utility corridors will be studied on a case-by-case basis, but will be consistent with the plans and programs of other agencies… Expanding compatible uses in existing corridors is emphasized over new corridor development."*

Changes in the GMUG LRMP, as Amended, 1991, were primarily related to timber management.

### *1.6.3 USFS San Juan National Forest Land Management Plan*

The September 2013 Land Management Plan (LMP) for the SJNF includes the following general guidance pertaining to the existing transmission line and proposed project area: Existing utility

corridors would not change (USFS 2013; Volume I page 20). The LMP describes the existing Tri-State transmission line as a designated utility corridor (USFS 2013; Volume II page 146). Areas designated as utility corridors would be designed to be compatible with the management goals of the areas through which they pass (USFS 2013; Volume I page 471). Expansion, as well as other actions, would not be approved if they did not meet these requirements (USFS 2013; Volume I page 475).

#### *1.6.4 BLM Tres Rios Field Office Resource Management Plan*

The action is in conformance with the 2015 RMP for the Tres Rios Field Office and Record of Decision (BLM 2015).

As described on page II-139 of the RMP, energy transmission projects would be an appropriate use of land allocated to designated energy corridors and project applicants would be encouraged to locate facilities in these corridors. The existing transmission line (Tri-State Generation and Transmission Association, Inc. – Nucla to Cahone) is listed in Table 2.18.1 of the RMP as a designated corridor. Potential uses including upgrade of existing facilities; and additional facility construction would be considered on a case-by-case basis (BLM 2015).

Part of this project goes through an area that is managed to protect lands with wilderness characteristics. While lands managed for wilderness characteristics are excluded from location of new ROWs, modifications of existing authorizations or ROWs that would reduce or eliminate effects to wilderness characteristics would be allowed (BLM 2015 page II-133). This action and alternatives would address these potential effects (see analysis in Section 4).

### 1.7 Relationship to Statutes, Regulations, or Other Plans

The EA must comply with NEPA, 1969 as amended, the Environmental Quality Improvement Act of 1970, and all other applicable laws, EOs, regulations, and direction. An EA for Tri-State's access ROW and transmission line maintenance for the existing 115 kV transmission line was completed and a FONSI signed in 2007 (BLM 2007b).

The following permits, approvals, or consultations would be required.

**Table 1. Required Agency Permit, Approval, or Consultation for the Proposed Project**

| Regulatory Agency | Required Permit, Approval, or Consultation | Agency Action |
|---|---|---|
| ***Federal*** | | |
| Advisory Council on Historic Preservation | National Historic Preservation Act (NHPA), Section 106 Consultation | Determination of effects to listed or eligible historic properties and cultural resources |
| USFS | Temporary Special Use Authorization (SUA) | For temporary uses of NFS lands during construction. Includes a Surface Reclamation Bond |
| USFS | Special Use Authorization (SUA) | Authorization of NFS lands for operation and maintenance of the transmission line, including use of National Forest System Roads (NFSRs) open to the public, administrative NFSRs closed to the public, and special use routes |

| Regulatory Agency | Required Permit, Approval, or Consultation | Agency Action |
|---|---|---|
| USFS | Road Use Permit | Authorization of use of NFSRs during construction the transmission line. Includes a Performance Bond and Surface Rock Replacement |
| USFS | Notice to Proceed (NTP) | Allows proposed project to proceed to construction |
| USFS | Plan of Development (POD) | Consider approval of a detailed Final POD for proposed project construction, operation, and maintenance; meets the need for an SF-299 |
| United States Department of Defense, Army Corps of Engineers (USACE) | Section 404, Clean Water Act Permit | Consider issuance of a Section 404 permit for fill in wetlands or other waters of the U.S. for upgrading access roads |
| BLM | Short and Long-term ROW Grant(s) | Consider issuance of short (construction related) and long-term ROW grants |
| BLM | Plan of Development (POD) | Consider approval of a detailed Final POD for proposed project construction, operation, and maintenance |
| BLM | Notice to Proceed (NTP) | Allows proposed project to proceed to construction |
| United States Department of the Interior<br>U.S. Fish and Wildlife Service (USFWS), Mountain Prairie Region, Colorado Field Office | Section 7 Consultation (Endangered Species Act [ESA]) | Consider the findings (biological assessment) of the lead agency; provide a biological opinion if adverse effects to federal listed species or habitats would occur |
| ***State*** | | |
| Colorado Parks and Wildlife (CPW) | Long-term and temporary ROW Grant(s) | Consider issuance of both long-term and temporary (construction-related) ROW grants across CPW lands |
| Colorado State Land Board | Long-term and temporary ROW Grant(s) | Consider issuance of both long-term and temporary (construction-related) ROW grants across State Land Board lands |
| Colorado Department of Public Health and Environment (CDPHE) | National Pollutant Discharge Elimination System (NPDES) Construction Stormwater; Construction dewatering | Consider issuance of permits |
| Colorado Department of Transportation (CDOT) | Encroachment Permit | Consider issuance of permit for transmission line crossing of State Highway (SH) 141 and 145 |

| Regulatory Agency | Required Permit, Approval, or Consultation | Agency Action |
|---|---|---|
| ***Local*** | | |
| Dolores County | Land Use Change permit; permit for Construction in ROW; Driveway permit for substation; Traffic Control; Contact for smoke notification | Consider issuance of permits (proposed project is consistent with the land use plan) |
| San Miguel County | Land Use Change; 1041- Matters of state interest; Access permit (Special Construction Permit); Driveway permit; Traffic Control (see additional notes below) | Consider issuance of permits |
| Ouray County | Access permit (ROW Permit) | Consider issuance of permits |
| Montrose County | Special Use permit for new 230-kV substation; ROW Use Permit(s) as applicable | Consider issuance of permits |

### *1.7.1 Regulations and Guidance*

Since the time when the line was constructed, new legislation, administrative actions, and MOUs have driven changes in the way federal land managers and utility companies manage transmission line ROWs. Most recently, transmission lines are being recognized and treated as an essential part of the nation's "critical infrastructure." Recent legislation and other actions designating energy infrastructure as critical infrastructure or otherwise requiring management and maintenance of such infrastructure include the National Fire Plan (USFS 2001); Healthy Forests Initiative (USFS 2002); Healthy Forest Restoration Act (USFS 2003); Energy Policy Act (U.S. 2005); and MOU between Edison Electric Institute and Federal Agencies – USFS, BLM, National Park Service (NPS), USFWS, and the Environmental Protection Agency ([EPA] USFS 2006a).

In response to changing legislation and industry standards, Tri-State has developed a Transmission Vegetation Management Program (TVMP) to ensure the vegetation treatment of its transmission ROWs is consistent with the NERC Vegetation Management Standard FAC-003-1. A copy of the TVMP would be provided in Appendix T-Operations, Maintenance, and Vegetation Management of the Final POD. The objective of the TVMP is to ensure the safe and reliable operation of Tri-State's transmission system in an environmentally sensitive, cost-effective manner while also protecting the forest from fire.

It is Tri-State's policy to proactively mitigate vegetation hazards and threats to power system safety and reliability to the extent reasonable and practical within three main areas of concern:

- Vegetation and fuels on the ROW
- Vegetation and fuels adjacent to the ROW
- Prevention of wildfire on and off the ROW

The new MNC 230-kV transmission line would be regulated under NERC standards for reliability, which includes vegetation management. Violations of these standards can result in fines up to $1 million dollars per day in the event of a vegetation induced outage.

San Miguel County Land Use Code section 5-709 states that all proposed aboveground extensions are routed wherever possible to avoid paralleling major transportation routes, such as SH 141. San Miguel County would consider consistency of the selected alternative with the Land Use Code in the decision to issue a land use change permit.

The following documents and reports have been prepared to support the EA and are relevant to the analysis:

- Certificate of Public Convenience and Necessity (CPCN) (Colorado Public Utilities Commission [CPUC] 2013)
- Cultural Resource Reports, Amendments, and Section 106 Memorandum of Agreement ([MOA] Reed et al. 2014 in *progress*)
- Visual Resource Report (Holdeman Landscape Architects [HLA] 2015)
- Paleontological Resources Technical Report (Zubin-Stathopoulos, K.D., and Murphey, P.C. 2014)
- Montrose-Nucla-Cahone Underground Transmission Line Estimate (Kleinfelder 2014)

In addition, a Biological Assessment (BA) would be finalized and submitted to the USFWS following the selection of a Preferred Alternative and would document potential effects to any species listed as Threatened or Endangered under the ESA, as well as Candidate species and those proposed for listing. Tri-State's Draft POD also supports the EA (see Appendix D).

### 1.8 Scoping and Identification of Issues

Scoping is an early and open process for identifying the key issues related to a Proposed Action. Information collected during scoping may also be used to develop the alternatives to be evaluated in detail in a NEPA document. The process has two components: internal scoping and external scoping. Internal scoping is conducted within an agency or cooperating agencies to determine preliminary and anticipated issues and concerns. External scoping is a process to notify and provide opportunities for involvement of other agencies, organizations, tribes, local governments, and the public. External scoping can identify coordination needs, and refine and identify issues. The BLM NEPA Handbook (Section 6.3.1) and USFS NEPA Handbook (Chapter 10) provide agency guidelines for scoping (BLM 2008; USFS 2012).

Public involvement is being conducted in the following phases for the Tri-State MNC Transmission Improvement Project environmental review process:

- Public scoping and public outreach, including news releases and newspaper advertisements, prior to NEPA analysis to determine the scope of issues and alternatives to be addressed (complete: May 5 to June 4, 2014 scoping period)
- Coordination with federal, state, local, and tribal governments, and cooperating agencies (ongoing)
- Public review of and comment on the Preliminary EA, which analyzes likely environmental effects of the Proposed Action and Action Alternatives (anticipated Fall 2015)

During scoping, various parties provided comments, and a total of 17 individual letters were received. The BLM used the issues and other information collected in the early planning and scoping phases to help formulate a reasonable range of alternatives to be analyzed during the EA process (see Section 2). See Section 6 for a more detailed discussion of public involvement and scoping.

### *1.8.1 Concerns Identified in Scoping*

Preliminary resource concerns identified during scoping were researched, and an analysis was completed to determine if concerns were present, the potential effects, and if environmental protection measures (EPMs) proposed by Tri-State would avoid or minimize the effects. Resource concerns, potential effects, and applicable EPMs are summarized in Table 2. A complete list of proposed project EPMs are in Table 8 and Table 9.

**Table 2. Preliminary Resource Concerns Identified during Scoping that did not direct the Development of Alternatives**

| Affected Resource | Concern | Potential Effects | Applicable Environmental Protection Measures |
|---|---|---|---|
| Wildlife | Construction noise and human activity may cause bald eagles to temporarily avoid portions of their habitat and could affect their foraging activities. | No bald eagle winter concentration areas, nests or roosts documented in the proposed project vicinity. Other effects on bald eagles would be avoided through implementation of EPMs. | BR-3, BR-4, BR-6 |
| Wildlife | Surface and human disturbance from construction of the Dolores River crossing location may affect desert big horned sheep. | Proposed project area not within desert big horn sheep range. No analysis necessary. | N/A |
| Wildlife | Surface and human disturbance from construction of the Dolores River crossing location may affect terrestrial wildlife. | Effects on habitat would be negligible in comparison to the extent of habitat available within the proposed project area. Aboveground facilities would have a relatively small disturbance footprint, and direct, long-term effects on terrestrial wildlife habitat from constructing or upgrading substations, access roads, and other permanent facilities would be negligible. Less than 1 percent of the total big game habitat, including elk production, elk winter concentration, and deer winter concentration areas in the Game Management Units (GMUs) would be affected. Human disturbance effects would be primarily during construction and would be short-term. | BR-1 through BR-10, BR-12, VG-8 through VG-11 |
| Wildlife | Construction activity could affect raptor nesting and roosting. | Implementation of EPMs would minimize effects on raptors. | BR-2, BR-4, BR-6 |

| Affected Resource | Concern | Potential Effects | Applicable Environmental Protection Measures |
|---|---|---|---|
| Invasive Species | New ground disturbance associated with the proposed project could result in the spread of noxious weeds. | Implementation of EPMs would minimize the spread of noxious weeds. | NW-1 through NW-6 |
| Recreation | Construction timing may affect recreation, including hunting season. Proposed project construction could disrupt and/or disturb mountain bike trails (South Buck Trail, Parallel Trail, and Power Line Trail). | Recreation uses that occur within or through the transmission line corridor would be affected for a short time period during construction, due to route closures, truck and equipment access, construction activity, and noise. Implementation of EPMs would minimize effects on recreation, and recreation uses would return to pre-construction levels following proposed project construction. | A-1 through A-8, AQ-2, R-1 and R-2 |
| Socio-Economics | An improvement in the transmission line from 115-kV to 230-kV could negatively affect private property values. | Any change in property values would likely be negligible due to the presence of the existing transmission line and highway. | LU-2 |
| Noise | The proposed project could result in increased noise from construction and the "corona effect" from the transmission line itself. | Short-term noise effects during construction would range from moderate to negligible, depending on the location of the noise receptor. The new transmission line would not introduce any new long-term elevated noise levels. The corona noise associated with electrical transmission would be negligible at the edge of the ROW. Noise effects would be minimized with implementation of EPM N-1. The design standard for transmission line construction is to generate less than 50 decibels (dBA) at the edge of the ROW. | N-1, G-7 |
| Electro-Magnetic Fields (EMF) | Increased line voltage could increase EMF and subsequently affect health and safety. | EMF generated by the improved line would dissipate by the edge of the ROW; risks to human and animal health would be non-existent or negligible. The ROW width associated with the transmission line is intended to prevent construction of residences or other structures in the corridor. | N/A |

Additional information on resources evaluated is in Section 3 (see Table 12).

### *1.8.2 Issues Identified during EA Scoping*

Two issues that influenced the development of alternatives were identified based on information obtained during external and internal scoping conducted in 2014:

#### *1.8.2.1 Threatened and Endangered Species*

- The proposed project may result in increased habitat fragmentation within occupied Gunnison Sage-Grouse (GuSG) habitat in the Dry Creek Basin.
- During construction, noise and human activity may cause GuSG to temporarily avoid portions of their habitat and affect their foraging activities.

#### *1.8.2.2 Visual Resources*

- Scenic quality for river users and other recreationists may be negatively affected at the Dolores River crossing.
- Larger structures and facilities as well as conversion from wood to metal structure poles in some portions of the proposed project could diminish scenic quality.
- Moving the facility along SH 141 in the Dry Creek Basin could affect scenic quality for residents and drivers.

In response to potential adverse effects on GuSG habitat, an alternative alignment through the Dry Creek Basin was included as a routing option. To address potential scenic quality effects in Dolores Canyon, upgrading in place at the existing crossing was evaluated as a routing option.

# 2 DESCRIPTION OF ALTERNATIVES, INCLUDING PROPOSED ACTION

## 2.1 Introduction

During the alternatives development process, the BLM relied on the BLM NEPA Handbook and the USFS NEPA Handbook (BLM 2008; USFS 2012) for guidance on developing a range of reasonable alternatives. This EA is tiered to the 2006 EA (BLM 2006), which authorized Tri-State's use of 118 miles of existing access roads for maintenance and repairs to the existing 115-kV transmission line. All of the Action Alternatives would use most of the previously authorized roads for construction access and long-term maintenance, unless otherwise noted in the alternative description. The No Action Alternative would also use existing access roads for maintenance of the existing transmission line.

Aside from two routing option areas in the Dry Creek Basin and Dolores River crossing, improvements to the existing transmission line are identical under both Action Alternatives (Alternatives A and C) and would follow the existing transmission line corridor. Alternative B is the No Action Alternative (see Section 2.3.2). There are a total of four combinations of Action Alternatives that are possible for the project, as follows:

- Tri-State's Proposed Action, Alternative A: realignment at the Dolores River crossing and upgrade-in-place at the Dry Creek Basin (see Section 2.3.1 and Figure 14);
- BLM Routing Options, Alternative C:
    - Dolores River crossing routing option: Alternative A incorporating the upgrade-in-place at Dolores River crossing (see Section 2.3.3 and Figure 15);
    - Dry Creek Basin routing option: Alternative A incorporating the realignment in Dry Creek Basin (see Section 2.3.5 and Figure 16);

- Both routing options: Alternative A incorporating the upgrade-in-place at Dolores River crossing and the realignment in Dry Creek Basin (see Section 2.3.6 and Figure 17).

The remainder of the transmission line would be improved as described below in Section 2.3.6, which includes design features and EPMs (see Table 8).

Finally, two smaller realignment options were considered. One option was eliminated from detailed analysis (see Section 2.4.1), for an adjustment requested by a private property owner. A second option – a small alignment shift near the Cahone substation – was incorporated into all Action Alternatives. In these cases, public letters in response to scoping were evaluated, as well as agency resource information and Tri-State's preliminary correspondence with private landowners for these two options.

Tri-State's Proposed Action is to improve the existing MNC 115-kV transmission line to a 230-kV transmission line, and to operate and maintain the new 230-kV transmission line and fiber optic cable. The Proposed Action would upgrade the transmission line in its existing alignment with a realignment at the Dolores River crossing and near the Cahone substation (see Section 2.3.1). The Proposed Action would include upgrades to the Montrose and Cahone substations, as well as a new Nucla substation (called the "Maverick" substation). The sections that follow describe:

1. Routing options at the Dolores River crossing (see Section 2.2.1), which were developed to address maintenance/safety and visual resource concerns;
2. Routing options at the Dry Creek Basin (see Section 2.2.2), which were developed to address GuSG habitat concerns;
3. Compilation of routing options into alternatives, including the Proposed Action (Alternative A; Section 2.3.1), the No Action Alternative (Alternative B; Section 2.3.2), and one other agency-developed Action Alternative (Alternative C; Sections 2.3.3, 2.3.4, and 2.3.5) with three different combinations of the routing options;
4. Detailed description and design sketches of components common to all Action Alternatives, including design and processes for construction, maintenance, and operation of the new transmission line(Section 2.3.6);
5. Environmental protection measures proposed by Tri-State (see Table 8 and Table 9) to minimize resource effects; and a
6. Summary comparison of effects to the resource issues that informed the development of alternatives (see Table 11).

## 2.2 Routing Options

Maintenance, safety, and visual quality concerns at the Dolores River crossing, and GuSG concerns through the Dry Creek Basin led to the development of routing options in these two areas (see Figure 2).

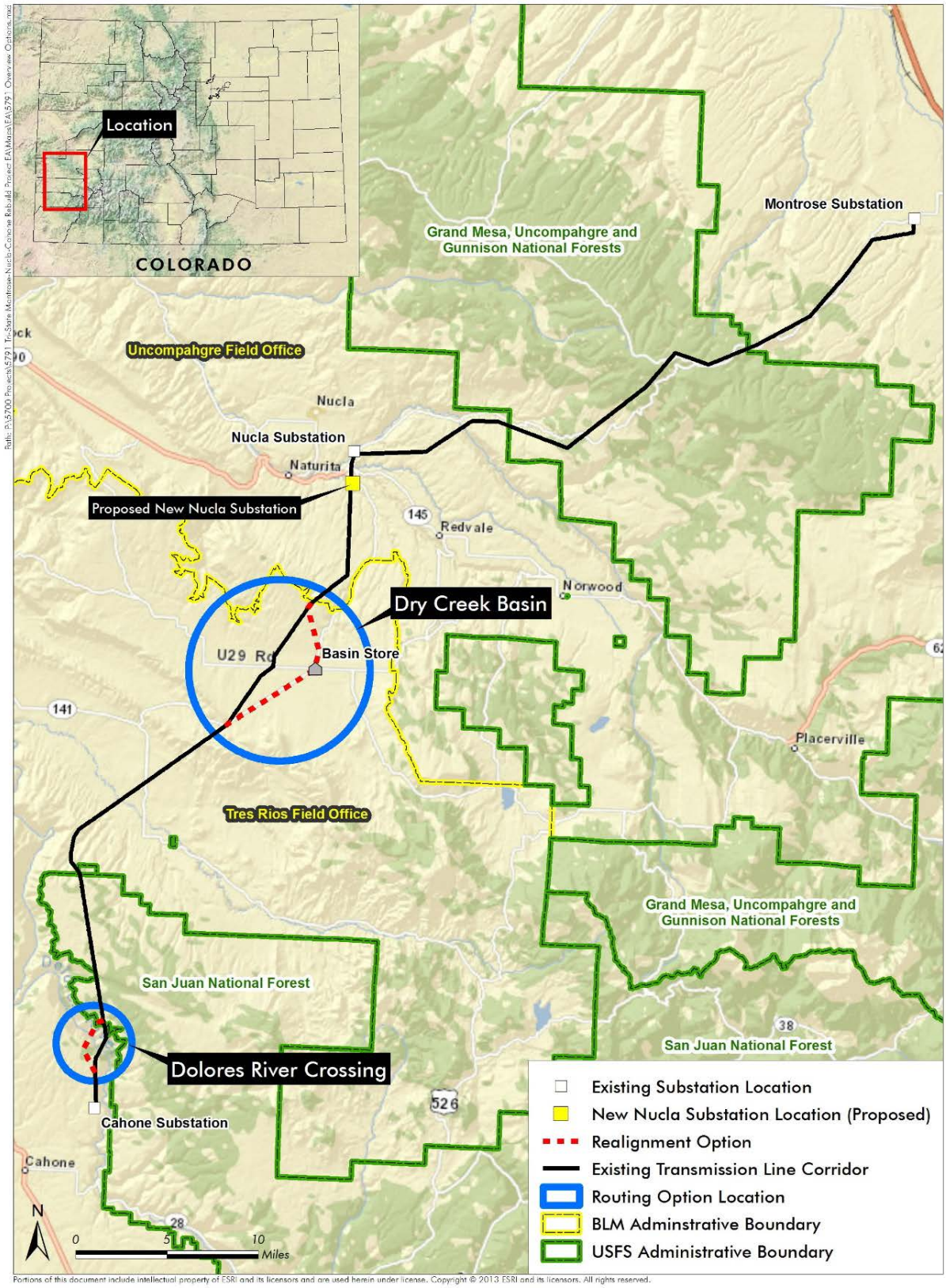


**Figure 2. Routing Options Overview**

### *2.2.1 Dolores River Crossing*

The BLM and USFS evaluated options for minimizing visual effects while accommodating safe access for construction and for routine and emergency maintenance activities at the Dolores River crossing. Accessing the line from the ground on each side of the canyon year-round is necessary for inspection and maintenance, and for emergency repairs. The steep slopes associated with access to the existing crossing on the north rim have created ongoing maintenance access and safety issues for Tri-State's maintenance crews. Localized erosion is also an ongoing concern with the existing crossing.

In order to identify potential alternatives at the Dolores River crossing, the BLM and USFS reviewed existing conditions, reviewed topographical information, and evaluated draft photo simulations taken from agency identified Key Observation Points (KOPs) (Visual Resources Report; HLA 2015), as well as Tri-State's road standards for construction and maintenance of transmission lines. Two routes – Tri-State's proposed realignment option and an upgrade-in-place option – are evaluated in detail for the Dolores River crossing and described in the sections that follow.

#### *2.2.1.1 Background of Existing Conditions*

The existing Dolores River crossing was routed, designed, engineered, and constructed using materials and equipment from 1958. Due to engineering constraints of that time period (specifically the ability to engineer and construct long spans), the line was routed in one of the narrowest areas of the canyon, and the line was diverted below the rim onto steep side slopes in an effort to reduce span length. The existing transmission line diverts from the rim of the canyon downslope onto a narrow promontory. While the existing route does shorten the total span length across the canyon, nine of the structures (and associated access roads) leading up to the crossing on the north side are on steep slopes with erodible soils. Some of the smaller structures, particularly structure 366 (see Figure 3), have continued to shift down the unstable slope, requiring several repairs and replacements.

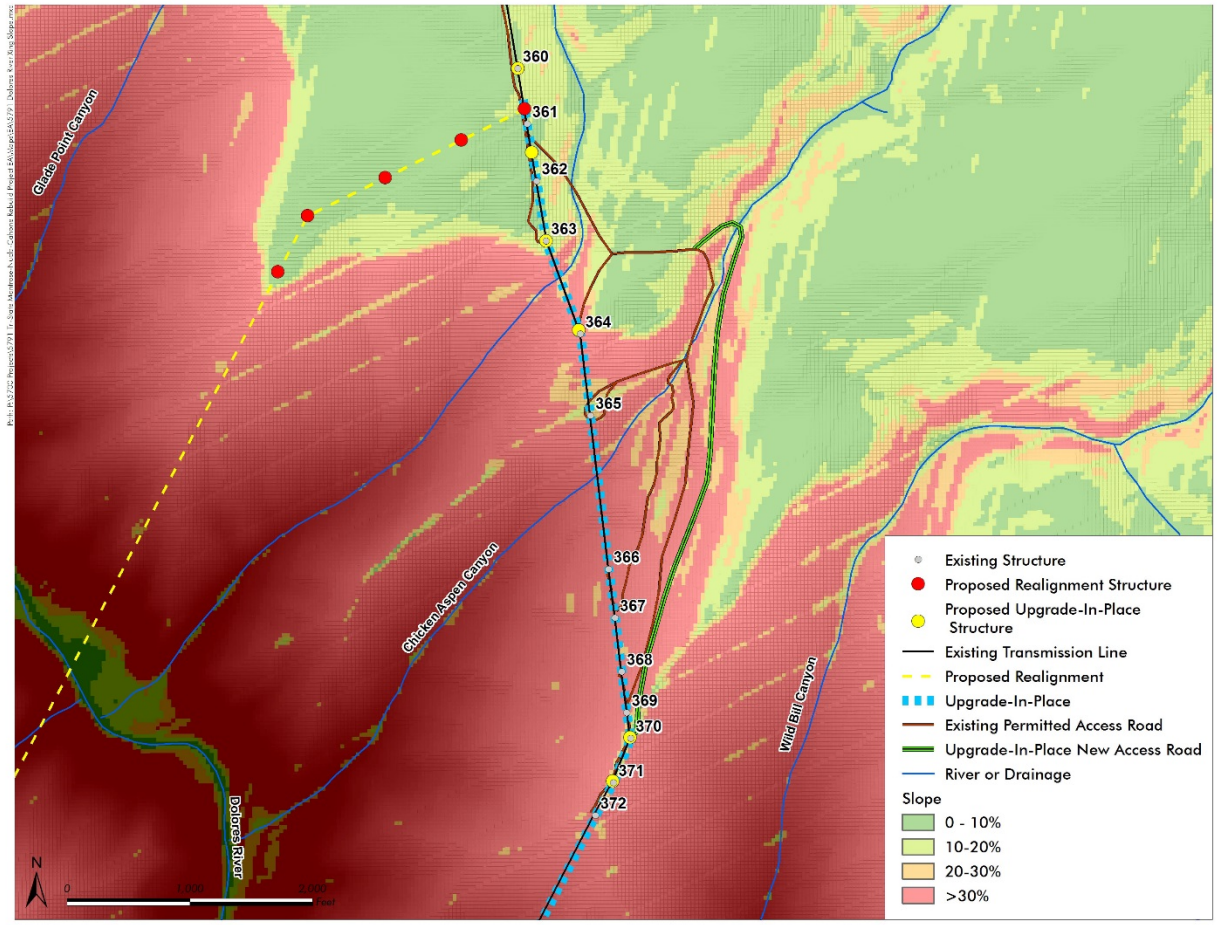


**Figure 3. Slopes at Dolores River Upgrade-in-Place and Proposed Realignment Crossing**

In addition to structure-related issues, access and maintenance of structures 365 through 372 (see Figure 3) are seriously hampered by side slopes (some exceeding 30 percent) and eroding soils, making it very dangerous for crews and maintenance equipment. Currently, when repairs are needed, a large bulldozer is needed to pull equipment up and down the slopes and to serve as an anchor for maintenance equipment. Use of the bulldozer and associated maintenance activities have resulted in the further destabilization of the erodible soils on the original access grade. The line has exceeded its life span, and, consequently, required maintenance and use of the road have increased. The road must be maintained by grading when maintenance work is required. The current road alignment requires a crossing of Chicken Aspen Canyon. This creates environmental and maintenance-related issues. Figure 4 and Figure 5 show the extent of the erosion at the north rim between 2006 and 2012. The erodible soils are difficult to re-vegetate and stabilize after major maintenance-related road work takes place.


**Figure 4. Structure 371 in 2006, above Main Crossing Structure along Access Route**

**Figure 5. Structure 371, Same Location in 2012 – Note Erosion of Access Route and Pad**

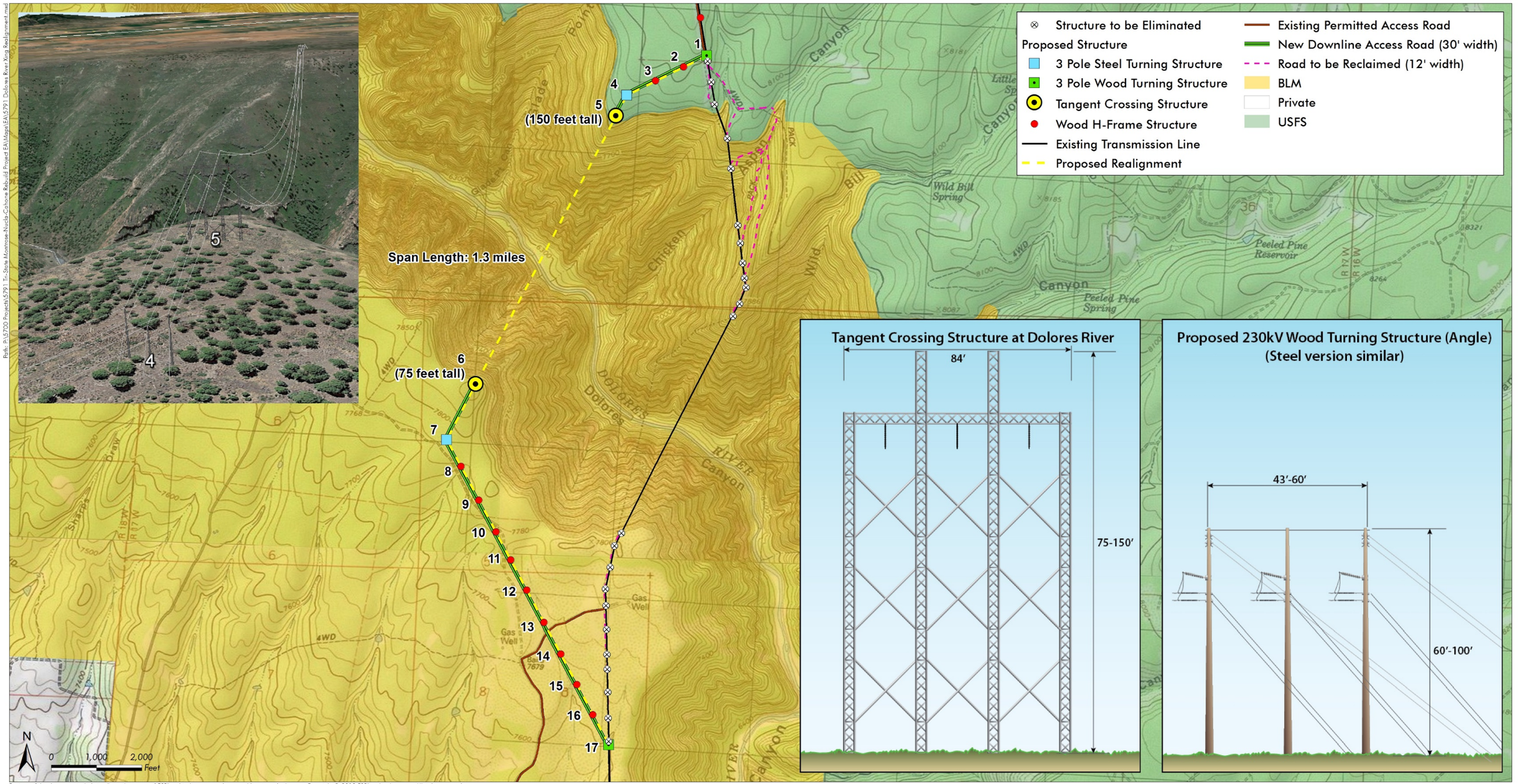


**Figure 6. Dolores River Crossing Realignment Option (Proposed Action, Alternative A)**

Inspection activities are currently conducted by helicopter and all-terrain vehicle (ATV); however, vehicular access is needed for maintenance, repairs, and emergency situations. To safely access the structure with maintenance equipment, especially during inclement weather, the existing road is continually rebuilt and improved as previously discussed.

#### *2.2.1.2 Tri-State Proposed Dolores River Crossing Realignment*

Tri-State proposes to realign the transmission line crossing at the Dolores River Canyon to resolve ongoing maintenance and safety concerns associated with the existing alignment. Under this alternative, Tri-State proposes to move the crossing approximately 1 mile (at the furthest point from the existing alignment) to the west where slopes are less steep, and soils are more stable. In addition, access at this location would be primarily at the same grade as the surrounding topography and immediately adjacent to the transmission line, without the need for substantial cut and fill. The new alignment would take advantage of relatively gradual slopes on both the north and south rims of the canyon (Figure 6; also see Figure 3). Road access on the north rim would be constructed adjacent to or under the line, and some existing roads would be used on the south rim. The proposed crossing would be about 6,700 feet long and would require steel towers and special conductor wire to safely span the canyon. The new ROW would be 150 feet wide except the canyon span. The ROW within the canyon span would be less than 100 feet wide.

##### **2.2.1.2.1 Structures and Construction**

Detailed sketches of the structures described in this section are shown on Figure 20 and Figure 21. More details about other pre-construction, construction, and maintenance activities are in Section 2.3.6.

Two new steel lattice (tangent crossing) structures would be constructed on each side of the canyon rim (Structures 5 and 6) and would result in a 6,700-foot span across the canyon. Based on preliminary engineering review, the tower on the north rim would be approximately 150 feet tall, and the tower on the south rim would be approximately 75 feet tall. The towers would be galvanized, non-reflective, weathered steel to minimize reflection and decrease visibility.

Structure 1 on the north rim and Structure 17 on the south rim would be a three-pole wood turning structure (guyed dead-end), approximately 80 feet in height. Structure 7 on the south rim and Structure 4 on the north rim would be a three-pole steel turning structure, also approximately 80 feet in height. The remaining crossing structures (Structures 1 through 3 and 8 through 16) would be standard 230-kV wooden H-frames, varying between 61 and 106 feet in height (Figure 18).

The new conductor proposed for this alternative is high strength and low sag, which allows for longer spans while maintaining reasonable structure heights (see Section 2.1.2). *Sag* is defined as the vertical distance between the point where the line is joined to the tower and the lowest point on the line. Sag is the result of conductor tension and can cause the conductor to be too close to the ground or vegetation thus causing safety clearances to be violated. Lines that are too close to obstacles such as rocks or vegetation may arc and cause outages, and represent a safety hazard for people nearby. The conductors at the Dolores River crossing would remain in a constant state of sag. This sag would vary with temperature, ice, and wind loads as well as the age of the conductor. The final design of the line would take all of these factors into account to ensure minimum ground clearance is maintained at all times.

There would be a total of five wires spanning the canyon: three current-carrying conductors below and two fiber optic cables above. Like the existing crossing, the top wires must be marked with colored marker balls as required by Federal Aviation Administration (FAA) regulations (FAA 2007). Thirty-six-inch diameter marker balls would be spaced no more than 400 feet apart on each of the top two fiber optic cables, using orange, white, and yellow balls in an alternating pattern, so that marker balls are not more than 200 feet apart in cross-section (see Figure 7).

**Figure 7. Alternating Marker Balls on optical fiber, Existing Dolores River Crossing**

Concrete foundations are necessary for the steel towers and steel structures at each side of the canyon rim (structures 4 through 7; see Figure 6). Foundation holes would be about 2.5 feet in diameter and 7.5 to 13 feet deep and would vary depending on location. These foundations would require the use of large drill rigs. Once the holes are drilled, concrete may be placed either by helicopter or truck. Multiple loads of concrete would be required for the installation of these structures. Once the foundations are constructed, the structures would be set by helicopter and ground equipment. Stringing of fiber optic cable and conductor would be partially completed by helicopter. Tensioning would also require large ground operations and equipment on both sides of the canyon. Construction of structures at the canyon crossing is expected to occur over about seven months.

#### 2.2.1.2.2 Clearing

Vegetation removal would be required for the proposed realignment, on both ends of the canyon, to meet federal reliability requirements and to facilitate construction and future maintenance

operations. The north rim is more heavily forested than the south rim, because the BLM has recently conducted fuels treatment in the general vicinity of the alignment on the south rim. The north rim realignment is managed by the USFS (NFS land), and the south rim is managed by the BLM. Required vegetation clearing would be conducted in compliance with Tri-State's TVMP (see Draft POD, Appendix T-Operations, Maintenance, and Vegetation Management).

#### 2.2.1.2.3 Access

About 2.2 miles of new 16-foot wide access roads would be required for the realignment, including about 0.7 miles of existing two-track roads on the south rim that would be improved. It is expected that only minor grading would be required for construction and future maintenance of these access roads due to the gentle terrain. No large areas of cut, fill, or soil compaction would be needed for road construction, and no water would be used other than what is needed for dust suppression (about three 4,000 gallon water trucks). Access road construction is expected to take three to five days. About 3.3 miles of existing access road would be reclaimed as part of the realignment. All applicable EPMs would be implemented regarding revegetation, public access, and other management measures.

### *2.2.1.3 Dolores River Crossing Upgrade-in-Place*

Under the Dolores River crossing upgrade-in-place option, the Dolores River crossing would remain within the existing transmission line corridor. The ROW would be expanded from 100 feet to 150 feet to accommodate the higher voltage conduit. The ROW within the canyon span would be less than 100 feet wide. A total of six existing structures would be eliminated as part of this alternative; a secondary span would eliminate structures and reduce safety and erosion issues (see Figure 8 and Figure 9). The transmission line alignment would remain in approximately the same corridor. A new north rim access road would be constructed, and existing roads that are not needed for the new routing option would be reclaimed. The approximate proposed structure locations and a preliminary route for the proposed access road are shown below in Figure 9.

#### 2.2.1.3.1 Structures and Construction

A total of six structures would be eliminated as a part of this alternative (Structures 365 through 369, and 372, shown on Figure 3 and Figure 8). Structure removal results in a secondary 3,300-foot span in addition to the main canyon span, which requires a span of 5,770 feet (see Figure 3 and Figure 8). The new alignment would require two tangent crossing structures made of steel lattice (see inset details in Figure 9) at each end of the primary canyon crossing (Structures 2-6 and 2-7). The tangent crossing structures at the Dolores River would be 95 feet tall on the north rim and 115 feet on the south rim, and would have the same non-reflective surface treatment as described in Section 2.3.6.2 (see Table 8, EPM A-6). Four, three-pole steel turning structures (see inset details in Figure 9) would be used as intermediate structures: three at the north rim (2-3, 2-4, and 2-5) and one on the south rim (2-8). There would be one three-pole wood turning structure at Structure 2-9. All turning structures would have guy wires. The number and type of conductors, the sag, and the marker ball arrangement would be the same as discussed under the Dolores River crossing realignment option. The conventional three-pole steel and wood turning structures would be approximately 80 feet tall. Other structures near the crossing would be wood H-frame structures (see Figure 18).

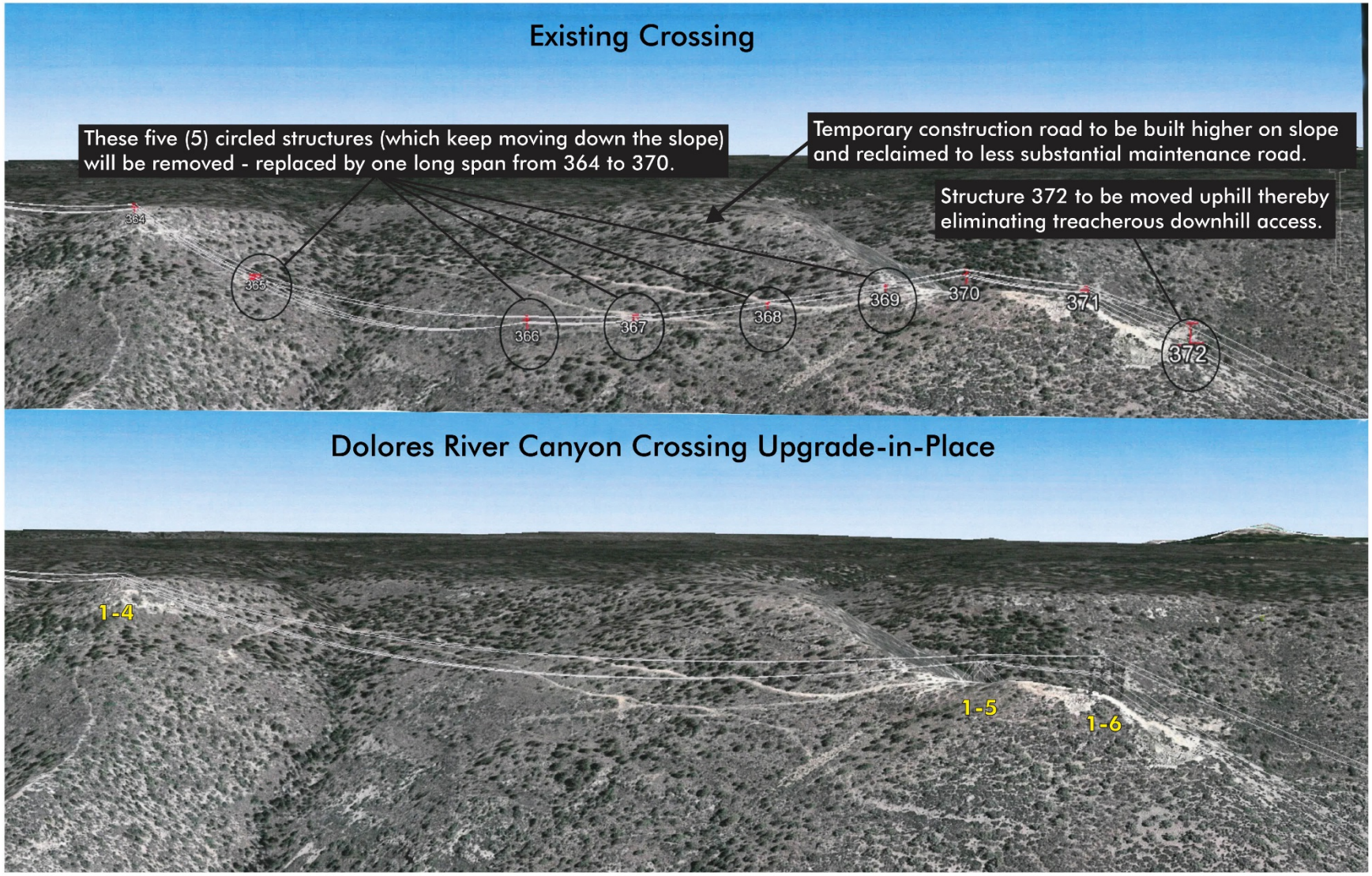


**Figure 8. Dolores River Crossing Secondary Span Compared with Existing Crossing**

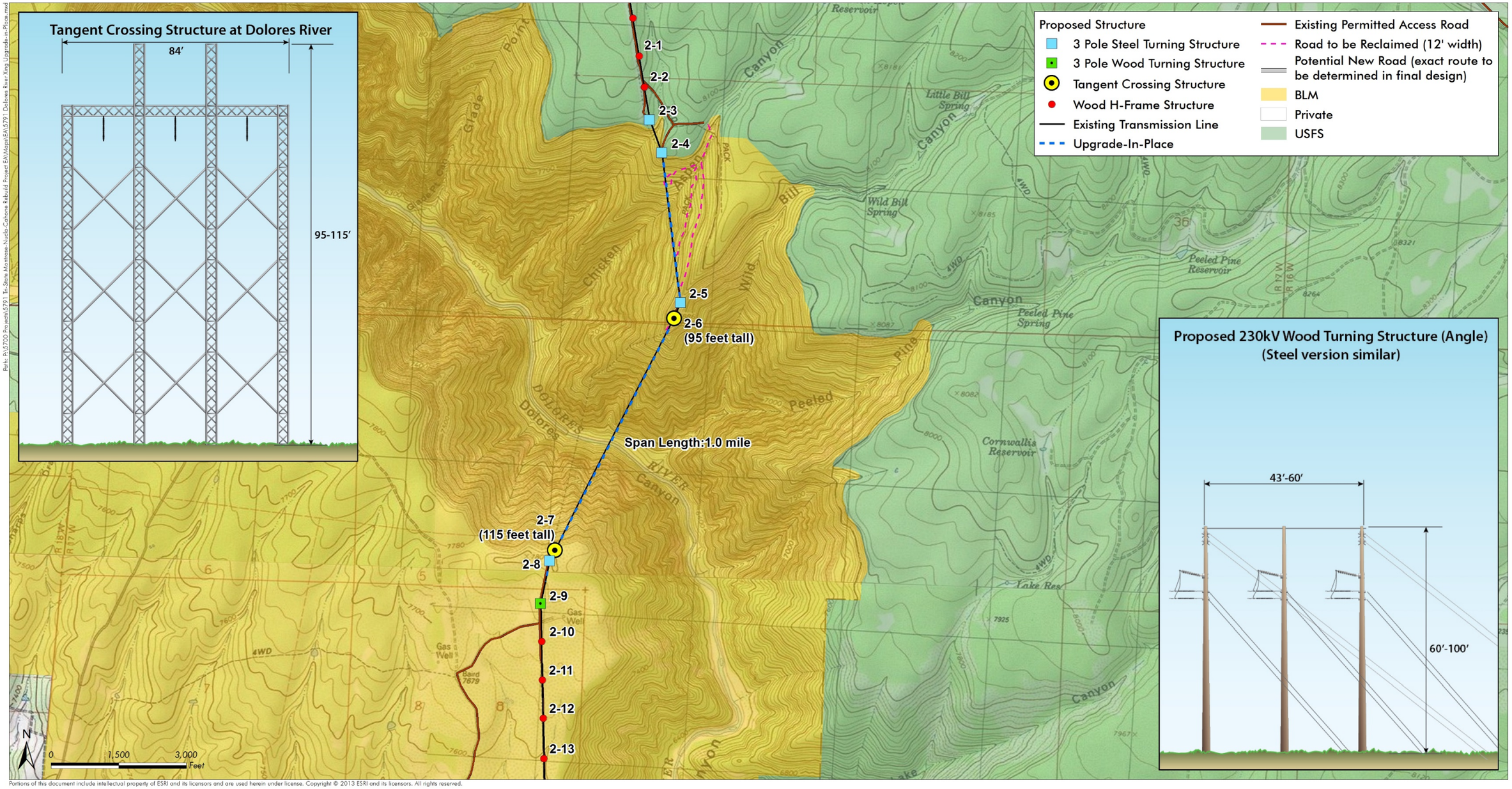


**Figure 9. Dolores River Crossing Upgrade-in-Place Routing Option**

The construction of the tangent canyon crossing structures would require concrete foundations (2-6 and 2-7; Figure 9). Concrete for foundations would be delivered by truck and/or helicopter. Each tangent crossing structure would require four concrete foundations approximately 5-feet in diameter and 25-feet deep to be strong enough to withstand the high tension forces of the special conductor that would be used as well as significant wind and ice loads. A truck-mounted drill rig and supporting bulldozer would be needed for drilling operations. The construction process is described in Section 2.3.6. The steel pole turning structures would be directly imbedded or placed on concrete foundations and anchored with guy wires, depending on the results of geotechnical investigations.

Drilling and wire stringing operations at 2-6 and 2-7 would require grading a flat temporary pad for the drill rig, approximately 30,000 square feet (150 feet by 200 feet), as well as the puller and tensioner equipment used to string, pull, and tension the conductor wires. Following construction, the temporary pad would be reclaimed and revegetated except for a smaller, permanent pad for long-term maintenance. The pad would be revegetated to the extent feasible with grasses and forbs to reduce long-term erosion, but the grade would be left in place to facilitate safe access for future line maintenance.

Helicopters could be used for some of the construction work (possible concrete delivery, pulling the sock line, and installing approximately 50 aerial marker balls), but ground vehicular access would be needed to drill the structure foundations for 2-4 through 2-8 using a drill rig and bulldozer, which may be used to anchor the drilling equipment.

The Dolores River crossing would require the use of an atypical conductor. A high temperature, low sag conductor has been proposed to keep structure heights to a minimum. Each wire over the canyon would weigh from 7,800 to 15,600 pounds, depending on the conductor selected. To string the conductor across the Dolores River crossing, a helicopter could be used to pull across a "sock line" which is much lighter and smaller than the conductor. Once the sock line is in place, it would be attached to the conductor, which would be pulled across and tensioned by using a puller and a tensioner located on the ground. In order to safely set up this puller and tensioner equipment, a flat pad site and access to the structure would be required.

#### 2.2.1.3.2 Clearing

Vegetation removal would be required for the Dolores River crossing upgrade-in-place option on both rims of the canyon to meet federal reliability requirements and to facilitate construction and future maintenance operations. Although much of the ROW is already cleared or would be spanned by the new structures, additional vegetation clearing would be needed. Additional trees would be cleared to extend the 100-foot ROW to 150 feet. Clearing would be conducted in compliance with Tri-State's TVMP (see Final POD, Appendix T-Operations, Maintenance, and Vegetation Management) and per BLM and USFS requirements for treatment and removal.

#### 2.2.1.3.3 Access

About 0.9 miles of new access road on the north rim would be required for the Dolores River crossing upgrade-in-place option (see Figure 9). The new north rim access road would be designed to accommodate the equipment and loads necessary for construction of the new transmission line as discussed above. This road would be designed with a plan and profile to minimize disturbance to the extent feasible. The road would be needed for long-term maintenance access following construction. Formal engineering design for this access road has

not been completed. Preliminary design was conducted using aerial photography, topographical maps, and the results of Tri-State staff field reviews.

Preliminary design results indicate that the steep (greater than 30 percent) cross-slopes shown in Figure 3 may require additional cuts and fills to construct the 16-foot wide road necessary to provide access for construction equipment. Access ROW widths for the road would vary depending on the slope. Assuming a worst case scenario (a continuous ROW width of 75 feet for the 0.9-mile road), the disturbance would be about 9 acres. Depending on final routing and design, the ROW width and acres disturbed would likely be less.

Construction is expected to require water to process and compact structural fill material from the native materials on-site. A large water tanker (possibly an 18-wheeler) would be used to fill an on-site pedestal-mounted bulk tank located on an existing access road. Smaller water trucks would be filled from the bulk tank, then travel down the ROW and deliver water to the work area. Water would be brought in from a permitted source off-site and would temporarily increase truck traffic on approximately 20 miles of USFS access routes prior to and during construction. Tri-State would coordinate final siting and engineering of the road with the agency road engineers to ensure the road required for transmission line construction is adequately designed for the planned use. Surface disturbance would be minimized to the extent feasible, given soils and terrain. Following construction, ground vehicular-access to the structures would be required for maintenance and emergency repairs; Tri-State would require a permanent road ROW for this purpose, for roads outside of the transmission line ROW.

Tri-State would reclaim and revegetate a portion of the road to reduce the visibility of the road from the south rim of the canyon following construction. The maintenance access road would require periodic grading and stabilization over the life of the transmission line. Additional measures to minimize visual effects of the road would be implemented. These measures may include placement of boulders, feathering, or rock staining. Prior to final approval for construction, Tri-State would detail the road reclamation and visual mitigation plans for post-construction activities, as well as the specifications for the long-term road that would remain in place for future maintenance activities. BLM and USFS would approve all plans before granting the construction Notice to Proceed (NTP). As noted previously, the level of design is preliminary; ROW widths, water use, and other details are conservative estimates.

#### *2.2.1.4 Summary of differences between Dolores River Crossing Alignments*

Table 3 summarizes the differences between the proposed realignment and the upgrade-in-place. Figure 10 shows the general topography for the two crossing alignment options on the north rim of the Dolores Canyon; view is generally toward the south.

**Table 3. Dolores River Crossing Design Summary and Comparison**

| | No Action | Realignment Option | Upgrade-in-Place Option |
|---|---|---|---|
| Total power line mileage | 3.1 miles | 3.5 miles | 3.1 miles |
| Right-of-way width | 100 feet | 150 feet (<100 feet in canyon span) | (same as Realignment) |
| Conductor type and size | 336.4 kcmil* Aluminum Conductor Steel Reinforced ([ACSR] 0.720") | High strength, low sag conductor (1.345") | (same as Realignment) |
| Circuit configuration | Horizontal | (same) | (same) |
| Design minimum ground clearance beneath conductors | 25 feet | 28 feet | (same as Realignment) |
| National Electrical Safety Code (NESC) minimum ground clearance | 20.7 feet | 23.3 feet | (same as Realignment) |
| Span between structures (maximum) | 5,400 feet | 6,700 feet (single span) | 5,770 feet Dolores River Canyon span<br>3,300 feet Chicken Aspen Canyon span |
| Typical span between wood structures (average) | 500 feet | 625 feet | (same as Realignment) |
| Number of structures per mile | 11 | 7 | (same as Realignment) |
| Height of wood H-frame structures (typical range) | 48 to 57 feet | 61 to 106 feet | (same as Realignment) |
| Height of tangent crossing structures | 90 feet (North Rim)<br>80 feet (South Rim)<br>Wood Structures | 150 feet (North Rim)<br>75 feet (South Rim)<br>Steel Lattice Structures | 95 feet (North Rim)<br>115 feet (South Rim)<br>Steel Lattice Structures |
| Height of three-pole wood guyed structures | 78 to 88 feet | 61 to 106 feet | 61 to 106 feet |
| Construction disturbance for H-frame structures | N/A | 4,800 square feet (about 70 by 70 feet) | (same as Realignment) |
| Permanent disturbance for H-frame structures | 30 square feet | 40 square feet | (same as Realignment) |
| Maximum construction disturbance at three-pole steel and wood guyed turning structures | N/A | 30,000 square feet (about 150 by 200 feet) | (same as Realignment) |
| Permanent disturbance at three-pole steel and wood guyed turning structures | 6,000 square feet (about 80 by 75 feet) | 13,000 square feet (about 100 by 130 feet) | (same as Realignment) |

* kcmil = thousands of circular mils

| | **No Action** | **Realignment Option** | **Upgrade-in-Place Option** |
|---|---|---|---|
| Construction disturbance at each tangent steel structure base (maximum square feet) | N/A | 30,000 square feet (about 150 by 200 feet) | (same as Realignment) |
| Permanent disturbance at each tangent crossing structure | About 50 square feet at south rim; about 15,000 square feet at north rim | About 610 square feet for north and south rim | About 610 square feet for south rim, and 7,500 square feet (about 100 by 75 feet) for north rim |
| New constructed access roads | N/A | 2.2 miles | 0.9 miles |
| Construction disturbance for new access roads | 0 | 8.0 acres | 8.3 acres |
| Duration of new access road construction | N/A | 3 to 5 days | 10 to 15 days |
| Gallons of water for dust suppression and soil compaction on new access roads | N/A | 12,000 | 120,000 |
| Total water truck trips | N/A | 3 | 18 |
| Reclaimed access roads | N/A | 3.3 miles | 1.7 miles |
| *Existing authorized access road impacts evaluated and disclosed in the 2006 EA*<br>*(Note: this document tiers to prior analysis in the 2006 EA)* | | | |
| Use of existing authorized down line access roads (2006 EA) | 3.3 miles | 0.0 miles | 1.7 miles |
| *Current disturbance for existing authorized access roads* | 6.5 acres | 0.0 acres | 3.3 acres |
| *Construction disturbance for existing authorized access roads* | 5.6 acres | 0.0 acres | 2.9 acres |

Note: Transmission line engineering information is preliminary and subject to change. Information provided is based on preliminary design conducted for the proposed project, using standard effect measurements for proposed structure types.


**Figure 10. Topography along the Upgrade-in-Place and Realignment Options at the Dolores River Crossing**

### *2.2.2 Dry Creek Basin*

The BLM carefully considered many different options within the Dry Creek Basin area to minimize effects to GuSG and visual resources, balancing the concerns of private land owners, the Colorado State Land Board, and CPW, as well as Colorado Department of Transportation (CDOT) along the SH 141 ROW. The BLM considered the final TRFO RMP (BLM 2015), instructional memorandums (IM), agency feedback during meetings (including BLM IM No. 2014-100: Gunnison Sage-Grouse Habitat Management Policy on Bureau of Land Management-Administered Lands in Colorado and Utah) and numerous meetings with USFWS and CPW (refer to Section 6.2 Persons, Groups, and Agencies Consulted), as well as land ownership mapping. Industry standard practices for high voltage rural transmission line construction were also considered. Based on these considerations, two routes were selected for analysis in the EA—a realignment option and an upgrade-in-place option. The upgrade-in-place is Tri-State's Proposed Action. The two routes at the Dry Creek Basin are described in the sections that follow.

#### *2.2.2.1 Background*

The Dry Creek Basin is a broad, flat, sagebrush-dominated basin south of Nucla. On November 12, 2014, the USFWS issued a final rule that listed the GuSG as threatened under the ESA in addition to designating critical habitat (FWS-R6-ES-2012-0108). Although the final rule specifies that lands covered by buildings, pavement or other manmade structures are not included in critical habitat, it further clarifies that a road or powerline right-of-way that is not paved would be considered critical habitat (79 FR 69326). GuSG inhabit sagebrush ecosystems in southwestern Colorado and southeastern Utah, including the Dry Creek Basin (see Sections 3 and 4). The realignment along SH 141 in the Dry Creek Basin option is being evaluated to address concerns regarding proposed project related effects to GuSG and occupied habitat from construction, operation, and maintenance of the proposed 230-kV transmission line. EPMs relevant to the GuSG are included in Table 8 and Table 9, and apply to both the upgrade-in-place and realignment options in the Dry Creek Basin.

#### *2.2.2.2 Upgrade-in-Place (Tri-State's Proposed Action, Alternative A)*

##### **2.2.2.2.1 Structures and Construction**

The proposed upgrade-in-place alignment in the Dry Creek Basin would follow the existing transmission line corridor (see Figure 11). This alignment would be about 7.9 miles long, and would cross five landowners. Self-supporting unguyed steel monopole structures would be used in occupied habitat for the GuSG. All horizontal surfaces as well as the pole top would be fitted with perch discouragers to reduce avian predator perching and nesting activities in occupied habitat. Steel structures would require concrete foundations (see Section 2.3.6.11).

##### **2.2.2.2.2 Access**

Existing access roads that are currently used to maintain the transmission line would be used to construct and maintain the improved line. Structures would be placed to avoid or minimize the need for new access road construction. Some improvements, particularly where the road has been eroded by stormwater and runoff, would be needed. Any temporary disturbance areas would be reseeded following construction.

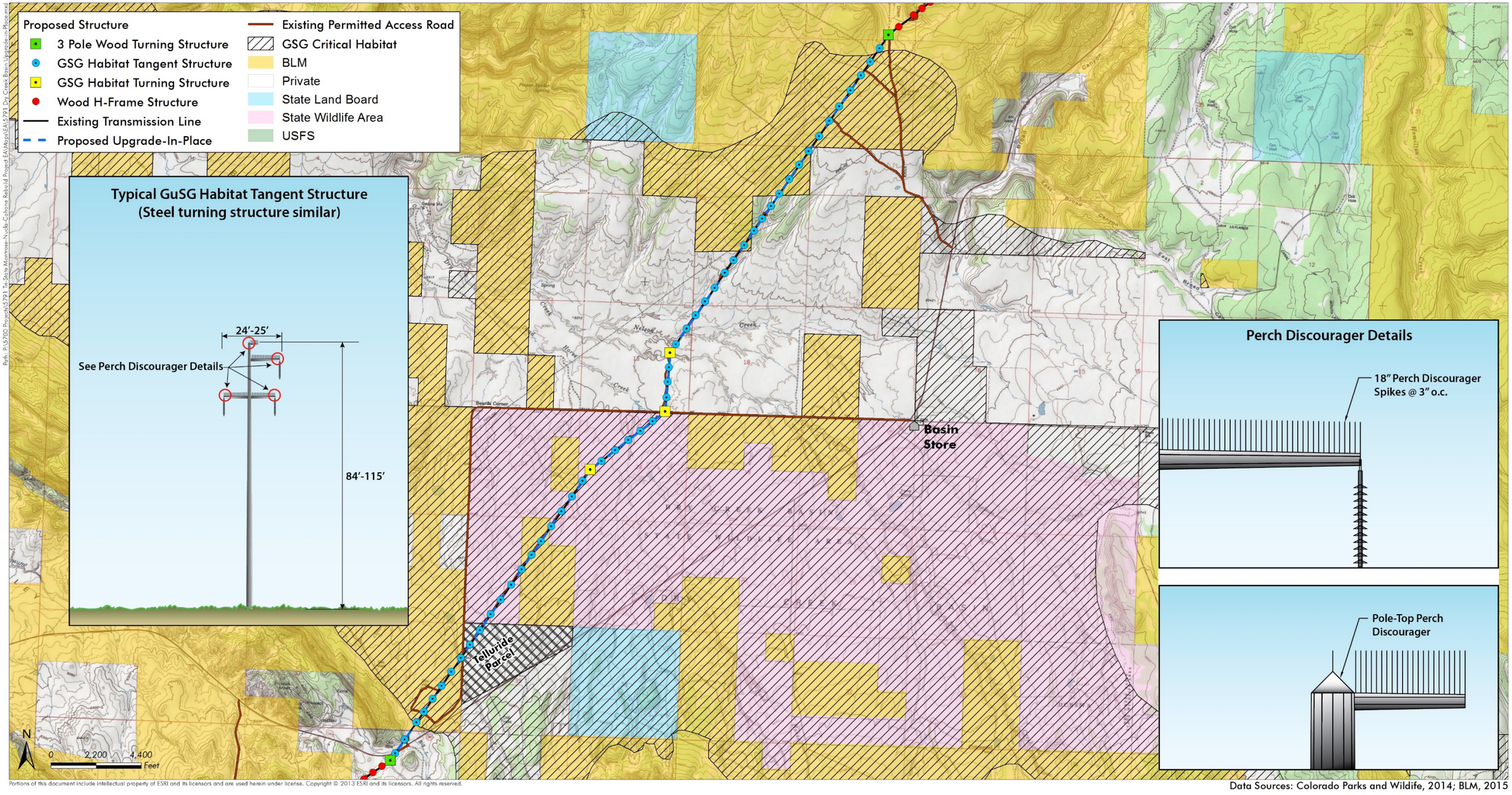


**Figure 11. Upgrade-In-Place in the Dry Creek Basin (Tri-State's Proposed Action, Alternative A)**

#### 2.2.2.2.3 Design Features/Applicant Committed Measures

Tri-State has developed a Draft Conceptual Biological Protection Plan for GuSG (see Draft POD's Appendix B-Biological Protection Measures). The Plan includes environmental protection measures, design features, and additional proposed conservation plan elements to conserve, protect, and aid in recovery of GuSG habitat. Environmental protection measures include Tri-State's proposed voluntary design features (specifically, use of steel structures, perch discouragers, and self-supporting turning structures), scheduling constraints, and other actions that are intended to minimize proposed project related effects to GuSG for the upgrade-in-place option. Detailed information including cost is included in Appendix B.

### *2.2.2.3 Realignment along SH 141*

#### 2.2.2.3.1 Structures and Construction

The Dry Creek Basin realignment option would move the existing transmission line alignment parallel to SH 141 to consolidate linear disturbances along a single corridor in Dry Creek Basin. The realignment would require construction of an additional 1.2 miles of transmission line relative to the existing alignment, for a total length of about 9.0 miles. Structure types, including perch discouragers, are described in Section 2.3.6.2.

The Dry Creek Basin realignment would diverge from the existing alignment at the north end of the Dry Creek Basin and connect to the SH 141 corridor (see Figure 12). The transmission line would follow the north side of SH 141 beyond U29 Road near the Basin Store. From that point, the line would either follow the north side or the south side of the SH 141. Tri-State has requested that a corridor along either side of SH 141 be analyzed for purposes of the EA, to provide siting flexibility to address land use and landowner concerns. Final alignment and design would be provided in the Final POD. For purposes of analysis, calculation of effects for vegetation, soils, and other resources presented in Section 4 is based on the preliminary design along the south side of the highway; however, effects are expected to be similar for either side of SH 141.

The proposed realignment would cross 8 landowners, including lands owned and managed by CPW, private landowners, City of Telluride (north side of highway), and lands administered by the BLM.

#### 2.2.2.3.2 Access

About 9.0 miles of new downline access road are anticipated for the realignment. Much of the access may be overland due to flat slopes in the area, but some minor grading/improvements would be required to facilitate the safe operation of construction equipment through drainages and steeper areas of terrain. The proposed long-term access road ROW for the realignment along SH 141 is 30 feet. Areas requiring additional improvement would require a 50-foot easement, but the access road would be re-seeded post construction. Tri-State would re-seed the overland access surface to reduce erosion and reduce noxious weed infestations. If grading is required, the road bed would be left in place, but it would be re-vegetated post construction. The downline access roads on the existing alignment would be revegetated where necessary.

#### 2.2.2.3.3 Design Features/Applicant Committed Measures

Under the realignment along SH 141 in the Dry Creek Basin option, Tri-State would construct approximately 1.2 additional miles of transmission line (relative to the upgrade-in-place) to

consolidate the ROW with SH 141. Tri-State's new ROW would overlap the existing CDOT ROW by 25 feet in some locations (see Figure 13; overlap is related to the width of the CDOT ROW, which varies throughout the corridor). The total cost of Tri-State's proposed voluntary design features to minimize proposed project related effects to GuSG is approximately $3.7 million. For additional details, please see the Draft POD's Appendix B-Biological Protection Measures.

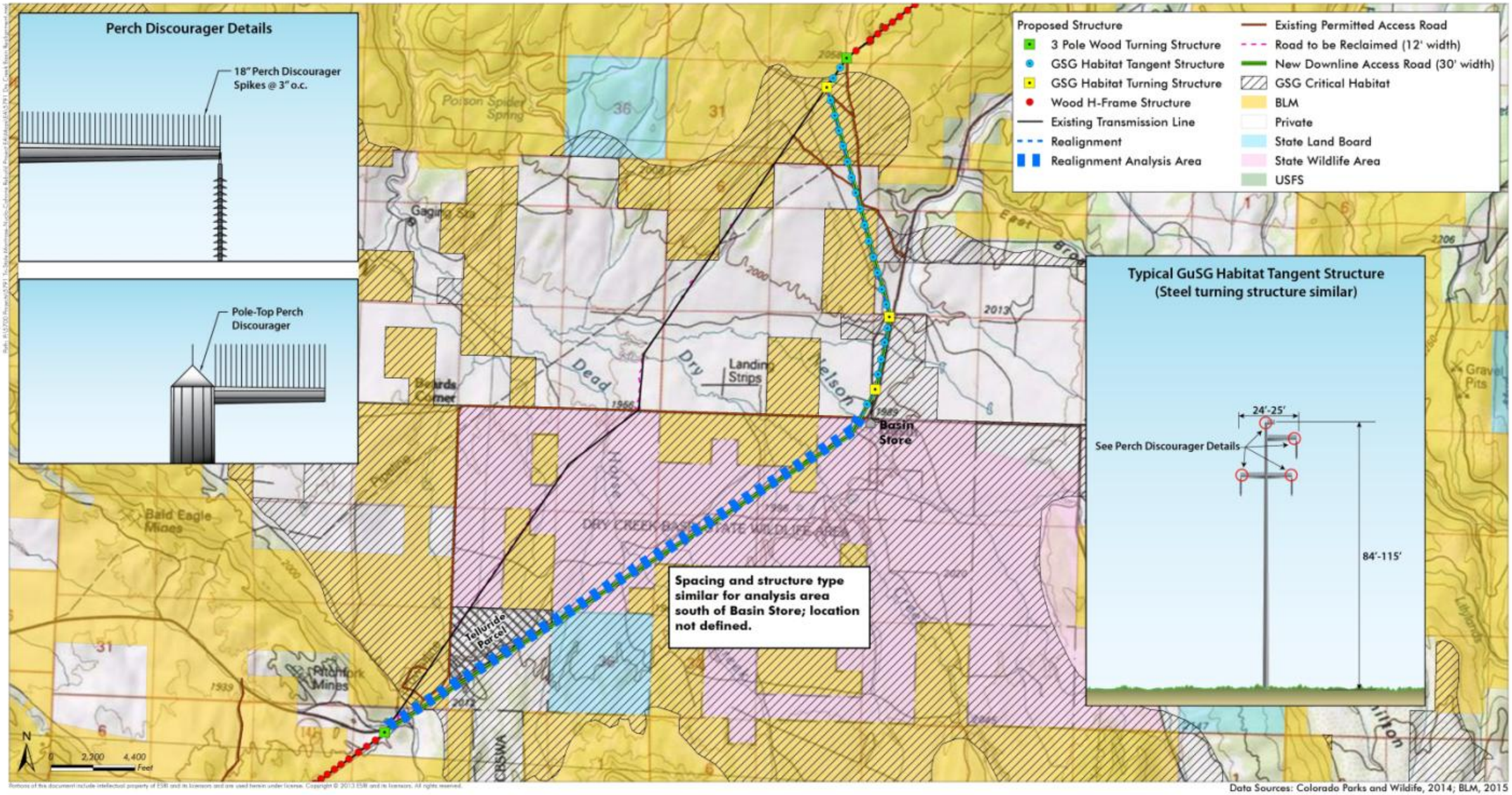


**Figure 12. Dry Creek Basin Routing Option-Realignment Along SH 141**

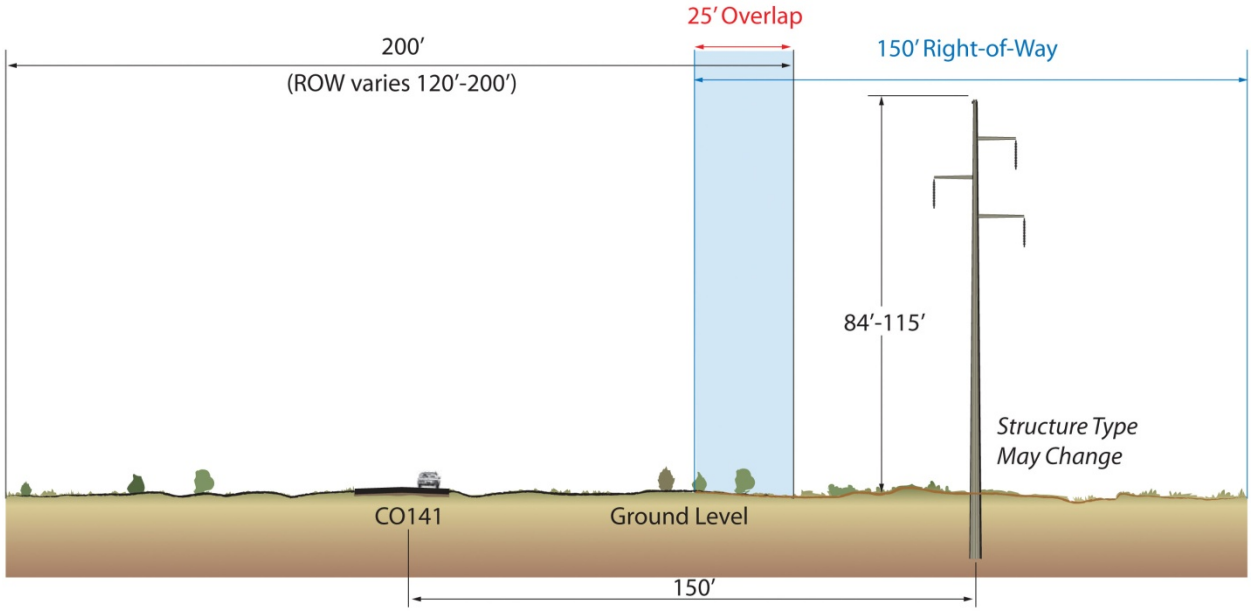


**Figure 13. Conceptual Cross-Section SH 141 Overlap for the Dry Creek Basin**

#### *2.2.2.4 Summary of differences between Upgrade-in-Place and Realignment along SH 141*

Table 4 summarizes the differences between No Action, upgrade-in-place, and realignment along SH 141.

**Table 4. Dry Creek Basin Design Summary and Comparison**

| | No Action | Upgrade-in-Place | Realignment Along SH 141 |
|---|---|---|---|
| Total power line mileage | 7.9 | 7.9 | 9.1 |
| Right-of-Way width | 100 feet | 150 feet | (same as Upgrade-in-Place) |
| Conductor type and size | 336.4 kcmil Aluminum Conductor Steel Reinforced ([ACSR] 0.720") | 1272 ACSR (1.345") | (same as Upgrade-in-Place) |
| Circuit configuration | Horizontal | Vertical | (same as Upgrade-in-Place) |
| Minimum ground clearance beneath conductors | 25 feet | 28 feet | (same as Upgrade-in-Place) |
| NESC minimum ground clearance | 20.7 feet | 23.3 feet | (same as Upgrade-in-Place) |
| Typical span between structures (average) | 500 feet | 625 feet | (same as Upgrade-in-Place) |
| Number of structures per mile | 11 | 7 | (same as Upgrade-in-Place) |
| Number of self-supporting steel turning structures | NA | 3 | 4 |
| Number of structures in occupied GUSG habitat | 72 | 50 | 54 |
| Number of structures in GUSG critical habitat | 50 | 35 | 47 |
| Height of steel monopole structures (typical range) | 48 to 57 feet | 84-115 feet | (same as Upgrade-in-Place) |
| Construction disturbance at each steel mono-pole structure base (maximum square feet) | NA | 6,500 square feet (about 100 by 65 feet) | (same as Upgrade-in-Place) |
| Permanent disturbance at each steel mono-pole structure base | NA | 1,600 square feet (about 80 by 80 feet) | (same as Upgrade-in-Place) |
| Construction disturbance for pole structure footprint | 0 | 5.1 acres | 5.3 acres |
| New access roads | 0 miles | 0 miles | 9.0 miles |

| | **No Action** | **Upgrade-in-Place** | **Realignment Along SH 141** |
|---|---|---|---|
| *Construction disturbance for new access roads* | 0 | 0 | 26.8 acres (includes minor pole structure footprint overlap) |
| Reclaimed access roads | 0 miles | 0 miles | 7.3 miles |
| *Existing authorized access road impacts evaluated and disclosed in the 2006 EA (Note: this document tiers to prior analysis in the 2006 EA)* | | | |
| Use of existing authorized down line access roads (2006 EA) | 8.5 miles | 8.5 miles | 0.3 miles |
| Use of existing authorized county roads (2006 EA); as-is, no or limited maintenance | 9.5 miles | 9.5 miles | 2.4 miles |
| Use of other authorized access roads (2006 EA) | 1.3 miles | 1.3 miles | 1.3 miles |
| *Current disturbance for existing authorized access roads* | 19 acres | 19 acres | 4.7 acres |
| *Construction disturbance for existing authorized access roads* | 16.6 acres | 16.6 acres | 4.1 acres |

Note: Transmission line engineering information is preliminary and subject to change. Information provided is based on preliminary design conducted for the proposed project using standard effect measurements for proposed structure types.

## 2.3 Alternatives

As noted previously, aside from two routing option areas in the Dry Creek Basin and Dolores River crossing, improvements to the existing transmission line are identical under both Action Alternatives (Alternatives A and C). There are a total of four combinations of Action Alternatives that are possible for the project, described in the following subsections.

### *2.3.1 Alternative A (Proposed Action) – Realignment of Dolores River Crossing and Upgrade-in-Place at Dry Creek Basin*

Under Alternative A, Tri-State proposes to improve the existing MNC 115-kV transmission line to 230-kV, utilizing the existing transmission line corridor with the exception of the Dolores River crossing (Figure 14), where a realignment is proposed. See Section 2.3.7 for a detailed description of many components common to all Action Alternatives, including structure type and design, conductor wires including fiber optic cable, ROWs, temporary use areas, access roads, vegetation management, substations, preconstruction and construction plans, construction workforce and schedule, post construction, emergency repairs, and EPMs.

As part of the improvements, the ROW would be expanded from 100 feet to 150 feet to accommodate the higher voltage, except the Dolores River span. At the Dolores River span, the ROW would be less than 100 feet. Throughout the corridor, Tri-State would primarily use wooden H-frame structures as well as some self-supporting steel and guyed turning structures in specific locations. The H-frame structures would be taller and wider than the existing structures.

The project incorporates many design features to avoid and minimize environmental effects; those design features are included in the sections that follow, and are summarized in Table 8.

For the Dolores River crossing (Section 2.2.1.2), the realignment approximately 1 mile to the west was proposed to address road access and safety concerns for maintenance and repairs, along with slope stability and erosion issues for specific structures. The crossing would be about 6,700 feet long. The proposed upgrade-in-place alignment in the Dry Creek Basin (Section 2.2.2.2) follows the existing transmission line corridor and would be about 7.9 miles long, crossing five landowners. Self-supporting steel monopole structures would be used in occupied habitat for the GuSG and would require concrete foundations. All horizontal surfaces as well as the pole top would be fitted with perch discouragers to reduce avian predator perching and nesting activities in occupied GuSG habitat.

If approved, Tri-State plans to construct the project as described in Section 2.3.6.12. Tri-State would continue to maintain the existing transmission line and associated access roads until the new 230-kV line is in operation (see Table 6).

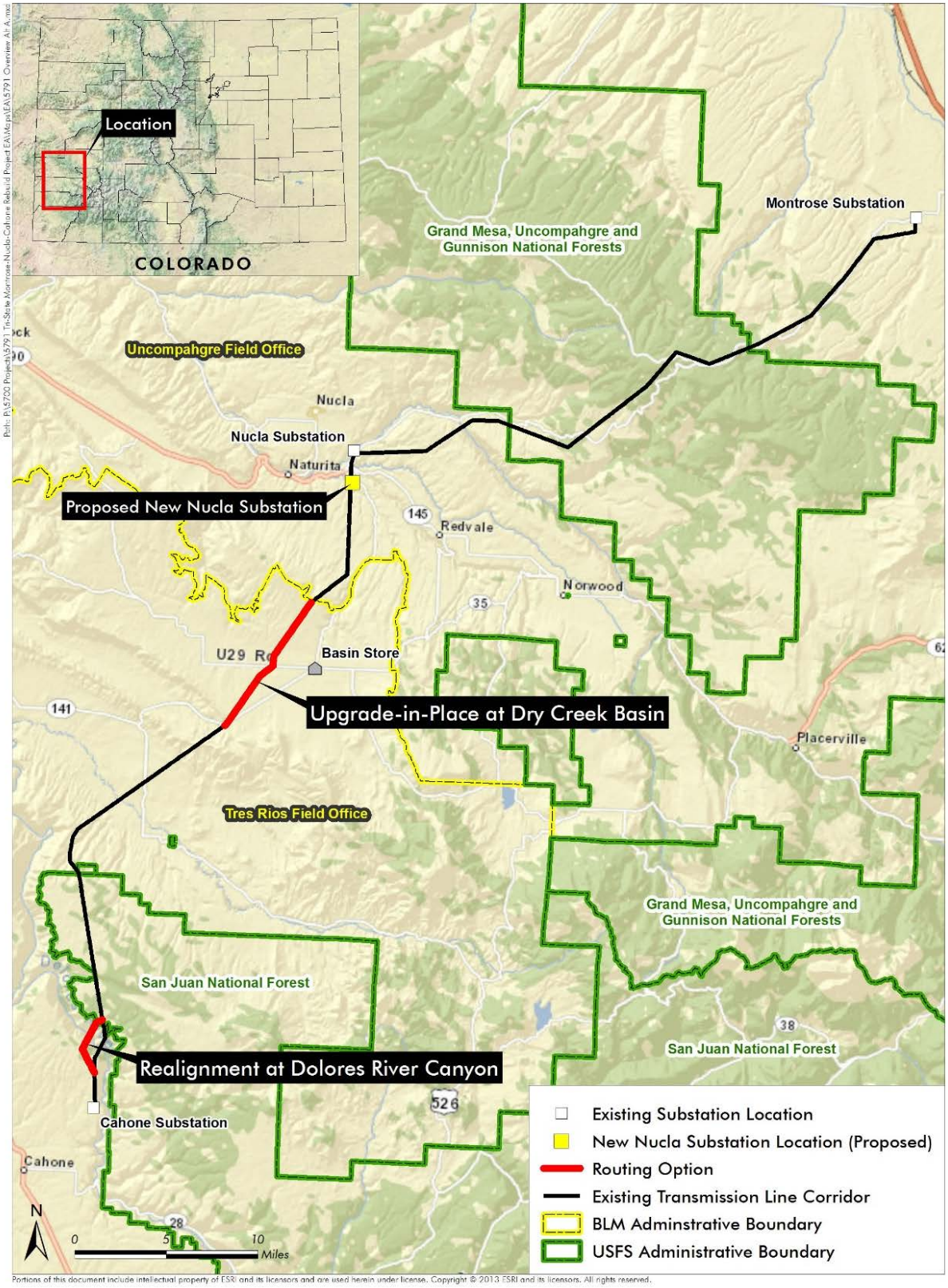


**Figure 14. Alternative A (Tri-State's Proposed Action) - Transmission Line Upgrade within Existing Corridor, with Realignment at Dolores River Crossing**

### *2.3.2 Alternative B – No Action*

In the No Action Alternative, the agencies would not grant Tri-State's request for a ROW grant and an SUA allowing the line to be improved. The existing 115-kV transmission line from Nucla to Cahone and associated access roads would remain, and the transmission line would not be upgraded to 230 kV. The age and condition of the structure dictates that over time, the entire 115-kV line will need to be rebuilt. In order to continue to maintain the 115-kV line, more frequent and major maintenance activities would be required, including cross arm replacement, hardware replacement, structure replacements, and re-conductoring of the line. These activities are included in the 2006 POD that was authorized by the BLM in 2007. The frequency with which Tri-State will be conducting inspection and maintenance activities in the ROW will increase over time as individual structures are replaced. It generally takes one to two days to replace a structure. The extent and timing of the structure replacements would depend on the annual inspection results and available budgets from year to year. Over the course of the next 10 years, replacement could result in a handful of structures needing to be replaced one year, and dozens of structures replaced in other years. In order to replace structures, large equipment is required to remove the existing pole, auger the hole for the new pole, and erect the new pole and wires. Typically this work requires a bucket truck, line trac, and a drill rig. Access roads would need to be improved in places to ensure safe access to the structures that need to be replaced. The disturbance/revegetation in the ROW over time would continue until all of the poles are replaced.

The No Action Alternative would also result in impacts to Tri-State's ability to meet its reliability requirements and load-serving capability in southwestern Colorado, which may result in extended outages in the near future.

### *2.3.3 Alternative C - Dolores River Crossing Routing Option (Alternative A Incorporating Upgrade-in-Place at Dolores River Crossing)*

Alternative C - Dolores River crossing routing option (Figure 15) includes an upgrade-in-place alignment at the Dolores River Canyon, described previously in detail (Section 2.2.1.3). A total of six structures would be eliminated, and structures on steep slopes would be moved farther upslope to address safety and erosion issues. A new north rim access road would be constructed upslope of the existing access roads to take advantage of natural contours and better grades. The existing access roads would be reclaimed. Aside from the Dolores River Canyon area, this alternative is the same as described in Alternative A and Section 2.3.7-Components Common to All Action Alternatives.

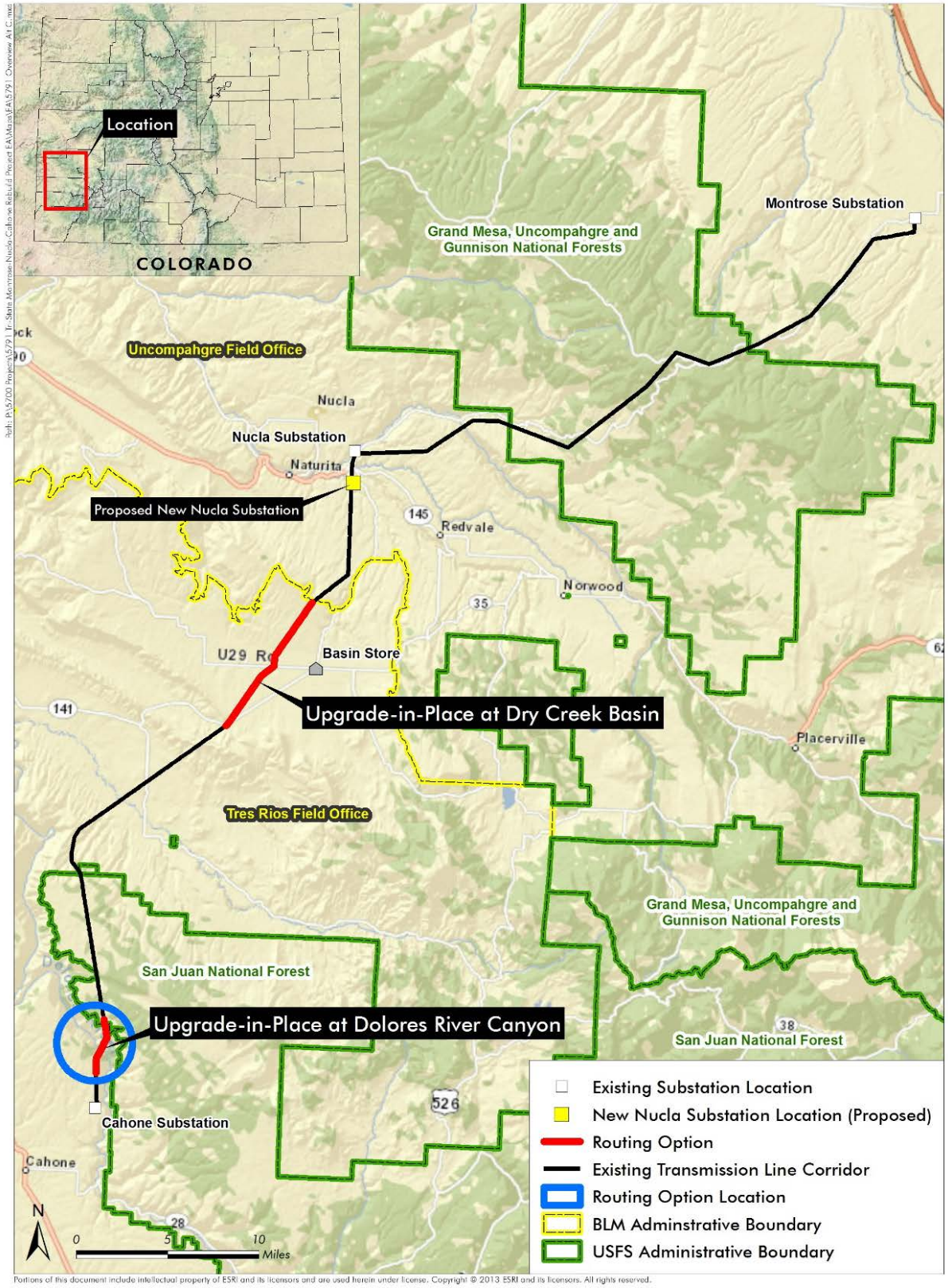


**Figure 15. Alternative C - Dolores River Crossing Routing Option (Alternative A Incorporating Upgrade in Place at Dolores River Crossing)**

### *2.3.4 Alternative C - Dry Creek Basin Routing Option (Alternative A Incorporating Realignment at Dry Creek Basin)*

Alternative C - Dry Creek Basin routing option (Figure 16) includes realignment through the Dry Creek Basin along SH 141, described previously in Section 2.2.2.3. The proposed realignment through the Dry Creek Basin was developed in response to habitat concerns for the GuSG. The new alignment would cross eight landowners and would require the construction of an additional 1.2 miles of transmission line, for a total length of 9.0 miles. Aside from the Dry Creek Basin area, this alternative is the same as described in Alternative A and Section 2.3.7-Components Common to All Action Alternatives.

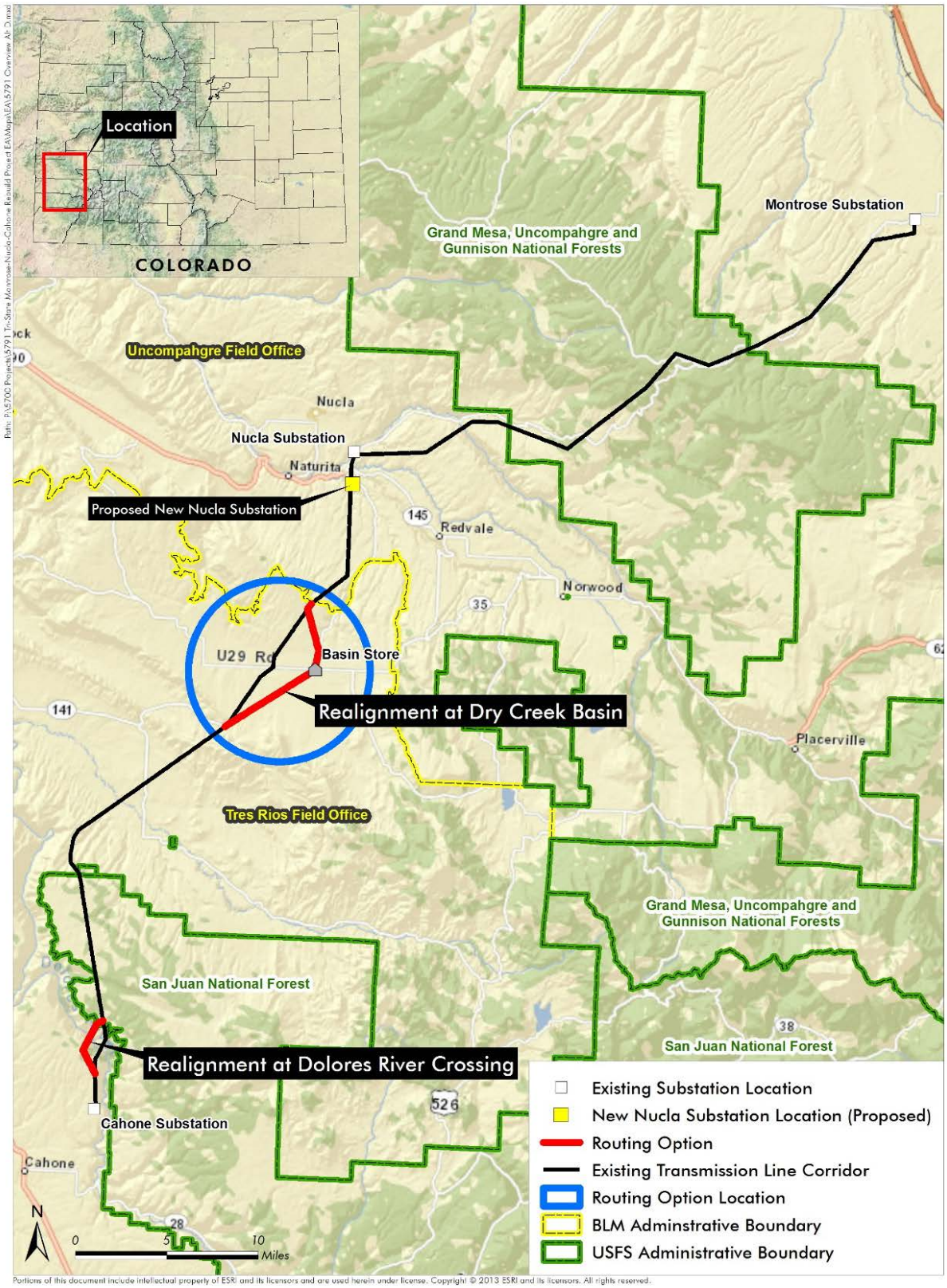


**Figure 16. Alternative C - Dry Creek Basin Routing Option (Alternative A Incorporating Realignment at Dry Creek Basin)**

### *2.3.5 Alternative C - Dolores River Crossing and Dry Creek Basin Routing Options (Alternative A Incorporating Upgrade-in-Place at Dolores River Crossing and Realignment at Dry Creek Basin)*

Under Alternative C - Dolores River crossing and Dry Creek Basin routing options (Figure 17), the transmission line would be upgraded-in-place at the Dolores River crossing (see Section 2.2.1.3) and realigned along SH 141 through the Dry Creek Basin (see Section 2.2.2.3).

Aside from the Dolores River Canyon and the Dry Creek Basin area, this alternative is the same as described in Alternative A and Section 2.3.7-Components Common to All Action Alternatives.

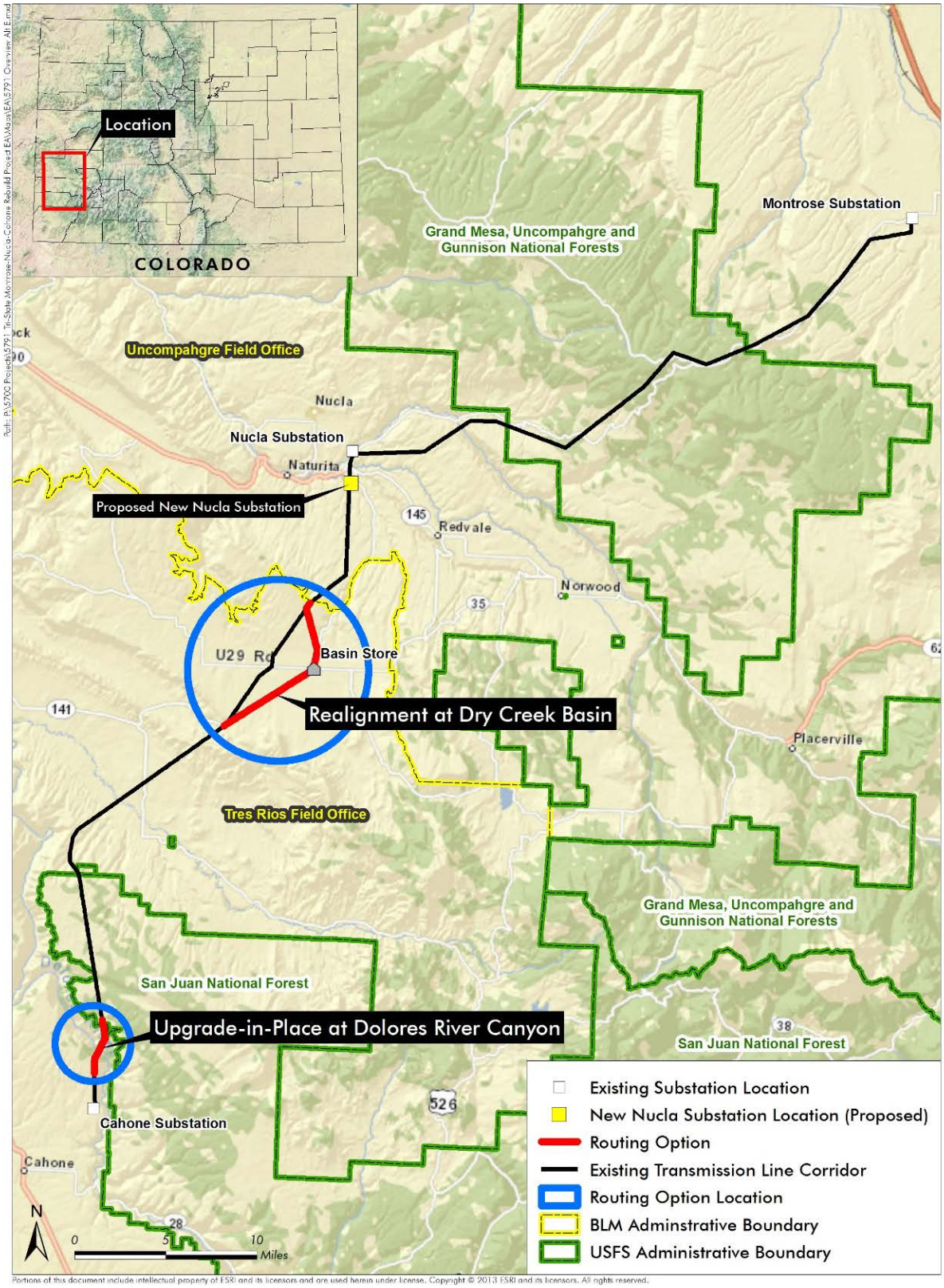


**Figure 17. Alternative C - Dolores River Crossing and Dry Creek Basin Routing Options (Alternative A Incorporating Upgrade-in-Place at Dolores River Crossing and Realignment at Dry Creek Basin)**

### *2.3.6 Components Common to all Action Alternatives*

Tri-State proposes to expand the existing 100-foot ROW for the 115-kV line to a 150-foot wide corridor to accommodate the safe operation and maintenance activities for the new larger 230-kV transmission line. The existing 100-foot ROW would be used to the extent feasible. Tri-State would primarily use wooden H-frame structures, as well as some self-supporting steel and guyed turning structures in specific locations. The H-frame structures would be taller and wider than the existing structures. The improvement would consist of the following components:

- A new substation near the existing Nucla substation and power plant, near Nucla, Colorado. The new substation would be called the Maverick 230-kV substation.
- A 230-kV transmission line from the existing Montrose substation west of Montrose, Colorado to a new Nucla 230-kV substation.
- A 230-kV transmission line from a new Nucla 230-kV substation to the existing Cahone substation near Dove Creek, Colorado. Expansion and equipment additions to the existing Montrose substation (on Tri-State property) to accommodate the new 230-kV circuit.
- Expansion and equipment additions to the existing Cahone substation (on Tri-State property) to accommodate the new 230-kV circuit.
- Double circuit structures between a new Nucla 230-kV substation and existing Nucla 115-kV substation at the Nucla station. The double circuit would consist of a new 115-kV line which would provide a 115-kV electrical connection from the new Nucla substation back to the existing 115-kV substation at the Nucla generating station; and a new 230-kV Nucla section to Cahone section of the MNC transmission line.
- A short deviation from the existing route to avoid canyon walls near the Cahone substation.
- As noted previously, existing access routes authorized in 2007 (BLM 2007b) for maintenance of the existing transmission line would be used, with any necessary modifications to accommodate construction vehicle widths/lengths, for construction of the improved transmission line.
- Pending final engineering design, additional spur routes could be needed for construction and long-term operation/maintenance of the line; tower locations would change in some locations due to an increase in the span between towers from the 115-kV tower spacing.
- Installation of the fiber optic cable.
- Removal of the existing 115-kV structures and line following construction of the 230-kV line.

If approved, Tri-State plans to construct the proposed project as described in the following sections. The Action Alternatives incorporate many design features to avoid and minimize environmental effects; those design features are included in the sections that follow, and are summarized in Table 8. The Action Alternatives incorporate the requirements of all applicable federal, state, and local laws, regulations, and permits as detailed in the POD. Additional details for all of the Action Alternative components are in the Draft POD (Appendix D) and would be edited and refined in the Final POD.

#### *2.3.6.1 Summary Description of Existing Conditions and Proposed Improvement Design Features*

Table 5 provides additional details on the proposed project components under the Action Alternatives. Additional details for the Dolores River and Dry Creek Basin routing options are discussed in Section 2.2.

**Table 5. Transmission Line Design**

| Description | Comparison of Existing and Proposed Structure Designs* | |
|---|---|---|
| | **Existing 115-kV Wood H-Frame Structures (to be removed)** | **Proposed 230-kV Wood H-Frame and Steel Mono-Pole Structures (to be installed)** |
| Right-of-Way width | 100 feet | 150 feet |
| Span between structures (average) | 500 feet | 625 feet |
| Span between structures (maximum) | 5,400 feet | 7,200 feet |
| Number of structures per mile (average) | 11 | 8 |
| Height of wood H-Frame structures (typical range) | 48 to 57 feet | 61 to 106 feet** |
| Height of steel monopole structures (typical range) | N/A | 90 to 130 feet (double-circuit portion of line) |
| Height of tangent crossing structures at Dolores River | North rim: 90 feet<br>South rim: 80 feet<br>Wood Structures | North rim: 150 feet<br>South rim: 75 feet<br>Steel Lattice Structures |
| Land temporarily disturbed by construction at each wood H-frame structure base | N/A | 4,800 square feet (about 70 feet by 70 feet) |
| Land permanently disturbed by construction at each wood H-frame structure base | 30 square feet | 40 square feet |
| Land temporarily disturbed by construction at each steel mono-pole structure base | N/A | 6,500 square feet (about 80 feet by 80 feet) |
| Land permanently disturbed by construction at each steel mono-pole structure base | N/A | 1,600 square feet (about 40 feet by 40 feet) |
| Land temporarily disturbed by construction at each 3-pole turning structure | N/A | 30,000 square feet (about 150 feet by 200 feet) |
| Land permanently disturbed by construction at each 3-pole turning structure | 6,000 square feet | 13,000 square feet |
| Land temporarily disturbed by construction at each tangent crossing structures at Dolores River | N/A | 30,000 square feet (about 150 feet by 200 feet) |
| Land permanently disturbed by construction at each tangent crossing structures at Dolores River | About 50 square feet at south rim; about 15,000 square feet at north rim | About 610 square feet for both realignment structures (north and south) and south rim upgrade-in-place; about 7,500 square feet for upgrade-in-place north rim structure |
| Conductor type and size | 336.4 kcmil ACSR (0.720”) | 1272 kcmil ACSR (1.345”) |
| Circuit configuration | Horizontal | Horizontal and vertical |
| Minimum ground clearance beneath conductors | 25 feet | 28 feet |
| NERC electrical clearance | 20.7 feet | 23.3 feet |

*Note: This table represents typical construction only for analysis purposes. Engineering is in the process of designing the line and numbers are preliminary and subject to change. Non-typical conditions, such as the Dolores River crossing, may require non-typical structure types, structure heights, special conductors and disturbance areas that are yet to be determined. More details would be included in the Final POD. **The circuits would be stacked vertically in the Dry Creek Basin and between the Nucla generating station and the proposed new Nucla substation.

#### *2.3.6.2 Structure Design and Types*

Tri-State would primarily use wooden H-frame structures, similar in configuration to the existing wooden H-frame structures on the existing line. Improved 230-kV H-frame structures would be taller and wider than the existing 115-kV H-frame structures to accommodate a higher voltage conductor (see Figure 18). New structures would range from about 61 to 106 feet in height, with an average span between structures of about 625 feet. Single steel pole structures would be used for reinforcing turning angles on the 230-kV line as well as the portion of the line that crosses the Dry Creek Basin (see Figure 19). Steel structures would average between 84 to 115 feet in height in the Dry Creek Basin, although some structures up to 130 feet in height may be required due to difficult terrain and for the double-circuit portion of the line. In areas outside of Dry Creek Basin where steel poles are required, especially the double circuit portion of the line running from the Nucla generating station to the new Nucla substation, steel structures would average 90 to 130 feet (Figure 20). In the Dry Creek Basin, steel structures would be outfitted with perch discouragers to prevent raptors and other GuSG predators from perching on the structures. Outside of the Dry Creek Basin, turning structures would use a configuration of three poles (either wood or steel, depending on location), stabilized by guy wires (see Figure 20). Tri-State would use special steel tangent towers on either side of the Dolores River crossing (Figure 21). These towers would range in height from 75 to 150 feet. Final structure type and position would be identified during final design and included in the Final POD. Additional information on transmission line construction is in Section 2.3.6.11.3 and on steel poles in Section 2.3.6.11.4. To minimize visual effects, Tri-State would treat all steel structures, including steel fence (see EPM A-6, Table 8).

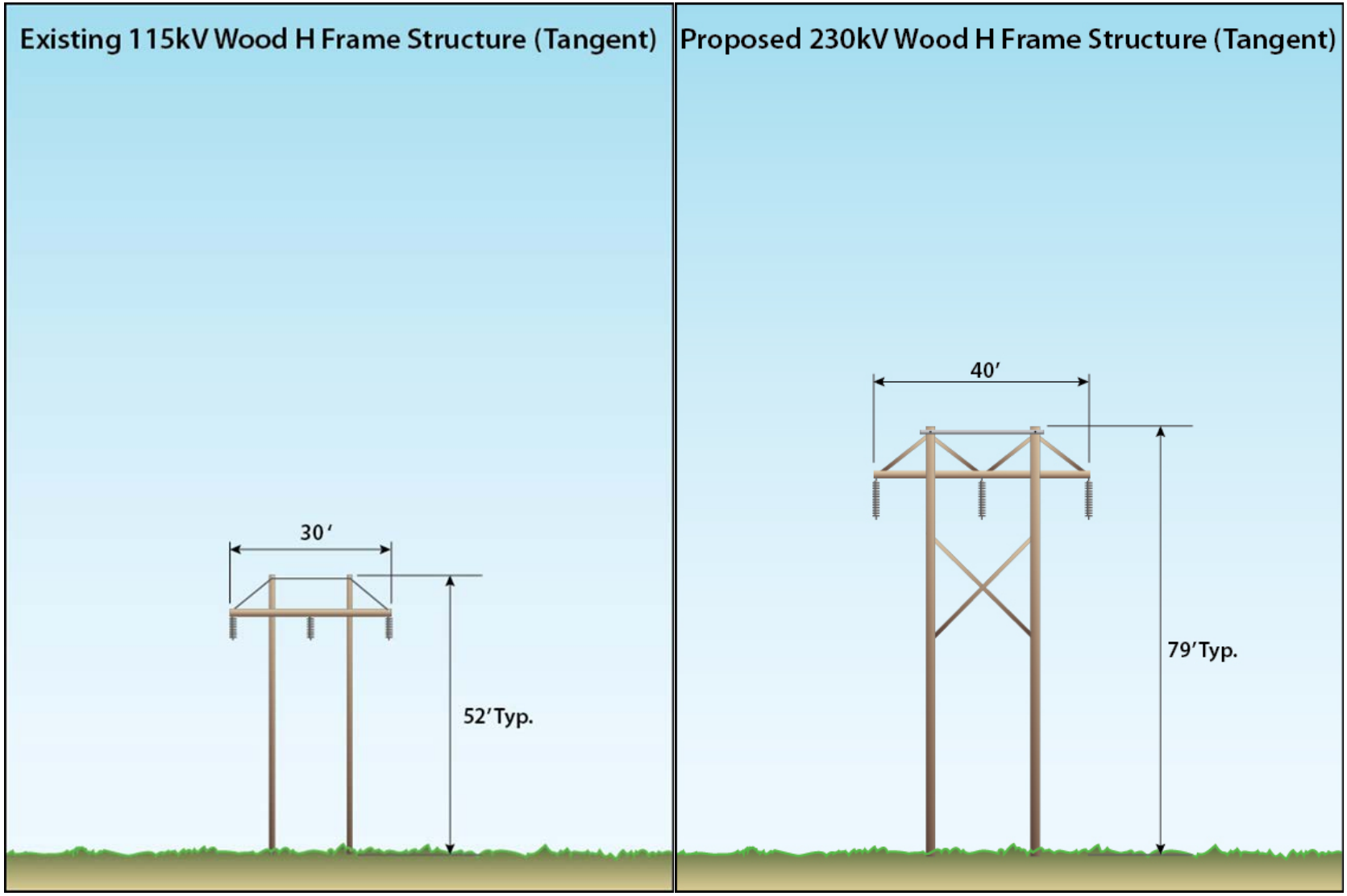


**Figure 18. Comparison of 115-kV and 230-kV Wooden H Frame Structures**

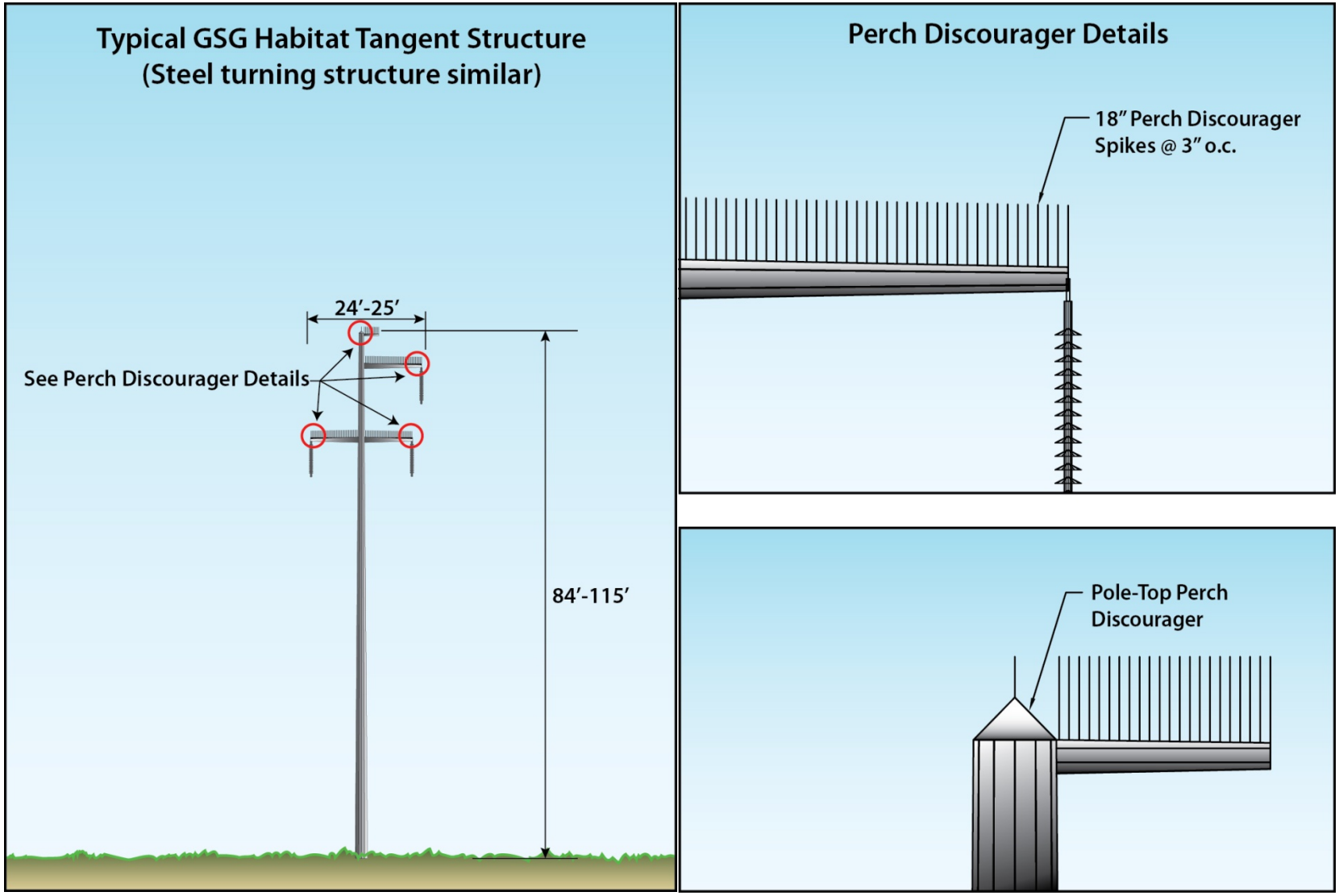


**Figure 19. Steel Structures in Dry Creek Basin Gunnison Sage-Grouse Occupied Habitat**

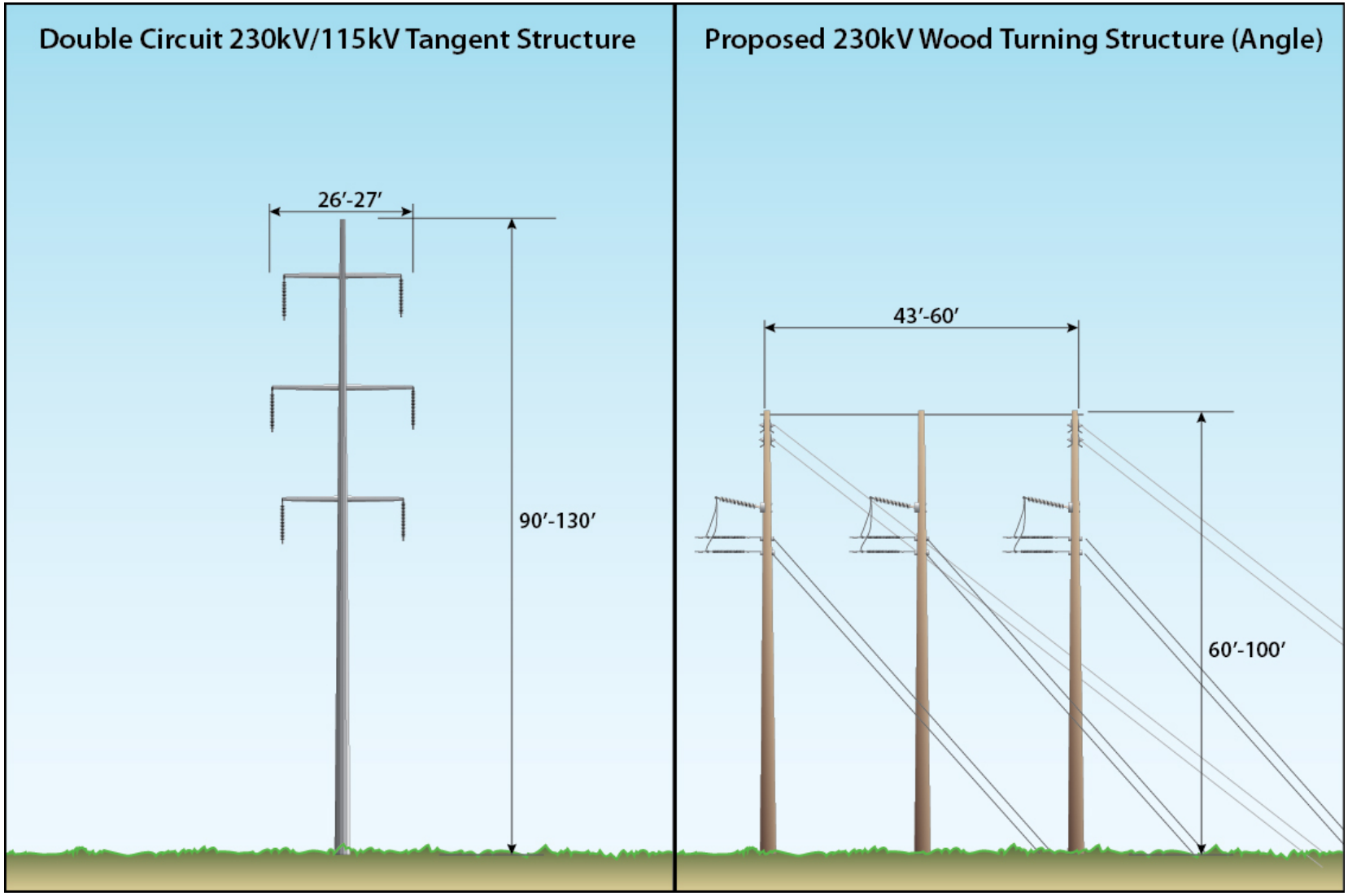


**Figure 20. Double Circuit Structure (Nucla Generating Station to Maverick 230-kV Substation) and Wood Turning Structure Detail (Steel Similar)**

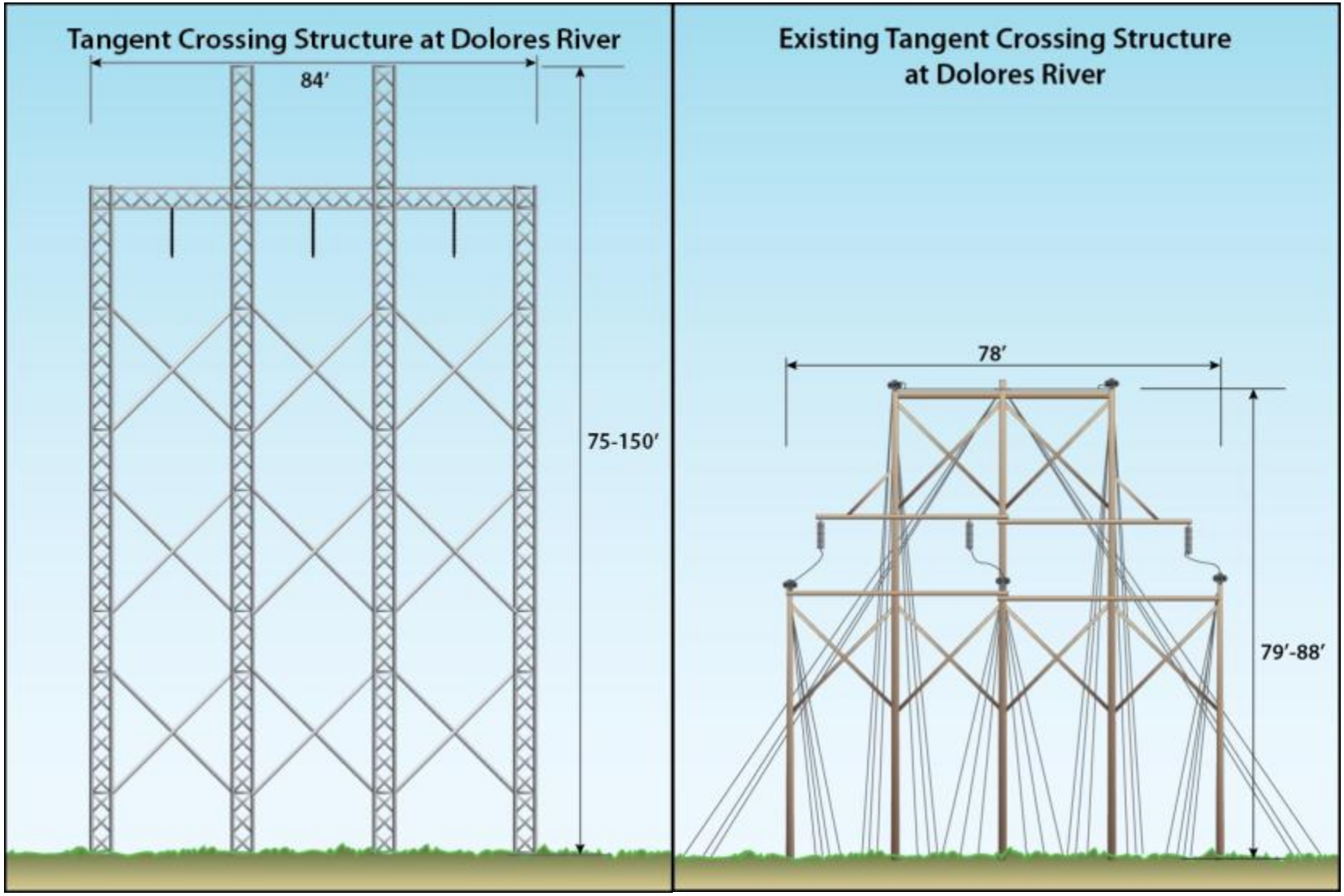


**Figure 21. Comparison of Proposed and Existing Tangent Crossing Structures at the Dolores River**

#### *2.3.6.3 Conductor Wires Including Fiber Optic Cable and Equipment Types*

New larger 1.35-inch-diameter conductors would be used for the 230-kV transmission line rather than the 0.72-inch-diameter conductors used on the 115-kV line (conductor size pending final engineering design). In order to minimize visual effects from the transmission line, Tri-State has committed to utilizing non-specular conductor; high strength, low-sag non-specular conductor would be used at the Dolores River crossing. Non-reflective insulators would be used for all conductor-to-structure connections.

One new shield wire and one new fiber optic cable would be installed as part of the Action Alternatives. The fiber optic cable would also provide Tri-State's communication for the new 230-kV transmission line. The fiber optic cable is a cable that contains numerous glass fiber optic rods that can be used for various applications, including communications. Fiber optic cable hangs along with the conductors on the H-frame structures. This wire provides protection from lightning strikes, similar to the normal static wire, while protecting and carrying the tiny fiber optic rods. Using fiber optics for communication allows for fewer microwave radio stations on the transmission system.

Along with communication for the transmission system, the current fiber optic cable contains a portion of the Northern Fiber Optic Telecommunication Project, which was added to the line in 2003. This 220-mile system, previously known as PathNet, provides critical communications for emergency services (911) to southwestern Colorado, along with commercial internet capabilities. Eighty miles of this system currently reside on the project transmission line system.

Service for this critical communication link cannot be interrupted and would need to remain in service while the new 230-kV line was constructed. This presents unique challenges to constructing the new 230-kV line and is described in Section 2.3.6.11. The fiber optic cable would be new, but the service and customer base would remain the same. An additional fiber optic cable would be installed at the Dolores River crossing only, in order to create backup service. This second fiber optic cable would only be activated if the first one is damaged.

The line voltage increase from the existing 115-kV to 230-kV would increase the possibility of corona, which is an electrical field around the surface of a conductor, insulator, or hardware caused by ionization of the surrounding air. This increase, however, would be offset by the selection of a much larger conductor (1.35-inch diameter vs. the existing 0.72-inch), and larger phase spacing (19.5 feet vs. the existing 15.5 feet). The polymer insulators selected for this line also tend to exhibit less corona than glass or porcelain (existing) insulators at the same voltage. Devices called 'corona rings' have been specified at the energized end of each insulator in this line to further reduce the effects of corona. These devices are designed to lower the electric field around an insulator below the threshold that would cause corona. In addition, Extra High Voltage (EHV) conductor fittings (dead-ends, terminals, and splices) specifically designed and fabricated with smooth surfaces, rounded edges and in some cases, recessed hardware would be installed specifically to reduce the potential for corona to occur.

#### *2.3.6.4 Long-Term Rights-of-Way*

Construction of the 230-kV transmission line would occur within a proposed 150-foot-wide long-term ROW and at temporary authorized work areas within and outside the ROWs (e.g., staging yards, pulling sites outside the ROW, helicopter landing areas; see Section 2.1.4). The proposed ROW width in the Dolores Canyon span is less than 100 feet. Access roads would also

require a long-term ROW about 30 feet wide. A wider ROW may be required in steep terrain. Access roads are described in more detail in Section 2.3.7.6.

#### *2.3.6.5 Temporary Use Areas (TUAs)*

##### 2.3.6.5.1 Storage and Staging Areas

Based on preliminary siting information, between three and six temporary staging areas likely would be needed to store poles, equipment, and vehicles. Staging areas would occur on private lands to the extent feasible. The largest staging area is expected to be approximately 60 acres. Two to five other staging areas of 10 to 20 acres each would be needed along the line. Staging areas of this size are required to store poles and conductor and construction equipment for the proposed project as well as provide space to assemble structures when necessary. Staging areas are expected to occur throughout the proposed project area, with the largest site centrally located. Staging areas would be located mainly on private lands with existing agricultural and industrial disturbance and level terrain, to the extent practicable. Sites occur along existing established access routes and outside of any sensitive areas. Helicopters may also need staging areas for storing fuel and landing. Staging areas would be identified during final project design and presented in the Final POD.

##### 2.3.6.5.2 Pulling Sites for Wire Setups, Splicing, and Structure Pads

There would be a number of sites along the ROW or immediately adjacent to the ROW that would be used for wire setups, referred to as "pull sites." The pull sites would be used during wire stringing and pulling activities for conductor wires and fiber optic cable, as well as wire splicing. The workspace is needed for a tensioner, puller, spools of wire, snub poles, and a crew.

In general, the pull sites would be in the ROW or in-line and behind large-angle, dead-end structures. However, a certain number of pull sites may be required off-ROW. Typical pulling sites are expected to require approximately 60,000 square feet or an area that is 150 feet by 400 feet. This area could be on either side of a structure.

Some grading and leveling may be required within individual pull sites in order to provide a level surface for equipment. Most of the area in each pull site is for allowance of wires to have adequate space to travel above the ground from the equipment to the structures. Preliminary estimates indicate that 20 pull sites would be required for the line segment running from Nucla to Cahone and 17 pull sites from the Montrose to Nucla segment of line. It is possible that a total of 25 pull sites may be required outside the 150-foot transmission ROW. Pulling sites would be reclaimed and re-seeded post-construction. Pull sites would be identified as part of final engineering, and locations would be presented in the Final POD.

More location information regarding pull sites, splicing locations, and structure pads would be available in the Final POD after engineering and final design are complete.

#### *2.3.6.6 Access Roads for Proposed Project Construction and Long-Term Maintenance*

Proposed project construction would require the use of numerous access routes to transport personnel, equipment, and materials to the transmission line ROW, structure sites, and work areas. The locations of access roads are shown in the Draft POD (Appendix A-Access Road Siting and Management Plan, Appendix R-Traffic and Transportation Management Plan, Appendix V-Right of Way Legal Descriptions, and Appendix W-Map Atlas). The existing

access network constructed for the 115-kV line would be used along with short spur roads, which would be required if overland or down-line access is not feasible due to terrain or other sensitive resource concerns. Tri-State would minimize construction of new access roads by placing new structures in proximity to existing structure locations (with authorized access) to the extent feasible. Any existing access roads not required for construction or long-term maintenance would be reclaimed.

Construction activities associated with removal of existing structures, installation of new structures, and road work would require a variety of work crews, equipment, and material deliveries during work from 2016 to 2018. Final traffic routes, crew sizes, and vehicle trips per day would be determined by the construction contractor following final design. In 2016, it is anticipated that road improvements and ROW tree clearing for the Nucla to Cahone section of transmission line would require small crews traveling on SH 141, County Road (CR) 190, and NFSR 504 for about 8 weeks. Expansion of the Montrose 345-kV yard would require small crews likely travelling from Ridgeway (SH 62), Montrose (SH 550), and Cortez (SH 491) to the work site for about 12 weeks.

In 2017, work on the Nucla to Cahone section of the transmission line would occur over a 7-month period from April to October using a variety of state, county, NFSR, and BLM roads. Primary travel would occur on SH 141, CR 190, CR 29W, CR 15, CR 16, CR M, CR J, and NFSR 504. A large staging area on private land off CR 190, which connects to SH 141, would have a concentration of increased traffic as workers travel to the site and as material is transported in and out of the staging area. The largest volume of material traffic would occur over about a three month period from the transport of poles and other material from the staging area to locations along the transmission lines. Approximately 50 to 60 workers would also be traveling to various work sites using pick-up trucks and smaller vehicles. These workers are likely to travel daily from Ridgeway (SH 62), Montrose (SH 550), Cortez (SH 491), and Norwood (SH 145). Work on the Nucla 230-kV substation would be accessed via SH 145 and SH 141 for about five months by a workforce of about 20 people. Construction of Phase II of the Montrose 345-kV substation would use SH 550 and SH 90 for access for about two months. Expansion of the Cahone substation would take about five months with work crews accessing the site primarily on SH 491, CR R, CR 15, CR 18, and CR 8.

In 2018, pole removal, construction, and revegetation for the Montrose to Nucla section of the transmission line would primarily use SH 90 and NFSR 540 for about 6 to 7 months. Smaller crews, of about 30 workers, may be possible for this segment of transmission line construction. Construction of the new Montrose substation would require access from SH 50 and 90 over about 6 months by a small crew of workers.

#### *2.3.6.7 Access Road Improvements*

Improvement levels for all access routes were evaluated, classified for levels of improvement, and designated as administrative access in the 2006 POD for the 115-kV line (Tri-State 2006). At that time, about 60 percent of the road system was considered to require little or no improvement. About 6 percent of the access roads needed brush removal, 22 percent needed minor grading, and about 13 percent of the roads needed moderate to extensive grading to restore grades and drainage crossings. Recent field reviews of the existing road system indicate that grading and brush and tree removal is needed on a larger percentage of the ROW. Other improvements needed are generally characterized in the 2006 EA (BLM 2007b) and 2006 POD

(Tri-State 2006). For purposes of this analysis, Tri-State has assumed that approximately 6 miles of new access roads/spur roads may be needed outside of that authorized in the 2006 EA and detailed in the 2006 POD to facilitate new construction. Actual locations needing improvement, beyond that approved in the 2006 EA and described in the 2006 POD are pending final engineering/structure design.

Road ROW widths would generally remain the same as detailed in the 2006 POD; specifically, 30 feet (15 feet either side of centerline). However, additional road improvements outside of the existing permitted access ROWs would likely be required in certain locations along the alignment due to uneven or steep terrain. Access road conditions in some locations have likely deteriorated and improvements would be required to create a road that would safely enable construction and maintenance equipment to pass. In addition, construction requires the use of equipment such as pole trucks, which require larger turning radii. Temporary disturbance outside of the driving surface would be reclaimed and revegetated post-construction. Un-retained cuts and fills would be limited to 30 feet. Ten-foot maximum retaining walls would be constructed between the maximum cuts and fills. More information regarding roads outside the 30-foot access ROW will be available in the Final POD after engineering and final design are complete.

#### 2.3.6.7.1 Dust Management

During construction, dust control measures would be implemented to avoid or minimize air quality issues related to fugitive dust from construction traffic on dirt roads (see Table 8). All water for fugitive dust control would be purchased from holders of existing, currently valid water rights such as municipalities, agricultural water users, or businesses with an ability to provide water for dust suppression purposes.

#### 2.3.6.7.2 Public Access

Construction activities would require some new access through existing fences. Permanent gates would be installed within the ROW limits or along designated access roads to provide for access during construction as well as for the long-term maintenance of the transmission line. To prevent the passage of livestock, all gates would be kept closed except to briefly allow the passage of equipment during construction. All gates would remain closed, unless the landowner or land management agency has given specified instructions to leave a gate open.

Tri-State would work with the BLM and USFS to close off access roads to the public that may result in travel management concerns. Currently, Tri-State and USFS maintain locked gates to restrict access south of the Big Water Springs Road and on both sides of Forest Road 509 east of Dolores Canyon in SJNF.

Any gates or traffic control posts (bollards) installed by Tri-State on behalf of the BLM and USFS would be in compliance with existing BLM and USFS travel management plans and would accommodate all agency requirements. All ROWs could be accessed by BLM or USFS personnel at any time especially in the event of emergencies, such as fires. Tri-State would provide funding for the BLM and USFS to install instructional signage in key areas along access roads, to clarify which roads are being used for administrative purposes only, or Tri-State may install signs with BLM and USFS approval. The Final POD would provide additional details on the proposed project components related to public access.

#### 2.3.6.7.3 Surface Water Crossings

Access roads may require surface water crossing of ephemeral, intermittent, or perennial drainages, arroyos, and wetlands. Those areas requiring improvement to facilitate road construction such as a culvert, armored rock crossing, or pulled back banks would fall under this category and would be identified as such on the associated construction drawings in the Final POD. Also see Table 8 EPMs WQ-1 through WQ-21.

### *2.3.6.8 Vegetation Management*

The primary cause of electrical outages is trees located within or adjacent to the ROW that grow or fall into overhead electric power lines. Vegetation management is crucial to access electrical facilities and reduce wildfire effects to and from power lines and is a key component of operations for the proposed project. While some of these outages cannot be prevented (due to storms, heavy winds, etc.), many can be mitigated by managing the vegetation below the line before it becomes a problem. Arcing can occur if the physical separation between trees and power lines is not properly maintained. Arcing distances vary depending on voltage and ambient conditions, but any branch in close proximity to a conductor can spark a fire. Utilities and regulators generally agree that keeping overhead conductors clear of trees and vegetation is critical to both electric service reliability and fire prevention. Preventing outages and fires related to tree and power line conflicts are in the interest of public safety and are mandated by federal law (also see Section 1.7, and Appendix O-Health, Safety, and Noise Plan of the Draft POD).

#### 2.3.6.8.1 Vegetation Management During Construction

In order to minimize effects, where grading is not required, low-lying vegetation would be trampled instead of removed along access routes where it does not pose a safety or fire hazard. If there is the potential for vehicle catalytic converters to ignite tall brush or if vegetation impedes work, the vegetation would be bladed or cut at ground level. Construction vehicles would be equipped with government approved spark arresters and used where feasible. Larger woody vegetation within approximately a 75-foot radius around each transmission structure would be removed to improve structure survivability in the case of wildfire, reduce risk of vehicle induced fires on the ROW during construction and maintenance activities, and to ensure maintenance and construction vehicles can safely set up next to the structure. A vegetative cover crop (low-lying vegetation) would be left in place, to the extent feasible, for erosion control.

Trees and vegetation that could pose a hazard to the safe construction and/or long-term operation of the power line would be trimmed or removed as necessary to meet the NERC guidelines for vegetation management; see Draft POD for vegetation management practices that would be used for the long-term maintenance of the transmission line (Appendix T-Operations, Maintenance, and Vegetation Management).

Trees and vegetation removed during clearing activities would be hauled offsite to an approved disposal facility or disposed of onsite as directed by the BLM and USFS. Where appropriate, cleared trees and/or vegetation may be spread onsite to promote wildlife habitat or chipped/masticated in place and used as mulch for erosion control with approval from the environmental monitor and the landowner or land management agency. On forested land, Tri-State would consult with the BLM and USFS regarding design criteria for the treatment and removal of woody vegetation.

Grading would be required for some access roads, structure sites, staging yards, and work areas. Grading would be limited to the minimum necessary to provide a safe work area for crews and equipment. Special care would be taken to avoid damage to trees, shrubs, and vegetation adjacent to designated work areas.

Prior to ground-disturbing activities, temporary erosion and sediment control measures, including water bars and sediment barriers (i.e., silt fences, straw wattles, and/or straw bales), would be installed as needed to minimize erosion and prevent sediment from leaving work areas. The location of erosion and sediment control measures would be determined as part of the Stormwater Management Plan (SWMP) as required by CDPHE and would be discussed in Appendix Q-Storm Water Management Plan of the Final POD.

Where possible, topsoil would be salvaged from temporary work areas where grading is required, including pull/stringing sites and spur roads. Topsoil would be salvaged to the actual depth (first color change) to a maximum of 12 inches and protected for use during restoration. Topsoil would not be salvaged from foundation holes or where permanent effects have been designed (i.e., existing access roads, guy wires, or substation expansions). Tri-State would salvage adequate topsoil from the new Nucla 230-kV substation to reclaim disturbed areas outside the fenced footprint of the substation after construction is complete.

#### 2.3.6.8.2 Vegetation Management During Operation

Regular management of vegetation along access roads and under the transmission line would be needed. Access roads will remain clear of tall/woody vegetation to allow maintenance of the transmission line (Appendix T-Operations, Maintenance, and Vegetation Management).

### *2.3.6.9 Substations*

The existing transmission system is supported by three substations; Montrose, Nucla, and Cahone. Substation modifications at the Montrose and Cahone substations would require about 10 acres of expansion at existing facilities owned by Tri-State. The location of the new Nucla 230-kV substation would be south of the SH 145 and SH 141 intersection and would be called the “Maverick” substation (see Figure 22 below). The new substation cannot be located at the existing Nucla substation because space is limited at this facility and the new substation requires approximately 20 acres. A new substation is proposed on private land. Construction activities for substation modification and construction include:

- Conducting survey work, geotechnical drillings, and soil resistivity measurements;
- Assessing area to ensure drainage patterns are maintained and the area is prepared to manage stormwater in accordance with the project SWMP (Draft POD Appendix Q-Storm Water Management Plan);
- Site clearing and grading;
- Constructing access roads;
- Building staging and storage yards;
- Placing and compacting structural fill to serve as a sub-base under the foundations for equipment;
- Installing subsurface grounding rods;
- Installing subsurface control conduits;
- Erecting chain link fencing;

- Building the facility and power equipment assembly including foundations, structure erection, switches, bus work, circuit breakers, oil spill containment facilities, etc.; and
- Conducting site cleanup, stabilization, and revegetation, as necessary.

The point of system interconnection for the improved 230-kV transmission line would be located at the existing Montrose 345-kV substation in order to transform the voltage from 345-kV to 230-kV. The Montrose 345-kV substation would be expanded to allow for the installation of the 345/230-kV transformer and other related equipment. In addition to the expansion of the existing 345-kV facility, a new 230-kV facility would be constructed at Montrose and the Montrose-Nucla transmission line segment would terminate within the new 230-kV facility.

Once the substations are energized and in operation, substation monitoring and control functions would be performed remotely by Tri-State from its operation center. Proposed project substations would not be staffed; however, a remotely monitored security system would be installed. More information about the substation would be included in the Final POD.

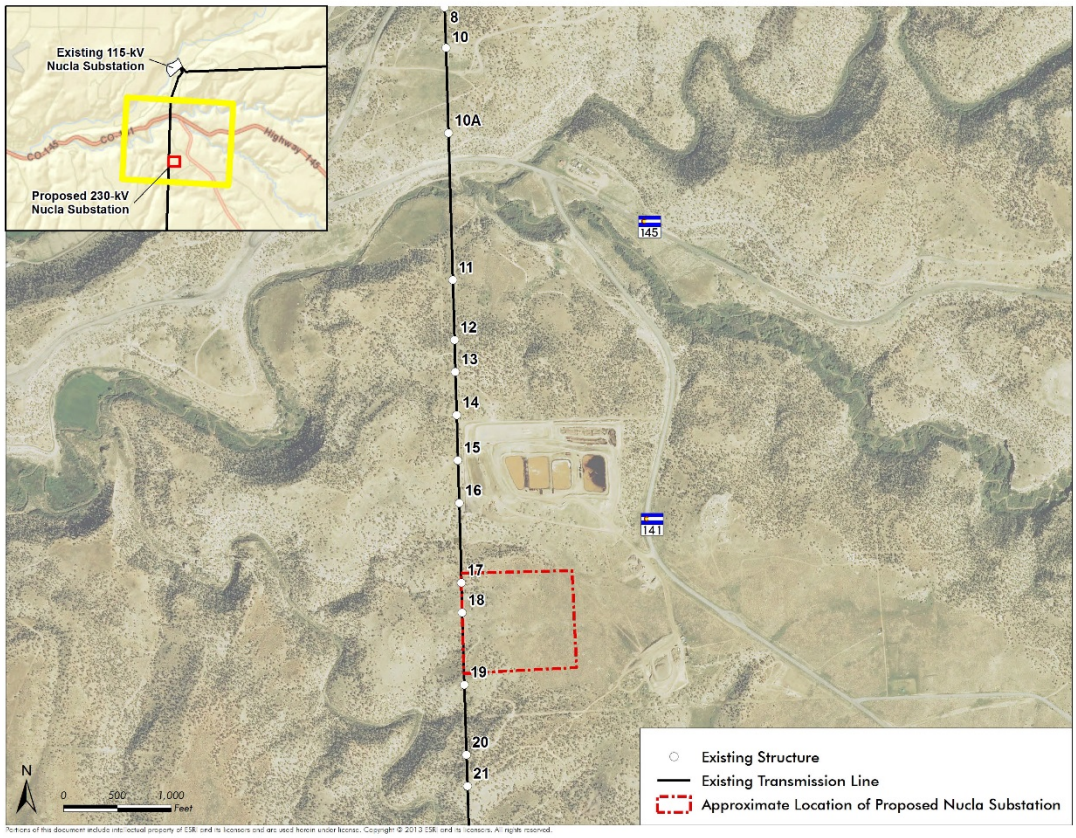


**Figure 22. Proposed Maverick 230-kV Substation Location**

*2.3.6.10 Preconstruction Activity*

Preconstruction activities would occur prior to construction crews mobilizing to the ROW and substation locations. Preconstruction activities entail obtaining necessary permits, notifying resource agencies, and conducting preconstruction surveys. Conducting environmental training for proposed project personnel and identifying work areas described below would also occur

during the preconstruction phase of the proposed project. Pre-construction environmental surveys would occur (see Table 8, EPMs BR-2, BR-3, BR-5, BR-11, CR-5, CR-7, NW-1, and VG-4).

#### 2.3.6.10.1 Environmental Training

All construction personnel working the proposed project would be required to attend an environmental briefing to review the environmental requirements approved by the agencies. Participants of the training program would be required to sign a form that acknowledges their commitment to complying with the EPMs and mitigation measures stipulated in the compliance monitoring plan (with cultural, biological, and other environmental monitors as needed) (see Draft POD Appendix G-Environmental Monitoring and Compliance Plan; Table 8, EPMs G-2, G-3, BR-2, BR-3, GuSG-9, CR-4, and CR-7).

Sensitive resources identified during environmental surveys that are within or immediately adjacent to work areas would be marked in the field as determined by the environmental monitor. Resource areas requiring avoidance would be clearly marked as an exclusion zone and flagged or fenced so that crews do not inadvertently enter the area (see Table 8).

#### 2.3.6.10.2 Traffic Control and Planning

Tri-State or its construction contractor would be responsible for obtaining permits from CDOT and county road departments for use of highways and county roads as well as the USFS for use of NFS roads and BLM for use of BLM roads. These permits include measures to minimize effects of construction traffic on the public. Traffic plans would likely include the use of signs and flagman to control traffic. Tri-State likely would use guard structures across major roadways when stringing conductor and fiber optic cable; traffic and transportation management would be detailed in (see Appendix R-Traffic and Transportation Management Plan of the Final POD).

#### 2.3.6.10.3 Project Staking

Prior to the start of construction, the locations of proposed project facilities, including pole sites, access roads, staging yards, pulling/stringing sites, and the centerline would be defined. This may occur along the entire route, or for a discrete section of the line depending on the construction schedule. In either case, staking would be completed prior to construction crews beginning work on any given section of the ROW. The use of signs, flagging, or survey staking would be based on the engineering specifications and the final design. Some activities may occur on the ROW prior to surveying and staking, such as biological, cultural, and geotechnical work, but these activities would result in negligible or no ground disturbance. Project staking would be an ongoing activity and would occur as needed throughout the duration of construction. More information regarding project staking would be available in the Final POD after engineering and final design are complete.

### *2.3.6.11 Transmission Line Construction*

The MNC transmission line would be constructed in phases in order to maintain electrical service. Outages must be planned in advance in cooperation with other electric utility companies to allow for the system to be supported by other portions of the grid while this line is being improved. Tri-State is proposing to begin construction at the Montrose substation to coincide with outages associated with scheduled maintenance at one of the Craig generating station units.

The new 230-kV substation must be operational before the line is completed, and the existing fiber optic cable must remain in service at all times. These constraints, along with the seasonal constraints of constructing at high elevations and in rugged terrain, present unique challenges to constructing this proposed project.

Tri-State would use a variety of construction techniques and strategies to complete the proposed project. The schedule for construction is described in Section 2.3.6.12. Using the existing road system, much of the transmission system can be built using traditional construction techniques. However, given rugged terrain, seasonal timing constraints, and a short (7-month) outage timeframe, some portions of the line likely would be constructed using helicopters. The location and extent of helicopter use would be determined by the contractor once final engineering design is complete and would be detailed in the Final POD.

#### 2.3.6.11.1 Removal of 115-kV Poles and Conductor

Wood structures and wires on the 115-kV line would be dismantled and removed either prior to or post -construction of the new 230-kV transmission line. Since the existing fiber optic cable must remain operational throughout construction, Tri-State may leave the structure in the ground until the new line is constructed and the fiber optic cable is transferred; Tri-State may remove only a portion of the structure so one pole could remain to support the fiber optic cable; or the fiber optic cable may be moved to other temporary poles until construction is complete. A new fiber optic cable would be installed on the 230-kV structures. When the new fiber optic cable is operational the old fiber optic cable and the supporting pole would be removed.

Conductor would be removed while under tension to avoid contact with the ground. Poles designated for removal would be pulled completely out of the ground in most instances. The poles would be winched out of the holes, and the hole would then be filled. In sensitive areas, poles could be cut off at ground level. Additional details would be provided in the Final POD.

#### 2.3.6.11.2 Foundation Drilling

Each wood pole structure requires a foundation hole approximately 2.5 feet in diameter by 7.5 to 13 feet deep depending on the pole height and subsurface conditions. Foundation holes would be augured with a truck-mounted or track-mounted auger. Foundation holes may also be augured by hand in areas inaccessible to vehicles and heavy equipment. If possible, spoil generated from auguring the holes would be used to tamp the pole in place. Usually excess soil can be mounded around the pole and spread around the pad site to match the original contours. Sometimes excess soil may need to be hauled off site. In areas with soils that cannot be compacted or are too rocky, road base material or concrete would be used to backfill and compact around the pole. Special care would be taken to ensure that spoil is not inadvertently placed on salvaged topsoil or on topsoil that was not segregated during grading activities.

#### 2.3.6.11.3 Embedded Wood Poles

Structure assembly would be completed within the approved workspace at each pole site. Assembly includes affixing cross arms to the poles, installing insulator hardware, and installing pulleys (stringing blocks) to assist during wire stringing operations. All transmission poles would be treated prior to delivery on-site with copper napthanate, pentachlorophenol, or creosote to inhibit deterioration. Once the structures have been assembled, they would be inserted into the holes using a crane, boom truck, or helicopter.

#### 2.3.6.11.4 Steel Poles

Steel structures would be used in the Dry Creek Basin and at the Dolores River crossing. Steel structures require concrete foundations to support the steel design. After the foundation hole has been drilled, a rebar cage would be constructed at the pole site and inserted into the foundation hole. An anchor bolt plate would be inserted and aligned and then concrete would be poured into the hole to form the foundation. After a period of curing and testing, the steel poles would be placed onto the anchor bolts with a crane or helicopter and secured to the anchor bolts with nuts.

In order to prevent concrete from hardening inside of the concrete trucks, concrete washout sites may be required prior to concrete truck drivers leaving the work area. Where concrete washout is necessary, it would only occur in approved work areas (e.g. staging areas) or at a designated concrete washout station. Additional detail on washouts, locations, and disposal would be included in the Final POD.

#### 2.3.6.11.5 Wire Stringing and Conductor Splicing

Wire stringing for both electrical conductor and fiber optic cable typically does not begin until several miles of structures have been installed. The first activity is to install string blocks or sleeves to the insulators or shield wire support(s). The string blocks can either be installed while the structure is on the ground, or after the structure has been erected by climbing the structure manually or using a bucket truck.

A compression splice would need to be installed somewhere along the centerline of the pull with hydraulic tools. The exact location of the splice would be determined during stringing.

To prevent damage to the conductor and to facilitate wire stringing, a sock line made of rope would be placed in each stringing block located on each structure from a bucket truck. Where access is not possible by vehicles or equipment, helicopters can be used to fly the sock line, or crews would install the rope by hand. Additional information regarding conductor and fiber optic cable stringing and splicing would be included in the Final POD. To protect against accidental contact of the public with wires during stringing operations, temporary guard structures will be installed as detailed in the Final POD.

The fiber optic cable located on the existing 115-kV pole would be removed after the new fiber optic cable was installed, tested, and operational on the proposed new 230-kV project. The single poles remaining after the fiber optic cable was removed would be winched out of the holes, and the poles removed and disposed of in approved landfills. In sensitive areas, poles could be cut off at ground level.

#### 2.3.6.11.6 Aerial Markers

To ensure air traffic safety, Tri-State would mark the top wires for spans that exceed 200 feet above ground (for example, at the Dolores River Canyon crossing) using 36-inch diameter marker balls (see Section 2.2.1.2.1 and Figure 7).

In addition, any areas identified as having a moderate to high collision risk for avian species would be marked with some form of flight diverter. The collision risk assessment would occur once final engineering is complete. Additional information on aerial markers would be provided in the Final POD.

#### *2.3.6.12 Construction Workforce and Schedule*

Construction must be staged to allow for outages to be taken sequentially to maintain electrical service in the region. Table 6 lists a tentative schedule of activity.

**Table 6. Preliminary Montrose-Nucla-Cahone Transmission Line Improvement Schedule**

| Construction Task | Schedule/duration |
|---|---|
| ROW clearing and expansion of the existing Montrose 345-kV substation | Summer and Fall 2016 |
| Energize Montrose substation expansion | Spring 2017 |
| Construction of new 230-kV Maverick substation (Nucla) | Summer and Fall 2017 |
| Construction of Nucla-Cahone transmission line | Spring to Fall 2017 |
| Construction of Cahone substation expansion | Summer and Fall 2017 |
| Completion of Montrose 230-kV substation | Summer and Fall 2018 |
| Construction of Nucla-Montrose transmission tine | Spring to Fall 2018 |

##### 2.3.6.12.1 Construction Personnel

Proposed project personnel will encompass a wide breadth of Tri-State staff and contractors. Transmission and substation construction require a specialized workforce that will likely come from outside of the region. Other support contractors, such as environmental consultants, surveyors, and inspectors, may come from the local workforce. Table 7 summarizes the construction workforce and equipment anticipated for the 115-kV transmission line and substation facilities. The construction workforce will include, but is not limited to:

- General Contractor specializing in transmission line construction;
- General Contractor specializing in the installation of power cables;
- Clearing and grading subcontractors;
- Environmental compliance inspectors;
- Biological and cultural resource specialists;
- Construction inspectors and management team;
- Survey staking contractor;
- Concrete contractor for steel pole foundations and conduit duct bank;
- Trucking and shipping contractors; and
- Helicopter and helicopter support crew.

Many individuals may be trained and qualified to complete multiple tasks; therefore, the crew sizes and totals in Table 7 overestimate the actual number of people that would be needed.

**Table 7. Anticipated Construction Workforce and Equipment**

| Crew Total | Total Time |
|---|---|
| **230-kV Overhead Line Construction 2017 and 2018** | |
| Maximum each year<br>40 to 60 people | Maximum each year<br>7 months |
| **Substation Construction** | |
| **Montrose 345-kV Substation – Phase I (yard expansion) – 2016** | |
| 21 to 26 people | 14 to 18 weeks |
| **Montrose 345-kV Substation – Phase II (energizing) – 2017** | |
| 12 to 16 people | 5 to 6 weeks |
| **Montrose 230-kV Substation – 2018** | |
| 31 to 40 people | 20 to 24 weeks |
| **New Nucla 230-kV Substation – 2017** | |
| 41 to 50 people | 20 to 24 weeks |
| **New Cahone 230-kV Substation – 2017** | |
| 27 to 36 people | 14 to 21 weeks |

#### *2.3.6.13 Stormwater Management*

##### 2.3.6.13.1 Temporary Controls/EPMs

While most poles would be installed without substantial ground disturbance, temporary erosion and sediment control may be required where exposed soils are susceptible to erosion. Areas susceptible to erosion may include, but are not limited to, access and spur roads, staging areas, marshalling yards, pole sites where grading is required, pad sites, and work areas adjacent to sensitive resource areas. EPMs in Table 8 for Water Resources and Quality would be implemented to further reduce effects to surface waters and water quality and would reduce erosion related effects (also see the Draft POD Appendix F-Water Resources Protection Measures and Appendix Q- Storm Water Management Plan).

##### 2.3.6.13.2 Permanent Controls

Slope breakers (also known as water bars and rolling dips) are intended to shorten the effective slope length, reduce runoff velocity, and divert water off of work areas and/or access roads. The number, location, and design of slope breakers or rolling dips would be approved by the affected agency and documented in the stormwater management plan submitted to the CDPHE.

Disturbed ground not needed for permanent use would be seeded and mulched as specified in the SWMP and by landowner/land management agencies. Stabilization would be considered permanent when disturbed sites reach 70 percent of pre-existing vegetative cover. Also see Table 8 and the Draft POD, Appendix P-Reclamation Plan.

#### *2.3.6.14 Post Construction*

Final clean-up and restoration activities would begin once pole structures, conductors, and the fiber optic cable have been installed and no further construction-related work is anticipated. All areas disturbed by construction that would not be used or maintained during the operation phase

of the proposed project would be returned to 70 percent preconstruction conditions and seeded as required in the Reclamation Plan (see Draft POD, Appendix P-Reclamation Plan) or as specified by landowners and land management agencies.

#### 2.3.6.14.1 Clean-up

Upon completion of construction in a given section of the line, Tri-State would remove all construction debris and materials, including the 115-kV structures, unused conductor and guy wire, excess conduit and cable, and survey lath from the ROW and dispose of it at a licensed waste or recycling facility. Brush piles generated during clearing operations would also be removed from the ROW and disposed of at a licensed facility, unless previously approved by the landowner or land management agency. Brush or masticated material could also be used for erosion control at the affected agencies discretion. In addition, Tri-State would repair and restore driveways, roads, trails, gates, landscaping, or other features damaged during construction of the proposed project. Additional information on clean-up after construction is in Table 8 and the Draft POD (Appendix P).

#### 2.3.6.14.2 Restoration and Revegetation

Interim reclamation activities would be completed to stabilize the ROW and associated access while allowing long-term maintenance of the transmission line. More details on reclamation activities are in Table 8, and in Appendix P-Reclamation Plan of the Draft POD.

#### 2.3.6.14.3 Noxious Weeds

Monitoring for noxious and invasive species is currently conducted on the existing 115-kV line by agency staff under a management agreement covering all Tri State transmission lines on SJNF- and GMUG NF-managed lands. Appropriate mitigation and treatment are completed by USFS Rangeland Management Program staff on an annual basis. Records of all monitoring and treatment activities are maintained by USFS staff. Tri-State may collaborate with BLM and county weed programs or contract with a certified applicator to control weeds on BLM-administered and private lands.

More information is in the Noxious Weed Management Plan (Appendix S-Noxious Weed Management Plan of Draft POD).

### *2.3.6.15 Emergency Repairs*

Tri-State has procedures in place to address the potential for accidents and emergency repair and response during the operation phase of the proposed project. Protection equipment within the substations would monitor the operating condition of the electrical system and would rapidly de-energize the line or substation equipment if a fault or other problem is detected. The nature of the problem would be relayed to Tri-State's Control Center via the utility's communication system (fiber optic cable). The system operator would diagnose the problem and restore service using remote operation of switches and circuit breakers if possible. Montrose and Durango maintenance personnel would be dispatched to the site if necessary.

Emergency outages may be caused by lightning strikes, high winds, heavy snow and ice, vandalism, or equipment failure. The type of emergency, location, weather, or season would define the equipment required to restore service. If the new line was significantly damaged, the repairs could take from one day to several days, depending on location and weather conditions.

The duration of the interruption would depend on the source of the fault and would vary from a couple of seconds to up to a few days.

#### *2.3.6.16 Environmental Protection Measures*

EPMs committed to by Tri-State for the construction and operation of the proposed 230-kV transmission line are included below in Table 8. This table would be updated in the Final POD (Table 4 of the POD) to include more specific EPMs once engineering and design is complete.

**Table 8. Tri-State EPMs for Construction Projects**

| Topic - No. | Applicant Committed Environmental Protection Measures and Design Features for Construction, Operation, and Maintenance |
|---|---|
| *General* | |
| G-1 | Tri-State and its contractors will comply with all federal, state and local environmental laws, orders and regulations. Prior to construction, all construction personnel will be instructed on the protection of cultural and ecological resources. |
| G-2 | Prior to and throughout construction, Tri-State shall discuss with the Contractor areas of environmental sensitivity within the project area, and, in particular, those areas where a monitor must be present during construction. |
| G-3 | Tri-State will contract an agency approved and qualified transmission construction environmental monitor who will be present at all times when working on federal and state lands as well as on private lands when work would occur in proximity to sensitive biological or cultural resources. The environmental monitor would be responsible for keeping Tri-State and its contractors in compliance with the Final POD and associated permits/easements. The environmental monitor would report any compliance concerns to the agencies authorized representative and Tri-State's chief environmental compliance officer concurrently within 24 hours or less of all reportable violations. The environmental monitor will be given full authority to halt construction if an activity would result in non-compliance with any terms of grants, permits, easements and associated committed environmental protection and mitigation measures approved for the project. |
| G-4 | Tri-State and its contractors will adhere to the Final POD which includes keeping all construction and future maintenance activities within the permitted transmission and access road ROWs. Any deviation from the Final POD would require submittal and approval of a variance request to the BLM/FS.<br>The Final POD would include environmental protection measures (EPMs) applicable to future routine and emergency maintenance activities including vegetation management. All construction plans will be approved by the agencies before the Notice to Proceed (NTP) is issued by BLM. |
| G-5 | The project will be planned, constructed, and operated in accordance with the Finding of No Significant Impact (FONSI), ROW grant (BLM), special use authorization (FS), and requirements of other federal, state and local permitting agencies. |
| G-6 | Tri-State will notify the BLM, USFS, and appropriate landowners regarding the schedule and scope of work for construction of the transmission line as well as for future major maintenance activities. A pre-construction meeting will be held with Tri-State, its contractors, environmental monitors, and agency representatives to review environmental and land use compliance for the project. |
| *Access Routes (also see Traffic section, T-1 and T-2)* | |
| AR-1 | No construction activities will be performed during periods when the soil is too wet to adequately support equipment and vehicles. If equipment or vehicles create ruts in excess of 4 to 6 inches deep for a distance of 10 feet on native surface roads, the soil shall be deemed too wet to adequately support construction equipment. If equipment or vehicles create ruts in excess of 1 inch deep on graveled roads, the roads shall be deemed too wet to support construction equipment. |

| Topic - No. | Applicant Committed Environmental Protection Measures and Design Features for Construction, Operation, and Maintenance |
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| AR-2 | Only the minimum amount of soils and vegetation necessary for the construction and maintenance of the access routes and the safe and reliable operation of transmission line will be disturbed. If excavation is necessary, topsoil (if present) will be conserved and reused as cover on disturbed areas to facilitate re-growth of vegetation. Vegetation will be cleared from those areas necessary to obtain adequate working width and turning radius space for maintenance equipment and allow for the safe operation of the transmission line. |
| AR-3 | Tri-State's construction contractor and maintenance crews will be required to remain within authorized access ROWs. Access outside of permitted access ROWs will need to be approved by the affected land management agency/owner prior to use. Future maintenance work will also occur entirely within the transmission and access ROWs unless otherwise authorized by the affected agency/landowner. |
| AR-4 | Tri-State and its contractor(s) will work with the BLM and USFS regarding travel restrictions as well as the need, location and type of closure devices that will be utilized and installed to protect key areas along access roads and to clarify which roads are being used for administrative purposes only. Tri-State will provide funding for closure devices and informational signage. All rights-of-way will be maintained to allow BLM and USFS personnel access at any time, especially in the event of emergencies (e.g. fires). |
| AR-5 | Tri-State will design access roads to BLM/FS road standards through coordination with the authorized agencies road engineer and obtain design approval from the relevant agency road engineer prior to construction. In areas where more than 3 feet of grading is required (Tri-State improvement Level 3b). Tri-State will coordinate with the BLM and Forest Service engineers prior to the initial work on the ground to strategize on how the work can be accomplished with the minimum amount of surface disturbance.<br>Tri-State will use the USFS/USID's (United States Agency for International Development) Low-Volume Road Engineering: Best Management Practices Field Guide and the BLM Gold Book to minimize soil losses, erosion and unstable slope conditions. These measures include: maintenance of soil erosion features such as dips and cross drains, repair of ditches, clearing of culverts and avoiding maintenance during wet periods. |
| AR-6 | Tri-State will work with the USFS to maintain locked gates to restrict access south of the Big Water Springs Road and on both sides of Forest Road 509 in the San Juan National Forest (east of Dolores Canyon). |
| AR-7 | Emergency Maintenance Access:<br>Emergency access will be allowed during any time of the year. In the event of an emergency, Tri-State and its contractor(s) will notify the BLM and/or USFS/landowner as soon as possible. Tri-State will meet with BLM and/or USFS/landowner onsite after an emergency to determine the required rehabilitation work and to establish a rehabilitation schedule.<br>If emergency access to the transmission line is required during wet weather, or if other maintenance activities result in the removal of vegetation, or substantial vehicle impacts to existing native vegetation, revegetation of disturbed areas will be completed as directed by the BLM/FS or affected landowner. Reclamation and revegetation will be implemented, as required, as soon as practical after any emergency road access or maintenance work needed to repair the transmission line.<br>If emergency line maintenance is required during the winter or spring months, care will be taken to minimize erosion and sedimentation to the extent practicable and effects would be mitigated after the emergency has been resolved in coordination with the affect land management agency or landowner. |

| Topic - No. | Applicant Committed Environmental Protection Measures and Design Features for Construction, Operation, and Maintenance |
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| *Aesthetics/Visual Resources* | |
| A-1 | Tri-State and its contractors shall exercise care to preserve the natural landscape and shall conduct construction operations so as to prevent any unnecessary destruction, scarring or defacing of the natural surroundings in the vicinity of the work. Except where clearing is required for permanent work, approved temporary or permanent construction roads, staging areas or excavation operations, vegetation shall be preserved and shall be protected from damage by the contractor's construction operations and equipment. |
| A-2 | Tri-State and its contractor(s) shall minimize scarring, defacing, damage, or destruction of the natural landscape resulting from construction operations: any unnecessary or unauthorized disturbance shall be repaired by the contractor to the satisfaction of the agency authorized officer. |
| A-3 | All construction and future maintenance materials, waste, and debris shall be removed from the project area in a timely manner. Burning or burying of waste materials on the ROW or construction sites will not be allowed. All materials resulting from the contractor's clearing operations shall be removed from the ROW. |
| A-4 | Structures and access roads will be located and designed to conform to the terrain and to minimize visual effects whenever possible. Specifically, visibility from key observation points (KOP) will be considered at the Dolores River crossing. (See A-6).<br>Leveling and benching of the structure sites will be done to the minimum extent necessary to allow for construction and future maintenance operations. Existing cleared or disturbed areas will be used to the extent practicable for staging areas and other temporary use areas. |
| A-5 | Tri-State and its contractor(s) will attempt to manage vegetation within the ROW in a manner that reduces the visual effect by only removing non-compatible vegetation that could pose a threat to the transmission line in the next 10 years and leaving compatible vegetation in the ROW. The first priority is to allow Tri-State to meet their federal reliability standards for vegetation management within and adjacent to the transmission ROW. |
| A-6 | In order to minimize visual effects from the transmission line from a design perspective, Tri-State has committed to utilizing non-specular conductor, applying acid-etched galvanized finish to all steel structures including steel fence, and using non-reflective insulators for all conductor to structure connections. |
| A-7 | EPM VG-2 through VG-10 would minimize visual effects from project construction and operation by reclaiming areas of temporary disturbance and minimizing vegetation removal to tall woody vegetation required for the safe construction, operation, and maintenance of the transmission line. |
| A-8 | The alignment of any new access roads will follow the designated area's landform contours where practical, provided that such alignment does not additionally affect resource values. This will minimize ground disturbance and reduce scarring (visual contrast). |
| *Air Quality* | |
| AQ-1 | Tri-State and its contractor(s) shall utilize practicable methods and devices as are reasonably available to control, prevent, and otherwise minimize atmospheric emissions or discharges of air contaminants. |
| AQ-2 | Possible construction related dust disturbance shall be controlled by the periodic application of water to all disturbed areas along the ROW and access roads, thus preventing any visible dust plumes from project-related traffic or excavation activities. |
| AQ-3 | Vehicles and equipment showing excessive emission of exhaust gases due to poor engine adjustments or other inefficient operating conditions shall not be operated until corrective adjustments or repairs are made. |
| AQ-4 | Post seeding mulch or other approved methods will be utilized during reclamation activities to help reduce wind erosion and blowing dust. Soil stabilization will be performed as soon as possible after completion of project activities to minimize potential fugitive dust generation as re-vegetation occurs. |

| Topic - No. | Applicant Committed Environmental Protection Measures and Design Features for Construction, Operation, and Maintenance |
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| AQ-5 | The contractor shall turn off equipment when it is not in use. |
| AQ-6 | When wind speeds exceed 20 miles per hour (mph), Tri-State and contractors would minimize new disturbance to the extent possible and/or mobilize additional water trucks to minimize fugitive dust from exposed surfaces. Also see AQ-4. |
| *Biological Resources and Federally Listed Species* | |
| BR-1 | Tri-State and its contractor(s) will also restrict construction activities and future major routine maintenance activities in elk production areas on lands administered by the USFS from May 15 through June 30 unless previously authorized by agency authorized officer. There are also big game closures on BLM administered lands in lands in accordance with the respective Resource Management Plans. These timing restrictions will be adhered to whenever feasible and a waiver would be required from the agency in coordination with Colorado Parks and Wildlife (CPW) if construction needs to occur in sensitive big game habitats during sensitive time periods. |
| BR-2 | Tri-State and its contractor(s) will incorporate BLM, USFS, CPW, and US Fish and Wildlife Service (USFWS) guidelines for raptor protection if construction occurs during the breeding season (Migratory Bird Executive Order 13186, January 10, 2001).<br>Raptor nest surveys will be conducted prior to construction. If an active raptor nest is found within the project area, seasonal buffers and timing restrictions will be determined through coordination with the affected agency and will utilized guidance as outlined in CPW's Recommended Buffer Zones and Seasonal Restrictions for Colorado Raptors (CPW 2008) on private, State, and USFS administered lands. Separate guidance will be followed on lands in the BLM TRFO. Buffers will be determined according to species, existing disturbance in the area, and line of sight. If complete avoidance of a buffer is not feasible, a qualified biological monitor could be used to observe the nest during construction activities to ensure the activity does not disturb nesting activities. The biological monitor will have the authority to halt or modify construction if an activity is likely to result in nest abandonment. |
| BR-3 | No bald or golden eagle nests are known to occur within 0.5 mile of any portion of the project. Surveys will be conducted prior to construction to identify any active nest or roost location within 0.5 miles of the transmission ROW and associated access roads. If an active eagle nest found prior to construction, no work will be permitted within 0.5 mile of the active nest from December 15 through July 15.<br>Historically, bald eagle communal roosting site and winter concentration areas have been documented along the San Miguel and Dolores Rivers, Wrights Mesa, Dry Creek Basin, and Disappointment Valley. Activity will be restricted from November 15 through March 15 if an active communal roost is found within 0.5 miles the proposed project activities during pre-construction surveys unless otherwise authorized by the USFWS.<br>If complete avoidance of a nest or roost buffer is not feasible, the USFWS would be contacted to approve a modified buffer or approve use of a qualified biological monitor to observe the nest during construction activities to ensure the activity does not disturb nesting activities. The biological monitor will have the authority to halt or modify construction if an activity is likely to result in nest abandonment. If USFWS determines take may occur, Tri-State would obtain an eagle take permit from the USFWS prior to construction. The same process would apply to future major maintenance activities. |
| BR-4 | Once pre-construction surveys have been completed, the Final POD would be updated to reflect appropriate seasonal restrictions and buffers to ensure construction activities are in compliance with the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. Seasonal avian restrictions would also apply to heavy maintenance activities as defined in the POD. |

| Topic - No. | Applicant Committed Environmental Protection Measures and Design Features for Construction, Operation, and Maintenance |
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| BR-5 | On State owned lands, USFS, and private property, if a prairie dog colony is found within the project area prior to construction, and construction is scheduled to occur during the breeding season for burrowing owls (April 1 through September 1), surveys will be conducted using CPW's approved protocol.<br>If prairie dog colonies occur on BLM lands, burrowing owl surveys will be conducted using protocol from the TRFO BLM. If an active nesting burrow is found, it will be buffered 0.25 miles feet from March 15 through August 15 or until the young have fledged and left the net. |
| BR-6 | In order to preclude avian electrocutions and minimize collision risk, Tri-State will incorporate guidelines developed by the Avian Power Line Interaction Committee (APLIC) and USFWS (APLIC 2012) to protect birds on power lines. |
| BR-7 | The construction contractor will be required to avoid active burrows whenever feasible within the ROW during project construction to minimize impacts to ground dwelling species. |
| BR-8 | Structure holes will be covered when work is completed each day to prevent entrapment of wildlife. |
| BR-9 | Impacts to wildlife and special status species habitats will be minimized through incorporation of EPMs included under Vegetation and Water Resources. |
| BR-10 | In order to minimize impacts to nesting migratory birds, vegetation removal required for construction and maintenance of the power line will occur to the greatest extent feasible in the fall and winter months. If this is not feasible, Tri-State will conduct nest surveys and flag and avoid any active nests identified. |
| BR-11 | Surveys for sensitive plants will be conducted in suitable habitats prior to construction within previously un-surveyed areas within 100 feet of proposed disturbance. Additionally, sensitive species located in 2014 and 2015 will be re-surveyed to determine plant locations in relationship to proposed project impacts. Tri-State and its contractors will site transmission structures and access roads to avoid BLM/USFS sensitive plant species to the greatest extent feasible. Where sensitive plants are located adjacent to the transmission structures or access roads, fencing/ropes/signs would be installed to prevent construction crews from impacting BLM/USFS sensitive plants. Management of fugitive construction dust as discussed under water resources and quality will also minimize indirect effects to sensitive plant species. |
| BR-12 | Emergency maintenance activities will be permitted any time of year to ensure electric reliability and to protect the public health and safety. Examples of emergency maintenance activities include wires on the ground, structure repairs required as a result of severe weather incidents and vandalism activities. The affected agencies will be notified as soon as possible, but within 48 hours of the activities occurring and any required reclamation will be completed as soon as possible. |
| *Gunnison Sage-Grouse* | |
| GUSG-1 | Tri-State will utilize single-pole structures to reduce perching surfaces for GuSG avian predators through Dry Creek Basin. |
| GUSG-2 | Tri-State and its contractor(s) will install perch discouragers on the remaining horizontal portions of the steel structure including the pole tops in Dry Creek Basin. |
| GUSG-3 | Tri-State will utilize self-supporting steel structures in GuSG occupied habitat to reduce GuSG and other avian and wildlife collisions with guy wires. |
| GUSG-4 | The project will comply with the 0.6-mile No Surface Occupancy Buffer for lek sites and there are no access roads proposed within 0.6-mile of an active lek. In addition the project does not occur within 0.6 miles of riparian habitat or documented GuSG concentration areas. |
| GUSG-5 | Tri-State's transmission line and access road construction along the existing alignment will not occur within occupied habitat from March 15 through June 30th. |

| Topic - No. | Applicant Committed Environmental Protection Measures and Design Features for Construction, Operation, and Maintenance |
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| GUSG-6 | Planned heavy maintenance activities by Tri-State's and its contractor(s) including structure replacement, cross arm replacement, and replacement/re-pair of the conductor/fiber optic cable (OPGW) will not occur March 15 through June 30 in GuSG occupied habitat. Light maintenance activities such as annual inspections, hardware tightening, pole testing, and insulator replacement will be permitted year-round. However, during the lekking season, these activities will occur after 10:00 a.m. |
| GUSG-7 | Emergency maintenance activities will be permitted any time of year to ensure electric reliability and to protect the public health and safety. Examples of emergency maintenance activities include wires on the ground and structure repairs required as a result of severe weather incidents and vandalism activities. The affected agencies will be notified within 48 hours of the activities occurring and any required reclamation will be completed as soon as possible. |
| GUSG-8 | Maintenance and construction crews will be required to drive 35 miles per hour (mph) or less on all roads associated with GuSG occupied habitat in Dry Creek Basin (with the exception of SH 141) to minimize vehicle collisions with GuSG. |
| GUSG-9 | An agency approved environmental monitor will be present at all times during construction in GuSG occupied habitat to ensure compliance with any and all environmental protection and mitigation measures identified in the EA and BA. The environmental monitor is given full authority to stop or modify construction activities that may be affecting GuSG and other sensitive resources. |
| GUSG-10 | Construction and maintenance crews will be required to go through formal environmental training prior to the initiation of construction and maintenance activities in GuSG habitat to ensure compliance with all approved EPMs and mitigation measures for the project. |
| GUSG-11 | Any areas disturbed during project construction and future maintenance activities will be reclaimed using an approved weed-free native seed mix beneficial to GuSG, as provided by the affected land management agency/landowner. |
| GUSG-12 | Tri-State and its contractor(s) will treat noxious weeds infestations associated with construction and maintenance activities within the transmission ROW and administrative only access roads to minimize habitat effects impacts to GuSG. |
| GUSG-13 | Tri-State will monitor the condition of the perch discouragers for the life of the transmission line. Tri-State in coordination with BLM and CPW will monitor the efficacy of the perch discouragers installed in occupied habitat for GuSG for five years on the proposed rebuild and three years with an option to conduct two additional years, if warranted, on the reroute., This would include one year of monitoring to evaluate current perching activity on the existing 115-kV line. Tri-State will maintain and repair the perch discouragers for the life of the transmission line. |
| GUSG-14 | A draft GuSG design minimization and conservation strategy has been prepared by Tri-State for the existing alignment through Dry Creek Basin. This draft minimization strategy can be found in the *Biological Resources Plan, Appendix B.* |
| GUSG-15 | Establish and implement a fire prevention and suppression plan for construction activities. Adhere to seasonal fire restrictions and stipulations which may include:<br>• Educate crews how to enforce and practice appropriate fire prevention and suppression actions and behavior.<br>• Minimize idling during construction and routine maintenance activities.<br>• Park vehicles in designated parking or construction areas. Avoid parking over tall, dry vegetation.<br>• Implement use of spark arrestors. |
| GUSG-16 | Any areas disturbed during project construction and future maintenance activities will be reclaimed using an approved weed-free, native seed mix as provided by the affected land management agency/owner. |

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| GUSG-17 | Tri-State will design access and pad sites for structures locations in a manner that minimizes effects to the greatest extent feasible while also allowing for the safe operation of construction of maintenance and construction equipment. |
| GUSG-18 | Tri-State will treat noxious weeds infestations associated with construction and maintenance activities within the transmission ROW and administrative only access roads. |
| *Cultural Resources* | |
| CR-1 | Prior to construction, all construction personnel will be instructed on the protection of cultural and paleontological resources with reference to relevant laws and penalties, and the need to cease work in the location if cultural resource items are discovered. |
| CR-2 | Should any previously unknown historic/prehistoric sites or artifacts be encountered during construction, all land altering activities at that location will be immediately suspended and the discovery left intact until such time that the appropriate land management agency is notified and appropriate measures taken to assure compliance the National Historic Preservation Act and enabling legislation. |
| CR-3 | Cultural Resources—Inadvertent Discovery: Pursuant to 43 Code of Federal Regulations (CFR) 10.4 (g); Tri-State will notify the authorized officer, by telephone with written confirmation, immediately upon the discovery of human remains, funerary items, sacred objects, or objects of cultural patrimony or possible vertebrate fossils. Further, pursuant to 43 CFR 10.4 (c) and (d), Tri-State will stop activities in the vicinity of the discovery and protect it until notified to proceed by the authorized officer. |
| CR-4 | Sensitive cultural resource locations (historic properties) in proximity to the ROW will be flagged prior to construction and major maintenance activities to ensure avoidance. A qualified and agency approved cultural resource monitor will be on site when construction activities are planned in proximity to cultural resources to ensure historic properties are not disturbed. |
| CR-5 | Cultural resource inventories will be completed for areas that were not previously surveyed and the existing treatment plan will be appended to include newly documented areas of unavoidable disturbance to historic resources. The Memorandum of Agreement (MOA) and agency approved appended treatment plan will be updated and implemented prior to the start of any construction activities. |
| CR-6 | Tri-State and its contractors will comply with the site collection and mitigation plan approved by the BLM, USFS, and the State Historic Preservation Office (SHPO) to ensure unavoidable disturbance of cultural resources are properly mitigated. |
| *Fire Prevention/Control* | |
| FP-1 | Construction vehicles shall be equipped with government approved spark arresters. |
| FP-2 | Tri-State and its contractor(s) shall maintain in all construction vehicles a current list of local emergency response providers and methods of contact/communication. |
| FP-3 | A fire plan would be included in the Final POD and would be adhered to during transmission construction and maintenance activities. |

| Topic - No. | Applicant Committed Environmental Protection Measures and Design Features for Construction, Operation, and Maintenance |
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| FP-4 | The following procedures will be followed by Tri-State and its contractors to reduce fire danger during project construction and future maintenance activities:<br>• The BLM, USFS, and CPW will be kept appraised of Tri-State work locations during times of high fire danger to provide for evacuation purposes and fire alert opportunities.<br>• The nearest federal agency as well as the local fire department will be notified in the event a construction or maintenance crew observes a lightning strike or other suspicious smoke.<br>• Tri-State's contractors and maintenance crews will avoid parking hot vehicles in contact with dry vegetation.<br>• Vegetation will be removed around the structure (roughly a 75-foot radius) to allow bucket truck access which will help minimize effects to the power line in the event of a wildfire.<br>• Vegetation management within and adjacent to the ROW would minimize risk to the transmission line and federal, state, and private lands. |
| *Hazardous Materials* | |
| HM-1 | Tri-State and its contractors shall comply with all applicable federal laws and regulations existing or hereafter enacted or promulgated regarding toxic substances or hazardous materials during both construction and future maintenance activities. In any event, Tri-State and its contractors shall comply with the Toxic Substance Control Act of 1976, as amended (15 United States Code 2601, et seq.) with regard to any toxic substances that are used, generated by or stored on the ROW or on facilities authorized under this ROW grant (See 40 CFR, Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation and Liability Act of 1980, section 102b. A copy of any report required or requested by any federal agency or state government as a result of a reportable release or spill of any toxic substance shall be furnished to the authorized officer concurrent with the filing of the reports to the involved federal agency or state government. |
| HM-2 | No bulk fuel storage will occur within the public lands portion of the ROW project. All fuel and fluid spills within this area will be handled in accordance with appropriate state and federal spill reporting and response requirements. Tri-State's contractor shall notify Tri-State of any spills so appropriate notifications can be made to the appropriate regulatory authorities/landowners and managers. |
| HM-3 | The following hazardous materials management procedures will be used during maintenance and operation activities:<br>• Storage of hazardous materials, chemicals, fuels, and oils and fueling of construction equipment will not be performed within 100 feet of an ephemeral drainage.<br>• An effort will be made to store only enough products required to do the job.<br>• Materials will be stored in a neat, orderly manner, in appropriate closed containers, in secondary containment and, if possible, under a roof or other enclosure.<br>• Products will be kept in their original containers with the original manufacturer's label.<br>• Substances will not be mixed with one another unless recommended by the manufacturer.<br>• Whenever possible, all of the product will be used up before disposing of the container.<br>• Manufacturer's recommendations for proper use of a product will be followed.<br>• If surplus product must be disposed of, local and state recommended methods for proper disposal will be followed. |
| HM-4 | Any waste generated as a result of the project will be properly disposed in a permitted facility. Solid waste generated during construction and periodic maintenance periods will be minimal. All hazardous materials will be handled in accordance with applicable local, state, and federal hazardous material statutes and regulations. |

| Topic - No. | Applicant Committed Environmental Protection Measures and Design Features for Construction, Operation, and Maintenance |
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| *Land Use* | |
| LU-1 | All activities associated with the construction, operation and maintenance of the transmission line will take place within the authorized limits of the transmission line ROW and access routes. Additional access routes or cross-country travel will not be allowed outside of the authorized routes prior to review and approval by the affected land management agency authorized officer/landowner. |
| LU-2 | Tri-State will notify private landowners that will be affected during project construction and provide compensation if new easement agreements are required prior to construction. |
| LU-3 | Tri-State will coordinate throughout the planning and construction phases of the project with other ROW grant/Special use permit holders/other lessees within the project area to ensure there are no conflicts or effects to existing land uses. It is Tri-State's and industry standard practice to design and build infrastructure to avoid possible safety and operational concerns from existing land uses (oil and gas, water and gas pipelines, grazing, etc.).<br>Tri-State will work with affected oil and gas and other operators in the project area during project design, construction, and operations on a case-by-case basis. In general Tri-State will:<br>Contact all affected operators in the study area to explain the project and<br>Work with operators to identify areas that may require special design considerations on a case-by-case basis. This could include conducting field visits with operators, identifying pipelines that may require cathodic protection (due to proximity to the transmission line), or specific design considerations if they are located under or near access roads; or identifying areas where subsidence may be a concern. As part of these discussions, best management practices and standard operating procedures will be identified on a case-by-case basis, as well as measures that will be implemented to minimize effects to operators during construction. Tri-State will continue to work with operators throughout construction and operation of the project. |
| LU-4 | The contractor shall maintain all fences, brace panels, gates, and cattle guards during the construction period. Any fence, brace panel, or gate damaged during construction will be repaired immediately by the contractor to appropriate landowner or agency standards as determined by the authorized officer. |
| LU-5 | The contractor shall eliminate, at the earliest opportunity, all construction ruts that are detrimental to agricultural operations and/or hazardous to movement of vehicles and equipment. Such ruts shall be leveled, filled and graded, or otherwise eliminated in an approved manner. Damage to ditches, tile drains, culverts, terraces, local roads, and other similar land use features shall be corrected as necessary by the contractor. The land and facilities shall be restored as nearly as practicable to their original condition. |
| LU-6 | Structure foundation holes will not be left open overnight and will be covered. Covers will be secured in place and will be strong enough to prevent livestock, wildlife, or the public from falling through and into a hole. |
| LU-7 | Tri-State will provide as-built drawings to federal agencies when construction is completed. |
| *Noise* | |
| N-1 | Construction vehicles and equipment shall be maintained in proper operating condition and shall be equipped with manufacturers' standard noise control devices or better (e.g. mufflers, engine enclosures). Improperly functioning equipment will be removed from the construction site until the issue is corrected. |
| N-2 | Devices called 'corona rings' have been specified at the energized end of each insulator in this line to further reduce the effects of corona. |

| Topic - No. | Applicant Committed Environmental Protection Measures and Design Features for Construction, Operation, and Maintenance |
|---|---|
| *Noxious Weeds* | |
| NW-1 | Tri-State will conduct a noxious weed inventory prior to construction to identify potential problem areas and if timing of construction permits, will pre-treat the ROW and associated access roads and other construction related disturbance areas prior to construction to reduce the spread of noxious weeds during construction activities. Noxious weed management will continue through the maintenance and operation phase of the project. Timing of noxious weed inventory is critical to getting a good inventory. Inventory should be based on plant physiology and phenology and will require completing multiple inventories throughout the growing season for different elevations and plant communities. Pre-treatment also requires that plant phenology be taken onto consideration in order to be effective. For some species, pre-treatment needs to occur for multiple years prior to the construction activity. |
| NW-2 | The Final POD would include a reclamation and noxious weed management plan, which will be approved by the appropriate agency prior to the issuance of a ROW grant. The noxious weed management plan will be developed in accordance with appropriate land management agencies' standards, consistent with applicable regulations and agency permitting stipulations for the control of noxious weeds and invasive species (Executive Order 3112). Included in the noxious weed plan will be stipulations regarding reclamation, monitoring and treatment of noxious weed populations in the ROW resulting from transmission line construction and maintenance activities. The Final POD would also be in accordance with USFS direction for invasive species management (including Forest Service Manual 2900 invasive species management; Forest and/or regional invasive species strategy). |
| NW-3 | On-site weed control will be conducted through herbicide use and a weed control plan approved by the BLM, USFS, CPW, and affected landowner (on private lands). Separate treatment plans and agreements would be done with each agency. Tri-State will work with the BLM to develop a Noxious Weed Plan. The BLM requires a Pesticide Use Proposal package, and would approve proposed herbicides, treatments and time of treatment. Applicators are also legally required to supply the BLM with a written herbicide application record within 24 hours of applying herbicides on BLM-managed lands. The pesticide use proposal should be submitted to the agencies by March 1, annually. Application records will be submitted weekly and will include both spatial and tabular element (using forms provided by the agencies). |
| NW-4 | All heavy equipment, including all-terrain vehicles (ATV) and lowboys, utilized during construction will be washed prior to departure from the equipment storage facility. This method promotes containment of weed seeds on the work site; all seed mixes and mulch used for reclamation activities will be certified weed-free. Tri-State will provide a portable/mobile vehicle wash station on-site. Tri-State would require that all vehicles be washed prior to entering the project area; when travelling from an area invested with invasives to an area that has no known invasives; and when travelling from an area infested with spotted knapweed to any other parts of the project area. |
| NW-5 | Pre-construction treatment of weeds in staging or temporary use areas will be conducted. Tri-State and its contractors will avoid or minimize travel through weed-infested areas, or restrict travel to those periods when spread of seed or propagules is least likely until the areas have been treated. Pre-treatment of invasives will be effective only if plant phenology and physiology are taken into consideration. The final staging areas and temporary use areas on federal lands would be reviewed and approved by the agencies prior to construction. |

| Topic - No. | Applicant Committed Environmental Protection Measures and Design Features for Construction, Operation, and Maintenance |
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| NW-6 | Tri-State will hire an independent contractor to evaluate and report annually on List A and B invasive plant species on areas disturbed by construction. Where infestations of weedy species are noted by the contractor, Tri-State will treat noxious weeds using methods approved by the landowner and county weed coordinator on private land and BLM/FS/CPW on public lands. Treatments need to be based on plant phenology. Weed monitoring will be completed once a year for a period of three years on private and state lands or until self-sustaining native vegetation populations are established, whichever occurs first. Weed control and monitoring on federally-managed lands is required for the term of the ROW permit. Results will be recorded and submitted to the appropriate agency.<br>On lands administered by the USFS, Tri-State will continue to participate and voluntarily fund noxious weed management activities on Tri-State ROWs under the existing Collection Agreement between Tri-State and the USFS for the GMUG NF and SJNF (this agreement covers 18 miles of the existing transmission ROW). Additional detail would be provided in the Final POD (*Appendix S, Noxious Weed Management Plan).* |
| *Paleontological Resources* | |
| PA-1 | In consultation with applicable agencies, a paleontological resource monitoring and mitigation plan will be prepared for locations (if any), where construction will disturb geologic units with high Potential Fossil Yield Classification (PFYC) of high (PFYC) 4) or very high (PFYC 5) resource potential. The plan will include specific monitoring locations, monitoring and fossil salvage and data collection procedures, notification procedures in the event of a scientifically significant discovery, and notification procedures in the event of a fossil discovery by construction personnel in areas that are not monitored. |
| *Recreation* | |
| R-1 | Tri-State and its contractor(s) will be responsible for avoiding effects to the Power Line Trail and its associated facilities (signs, off-highway vehicle gates, fencing, cattle guards, etc.). If this trail and or any other trail facilities on BLM and USFS administered lands are impacted during project construction and or maintenance activities, Tri-State will rehabilitate/re-construct the trail and its corridor to USFS specifications and replace damaged trail facilities. Tri-State will also provide signs and coordinate any necessary trail closures with the BLM and/or USFS. Tri-State will add hazard notifiers/deflectors to guy wires where trails are in the vicinity of guyed structures to prevent collisions. |
| R-2 | Tri-State will work with CPW on reducing effects to hunters and providing information/maps to CPW to provide to hunters within the affected game management units about construction schedules and activities. |
| *Soils and Geology* | |
| S-1 | Tri-State and its contractor(s) shall mitigate temporary effects to soils compacted by movement of construction vehicles and equipment, by:<br>Loosened and leveled harrowing or disking to approximate pre-construction contours and<br>Reseeding with certified weed-free grasses and mulched (except in cultivated fields). The specific agency approved seed mix(s) and rate(s) of application will be determined by the affected land management agencies or private landowners. |
| S-2 | Movement of construction vehicles and equipment shall be limited to the ROW and approved access routes. |
| S-3 | Excavated material not used in the backfilling of structures shall be spread around each pole, evenly spread on the access routes in the immediate vicinity of the pole structure or transported off-site to a Tri-State approved disposal location. Disturbed areas shall then be regraded to approximate pre-construction contours and reseeded as specified in S-1 (above). |
| S-4 | If present in sensitive areas (wetlands), topsoil will be removed, stockpiled, and re-spread at temporarily disturbed areas not needed for maintenance access. |

| Topic - No. | Applicant Committed Environmental Protection Measures and Design Features for Construction, Operation, and Maintenance |
|---|---|
| S-5 | As part of pre-construction activities, Tri-State and/or Tri-State contractors will perform detailed geologic evaluation and investigations in certain locations to evaluate potential geological and geotechnical hazards and design the project to avoid and minimize potential geotechnical risks such as slope failure, unstable soils, and landslide risks. In addition, soil will be sampled if potentially contaminated soils were observed during the pre-construction geotechnical investigation. |
| *Traffic* | |
| T-1 | Tri-State and its contractor(s) shall make all necessary provisions for conformance with federal, state, and local traffic safety standards and shall conduct construction operations so as to offer the least possible obstruction and inconvenience to public traffic. |
| T-2 | Prior to construction, Tri-State or its contractors will develop a construction traffic management plan in consultation with affected landowners. This includes working with San Miguel and Montrose counties as well as CDOT to incorporate appropriate measures and obtain approval for construction of the transmission line across county roads and state highways as applicable. It also will include obtaining crossing permits as required by state, county, or local requirements and developing a plan for installation of warning signs where construction activities may cross a recreational trail. |
| *Vegetation* | |
| VG-1 | In designated areas, structures and new access roads (if required) will be placed to avoid and/or minimize sensitive features, such as, but not limited to, threatened or sensitive plants, riparian areas, water courses, and cultural sites. |
| VG-2 | Vegetation shall be preserved and protected from damage during transmission line construction and operation to the maximum extent practicable and within areas approved in the Final POD, with the exception of trees and other woody vegetation that poses a threat to the safe and reliable operation of the transmission line. Wherever possible, on access roads, vegetation will be trampled rather than cleared where vehicles can move safely across the vegetation.<br>By federal mandate, Tri-State is required to manage vegetation that creates a threat to the electrical reliability of the transmission line or substations or will impede access for safe operations. Danger tree/vegetation is defined as that vegetation that could grow, fall, or blow into the power line. Tri-State will also work the authorizing agency to address any fuel loading concerns in the ROW that may pose a threat to the safe and reliable operation of the transmission line. Tri-State will manage ROWs to maintain compatible “low growing” vegetation only. |
| VG-3 | Disturbed areas where vegetation has been temporarily removed by construction activities to the extent that the potential for soil erosion is increased to a detrimental level will be subject to seedbed preparation techniques, reseeded to an approved seed mixture, and mulched if necessary during a recognized planting season. Mulching shall be applied only to those areas where potential erosion will prohibit vegetation establishment and growth. BLM and USFS will provide information on the recognized planting season. |
| VG-4 | Timber removal and slash paid for at current stumpage rates for similar timber in the National Forest unless waived by the District Ranger or authorized representative. Timber below merchantable size will be paid for at current damage appraisal value; and all slash and debris resulting from the cutting or destruction of such timber shall be disposed of as necessary or as the USFS may direct. All commercial timber must be marked, cruised and paid for by Tri-State prior to cutting.<br>Timber removal and slash management will be coordinated and approved by the USFS/BLM per agency specifications outlined in the Plan of Development prior to construction and future maintenance activities. Tri-State will designate/flag the 150 ROW prior to construction. Tri-State will mark danger trees adjacent to the ROW and incompatible vegetation within the ROW required for removal. Trees to be removed will be painted with USFS tracer marking paint. Tri-State will hire a forestry contractor approved by the USFS to cruise the existing merchantable timber. Existing merchantable volume to be removed within and adjacent to ROW will be sold to Tri-State at the appraised rate, and Tri-State will arrange for removal/transfer/disposal of material. |

| Topic - No. | Applicant Committed Environmental Protection Measures and Design Features for Construction, Operation, and Maintenance |
|---|---|
| VG-5 | Tri-State and its contractor(s) shall not cross any wetland, riparian area (of or relating to, or located on, the banks of a river or stream), or ponds unless at designated locations authorized under the 404 permit. Any variance from the 404 permit will be reviewed and approved by the U.S. Army Corps of Engineers (USACE). |
| VG-6 | On completion of the work, all temporary use areas shall be regraded, as required, so that all surfaces drain naturally, blend with the natural terrain, and are left in a condition that will facilitate natural revegetation, provide for proper drainage and prevent erosion. |
| VG-7 | All temporary surface disturbances on State, BLM and USFS administered lands will be seeded with native seed mixtures that have been approved by the authorizing agency. Seed mixes on private land will be at the discretion of the landowner. Reclamation will be deemed complete once vegetation has been reclaimed to 70 percent of pre-construction conditions, or at the discretion of the agency authorized agent. |
| VG-8 | All construction materials and debris will be removed from the project area. |
| VG-9 | The Final POD would include a reclamation and noxious weed management plan, which would be approved by the appropriate agency prior to the issuance of a ROW grant. |
| *Water Quality and Erosion* | |
| WQ-1 | A Storm Water Management Plan (SWMP) shall be developed and implemented to address all construction, reconstruction activities. The plan will conform to Colorado Department of Public Health and Environment (CDPHE) requirements including regular inspections to ensure proper and effective functioning of Best Management Practices (BMPs). The Final POD would also be updated with specific water quality design measures once final engineering is complete. |
| WQ-2 | All Tri-State construction personnel including contractors will be trained on stormwater management requirements for the project. The environmental monitor will be responsible for compliance with the stormwater management plan from construction and through post-construction/reclamation. |
| WQ-3 | BMPs will be installed for project construction and future access road maintenance to protect water quality and surface waters. BMPs implemented will encompass a wide range of practices, both structural and non-structural in nature, such as road design requirements and construction techniques (installing cross drains, dips, and/or water bars) to minimize sediment discharge to surface water, as well as standards for maintaining road stability to control erosion.<br>Site assessments will be conducted bi-weekly (as outlined in the SWMP) to assess the adequacy of BMPs at the site, and the necessity of changes to those BMPs to ensure continued effective performance. Where site assessment results in the determination that new or replacement BMPs are necessary, BMPs will be installed to ensure effective erosion control. Where BMPs have failed, resulting in noncompliance, they will be addressed as soon as possible, immediately in most cases, to minimize the discharge of pollutants. In addition, there will be areas that will no longer require BMPs. These BMPs will be identified and removed when appropriate. |
| WQ-4 | Construction activities will be performed using methods that prevent entrance or accidental spillage of solid matter, contaminants, debris, and other objectionable pollutants and wastes into flowing streams or dry water courses, lakes, and underground water sources. Such pollutants and wastes include, but are not restricted to, refuse, garbage, cement, concrete, sanitary waste, industrial waste, radioactive substances, oil and other petroleum products, aggregate processing tailings, mineral salts, and thermal pollution.<br>Excavated material or other construction materials will not be stockpiled or deposited near or within 100 feet of any surface water, wetlands, stream banks, lake shorelines, or other water course perimeters where they can be washed away by high water or storm runoff or can in any way encroach upon the actual water source itself. BMPs will be installed if it is likely materials could leave the site (silt fence, waddles, or other methods could be implemented). |

| Topic - No. | Applicant Committed Environmental Protection Measures and Design Features for Construction, Operation, and Maintenance |
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| WQ-5 | With the exception of areas where access roads cross surface waters, buffers will be used when constructing new access roads and structure locations occur in proximity to water resources including wetlands. Tri-State will buffer surface waters, wetlands, riparian areas, and ditches 100 feet regardless of slope class whenever feasible. When 100 feet is not feasible, the following standard will be used: 30 feet for gentle slopes, 60 feet for moderate slopes, and 100 feet or more for severe slopes. If these buffers are not feasible in a particular area because of another resource, land use, or engineering constraint, BMPs will be utilized to ensure that sediment from construction does not enter surface waters and drainages. |
| WQ-6 | Tri-State does not expect dewatering to be required for the project. However, if future geological testing indicates dewatering at structure locations is required; dewatering work for structure foundations or earthwork operations adjacent to, or encroaching on, streams or water courses shall not be performed without prior approval by CDPHE and affected land management agency. Water and eroded materials will be prevented from entering the streams or watercourses by constructing intercepting ditches, bypass channels, barriers, settling ponds, or other approved methods. All fuel and fluid spills within this area will be handled in accordance with appropriate state and federal spill reporting and response requirements. |
| WQ-7 | Wastewaters from concrete batching and other construction operations during project construction or future maintenance activity will not enter streams, watercourses, or other surface waters without the use of such turbidity control methods as settling ponds, gravel-filter entrapment dikes, and approved flocculating processes that are not harmful to fish, recirculating systems for washing of aggregates, or other approved methods. Any such wastewaters discharged into surface waters shall be essentially free of settleable material. For the purpose of these specifications, settleable material is defined as that material which will settle from the water by gravity during a 1-hour quiescent detention period. |
| WQ-8 | If new access roads are required for construction they will be designed to properly drain in order to prevent future erosion. Final new access road design will be reviewed and approved by the affected authorized agency road engineer prior to construction. |
| WQ-9 | Erosion control measures including silt fences, straw bales, and other stormwater runoff and sediment controls will be implemented and regularly maintained on disturbed areas, including areas that must be used for maintenance operations (access ways and areas around structures). |
| WQ-10 | Prior to construction, a wetland and waters of the U.S. delineation will be completed within the area of proposed disturbance and fill within or proximity to potential waters of the U.S., and appropriate permits will be obtained from the United States Army Corps of Engineers (USACE) if the project exceeds Nationwide Permitting(NWP) thresholds. Construction activities will be limited to that approved in the NWP obtained from the USACE for the project. Tri-State will strictly adhere to all applicable conditions of the 404 permit (s). |
| WQ-11 | Delineated wetland boundaries within the project area will be identified clearly with wetland pin flags, fluorescent wetland tape, and/or orange plastic construction fencing. The markers will be installed prior to the initiation of construction and will be maintained throughout the construction process. |
| WQ-12 | Disposal of excess water from dust control will be done on flat upland locations away from surface drainages to prevent runoff and to encourage infiltration into the soil. |
| WQ-13 | Vegetation removal will be limited to the area necessary for construction activities, and disturbed areas will be scarified and revegetated after construction. |
| WQ-14 | Tri-State will hire an agency approved environmental monitor to ensure the project complies with all conditions of Nationwide Permit 12 (Utility Line Activities) to prevent unplanned impacts to wetlands and other waters of the U.S. Prior to construction, all supervisory construction personnel will be trained in avoidance and minimization techniques to lessen impacts to wetlands and other waters of the U.S. |

| Topic - No. | Applicant Committed Environmental Protection Measures and Design Features for Construction, Operation, and Maintenance |
|---|---|
| WQ-15 | In areas where construction may occur near surface waters and wetlands but no permanent or temporary impacts are planned and permitted under a USACE permit; buffers will be created to protect these resources from sedimentation and erosion impacts. Fueling will occur only at staging areas and commercial stations to avoid potential contamination of surface waters, wetlands, and riparian communities. All fuel and chemical spills will be contained and cleaned up promptly. |
| WQ-16 | Culverts or armored low water crossings and any changes to stream banks at crossings will be designed to sustain bank full dimensions of width, depth, and slope and keep streambeds and banks resilient to prevent effects to natural streamflow at stream crossings. New and existing culverts will be maintained in such a manner so as to allow continual flow of irrigation water, return water, waste water and on-and-off site run-off. |
| WQ-17 | Low water crossings will be used instead of culverts to the extent possible, particularly in drainages with floodplains. Armored low water crossings will be designed to prevent scouring along the downstream edge, and maintain the channel pattern, profile and dimension. |
| WQ-18 | Intermittent or ephemeral streams will be crossed at right angles to the main channel. |
| WQ-19 | No construction equipment will be operated within the stream channel, unless for the purpose of installing armored crossing and culverts or moving construction equipment across the channel for use on either bank. |
| WQ-20 | Implementation of EPMs outlined above under Vegetation and Soils will also minimize impacts to water quality and surface waters. Reclamation will occur soon as the season permits. Implementation of post-construction measures to stabilize areas of permanent and temporary disturbance. |
| WQ-21 | Excavated topsoil and/or hydric soils from temporarily or permanently impacted wetlands will be selectively stockpiled for appropriate use in the project area following disturbance. |

All EPMs except GUSG-14 discussed above would apply to all Action Alternatives. These additional measures have been included to specifically address the upgrade-in-place at the Dolores River crossing.

**Table 9. EPMs Specific to Dolores River Crossing and Dry Creek Basin Options**

| Topic - No. | Applicant Committed EPMs And Design Features For Construction, Operation, And Maintenance |
|---|---|
| A-9 | Visibility from KOPs will be considered in structure siting at the existing Dolores River crossing and structure location and design will respond to visual resource concerns to the extent practicable and feasible given other engineering constraints. |

### 2.4 Alternatives Considered, but Eliminated from Further Analysis

During the alternatives development process, the following BLM NEPA Handbook (BLM 2008) and USFS NEPA Handbook (USFS 2012) guidelines were used:

Alternatives May be Eliminated from Detailed Analysis if (BLM NEPA Handbook p.52 and USFS NEPA Handbook Chapter 10):

- It is ineffective (it would not respond to the purpose and need).
- It is technically or economically infeasible (consider whether implementation of the alternative is likely given past and current practice and technology; this does not require cost-benefit analysis or speculation about an applicant's cost and profit).

- It is inconsistent with the basic policy objectives for the management of the area (such as, not in conformance with the LUP).
- Its implementation is remote or speculative.
- It is substantially similar in design to an alternative that is analyzed.
- It would have substantially similar effects to an alternative that is analyzed.

Based on guidance from the BLM NEPA Handbook (BLM 2008) and USFS NEPA Handbook (USFS 2012), the following alternatives have been considered but eliminated from detailed analysis:

### *2.4.1 Love/Anderegg Route*

During the project scoping process, private landowners proposed a realignment on their property to eliminate the existing and future line visible from their personal cabin. Where the existing transmission line would cross private property owned by Love and Anderegg at the Dolores-San Miguel county line, the landowners suggested straightening the alignment to avoid crossing their land. This alternative would result in about 2.5 miles of new transmission line alignment and unknown length of access route.

The proposed Love/Anderegg dogleg adjustment was determined to be unjustified from a resource effects perspective. The reroute would not respond to a resource issue. The landowners did not establish a specific resource concern that would require the reroute. The alternative was eliminated because new permanent effects from clearing a new ROW and constructing new access routes would be substantial.

### *2.4.2 Undergrounding the Proposed Transmission Line through Dry Creek Basin*

CPW requested that the BLM and Tri-State evaluate the feasibility of undergrounding the proposed 230-kV line through GuSG occupied habitat in Dry Creek Basin. This alternative was vetted in great detail and dismissed from further analysis because it is not standard industry practice and is economically unfeasible. Tri-State contracted a feasibility study to underground portions of the proposed 230-kV line. A brief summary of the justifications for not undergrounding the transmission line is included below.

There are a variety of factors a utility must weigh when determining the feasibility of undergrounding a high-voltage transmission line including reliability, terrain, voltage, lifespan, existing non-compatible infrastructure/land use, environmental effects, topographical constraints, engineering and operational considerations, and cost.

Issues with burying transmission voltages include repair, heat dissipation, emergency access, increased surface disturbance, material costs, construction and operational costs, long-term line maintenance, and reduced life expectancy of the facilities.

While underground systems comparatively have fewer forced outages than overhead lines, damage to the cable or components often results in longer outage durations. Damage to underground power lines is difficult to locate and repair and the required repairs may take weeks to months, as compared to overhead lines that typically require hours to days to repair.

The ground disturbance associated with the operation and future repair of underground power line construction is greater than for a comparable overhead line. An overhead transmission line typically requires one or more augured foundations that may be several feet in diameter. Such foundations are required at every structure location, and each structure span can vary from 400 to

more than 1,000 feet apart. At a minimum, an underground transmission line would require a continuous trench at least 3 feet wide and 5 feet deep. Concrete manholes or large splice vaults are required at recurring intervals. During operational repairs, an entire segment between these vaults may require excavation. In addition, two above-ground riser structures would be required at both ends of the underground cable.

An underground line must be routed to avoid other underground installations such as water and gas pipelines. Unstable slopes, hazardous material sites, wetlands, and bedrock also must be avoided, if possible. In addition, it is not always possible to avoid sensitive resources such as sensitive plant species, paleontological, and archaeological resources during underground construction. Overhead power lines can be designed to entirely span sensitive resources.

Depending on the conductor type, the life expectancy of an underground high-voltage line is about half that of an overhead line (Public Service Commission of Wisconsin 2011). The Edison Electric Institute (2012) estimate that much of the underground cable installed in the 1970s and 1980s now needs replacement.

All these aspects of underground transmission construction lead to substantially higher costs relative to overhead line construction. Estimated costs for undergrounding a high voltage power line on a per-mile basis are estimated to be 4 to 17 times the cost of a standard overhead construction due to time, materials, process, and the use of specialized labor (National Grid 2009, Patrick Engineering 2010, and Public Service Commission of Wisconsin 2011). Therefore, substantial costs would be incurred for infrastructure that has half the life span of the overhead alternative. Specific costs for a 9.0 miles underground alternative across GuSG occupied habitat is discussed below.

As with the case of most electric utility cooperatives, Tri-State is a not-for-profit organization. Costs incurred by Tri-State and its member systems are directly passed on to the individual rate payers. Burying a transmission line in one part of the Tri-State service territory could result in the inequitable sharing of costs for customers outside of southwestern Colorado. For this reason, Tri-State has a Board Policy that states the company will only consider burying transmission lines if the landowners and/or local jurisdictions agree to pay the difference in cost from overhead construction.

Burying the proposed transmission line would change Tri-State's project scope, budget, and schedule substantially. The proposed project's purpose and need was approved in a CPCN by the CPUC (2013) as an "upgrade" of an existing facility, and Tri-State has already amended the project budget for engineering design (single pole steel through Dry Creek Basin; see Figure 19) to minimize potential effects to GuSG. Burying high-voltage transmission lines outside of urban areas is not standard industry practice, would result in considerable cost effects to Tri-State's members and result in considerable effects to Tri-State's schedule.

Tri-State contracted a third party engineering firm to complete cost estimates for six different underground alignments for the transmission line. Alternatives were divided by undergrounding on State lands (for each alternative) as well as burying the line entirely across GuSG occupied habitat for both Action Alternatives carried forward for detailed analysis.

The cost of building steel overhead transmission lines is estimated at $784,200 per mile. The cost of building the line underground is estimated between $5.4 and $5.6 million per mile (see Table 10).

**Table 10. Cost Comparison for Construction of Overhead Steel vs. Underground 230 kV Transmission Line**

| | Overhead Steel | Underground |
|---|---|---|
| Cost per Mile | $784,200 | $5,400,000 to $5,600,000 |
| Total Project Cost | $5.9 to 6.9 million | $41.5 to $48 million |

Total project costs for overhead construction on the realignment along SH 141 in the Dry Creek Basin would be $6.9 million. The total cost for constructing overhead transmission on the existing alignment (Tri-State's upgrade-in-place Proposed Action) would be $5.9 million. Total costs for underground construction on the existing alignment (Tri-State upgrade-in-place Proposed Action) within GuSG occupied habitat would be approximately $41.5 million. Total costs for undergrounding construction along the realignment along SH 141 in the Dry Creek Basin option would be approximately $48 million. Undergrounding the alignment associated with either alternative would result in approximately 7 times the cost for either alternative.

Due to the construction, operation, maintenance, and cost concerns with the undergrounding alternative, the BLM dismissed undergrounding from further detailed analysis. In addition, Tri-State has voluntarily agreed to design features as well as EPMs that minimize effects to GuSG and occupied habitat (see Table 8, EPMs GuSG-1 through GuSG-16; also see Draft POD Appendix B-Biological Protection Measures).

### *2.4.3 Avoidance of Occupied Gunnison Sage-Grouse Habitat*

The alternative proposed for routing the transmission line entirely around the occupied GuSG habitat within the Dry Creek Basin was considered but eliminated. The reroute was eliminated from further analysis because it would be economically infeasible and would lead to greater environmental effects than the routing options described above in Section 2.2.1.3. Since this alternative would result in greater environmental effects than the proposed action, due to the extensive new ground disturbance needed, it would not address any unresolved conflicts concerning alternative uses of available resources.

The reroute would be substantially longer (a distance of approximately 20 to 34 miles of new transmission line) and much of it would occur over challenging terrain, resulting in new resource effects from access road construction in steep, dissected landscapes. A realignment to avoid occupied GuSG habitat would require clearing of an entirely new transmission line ROW, as well as new access roads. New resource effects would include effects to landowners, scenic quality, wildlife habitat, including fragmentation of contiguous habitat, rare plant habitat, soils, and other resource effects.

Approximately 34 miles of new ROW, as well as access roads would be required to realign the transmission line to avoid occupied GuSG habitat. Construction cost (not including ROW, access road, or permitting costs) would be about $21.4 million or about $6 million more than building in the existing alignment. New ROW associated with this alternative would be about 618 acres. New ground disturbance would be substantial; without further design and analysis, no reasonably accurate effect estimates can be made.

### 2.5 Summary Comparison of Environmental Effects

Table 11 summarizes and compares the effects of the Action Alternatives on the GuSG and visual resource issues that were the basis for developing routing options for the Dolores River crossing and the Dry Creek Basin.

See Table 20 and Appendix E for a comprehensive summary of comparison of the alternatives analyzed and effects to resources.

**Table 11. Summary Comparison of GuSG and Visual Resource Effects for All Alternatives**

| Issue | Alternative A (Proposed Action) Realignment at Dolores River Crossing and Upgrade-in-Place at Dry Creek Basin | Alternative B (No Action) | Alternative C | | |
|---|---|---|---|---|---|
| | | | Dolores River Crossing Routing Option | Dry Creek Basin Routing Option | Both Dolores River Crossing and Dry Creek Basin Routing Options |
| | | | Alternative A incorporating Upgrade-in-Place at Dolores River Crossing | Alternative A incorporating Realignment at Dry Creek Basin | Alternative A incorporating Upgrade-in-Place at Dolores River Crossing and Dry Creek Basin Realignment |
| **Gunnison Sage-Grouse** | | | | | |
| Leks | No effects within 0.6 miles of known leks; distance to known lek is 3.8 miles | No change from existing condition. Distance to known lek is 3.8 miles. | Same as Alternative A. | No effects within 0.6 miles of known leks; distance to known lek is 4.9 miles | No effects within 0.6 miles of known leks; distance to known lek is 4.9 miles |
| GuSG Occupied habitat | 7.3 acres of new surface effects from new pole construction; 33.0 acres of temporary surface disturbance for upgrading the existing road access | No change from existing condition. | Same as Alternative A. | 6.1 acres of new surface effects from new pole construction; 6.75 acres of temporary surface disturbance for upgrading the existing road access that will continue to be used, and 31.2 acres of new road disturbance for construction and access along SH 141. 14 acres of permanent disturbance reclaimed | 6.1 acres of new surface effects from new pole construction; 6.75 acres of temporary surface disturbance for upgrading the existing road access that will continue to be used, and 31.2 acres of new road disturbance for construction and access along SH 141. 14 acres of permanent disturbance reclaimed |
| Critical Habitat | New long-term effects to critical habitat would be 5.1 acres from new pole construction; 23.6 acres of temporary surface disturbance for upgrading the existing road access | No new effects to critical habitat. | Same as Alternative A. | New long-term effects to critical habitat would be 5.4 acres for new pole construction, 5.1 acres of temporary surface disturbance for upgrading the existing road access that will continue to be used, and 26.8 acres of new road disturbance for construction and access along SH 141. 9.9 acres of permanent disturbance in critical habitat reclaimed | 5.4 acres for new pole construction, 5.1 acres of temporary surface disturbance for upgrading the existing road access that will continue to be used, and 26.8 acres of new road disturbance for construction and access along SH 141. 9.9 acres of permanent disturbance in critical habitat reclaimed |
| Avian predators | Eliminates existing nesting/perching opportunities on 72 existing wood H-frames | Existing nesting/perching opportunities would remain. | Same as Alternative A. | Eliminates existing nesting/perching opportunities on 72 existing wood H-frames | Eliminates existing nesting/perching opportunities on 72 existing wood H-frames |
| Fragmentation (reduced Habitat Effectiveness [HE]) | No change in existing fragmentation levels; about 4,901 acres (not including SH 141) with reduced HE; HE reduced basin-wide, including from SH 141 on about 8,287 acres | Habitat would continue to be fragmented at existing levels. about 4,901 acres (not including SH 141) with reduced HE; HE reduced basin-wide, including from SH 141 on about 8,287 acres | Same as Alternative A. | HE reduced on about 857 acres (beyond existing SH 141); HE reduced basin-wide, including from SH 141 on about 6,124 acres. Net improvement in HE on a total of 2,163 acres compared to existing conditions | HE reduced on about 857 acres (beyond existing SH 141); HE reduced basin-wide, including from SH 141 on about 6,124 acres. Net improvement in HE on a total of 2,163 acres compared to existing conditions |
| **Visibility/Aesthetics** | | | | | |
| KOP 1 (Dolores River Canyon Developed Scenic Overlook) | KOP about 4 miles from improved line in new alignment (1 mile closer than existing). North rim structure visible against skyline. South rim structure not skylined. | No change from existing conditions. | KOP about 5 miles from line in existing alignment | Same as Alternative A | KOP about 5 miles line in existing alignment |
| KOP 2 (Dolores River Canyon Cul-de-sac) | KOP 0.5 miles from improved line in new alignment. North rim structure visible in views to north. South rim structure screened by vegetation | No change from existing conditions. | KOP about 1.5 miles from improved line in existing alignment. Improved line, structure and roads would be visible in views to the east-northeast. Views in other directions would not include the proposed structures, road, and conductors. | Same as Alternative A | KOP about 1.5 miles from improved line in existing alignment. Improved line, structure and roads would be visible in views to the east-northeast. Views in other directions would not include the proposed structures, road, and conductors. |

| Issue | Alternative A (Proposed Action) | Alternative B (No Action) | Alternative C | | |
|---|---|---|---|---|---|
| KOP 6 (Basin Store) | Improved line not visible from KOP 6. Improved transmission line would be slightly more visible from areas in the central Dry Creek Basin due to increased structure height. | No change from existing conditions. | Same as Alternative A | Realignment visible for approximately 10 miles along SH 141 and adjacent to Basin Store. Existing line would be removed and no longer visible from the middle of the Dry-Creek Basin. | Realignment visible for approximately 10 miles along SH 141 and adjacent to Basin Store. Existing line would be removed and no longer visible from the middle of the Dry-Creek Basin. |
| KOP 9 (Dolores River bottom) | No change in visibility from existing conditions | No change from existing conditions. | No change from existing conditions. | No change from existing conditions | No change from existing conditions |
| KOP 10 (Dolores River bottom) | Realignment further from KOP; less visible | No change from existing conditions. | Increased visibility due to larger structures | Realignment further from KOP; less visible | Increased visibility due to larger structures |
| KOP 11 (Dolores River bottom) | Realignment not visible from KOP; less visible | No change from existing conditions. | Increased visibility with larger structures | Realignment further from KOP; less visible | Increased visibility due to larger structures |
| KOP 12 (Dolores River bottom) | View of power line would be to the north rather than to the south | No change from existing conditions. | Increased visibility with larger structures | Realignment further from KOP; less visible | Increased visibility due to larger structures |

Note: KOPs 3, 4, 5, 7, and 8 would have the same effects for all Action Alternatives; larger structures would increase their visibility.

# 3 AFFECTED ENVIRONMENT

## 3.1 Introduction

This section provides a description of the resources (physical, biological, social, and economic) potentially affected by the alternatives. It is organized by resource topics that were identified in internal scoping by the BLM and USFS Inter-Disciplinary Team (IDT); (IDT check lists are part of the Administrative Record) and public scoping. This section focuses on those resources that could be affected by the alternatives and that are relevant to the decision-making process. The affected environment provides the baseline condition for comparison of effects and evaluation of environmental consequences in Section 4.

## 3.2 General Setting

The proposed project area is situated in a variety of physiographic regions, climates, and vegetation types along the existing 80-mile transmission line. Elevation varies from about 5,800 feet above sea level (asl) in the arid valleys along the transmission line route, up to about 9,300 feet asl on the Uncompahgre Plateau. The proposed project area occurs within the Colorado Plateau and Southern Rockies ecoregions (Chapman et al. 2006). The Colorado Plateau ecoregion is found on the northern two-thirds of the proposed project area and consists of pinyon-juniper woodland, sagebrush, and other shrub covered mesas. Interspersed between these mesas are nearly level basins and valleys covered with semi-desert shrublands of saltbush and other desert shrubs and semi-desert grasslands. Fingers of the Southern Rockies extend into the southern and central portion of the proposed project area. These higher peaks (up to 10,000 feet) contain a mixture of mountain shrublands, coniferous forests, aspen forests, and mountain grasslands. Within both the Colorado Plateau and Southern Rockies ecoregions, the rivers and creeks support a variety of riparian woodlands, grasslands, and shrublands. Annual precipitation ranges from about 12 inches in the desert shrub regions to 40 inches in subalpine forests.

Land uses are varied in the proposed project area and include agriculture and grazing; recreation such as hunting, hiking, fishing, and mountain biking; and extractive industries such as oil and gas. The existing 80-mile transmission line crosses 37.4 miles of BLM-managed land and 22.7 miles of USFS-managed. The remainder of the line (22.6 miles) is located on state, county, and private land.

## 3.3 Resources/Issues Brought Forward for Analysis

A wide variety of resources were reviewed to identify potential effects from implementation of the Alternatives, as summarized in Table 12. Resources were grouped into three categories, with different levels of analysis depending on the potential for effects and value in comparison of the effects of the Alternatives. Based on internal and external scoping, the BLM and USFS first identified those resources that could be dismissed from detailed consideration in the EA because there would be no or negligible effects under any of the alternatives. These resources are briefly described in Table 12 and dismissed from further discussion in the EA. Second, resources that were determined to have measurable effects and value in comparing alternatives were selected for detailed analysis in the EA. These resources, denoted by a "Y" in Table 12, are described in detail in the affected environment Section 3.5 and in the environmental consequences analysis in Section 4. Remaining resources that might be affected by implementation of Alternatives, but for which the effects would be minor and similar among all Alternatives, were also identified.

These resources are identified in Table 12 by "Y*." For these resources, a brief description of the affected environment and summary of effects is provided in Section 3.4 without further discussion in the environmental consequences section of the EA.

**Table 12. Resources Considered for Evaluation in the EA**

| Resource/Issue | Analyzed in EA? (Y/N) | Justification for Inclusion in/Exclusion from EA Analysis | Applicable Design Features/EPM(s) (see Table 8) |
|---|---|---|---|
| Access, Roads, and Transportation | Y | The Action Alternatives have the potential to effect access during and following construction. Traffic and access could be disrupted for short periods during construction. New roads are needed and some existing roads can be reclaimed and abandoned. | G-4, AR-1 through AR-7, AQ-2, LU-1. LU-2, LU-4, T-1, T-2 |
| Air Quality | N | Effects to air quality from vehicle emissions and fugitive dust would be short-term and negligible, for a total of about 14 months of construction over 80 miles. EPMs would address short-term effects. There would be no long-term effect following construction. | AQ-1 through AQ-6 |
| Areas of Critical Environmental Concern (ACEC) | N | No ACECs are present in proposed project area. | N/A |
| Cadastral Survey | N | Cadastral surveys that establish the boundaries of public lands would not be affected because there would be no change in public land boundaries or ownership. | N/A |
| Cultural Resources | Y | Land disturbance under the Action Alternatives may affect known and unknown cultural resources in the proposed project area. Consultation with the SHPO and American Indian tribes is being conducted to ensure Section 106 compliance and mitigation of any adverse effects. | CR-1 through CR-7, VG-1 |
| Environmental Justice | N | No minority or low income populations are present in the proposed project area. All populations would be equally affected by the Action Alternatives. | N/A |
| Electro-Magnetic Field (EMF)/Safety | N | EMF generated by the improved line would dissipate by the edge of the ROW; risks to human and animal health would be non-existent or negligible. The transmission line ROW width is intended to prevent construction of residences or other structures in the transmission line corridor. | N/A |
| Farmlands (Prime or Unique) | N | No prime farmlands are in the proposed project area. | N/A |

| Resource/Issue | Analyzed in EA? (Y/N) | Justification for Inclusion in/Exclusion from EA Analysis | Applicable Design Features/EPM(s) (see Table 8) |
|---|---|---|---|
| Fish Habitat and Aquatic Species | N | Effects to fish habitat and aquatic species would be avoided by locating structures outside of aquatic habitat. With implementation of water quality and other EPMs to protect fish and aquatic habitat, effects would be negligible. | G-1, G-3, AR-1, AR-2, AR-5, AR-7, HM-1 through HM-3, VG-1 through VG-3, VG-6 through VG-8, WQ-1 through WQ-21 |
| Floodplains | N | No transmission line structures would be located in floodplains. Effects to floodplains from access roads would be negligible with implementation of EPMs. | WQ-1 through WQ-21, VG-6 |
| Forest Resources (High-Return Forest Activities [HRFA] Project)/Timber Resources | Y | Analyzed in EA to address timber clearing and lands suitable for timber production associated with a proposed wider transmission line ROW. | A-1, A-2, A-5, A-7, VG-2,VG-4, VG-5 |
| Fuels/Fire Management | N | Fire risk would be minimized through implementation of EPMs and compliance with NERC reliability standard FAC-003-2. | FP-1 through FP-4, VG-2, VG-4 |
| Geology and Minerals | Y | The Action Alternatives could result in effects to geology (geohazards) from proposed project construction. | S-1 through S-5 |
| Invasive Species/ Noxious Weeds | Y* | Construction activities could result in the introduction and spread of invasive plant species in the proposed project area. Implementation of noxious weed control EPMs would minimize the establishment and spread of weeds and provide monitoring and treatment requirements. | NW-1 through NW-6, VG-11 |
| Land Use Authorizations | Y* | Transmission line improvements could temporarily affect grazing on leased lands. Effects to realty authorizations would be negligible with implementation of EPMs, including Tri-State coordination with other leaseholders to minimize or avoid conflict. For the SJNF and TRFO the existing transmission line is located in a designated utility corridor. Also see Section 3.4.2 below. | LU-1 through LU-7 |
| Lands with Wilderness Characteristics | Y | The existing transmission line crosses the Dolores River Canyon, which contains land with wilderness characteristics. Action Alternatives would have no new surface effects in designated wilderness or wilderness study areas. | A-1 through A-8, LU-1, |
| Law Enforcement | N | No noticeable effects were identified for the Action Alternatives to law enforcement. | N/A |

| Resource/Issue | Analyzed in EA? (Y/N) | Justification for Inclusion in/Exclusion from EA Analysis | Applicable Design Features/EPM(s) (see Table 8) |
|---|---|---|---|
| Migratory Birds | Y* | Effects to migratory birds from noise and human disturbance during construction would be temporary. Long-term effects to raptors and other migratory birds, including the risk of line collisions and electrocutions, are unlikely with implementation of EPMs. | BR-2 through BR-6, BR-9, BR-10 |
| Native American Religious and other Concerns | Y* | The Action Alternatives could affect resources that may be valued by Native Americans for religious or cultural reasons. | G-1, CR-1 through CR-6 |
| Noise | N | Short-term noise effects during construction would be negligible, and would depend on the location of the noise receptor. The new transmission line would not introduce any new long-term elevated noise levels. The corona noise associated with electrical transmission would be negligible at the edge of the ROW. Noise effects would be minimized with implementation of EPMs. | N-1, G-7 |
| Paleontology | N | Effects to paleontological resources would be negligible with implementation of EPMs. | G-1, CR-7 |
| Rangeland Health Standards and Range Management and Livestock Grazing Management | N | Surface disturbance associated with the Action Alternatives are mostly short-term and would be revegetated following construction to minimize effects to rangeland. Effects to rangeland would be negligible with implementation of EPMs. | NW-1 through NW-6, VG-2, VG-3, VG-7 through VG-11, LU-3, LU-4 |
| Recreation | Y* | Recreation activities that occur within or across the transmission line corridor would be temporarily affected during construction, due to route closures, truck and equipment access, construction activity, and noise. Implementation of EPMs would minimize recreation effects. | A-1 through A-8, AQ-2, R-1, R-2, AR-4 |
| Sensitive Species – Animals | Y* | Effects to sensitive wildlife from noise and human disturbance would be temporary during construction. Habitat loss would be minor, with temporary disturbance revegetated. Implementation of EPMs would minimize effects. | G-1 through G-3, AR-2, AR-3, A-1, BR-9, VG-1, VG-2, VG-6, VG-11, WQ-5 |
| Sensitive Species – Plants | Y* | Effects in identified sensitive plant species habitat would be avoided and minimized to the extent possible, although small areas of disturbance in occupied habitat have been identified. | G-2, BR-11, VG-1, |

| Resource/Issue | Analyzed in EA? (Y/N) | Justification for Inclusion in/Exclusion from EA Analysis | Applicable Design Features/EPM(s) (see Table 8) |
|---|---|---|---|
| Socio-Economics | Y* | No new permanent employment would be generated, and there would be no change to existing population levels in the proposed project area. The anticipated workforce during construction would range from about 40 to 60 specialized workers (either existing Tri-State employees or contractors based in surrounding Colorado counties) over two 7-month periods in 2017 and 2018. | LU-2 |
| Soils | Y | Construction of the improved transmission line, roads, and substations would result in short and long-term disturbance to soils resources. Soil loss and erosion from soil disturbance would be addressed with implementation of erosion control and revegetation EPMs. | S-1 through S-5, AQ-2, VG-11 |
| Threatened, Endangered, or Candidate Animal Species | Y | Action Alternatives would result in disturbances in GuSG critical habitat and lynx habitat. No Mexican spotted owls have been recorded in the proposed project area. | BR-2 through BR-10, GUSG-1 through GUSG-16 |
| Threatened, Endangered, or Candidate Plant Species | N | No suitable habitat for threatened, endangered, or candidate plant species is present in the proposed project area. | G-1 through G-3, BR-11, VG-11, NW-1 through NW-6 |
| Upland Vegetation Excluding Special Status Species and Invasive Species | N | Surface disturbances under the Action Alternatives would result in small permanent vegetation effects associated with new roads and the footprint of new structures. All temporary disturbances would be revegetated. Effects to vegetation would be negligible with implementation of EPMs. | AR-2, S-1 through S-4, VG-2, VG-3, VG-11 |
| Visual Resources | Y | Existing visual resources, including specific scenic views, may be affected as a result of the Action Alternatives from taller structures and possible changes in alignment in Dry Creek Basin and the Dolores River Canyon. Short-term visual and aesthetic effects are expected during construction. Long-term visual and aesthetic setting for recreation would be similar to existing conditions. | A1 through A8 , VG-2, VG-7 through VG-11 |
| Wastes (Hazardous or Solid) | N | No hazardous wastes have been identified in the proposed project area. Hazardous material BMPs would minimize or eliminate risk of adverse effects. | HM-1 through HM-4, A-3 |
| Water – Ground | N | No direct effects to ground water were identified for the Action Alternatives. Effects to ground water would be negligible and avoided through implementation of EPMs. | HM-1 through HM-4, WQ-4, WQ-7 |

| Resource/Issue | Analyzed in EA? (Y/N) | Justification for Inclusion in/Exclusion from EA Analysis | Applicable Design Features/EPM(s) (see Table 8) |
|---|---|---|---|
| Water – Surface (Clean Water Act and others) | N | Surface disturbances under the Action Alternatives would increase the short-term potential for erosion and runoff. Effects would be negligible with implementation of revegetation and water quality EPMs. | G-1, G-3, AR-1, AR-2, HM-1 through HM-4, VG-1 through VG-3, VG-6 through VG-11, WQ-1 through WQ-21 |
| Wetlands/Riparian Zones | Y* | New transmission line structures would be located outside of wetlands. Small wetland effects are possible for new road crossings. Effects to wetlands would be minimized with implementation of avoidance measures and EPMs. | G-1 through G-6, VG-1, VG-6, VG-7, VG-11, WQ-1 through WQ-21 |
| Wild and Scenic Rivers | Y* | The proposed project has the potential to affect suitable Wild and Scenic rivers (Dolores River) in the proposed project area in the TRFO. | A-1 through A-8. LU-1 |
| Wilderness Study Areas | N | There are no Wilderness Study Areas in the project area | N/A |
| Wildlife – Terrestrial | Y* | Loss of wildlife habitat would result from roads and other permanent disturbances. Temporarily disturbed areas would be revegetated following construction. Effects from noise and human disturbance may temporarily displace wildlife. Effects would be minimized with implementation of EPMs. | G-1 through G-7, BR-1 through BR-10, N-1, NW-1 through NW-6, VG-1 through VG-11. |

*A brief description of the affected environment, summary of effects, and rationale for not providing a detailed effects analysis, are presented below in Section 3.4.

## 3.4 Resource Topics Dismissed from Detailed Analysis and Rationale

### *3.4.1 Invasive Species/Noxious Weeds*

To prevent the negative effects of noxious weeds on the economic and environmental values of Colorado, the Colorado Department of Agriculture (CDA) maintains lists of noxious weeds categorized by the severity of potential effects and management requirements (CDA 2014). These categories include List A (requires eradication), List B (requires implementation of plans to stop the spread of the species), and List C (requires the development of management plans to provide additional information where control is desired). In conjunction with data provided by the BLM and other agencies, noxious weeds were mapped on all public lands and field-verified. Where noxious weed populations were intermingled, the species were grouped together. Species of primary concern were spotted knapweed, whitetop, sulphur cinquefoil, and yellow toadflax.

No List A species were found in the proposed project area. Ten List B noxious weeds were found within the proposed project area (Table 13), with spotted knapweed, Russian knapweed, and Canada thistle occupying the largest areas. Saltcedar was found in several of the drainages. The remaining List B species – bull thistle, diffuse knapweed, whitetop (or hoary cress), houndstongue, musk thistle, and oxeye daisy – were scattered in the proposed project area. Six List C noxious weeds were observed scattered throughout the proposed project area. Cheatgrass,

field bindweed, halogeton, and redstem filaree were prevalent throughout the proposed project area and were not mapped because of their prevalence. Small populations of common burdock and common mullein were observed. Existing areas of noxious weeds are similar for all Action Alternatives, as is the potential for the introduction or spread of weeds. With implementation of EPMs under all of the Action Alternatives, as well as the Noxious Weed Management Plan (POD Appendix S), adverse effects from the spread of noxious weeds would be minor; therefore, noxious weeds are not analyzed in detail in this EA.

**Table 13. Acres of Noxious Weeds Present in the Proposed Project Area by Action Alternative**

| Noxious Weed | Colorado Noxious Weed Act List | Proposed Action Alternative A | Alternative C with Upgrade in place at Dolores River and Realignment at Dry Creek Basin |
|---|---|---|---|
| Bull thistle | B | 7 | 7 |
| Canada thistle | B | 25 | 26 |
| Canada thistle/Musk thistle | B | 71 | 71 |
| Canada thistle/Musk thistle/Russian knapweed | B | 1 | >1 |
| Diffuse knapweed | B | 4 | 4 |
| Houndstongue | B | 15 | 15 |
| Musk thistle/Russian knapweed | B | <1 | <1 |
| Oxeye daisy | B | <1 | <1 |
| Russian knapweed | B | 65 | 65 |
| Saltcedar | B | 1 | 3 |
| Spotted knapweed | B | 113 | 115 |
| Whitetop (hoary cress) | B | <1 | 2 |
| Whitetop (hoary cress)/ Russian knapweed | B | <1 | <1 |
| Common burdock | C | <1 | <1 |
| Common mullein | C | 7 | 7 |
| **Total** | | **315** | **318** |

### *3.4.2 Land Use Authorizations*

Most of the public lands in the proposed project area are leased for livestock grazing, primarily cattle and sheep. The proposed transmission line improvements could cause temporary disturbance to grazing activities, due to vegetation removal, construction activity, and the periodic removal of fencing. These effects, however, would be negligible and would be mitigated by EPMs; therefore, land authorizations are not analyzed in detail in this EA.

Existing land use plans for the BLM Uncompahgre Basin (BLM 1989) and the GMUG LRMP, as Amended, 1991 (USFS 1991) note that utility development would be evaluated on a case-by-case basis. The 2013 RMP for the SJNF and the BLM TRFO (USFS and BLM 2013; USFS 2013; BLM 2015) describes the existing Tri-State transmission line as a designated utility corridor.

As discussed below in Section 3.5.8, both of the alternative transmission line crossings of the Dolores River Canyon would avoid surface disturbances within lands with wilderness characteristics.

### *3.4.3 Migratory Birds*

Migratory birds, including raptors, and any active nests, are protected under the MBTA. The MBTA prohibits activities that may harm migratory birds, including the loss of eggs or nestlings due to abandonment or reduced attentiveness by one or both adults as a result of disturbance by human activity, as well as physical destruction of an occupied nest. In Colorado, most nongame birds except for European starling, house sparrow, and rock dove (pigeon) are protected under the MBTA (§§ 703-712).

In response to EO 13186, the BLM and USFWS signed an MOU (BLM MOU WO-230-2010-04) that outlines a collaborative approach to promote the conservation of migratory bird populations. The guidance directs Field Offices to promote the maintenance and improvement of habitat quantity and quality and to avoid, reduce, or mitigate adverse effects to habitats of migratory bird species of conservation concern to the extent feasible, and in a manner consistent with regional or statewide bird conservation priorities. In accordance with the 1988 amendment to the Fish and Wildlife Conservation Act, the USFWS (2008) developed a list of Birds of Conservation Concern (BCC). The proposed project area contains potential foraging, nesting, roosting, and winter habitat for seventeen BCC within the Southern Rockies/Colorado Plateau Bird Conservation Region (BCR 16) and a variety of other migratory birds.

Historic data for migratory birds, raptors, raptor nests, and BCC relevant to the proposed project area is limited. According to CPW and the BLM, no known bald or golden eagle nests or communal roost sites occur within the Dry Creek Basin. Eagles are occasionally observed perching or foraging in the basin in both summer and winter. Raptor surveys were conducted within 0.5 miles of the proposed project area in 2014 in compliance with BLM and USFS survey protocols. The following species (nests) were detected within approximately 0.5 miles of the proposed project area: golden eagle (6), peregrine falcon (3), common raven (7), Cooper's hawk (9), red-tailed hawk (3), northern goshawk (1), and unknown (23). All of the peregrine falcon eyries were located in the greater Dolores River Canyon greater than 0.5 miles from the proposed project area.

Effects to migratory birds and raptors from line collisions or electrocution would be negligible with implementation of EPMs. The potential increased risk of eagles colliding with the

transmission line while feeding on roadkill carrion would likely be negligible because: 1) the density of eagles in the Dry Creek Basin is low during all seasons, 2) for the Dry Creek Basin realignment option, the transmission line would be an average of 150 feet from the roadway, and 3) in all Action Alternatives the transmission line and structure design would conform to APLIC guidelines. Other potential effects to migratory birds include temporary construction effects from noise and human disturbance including helicopter use and loss of foraging/breeding habitat. Habitat-level effects to migratory birds include about 327 acres of potential vegetation disturbance. This habitat acreage includes all the area within the ROW. ROW clearing would only be required in forested areas; shrub cover would not be cleared. Most of the roads required for project access for construction and maintenance are already in place. Some loss of nesting substrate during the nesting period is likely. Although some nests may be destroyed and/or fail as a result of project activities, there would be no population-level impacts. Birds present during the transmission line construction would likely move temporarily to other adjacent habitat to forage and roost. Because of the temporary nature of the construction and implementation of EPM's minimizing effects on nesting birds and their habitat, the overall effect on migratory birds would be low and would be very similar for all Action Alternatives; therefore, effects on migratory birds are not analyzed in detail in this EA. In addition, the project would be implemented in accordance with the BLM-USFWS MOU (BLM MOU WO-230-2010-04; BLM 2010).

### *3.4.4 Native American Religious and other Concerns*

As the lead federal agency responsible for compliance with Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulations, the BLM SWDO initiated Native American consultation with 25 tribes via letter on August 12, 2014 (see project scoping report for list of tribes consulted). The BLM is also responsible for maintaining government-to-government consultation per 36 CFR 800.2 of the NHPA. Follow-up consultation has included emails, letters, and in-person meetings. To date, the BLM has responded to requests for continued consultation, additional information, and project updates. The BLM will continue to engage tribes through consultation for the duration of the proposed project and address any concerns expressed during consultations. Consultation thus far has identified no concerns with Native American tribes potentially affected by this project.

### *3.4.5 Recreation*

The proposed project area includes developed recreation sites as well as dispersed recreational uses associated with BLM-managed and NFS lands. The predominant recreational uses include trail-based recreation (hiking, mountain biking, and equestrian use), off-highway vehicle (OHV) use, camping, hunting, fishing, boating, and scenic driving. As described in Section 3.3.1, the BLM and USFS manage a variety of roads and trails for recreation and other purposes. Specific recreation areas near the proposed project area include the Dry Creek area near Montrose, the Uncompahgre Plateau, Norwood Canyon, the Glade Park area, and the Dolores River Canyon.

Recreation activities that occur within or through the transmission line corridor would be affected for a short time period during construction due to route closures, truck and equipment access, construction activity, and noise. Implementation of EPMs would minimize recreation effects under all of the Action Alternatives. An improvement or reroute of the transmission line across the Dolores River would not directly affect any recreation opportunities along the Dolores River, as the visual effects of any new line would be similar to the effects of the existing line.

Because all of the Action Alternatives would have primarily short-term effects during construction with minimal long-term effects that would be addressed by EPMs, recreation is not discussed in detail in the EA.

### *3.4.6 Sensitive Species – Animals*

Sixteen special status species, including BLM/USFS sensitive species (SS), USFS Management Indicator Species (MIS), and State of Colorado species of concern (SOC), potentially occupy forest, riparian, canyon/cliff, low elevation shrubland/grassland, and mountain shrubland/grassland habitats in the proposed project area. Potential effects to special status species in the proposed project area include temporary construction effects from noise and human disturbance and permanent loss of foraging/breeding habitat where forest vegetation was cleared. Overall habitat effects are small in relation to the habitat available within and adjacent to the proposed project area for all of the Action Alternatives. Adverse effects to all sensitive species would be low due to the use of the existing access road network and existing transmission line. Implementation of EPMs would minimize disturbance of sensitive species and their habitat and reclamation of temporarily disturbed areas would revegetate temporarily disturbed areas. New forest clearing would be required. Overall effects on special status wildlife species would be low and are therefore not analyzed in detail in this EA. In the Dry Creek Basin and in other locations with sage brush habitat, Brewer's sparrow nests are at a relatively high density. See Migratory Bird section (Section 3.4.3) for a discussion of potential impacts.

### *3.4.7 Sensitive Species – Plants*

The proposed project area was assessed for potential habitat to support sensitive species. A 200-foot wide corridor in potential habitat was surveyed during 2014 and 2015 during the appropriate survey season. Four BLM sensitive species were found during field surveys within the proposed project area: Naturita milkvetch, Gypsum Valley cateye, Payson lupine, and good neighbor bladderpod (Colorado Natural Heritage Program [CNHP] 2014). Additional suitable habitat for all four species extends beyond the survey corridor, and other known populations have been documented in the project vicinity. Three populations of Naturita milkvetch with about 366 individuals were observed within the proposed project area in pinyon-juniper woodlands. About 2,093 individuals of the Gypsum Valley cateye were observed in four populations in sparsely vegetated areas of either open pinyon-juniper woodlands or salt desert scrublands. Four populations of Payson lupine with about 2,400 individuals were found in pinyon-juniper woodlands in the proposed project area. Three small populations of good neighbor bladderpod totaling about 368 individuals were found in pinyon-juniper woodlands and Wyoming big sagebrush shrublands within the proposed project area.

Potential effects to sensitive plant species are possible under all of the Action Alternatives from ground disturbances during construction. However, the potential for effects would be low with implementation of EPMs. Measures used to avoid and minimize adverse effects include presence of a biological monitor to assist with avoidance of known populations and salvage of topsoil for use in revegetation of disturbed areas.

For the good neighbor bladderpod, all populations identified during the 2014 and 2015 surveys would be avoidable during construction. Because of the proximity to existing structures and access roads, there is some possibility of inadvertent crushing by vehicle or foot traffic, but the on-site biological monitor would avoid/minimize impacts to this species. Potential impacts to

Naturita milkvetch from any of the action alternatives would be about 30 to 70 individuals, which is about 8 to 19 percent of the total population documented within the survey corridor. About 10 to 50 Payson lupine individuals would potentially be impacted by project construction activities. This represents about 0.4 to 2 percent of the total population documented for this species within the survey corridor. Gypsum Valley cateye individuals potentially impacted by the project within the corridor common to all Action Alternatives is about 100 to 200, or about 5 to 11 percent of the total population documented in the survey corridor. One additional population along the Dry Creek Basin realignment (Alternative C) would be impacted. This population has about 115 individuals within the survey corridor, and about 10 percent (about 10 individuals) are anticipated to be impacted during construction.

In summary, effects on sensitive plant species under all of the alternatives would be low with adherence to EPMs, thus this topic is not analyzed in detail in this EA.

### *3.4.8 Socio-Economics and Environmental Justice*

Colorado counties in the proposed project area include Dolores, Montrose, Ouray, and San Miguel. Population centers within about 10 miles of the transmission line include incorporated municipalities (Montrose, Nucla, Naturita, and Dove Creek) and Cahone (unincorporated community). The proposed project area is largely rural and agricultural with few residences. Most of the transmission line corridor (about 72 percent, or 57.4 out of 80 miles) crosses public lands in unincorporated areas, with limited populations. Primary industries and employers in the project area include dryland and irrigated agriculture, mining, and recreation/tourism. Unemployment rates vary from about 4.6 percent to 9.8 percent. Income (per capita personal and household) were lower than state average in Dolores and Montrose counties and higher in San Miguel County (Colorado Department of Labor and Employment Labor Market Information Gateway 2014). For Ouray County, per capita personal income is slightly lower than the state average, while median household income is higher (U.S. Census Bureau 2013a and b; U.S. Bureau of Economic Analysis 2013). Vacant housing for all project area counties except Montrose, Colorado are much higher (about three times the state average), while Montrose County is slightly lower.

An Environmental Justice evaluation was conducted as required by EO12898 and in accordance with Council on Environmental Quality (CEQ) guidance. The evaluation considered both county- and census block- level population data sets. None of the populations of individual minority race categories, two or more races, Hispanic of Latino origin, total minority, or poverty status in project area counties meet the criteria to be identified as environmental justice populations when compared to the State of Colorado (U.S. Census Bureau 2014). Additionally, none of the populations of individual minority race categories, two or more races, Hispanic or Latino origin, total minority, or poverty status in the pertinent block groups meet the criteria to be identified as environmental justice populations when compared to the block groups meet the criteria to be identified as environmental justice populations when compared to the block group's associated county (e.g. block group 1, census tract 1, Dolores County compared to the overall population of Dolores County).

Permanent direct effects to the local economy at a project area scale would be minimal as a result of implementing any Action Alternatives. Existing Tri-State employees would continue to be responsible for operation and maintenance of the transmission line and associated facilities that would be owned by Tri-State. No new permanent employment would be generated, and there

would be no change to existing population levels or additional demands on housing in the proposed project area. The anticipated workforce during construction of the 230-kV transmission line would range from about 40 to 60 workers over one approximately 7-month period in 2017 and one 7-month period in 2018. Given the specialized nature of transmission line construction and the expertise required, the majority of the workers employed for transmission line construction would likely be recruited from outside the local area. There could be a short-term increase in housing demand during construction.

Implementation of Alternative A and Alternative C - Dolores River crossing routing option would result in approximately $90,681,900 (2018 dollars) in construction-related spending (CPUC 2013). Because of the additional cost associated with the Dry Creek Basin routing option (realignment along SH 141), the remaining two combinations including that option would result in approximately $93,681,900 in construction-related spending (2018 dollars). Construction-related spending would generate secondary effects from spending on local goods and services such as restaurants and gas stations. Although the Action Alternatives would increase short-term employment, no substantial change to economic factors from the proposed construction activities or long-term operation of the transmission line would occur. Effects from both Action Alternatives would be short-term and low, thus socio-economics was dismissed from detailed discussion in the EA.

For individual property owners with existing 115-kV transmission line easements, the potential effect to property values from the upgrade would be difficult to quantify but is anticipated to be low. For the Dry Creek Basin realignment option, several private landowners would be affected by new easements and locations for the transmission line. Studies of new transmission line effects to property values are limited, but suggest a potential reduction in sales value of about 2 to 9 percent (Jackson and Pitts 2010). Study results are inconclusive, especially for rural areas. All landowners would be compensated for easements at fair market value.

The proposed realignment in Dry Creek Basin is likely to result in negligible changes in traffic volumes following construction. Currently the average annual daily traffic count (AADTC) for the southern section of SH 141 in the project area is 260 vehicles (CDOT 2015). North of U29 Road, the AADTC on SH 141 increases to 560. Traffic increases to an AADTC of 1,300 vehicles closer to Naturita, most likely from commuter traffic with additional travelers using sections of SH 145 and SH 141 that are designated as scenic highways. Routing the transmission line along SH 141 in the Dry Creek Basin would have negligible impacts to travelers using other sections of SH 145 and SH 141. The realignment also is unlikely to impact current traffic volumes in the project area following construction. No impact to tourism-related spending is anticipated as a result of the proposed realignment in Dry Creek Basin.

Under Alternative B (No Action), ongoing voltage constraints would continue to exist which would affect the reliability of the system for local members as well as result in effects to the reliability of the electrical grid in southwestern Colorado. Tri-State would not be able to effectively provide transmission capacity to serve future residential, commercial, and industrial loads in the proposed project area, which would affect the regional capacity to serve the region.

In summary, socio-economic effects under all of the alternatives would be low; thus this topic is not analyzed in detail in this EA.

### *3.4.9 Wetlands/Riparian Zones*

There are a total of six perennial streams in the proposed project area, as well as a number of unnamed and named intermittent or ephemeral streams, and stock ponds.

Wetlands and riparian areas are very limited within the dry mesas of the Colorado Plateau and lower flanks of the Southern Rocky Mountains. Based on the National Wetlands Inventory (NWI) dataset, there are only a few mapped wetlands within the existing or proposed project ROW (NWI 2014). These include a mixture of herbaceous, shrub, and cottonwood riparian wetlands along streams, agricultural ditches, and stock ponds.

No wetland effects would occur within the areas common to both Action Alternatives. All of the streams within these areas would be spanned by the proposed transmission line and no new access roads are proposed in wetlands. Some existing access roads may require new culverts or low water crossings to replace existing structures in disrepair. Wetlands and waters of the U.S. would typically be avoided. The Dolores River Canyon crossing realignment would span the canyon and would not affect the wetland and riparian areas adjacent to the River. Should unavoidable temporary or permanent effects to wetlands or other waters of the U.S. be identified during final design, appropriate EPMs described in Section 2.3.6.16 would be implemented and a Section 404 wetland permit would be secured from the USACE. Because the potential for wetland effects would be low, and mitigated, this topic was dismissed from detailed analysis in the EA.

### *3.4.10 Wild and Scenic Rivers*

Under the Wild and Scenic Rivers Act of 1968 (WSRA), designated Wild and Scenic Rivers are selected rivers that possess outstandingly remarkable values (ORVs) including scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values to be preserved in their free flowing condition. Under Section 5(d)(1) of the WSRA, federal agencies undertaking management planning are required to assess whether any of the rivers and streams in the planning area would be appropriate for addition to the National Wild and Scenic Rivers System. The existing transmission line and analysis area crosses two substantial rivers, the San Miguel River and the Dolores River. Neither is currently congressionally-designated as Wild and Scenic; however, the 2015 RMP for the Tres Rios Field Office and Record of Decision (BLM 2015) determined that the Dolores River is suitable for Wild and Scenic designation. This river reach contains many ORVs, (including recreation and scenery, fish and wildlife, geology, ecology, and archaeology) has relatively few conflicts between river protection and other uses, and primarily involves federal land (USFS and BLM 2013).

An improvement or reroute of the transmission line across the Dolores River would not directly affect any recreation opportunities, geologic, biological, or archaeological resources, because no surface disturbance is proposed within 0.25 miles of the Dolores River while the effect of any realignment would be similar to the effects of the existing line. Because all of the Action Alternatives would have primarily short-term effects associated with construction and minimal long-term effects on ORVs, the subject of Wild and Scenic rivers is not discussed in detail in the EA.

### *3.4.11 Wildlife – Terrestrial*

The San Miguel and Dolores river canyons provide a combination of vegetation and topography that supports a diverse wildlife community of birds, mammals and reptiles. Forest communities

at higher elevations within the proposed project area are characterized by a mosaic of patchy and intermixed forest types. Pinyon-juniper dominates lower elevation forests. Grassland and shrubland habitats within the proposed project area include mountain shrubland/grassland, and low elevation shrubland/grassland habitat including sagebrush shrubland, semi-desert shrubland, and semi-desert grassland.

The proposed project area provides wintering, summering, and/or production area habitat for mule deer and elk (CPW 2013). CPW-mapped Elk Production Areas, Elk Severe Winter Range, Elk Winter Concentration Areas, Mule Deer Severe Winter Range, and Mule Deer Winter Concentration Range are present in the proposed project area (Table 14, CPW 2013). Many of these habitat ranges overlap with portions of the Uncompahgre Plateau and/or adjacent basins, including Dry Creek Basin and Big Gypsum and Disappointment valleys. Agency guidance on SJNF, TRFO, and portions of the Uncompahgre field office recommend that management activities should be limited or avoided in critical winter range, severe winter range and winter concentration areas for elk and mule deer from December 1 through April 30 (BLM 2015; Guideline 2.4.49). If construction was necessary during winter in elk or mule deer severe winter range or winter concentration areas in the SJNF- or TRFO-managed lands, Tri-State could request a waiver of the timing restrictions in coordination with CPW.

Effects to terrestrial wildlife under all of the Action Alternatives include temporary construction effects from noise and human disturbance and permanent loss of foraging/breeding/wintering habitat where forest habitat is cleared. Wildlife present during transmission line construction would likely move temporarily to other adjacent habitat for protection, cover and feeding. After construction is complete, terrestrial wildlife would resume use of habitat within the proposed project area similar to current use.

Based on the small amount of habitat that would be directly disturbed and the short proposed project duration, transmission line improvement activities would have negligible direct effects on habitat for small mammals and reptiles for both Action Alternatives. Direct effects on big game habitat would be less than 1 percent of the total habitat available within the effected Game Management Units (GMUs) (Table 14). Effects to terrestrial wildlife would be minimized through implementation of EPMs, such as restricting construction during the elk calving season in elk production areas, minimization of vegetation clearing, and implementation of a vegetation management plan. Overall, effects on terrestrial wildlife would be negligible with implementation of EPMs and are not discussed in detail in this EA.

**Table 14. Direct Effects on Big Game Habitat by Action Alternative**

| Big Game Habitat | Habitat Available in GMU (acres) | Alternative A Proposed Action | | Alternative C (Dolores River Crossing Routing Option) | | Alternative C (Dry Creek Basin Routing Option) | | Alternative C (Dolores River Crossing and Dry Creek Basin Routing Options) | |
|---|---|---|---|---|---|---|---|---|---|
| | | Permanent | Temporary | Permanent | Temporary | Permanent | Temporary | Permanent | Temporary |
| | | Acres (% effect to habitat in GMU)* | | | | | | | |
| Elk production area | 194,074 | 10.9 (<0.1%) | 28.5 (<0.1%) | 10.9 (<0.1%) | 28.5 (<0.1%) | 10.9 (<0.1%) | 28.5 (<0.1%) | 10.9 (<0.1%) | 28.5 (<0.1%) |
| Elk severe winter range | 1,127,263 | 136.5 (<0.1%) | 464.9 (<0.1%) | 136.5 (<0.1%) | 464.9 (<0.1%) | 177.7 (<0.1%) | 375.9 (<0.1%) | 177.7 (<0.1%) | 375.9 (<0.1%) |
| Elk winter concentration area | 513,339 | 65.6 (<0.1%) | 97.2 (<0.1%) | 46.7 (<0.1%) | 106.26 (<0.1%) | 72.7 (<0.1%) | 114.6 (<0.1%) | 53.8 (<0.1%) | 123.5 (<0.1%) |
| Mule deer severe winter range | 984,788 | 127.8 (<0.1%) | 335.4 (<0.1%) | 127.8 (<0.1%) | 335.4 (<0.1%) | 169.0 (<0.1%) | 346.8 (<0.1%) | 169.0 (<0.1%) | 346.8 (<0.1%) |
| Mule deer winter concentration area | 518,880 | 100.8 (<0.1%) | 319.5 (<0.1%) | 100.8 (<0.1%) | 319.5 (<0.1%) | 139.3 (<0.1%) | 332.9 (<0.1%) | 139.3 (<0.1%) | 332.9 (<0.1%) |

* Notes: Percentage of effect to habitat available in parentheses. Habitat available is the sum total of the specific habitat type available within the four Game Management Units (GMUs 61, 62, 70, and 711) affected by the alternative. Permanent effects include structures, substations, roads and potential forest clearing within the ROW. Temporary effects include removal of vegetation around structures and displacement from the transmission line ROW and work areas during construction.

## 3.5 Resource Topics Evaluated in Detail

### *3.5.1 Access, Roads, and Transportation*

Access to the existing transmission line is on BLM, USFS, county, state, and private roads. Tri-State currently uses about 241 miles of existing access roads, not counting state highways and including 124 miles requiring agency authorization (includes 6 miles of new access road), for periodic inspection and maintenance of the existing 115-kV transmission line (Table 15). This includes about 45.7 miles of road on BLM land, 78.8 miles on NF, 85.9 miles of county roads, 28.2 miles on private land, and 2.1 miles on state land. About 67 miles of these roads are down-line access roads located below the existing 115-kV line that Tri-State maintains. Tri-State maintains about 34 miles of spur roads outside of the ROW that are typically closed to the public.

Tri-State holds a ROW grant for the portion of the existing transmission line and access roads located on federal lands. The ROW includes roads that cross land administered by the BLM UFO and the BLM Dolores Public Lands Office, the GMUG NF and the SJNF (BLM 2007a). In 2006, an EA was completed (BLM 2006) for the re-authorization of Tri-State's 115-kV transmission line ROW grants and permits, including maintenance of access roads for the transmission line between the Montrose and Cahone substations. The EA included different levels of maintenance depending on the type of access required and the location and condition of the road. Based on the EA, the ROW grant was approved, including the associated POD, in 2007.

The ROW width for existing access roads outside of the transmission line ROW is 30 feet. Access roads are generally "two-tracked," and with relatively level cross-slopes to allow safe travel by trucks with a high center-of-gravity. Roads are typically maintained using native rock and soil found at the site without adding gravel. Over the past decade, Tri-State has inspected the transmission line primarily using all-terrain vehicles (ATVs), although larger vehicles are used for repairs. Vegetation is cleared (as authorized by BLM/USFS) to a minimum width of 15 feet to allow passage by large boom and bucket trucks.

Following re-authorization of the ROW and permits for the transmission line and roads in 2007, Tri-State has implemented minor road maintenance work.

**Table 15. Existing Roads used for Accessing Tri-State's MNC Transmission Line**

| Land Ownership | Miles | Percent of Total Road Length |
|---|---|---|
| BLM Uncompahgre Field Office | 25.2 | 10% |
| BLM Tres Rios Field Office | 20.5 | 9% |
| Uncompahgre National Forest | 42.2 | 18% |
| San Juan National Forest | 36.6 | 15% |
| State of Colorado (Dry Creek Basin State Wildlife Area [SWA]) | 2.1 | 1% |
| County | 85.9 | 35% |
| Private | 28.2 | 12% |
| TOTAL | **240.7** | **100%** |

The BLM and USFS manage access and transportation on federal lands for a variety of motorized and non-motorized activities including recreation, livestock, wildlife management, resource exploration and development, and utilities and transmission lines in accordance with travel management plans. The portion of the transmission line located in SJNF is administered under the Boggy-Glade Travel Management Plan (USFS 2011). The Uncompahgre Travel Plan (USFS 2000) provides management direction for roads in the GMUG NF. Forest Service roads consist of NFSRs open to the public, NFSR administrative roads closed to the public, and special use routes that include downline access roads under the transmission line and other spur roads used for transmission line access that are also closed to public access. The Resources Management Plan Amendment/EA (BLM 2009) addresses management of motorized and mechanized travel on public lands administered by the UFO. Travel management for roads in the TRFO is managed under the current LRMP (USFS and BLM 2013; USFS 2013; BLM 2015).

Both federal agencies routinely maintain roads in accordance with designated uses. BLM and USFS road maintenance levels and objectives vary with the road type and anticipated vehicle types, and include paved roads accessible by all vehicles, gravel-surfaced roads, and native surface roads. Native surface roads are typically suitable for high clearance vehicles. Roads used by Tri-State for transmission line access includes both roads open to the public and administrative roads that are closed to public access. Tri-State maintains transmission line access on BLM and NFSRs in accordance with the five maintenance levels approved by the 2007 ROW grant. Maintenance levels vary from roads in good condition with minimal maintenance required to those requiring grading, drainage, and vegetation clearing to provide vehicle access. Tri-State maintenance level classifications differ from those used by the USFS and BLM, but, in general, include a similar range of maintenance actions. Many currently-maintained roads are in poor condition and present a safety concern; in particular, the access to the north rim of the Dolores River crossing.

County- and state-owned roads are maintained by these agencies in accordance with the designated road classification and traffic. Tri-State use of county and state roads follows applicable permitting requirements. Private roads used by Tri-State are maintained by Tri-State in accordance with easement agreements with the landowner.

There are no Roadless Areas or Scenic Byways in the proposed project area. The Horsefly Canyon Roadless Area is southeast of the existing transmission line corridor.

### *3.5.2 Cultural Resources*

Section 106 of the NHPA of 1966 as amended and its implementing regulations under 36 CFR 800 require all federal agencies to consider effects of federal actions on historic properties. Historic properties are those cultural resources that are either listed or eligible for listing on the National Register of Historic Places (NRHP).

During the Section 106 review, the federal agency considers effects on historic properties within the area of potential effect (APE). The APE is defined as "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist (36 CFR 800.16)." For the Tri-State transmission line, the APE for cultural resources was established as a 200-foot survey corridor centered on the existing transmission line and 50 to 100 feet for access roads, depending on the agency jurisdiction of the access road (Reed et al. 2014). An agency may use the NEPA process to fulfill its obligations under Section 106 of the NHPA (36 CFR800.8{c}). The standards for identifying and

considering potential effects are the same as those provided under the 36 CFR regulations, including consulting with Native American tribes to identify traditional cultural properties, which can include entire landscapes, traditional gathering places, and other aspects of cultural significance.

Cultural resources can take the form of a building, structure, object, or site and can include districts, cultural landscapes, and traditional cultural properties. The NPS has established an age criteria guideline of 50 years in order for a cultural resource to be evaluated as potential historic property (but see criteria consideration (g) for exceptions to the age criteria). The NRHP defines an archaeological site as "the place or places where the remnants of a past culture survive in a physical context that allows for the interpretation of these remains" (Little et al. 2000). Within the context of the proposed project, all potential historic properties are archaeological sites.

#### *3.5.2.1 Cultural History*

The cultural context provided below is intended to provide the reader with a basic overview of the cultural history of the northern and southern Colorado River basins, which encompass the proposed project area. The reader should refer to *Colorado Prehistory: A Context for the Northern Colorado River Basin* (Reed and Metcalf 1999) and *Colorado Prehistory: A Context for the Southern Colorado River Basin* (Lipe et al. 1999) for in depth overviews. The historic era is summarized under *Colorado History: A Context for Historical Archaeology* (Church et al. 2007).

##### **3.5.2.1.1 Prehistoric Era**

The Paleoindian period covers the time from about 13400 before present (B.P.) to 7500 B.P. Paleoindian hunter-gatherers were highly mobile, leaving few cultural imprints on the landscape. Subsistence strategies focused on big game, which included now-extinct megafauna such as mammoth and *Bison antiquus*. Evidence for Paleoindian use of the proposed project area has not been documented.

The Archaic Stage (7500 B.P. to 2000 B.P.) is a temporally extensive period marked by broad spectrum hunting and gathering. Aside from a decreased emphasis on large game and an increased emphasis on the gathering and processing of vegetal food, as evidenced by ground stone in the archaeological record, settlement strategies appear to have remained similar to that of the late Paleoindian era when "settling in" to the local landscape took place.

The Formative Era (2400 B.P. to 700 B.P.) is a period when horticulture became a major subsistence focus in western Colorado. The Fremont practiced horticulture in far northwest Colorado and into Utah, and evidence of Ancestral Puebloan use extends from southwest Colorado, but was of limited intensity and is restricted to the area associated with the Dolores River drainage. The Formative Era saw the introduction of the bow and arrow and distinctive ceramic traditions. Structures generally became more permanent, and rock art was a major ideological element (Reed and Metcalf 1999).

The Protohistoric Era (700 B.P. to 200 B.P.) begins with the end of horticultural subsistence practices of the Formative Era and ends with the expulsion of the various Ute bands to reservations. The primary group to occupy the northern Colorado River Basin was the Numic-speaking Ute. Before contact with the Spanish in the early 1600s, the Ute were mobile hunters and gatherers who constructed wickiups for shelter, produced a particular brown-ware ceramic

tradition (Uncompahgre brown-ware), and crafted small side-notched (Desert) and unnotched triangular (Cottonwood) projectile points (Reed and Metcalf 1999).

#### 3.5.2.1.2 Historic Period

Historic settlement of western Colorado occurred during the early 1800s with the arrival of government survey expeditions. Fur trappers and traders had entered the area shortly after Anno Domini (A.D.) 1800. The Colorado Territory was established in 1861. With the relocation of the Ute to reservations in 1881, Euroamerican settlers built towns and established mineral mines and lumber mills. Land was cleared for crop cultivation, cattle ranchers moved into the area, and railroads were eventually built to move goods in and out of the region. Sheep and cattle herding became the dominant industry in the early 1900s in west-central Colorado. Historic occupation of the Dry Creek Basin has been limited to homesteading, mining, and livestock grazing. Carnotite ore was first mined in 1919 as part of the Uravan Mining Belt. Oil and gas exploration began in 1948 and continues to the present day (Paulson and Baker 2006).

### *3.5.2.2 File and Literature Review*

The file search was conducted through federal agency records and through the Colorado Office of Archaeology and Historic Preservation. A total of 93 previously conducted surveys occur within 300 feet of the transmission line centerline, including the previous survey project for Tri-State's 115-kV Montrose to Cahone transmission line (McGuire 2004; Reed et al. 2014). Those previous surveys identified 142 previously recorded cultural resources within 300 feet of centerline and along access roads. Of those, 127 previously recorded cultural resources occur within the APE for cultural resources (Reed et al. 2014).

### *3.5.2.3 Summary Findings*

Cultural resource inventory undertaken by Alpine Archaeological Consultants (Alpine) included 79.5 miles of transmission line ROW and 16.5 miles of associated access roads. Inventory took place on public lands managed by the BLM TRFO and UFO, SJNF and GMUG NF land, CPW land, and privately owned lands (Reed et al. 2014).

The cultural resource inventory resulted in documentation and evaluation of 142 cultural resources within the APE. Of the 142 cultural resources, 54 are "historic properties"—a formal term that denotes eligible or potentially eligible resources for listing on the NRHP. The "historic properties" would require an assessment of proposed project effects resulting from the undertaking (Reed et al. 2014). The technical report for the project is the vehicle for evaluating cultural resources for significance and assessing overall project effects to historic properties, and the Memorandum of Agreement (MOA) is the vehicle for resolving adverse effects to historic properties.

Of the 142 evaluated cultural resources, 124 are prehistoric including 96 open lithic scatters, 22 open camps, and 6 quarry sites. Historic sites include 4 artifact scatters, 2 roads, and 2 arborglyphs—also called "aspen art" or carvings in aspen trees (Reed et al. 2014).

## *3.5.3 Forest and Timber Resources*

Timber management and harvesting is a tool used for managing ecosystem diversity, forest insect and disease populations, tree growth and yields, recreation settings, wildlife habitat, and wildfire hazard. Timber harvesting provides forest products that may help support local wood processing industries and associated communities.

Identification of lands suitable for timber production is one of the key elements of forest plans and delineates where timber production may occur on NFS lands. Timber harvests may also occur on other lands. "Other lands" is a classification regarding lands where commercial timber production is not compatible with desired conditions and objectives, but that are physically capable and administratively available, for purposes other than the production of wood fiber (e.g., hazardous fuels reduction, ecosystem restoration, visuals, scenic vistas, and habitat improvement). Lands not suitable for timber harvest, due to various physical and administrative factors (i.e., slope, soil characteristics, productivity, and/or administrative withdrawals) are also identified.

Currently, approximately 17,800 acres (42 percent) of the NFS lands on the GMUG NF and 11,100 acres (49 percent) on the SJNF within the planning area (two miles each side of the existing transmission line) are identified as suitable timberland. On the GMUG NF, forests are categorized as suitable or nonsuitable, with the "suitable" category further subdivided into aspen or conifer resources. The SJNF timber classification includes "suitable," "tentatively suitable," and "generally unsuitable" categories. Timber harvesting or thinning on BLM-managed lands occurs primarily in the ponderosa pine vegetation community type (see the Character Regions Section 3.5.7.3) and is seldom commercial in nature.

Past timber harvesting and fire suppression are the principal factors that have influenced forest vegetation throughout the proposed project area. That is, the majority of forest vegetation types are in the mature stage due to lack of disturbance (e.g., fire or harvesting) with dense stand conditions. At the same time, areas that have been treated (i.e., thinned or harvested) more recently may not be available for harvesting activities in the near term.

Dense stand conditions found in the proposed project area are vulnerable and have been recently subjected to significant levels of insect and/or disease attack. High levels of mortality have occurred, or are ongoing, in all but the ponderosa pine vegetation type described in the Character Regions Section (3.5.7.3). Timber management is generally not effective in stopping or inhibiting ongoing insect epidemics, but may be used to alter stand conditions in order to reduce ongoing insect and disease activity, as well as the risk for future outbreaks. Timber management trends in recent years have been to restore timber stands to conditions more resilient to insect outbreaks, disease, and catastrophic wildfire.

Long-term drought conditions have facilitated insect- and disease-related effects on timber resources and are associated with declining forest health in all forest vegetation types. In general, silvicultural prescriptions have been designed in recent years to favor drought-resistant species (e.g., ponderosa pine) while focusing removal of drought-susceptible species (e.g., white fir). Additionally, forest thinning projects have been implemented, particularly in lower-elevation areas, to substantially reduce tree densities and improve forest health.

Within the proposed project area, timber management (i.e., demand for timber resources) is largely dependent on the Colorado timber industry. The demand for timber resources, particularly demand for conifer-based products, has decreased in recent years. At the same time, the capacity of the timber industry has declined with recovery of the industry expected to be slow. Further reductions in the industry may severely decrease demand for timber resources and restrict timber management as a tool used to accomplish desired changes in vegetation conditions (USFS and BLM 2013; USFS 2013; BLM 2015).

In contrast to the conifer-based product industry, the aspen-product industry has remained relatively stable. Aspen has been managed throughout the proposed project area for over 60 years. Many of the aspen stands thinned or harvested in the 1940s and 1950s are approaching maturity (USFS and BLM 2013; USFS 2013; BLM 2015).

### *3.5.4 Geology*

#### *3.5.4.1 Geology*

The proposed project area is within the Colorado Plateau physiographic region, a high desert of relatively undeformed flat-lying rocks with deeply incised canyons. The north end of the proposed project area is on the east side of the Uncompahgre Plateau, a large northwest-southeast-trending upland dome of sedimentary rocks underlain by Precambrian granite. The existing transmission line crosses through the Cretaceous Dakota and Burro Canyon formations and Mancos Shale and the Jurassic Brushy Basin Member of the Morrison Formation as it passes over the plateau. On the west side of the plateau the transmission line crosses drainages with exposures of the Jurassic Summerville and Entrada formations and the Salt Wash and Brushy Basin Members of the Morrison Formation. The transmission line heads south from the Nucla substation, continuing in the Dakota and Burro Canyon formations, with exposures of the Brushy Basin Member of the Morrison in drainages. It then crosses the Mancos Shale in Dry Creek Basin and runs up the northeastern edge of the northwest-southeast-trending Disappointment Valley, a collapsed salt dome anticline overlain primarily by the Mancos Shale. The line runs above the east side of the Dolores River through the Morrison, Burro Canyon, Dakota, and Mancos Shale Formations, crossing over Dolores Canyon and continuing across the same formations, with some Quaternary eolian (windblown) deposits, to the terminus at the Cahone substation.

There are no known metallic mineral resources, coal-bearing formations, or other industrial mineral deposits near the study area (Colorado Division of Reclamation, Mining, and Safety [CDRMS] 2014). Eight producing oil and natural gas wells and one plugged and abandoned well are within 0.25 miles of Proposed Alternatives (Colorado Oil and Gas Conservation Commission [COGCC] 2014).

#### *3.5.4.2 Geologic Hazards*

Geologic hazards of potential concern in the proposed project area include landslides, corrosive soils, shallow bedrock, expansive soils and bedrock, faults and folds, and seismicity.

Landslides are the downward and outward movement of earth materials on a slope. Because records for historical landslides are limited, the most important factor in evaluating the landslide hazard is susceptibility. The United States Geological Survey (USGS) ranked areas throughout the nation into low, moderate, and high susceptibility areas, based on the soil/rock types, slope angles, precipitation, and other factors (Radbruch-Hall et al. 1982, Godt 2001). According to the USGS map, areas with a high susceptibility for landslides have been identified throughout the proposed project area, especially in areas with steep slopes or crossed by canyons. Landslides are a primary concern and the focus of the analysis in Section 4.

Corrosive soils are a concern because of their potential effects on buried infrastructure, such as metal transmission poles and guy wires. Soil corrosion is an electrochemical process that is responsible for the corrosion of metals in contact with soil. Soils with high moisture content,

high electrical conductivity, high acidity, and high dissolved salts would be most corrosive. Potentially corrosive soils have been identified throughout the proposed project area. Construction in corrosive soils would need to be managed at a greater level of detail through the structural engineering design process.

Shallow bedrock in the proposed project area is defined as competent bedrock (solid rock that underlies unconsolidated deposit which displays limited evidence of weathering throughout the rock mass) that is less than 79 inches (201 centimeters) from the ground surface. Areas with shallow bedrock could create difficulties with installing transmission line poles and excavating substation foundations. Areas of shallow bedrock have been identified throughout the proposed project area. Construction in areas of shallow bedrock would need to be managed at a greater level of detail through the structural engineering design process.

Expansive soils and bedrock, geologic faults, and seismic hazard areas are either stable in the proposed project area or limited in extent (Hart 1974; Morgan et al. 2014; USGS 2014). Expansive soils within the project area can be found in Mancos Shale bedrock or soils derived from Mancos Shale as well as the Morrison Formation. Construction in expansive soils would need to be managed at a greater level of detail through the structural engineering design process.

### *3.5.5 Soils*

Soils in the proposed project area developed in a range of various land forms including plateaus, rolling mountains, alluvial plains, and canyons (see Table 16). Parent material is primarily interbedded layers of sandstone and shale, with areas of igneous rock, volcanic ash, and other sedimentary rock. Soils in the proposed project area consist mainly of residuum from weathering of parent bedrock material with colluvium along and below steep slopes and alluvium at the toes of slopes, on alluvial fans, and along drainages. Soils derived from eolian blown soil material are also present.

**Table 16. General Soil Characteristics by Land Form**

| Land Form | General Soil Description |
|---|---|
| Mesas | Formed in alluvium, residuum and eolian material derived dominantly from sandstone, shale and a few areas of igneous rocks |
| Canyons | Formed in residuum and colluvium material derived from sandstone and shale with around 40 percent being rock outcrop of exposed sandstone, found on sloping to very steep mesa edges, on terraces and landslides |
| Mountains | Formed in residuum, alluvium, colluvium, glacial drift and landslide material derived dominantly from sandstone, shale and mixed sources |
| Valleys | Formed in alluvium derived from shale |

Source: Natural Resource Conservation Service (NRCS) 1995 and 2003.

Deeper soils are found on alluvial valley floors such as the Dry Creek Basin and Disappointment Valley, with shallow soils present on steep mesa and mountain side slopes. Slopes range from near zero in alluvial plains to near-vertical in Dolores Canyon and plateau sideslopes. Soil textures derived from shale parent material are typically loams, clay loams, and silt loam, with sandy loams dominant where sandstone is the parent material. Soils in the proposed project area support a variety of native vegetation communities including forests, pinyon-juniper woodlands,

shrubland, and rangelands that provide forage for livestock grazing and wildlife. Soil productivity varies depending on soil depth, texture, moisture holding capacity, depth to rock, slope, topographic aspect, precipitation, and land use. Revegetation of disturbed areas depends on soil depth and texture, slope, organic matter content, rock content, and other chemical and physical properties

Previous soil disturbances in the proposed project area include road construction, mineral exploration, oil and gas well pads, timber harvesting, scattered commercial and residential developments, existing transmission lines and pipelines, agricultural activities, and other land use development. Accelerated erosion is currently a concern near the existing transmission line structure on the south rim of Dolores Canyon where steep unstable slopes are severely eroded.

### *3.5.6 Threatened, Endangered, or Candidate Animal Species*

Species listed as threatened and endangered species are protected under the ESA, as amended. The ESA requires the BLM and the USFS to ensure that any actions it approves will not jeopardize the continued existence of a threatened or endangered species or result in the destruction or adverse modification of critical habitat. The USFWS Information, Planning, and Conservation System (IPaC) lists 14 species which could occur in the proposed project area vicinity (USFWS 2014a; Table 17). Of these, USFS and BLM biologists determined that only Mexican spotted owl, GuSG, and Canada lynx potentially occur in the proposed project area. There is no suitable habitat for the western yellow-billed cuckoo in the proposed project area, and the nearest proposed critical habitat is about 4 miles from the north end of the proposed project area. The proposed project area is outside of the habitat range for the New Mexico meadow jumping mouse.

No construction activities are anticipated in habitat suitable for the four Colorado River endangered fish species and greenback cutthroat trout. This project falls under BLM Colorado's Programmatic Biological Assessment (PBA) for water depleting activities (excluding fluid minerals development) on BLM lands in the Colorado River basin in Colorado (BLM 2008). In response to BLM's PBA, the USFWS issued a Programmatic Biological Opinion (PBO) (ES/GJ-6-CO-08-F-0010) on February 25, 2009. Water depletions associated with dust suppression will require less than 100 acre-feet (AF). The PBO issued by the USFWS determined that relatively small water depletions (less than 100AF) would avoid the likelihood of jeopardy and/or adverse modification of critical habitat for depletion impacts to the Upper Colorado River Basin. EPMs for all species will be adhered to (see Table 8 and Table 9). In addition, Tri-State would implement the GuSG Conservation Strategy presented in Appendix B (Biological Protection Measures) of the POD. The western yellow-billed cuckoo, fish species, and jumping mouse are not discussed further. For simplicity, scientific names are included in Appendix B, and not in the body of the EA.

**Table 17. Federally Listed Animal Species Occurring in the Proposed Project Area or Potentially Affected by Project Activities**

| Common Name | Federal Status | Habitat Description | Potentially Occurring in Proposed Project Area? | Critical Habitat in Proposed Project Area? |
|---|---|---|---|---|
| Gunnison sage-grouse | Threatened | Sagebrush communities (especially big sagebrush) for hiding and thermal cover, food, and nesting; open areas with sagebrush stands for leks; sagebrush-grass-forb mix for nesting; wet meadows for rearing chicks | Yes | Yes |
| Mexican spotted owl | Threatened | Mixed-conifer forests and steep-walled canyons with minimal human disturbance | Yes | No |
| Canada lynx | Threatened | Spruce-fir, lodgepole pine, willow carrs, and adjacent aspen and mountain shrub communities that support snowshoe hare and other prey | Yes | No |

#### *3.5.6.1 Gunnison Sage-Grouse*

On November 12, 2014, the USFWS issued a final rule that listed the GuSG as threatened under the ESA in addition to designating critical habitat (FWS-R6-ES-2012-0108). GuSG inhabit sagebrush ecosystems in southwestern Colorado and southeastern Utah. The regulatory setting, including BLM and CPW guidelines, are provided in Section 1.7.1.

This ground-dwelling bird is approximately one-third to one-half the size of a domestic chicken. Each spring, GuSG perform elaborate mating displays in an area known as a lek. Leks are typically small open areas adjacent to sagebrush. Good nesting and brood rearing habitat requires sagebrush with sufficient canopy cover as well as substantial grasses and forbs in the understory. In a study by CPW, 85.2 percent (n = 69/81) of all GuSG nests were located within 4 miles from the lek (GuSG Rangewide Steering Committee [RSC] 2005). Nesting season typically begins in April and continues into July (USFWS 2014b). Approximately 4,000 GuSG exist across seven populations. About 87 percent of these birds belong to the Gunnison Basin population. The other six populations account for the remaining 13 percent of the total population.

In the final rule for listing GuSG as a threatened species (79 FR 69192), the USFWS identified the most substantial threats as small population size and structure, drought, climate change, and disease. Other threats to GuSG to a lesser degree or in localized areas include grazing practices inconsistent with local ecological conditions, fences, invasive plants, fire, mineral development, pinyon-juniper encroachment, large-scale water development, predation primarily in association with anthropogenic disturbance, and habitat decline due to human disturbance. Avian predators, such as eagles, hawks, and common ravens and other corvids, frequently forage on the young, eggs, and adults of many animals, including sage-grouse (Schroeder and Baydack 2001). Raven populations in desert environments are increasing (Sauer et al. 2008) and, therefore, pose an

increased threat to sage-grouse nest success. In general, sage-grouse that nest within or near areas with unnaturally high raven numbers may be especially vulnerable to nest depredation. Ravens commonly select man-made features, such as tall structures (e.g., transmission line towers), for building nests (Knight and Kawashima 1993; Knight et al. 1995; Coates et al. 2014; Howe et al. 2014; Bui et al. 2010).

The Monticello-Dove Creek and San Miguel Basin GuSG populations are the two distinct populations with both occupied and critical habitat within or near the proposed project area (see Figure 23). Occupied habitat for the Monticello population is generally located between Dove Creek, Colorado and Monticello, Utah. Areas of unoccupied habitat near Dove Creek were designated as critical habitat by the USFWS because these areas are important to the recovery of the Monticello-Dove Creek population but need additional management. The area is characterized by varying topographies, habitat types, precipitation amounts, and elevations. The southern end of the proposed project area is along the eastern border of critical habitat for the Monticello-Dove Creek population of GuSG. The critical habitat for the Monticello-Dove Creek population of GuSG is classified as unoccupied, and the proposed project area is highly degraded or surrounded by degraded habitat that lacks habitat components for GuSG. Much of this area consists of an existing substation, paved roads and other man-made structures that are not considered critical habitat. The Federal Register (FR) Final Rule Notice designating critical habitat for GuSG states: "In all other areas, lands covered by buildings, pavement, and other manmade structures, as of the effective date of this rule, are not included in this designation, even if they occur inside the boundaries of a critical habitat unit, because such lands lack physical and biological features essential to the conservation of Gunnison sage-grouse, and hence do not constitute critical habitat as defined in section 3(5)(A)(i) of the Act."

The San Miguel Basin supports six subpopulations of GuSG, including the Dry Creek Basin subpopulation. In 2001, CPW researchers estimated 392 total birds inhabited the San Miguel Basin, decreasing to 186 birds in 2013. A portion of the proposed project area crosses occupied habitat of the Dry Creek Basin subpopulation, some of which has been designated as critical habitat (Figure 23, USFWS 2014c). Some private lands within occupied habitat were excluded from critical habitat designation because landowners had enrolled in a Candidate Conservation Agreement with Assurances (CCAA) prior to the "threatened" listing of the species. By enrolling into a CCAA, the landowners agreed to comply with or implement conservation measures that would provide direct GuSG population and habitat conservation benefits sufficient to preclude designation as critical habitat. The Dry Creek Basin currently supports one known active lek about 4 miles west of the existing transmission line. GuSG were first surveyed in the Dry Creek Basin in 1959 with nine birds recorded at the Nelson Creek lek. Reliable and consistent data was not collected in the Dry Creek Basin again until 1992 (Phillips 2014). Since then, surveys and monitoring show that GuSG population numbers in the Dry Creek Basin are declining. The spring 2014 GuSG population estimate for the Dry Creek Basin was fewer than 70 individuals. In 2014 CPW augmented the existing population with an additional 29 birds from the Gunnison Basin. In 2015, CPW again augmented the population releasing birds from the Gunnison Basin on both sides of SH 141 (Phillips 2015).

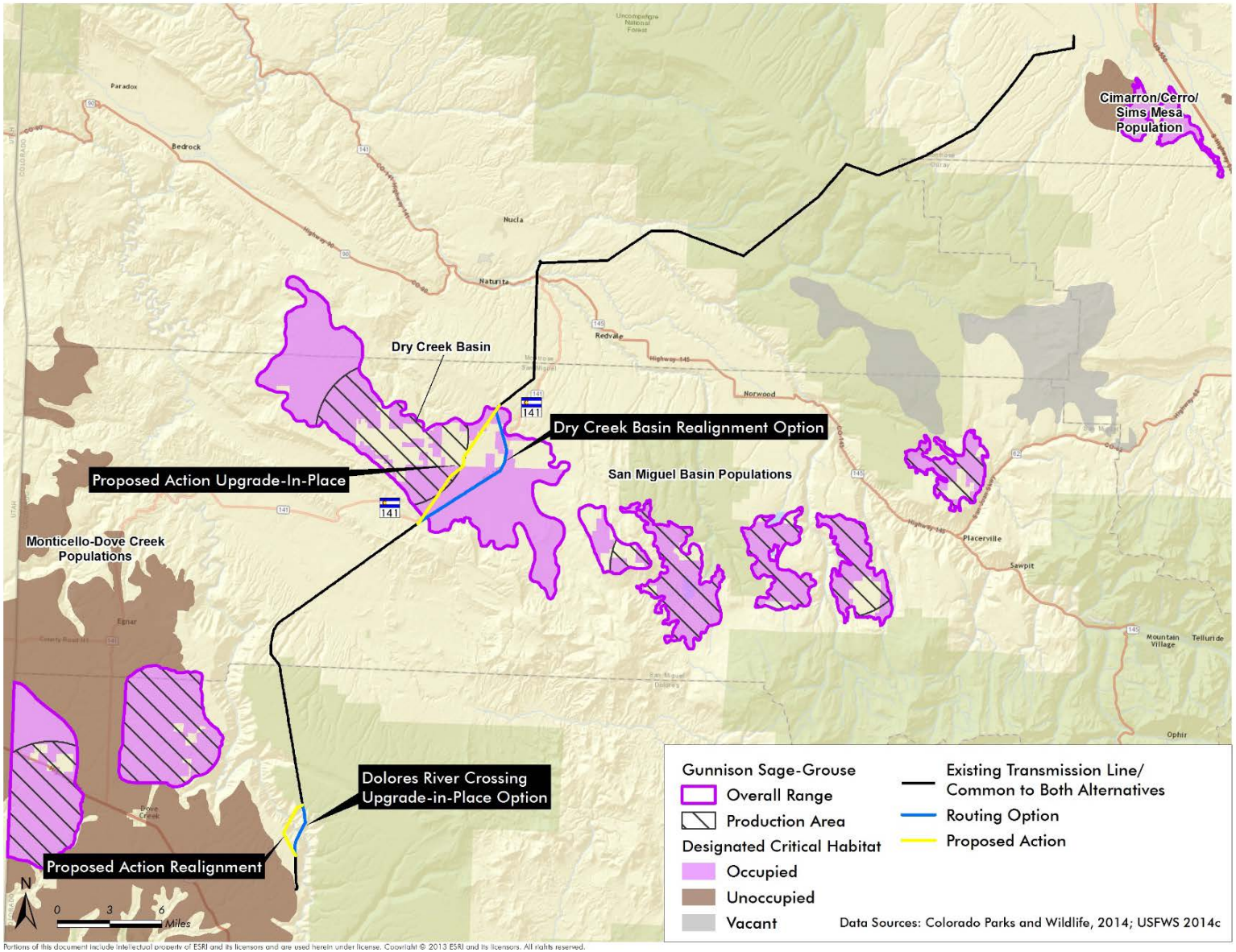


**Figure 23. Gunnison Sage-Grouse Range and Habitat in the Proposed Project Vicinity**

GuSG require large contiguous areas of undisturbed or minimally disturbed sagebrush habitat for long-term persistence. The birds exhibit site fidelity (or the tendency to continually return to the same geographical areas) to seasonal habitats, although habitat quality can vary depending on annual precipitation and drought conditions. Seasonal habitats are largely defined by vegetative cover percentage and type and localized water regimes.

Lek habitat is generally present in areas where the vegetation is low/clear with adjacent sagebrush. Other seasonal habitats such as breeding and summer-fall habitat typically exist within four or more miles of an active lek.

GuSG are surveyed and monitored annually in the Dry Creek Basin. However, seasonal habitat for the species has not been mapped in the Dry Creek Basin. As a result, seasonal habitat use data is incomplete and specific threats and stressors to the GuSG in the Dry Creek Basin are difficult to quantify. Lek surveys and presence-absence surveys, conducted in compliance with USFWS, CPW, and BLM survey protocols, were completed within 1.25 miles of each side of the proposed project area in spring 2014. No GuSG or signs of the species were detected during the surveys. Although GuSG were not observed in the Dry Creek Basin during the lekking season, they may use the habitat in the proposed project area occasionally at other times of the year.

The Dry Creek Basin is generally characterized by large expanses of desert scrub and sagebrush habitat, minimal precipitation, and multiple land uses including agriculture (farming and ranching), industrial, and an SWA. Existing human disturbance consists of the existing transmission line built in 1958, SH 141, county and dirt roads, oil and gas wells and pipelines, and farm/ranch buildings and activity (Figure 24). To develop Figure 24, aerial photographs were reviewed in the Dry Creek Basin, a distance of 1 mile surrounding the existing transmission line, permitted access roads for the transmission line, and SH 141. Many of these human disturbances include or are associated with linear footprints or physical infrastructure that decrease habitat effectiveness, such as highways and roads, overhead power lines, and oil and gas well pads. Habitat effectiveness is defined as the percent of area or percent of time that habitat is fully usable by a species (Lyon and Christensen 1992). Decreased habitat effectiveness is the indirect habitat loss that occurs when wildlife avoid areas immediately adjacent to a disturbance or physical infrastructure that extends beyond the physical footprint of individual projects.

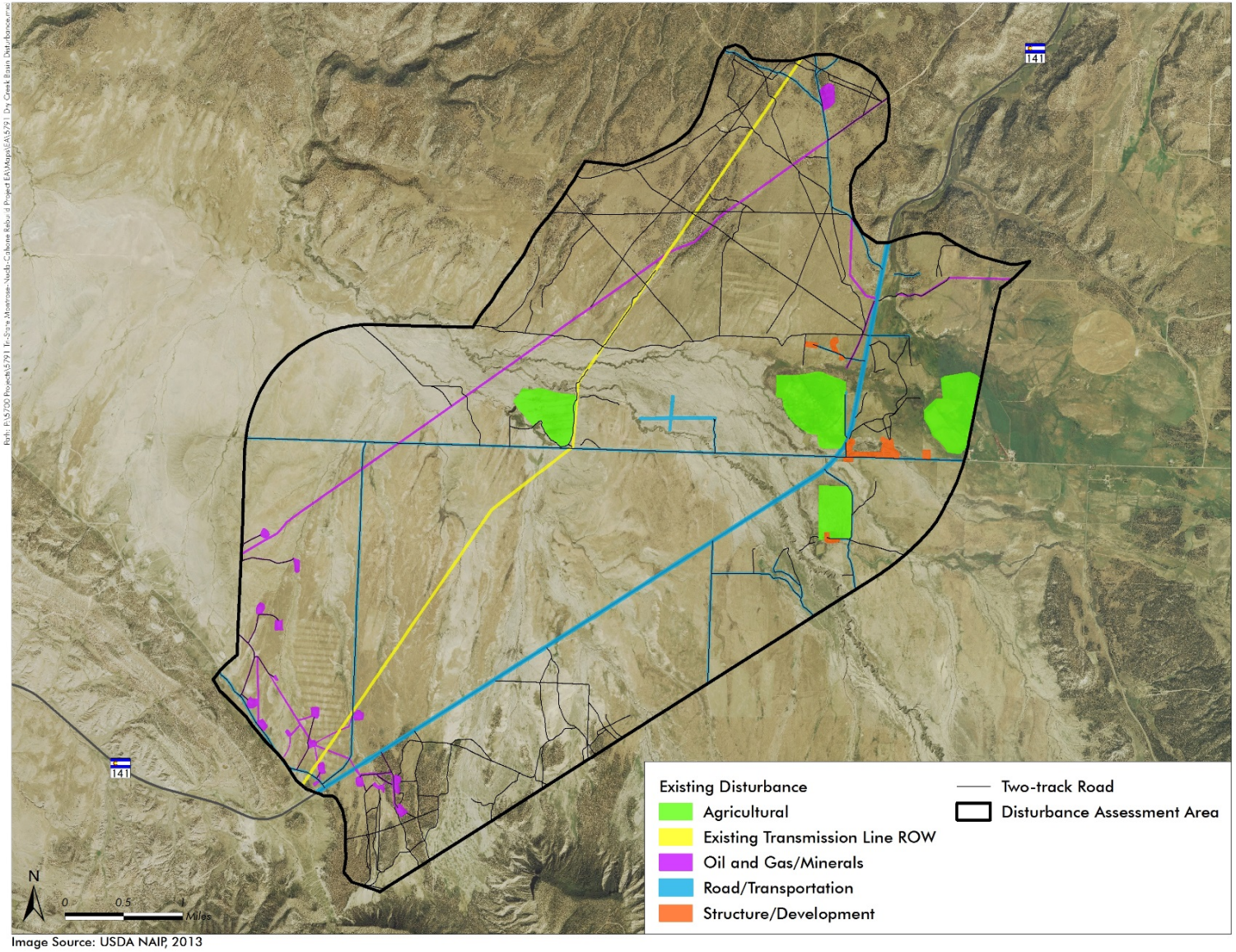


**Figure 24. Existing Disturbance in the Dry Creek Basin**

#### *3.5.6.2 Mexican Spotted Owl*

Mexican spotted owls inhabit canyons with mature trees and complex rock outcrops with vertical stratification. The owls hunt exclusively at night and prey primarily on rats, mice, voles, bats, birds, and reptiles. In 1993, Mexican spotted owls were listed as federally threatened under the ESA, as amended (16 U.S.C. 1531 et seq.; 58 FR 14248). Critical habitat for the Mexican spotted owl was designated in 2004 on federal lands in Arizona, Colorado, New Mexico, and Utah. No critical habitat was designated on the BLM UFO and TRFO or the SJNF and GMUG NF. No Mexican spotted owl Protected Areas of Concern (PACs) exist in the proposed project area.

The Dolores River Canyon and associated side drainages support potentially suitable Mexican spotted owl habitat. The canyon contains densely forested mixed-conifer stands, complex rock outcrops, steep cliffs, and cool, moist microclimates, which Mexican spotted owls prefer for nesting, roosting, and foraging. Surveys of suitable habitat in the entire proposed project area were completed in the Dolores Canyon in 2012, 2013, and 2014 in compliance with USFWS species-specific protocol (USFWS 2012a). No Mexican spotted owls were detected during any of the three years of surveys. According to USFWS protocol, potential spotted owl habitat can be considered unoccupied for up to five years if no spotted owls are detected within two consecutive years of surveys (USFWS 2012a). Surveys for Mexican spotted owls were conducted within the proposed project area in 2012 and 2013 for a 3D seismic project (Dunmire per. comm. 2014) and expanded in 2014 specifically for transmission line improvements (Appendix A). No Mexican spotted owls were detected in the proposed project area during these three consecutive years of surveys.

#### *3.5.6.3 Canada Lynx*

The Canada lynx is a secretive forest-dwelling cat that inhabits much of Canada, the forests of the northern U.S., and subalpine forests of the central and southern Rocky Mountains (Fitzgerald et al. 1994). Colorado is the southernmost distribution of the lynx (Fitzgerald et al. 1994). The Canada lynx was federally listed as threatened in 2000 (65 FR 16052). In 2014, the USFWS revised the definition of the Distinct Population Segment of Canada lynx listed as threatened to extend throughout the lower 48 states to encompass lynx wherever they are found (79 FR 35303). Detailed information about Canada lynx status, including critical habitat designation, can be found in the Federal Register published on June 20, 2014 (79 FR 35303).

Lynx habitat is generally described as climax boreal forest with a dense understory of thickets and windfalls (DeStefano 1987). In the southern Rockies, primary lynx habitat is found in the subalpine and upper montane forests between 8,000 and 12,000 feet (Interagency Lynx Biology Team [ILBT] 2013). Subalpine forest habitat is dominated by subalpine fir and Engelmann spruce, while the upper montane forest supports lodgepole pine and aspen. Lower elevation montane forests of ponderosa pine, Douglas fir, and riparian corridors provide connective habitat that may facilitate dispersal and movement between primary habitats and provide additional foraging opportunities (Lynx Biology Team 2000). Lynx habitat in Colorado is naturally fragmented by elevation, dry south and west exposures, alpine tundra, open valleys, and shrubland (McKelvey et al. 2000).

In 2008, all forest plans in the southern Rockies were amended to add objectives, standards, and guidelines to conserve Canada lynx while implementing a variety of resource management

programs and activities (USFS 2008). The Southern Rockies Lynx Amendment (SRLA) includes the applicable or similar conservation measures for Canada lynx from the Canada Lynx Conservation Assessment and Strategy (LCAS) which was developed to provide a consistent and effective approach to conserve Canada lynx on federal lands in the conterminous United States. The SRLA (through incorporation of the LCAS) indicates that project planning should evaluate the effects to lynx habitat within designated Lynx Analysis Units (LAU) that are generally greater than 25,000 acres in the Southern Rocky Mountain Geographic Area. LAUs do not represent actual lynx home ranges, but their scale approximates the size of an area used by an individual lynx. Approximately 752,435 acres of suitable lynx habitat and 24,479 of unsuitable habitat (habitat in the stand initiation stage) are currently mapped across the SJNF. The majority of primary lynx habitat is located in subalpine forests in designated wilderness areas (Lizard Head, Weminuche, and South San Juan) and other protected areas (BLM 2015; USFS 2013). The proposed project area does not include any LAUs on the SJNF.

In the GMUG NF, the proposed project area includes portions of two LAUs: Spring Creek and Traver Mesa. Habitat within these two LAUs has been classified as suitable, unsuitable, or is not mapped (Table 18). Most of the transmission line corridor was excluded from habitat type designation. Habitat within the existing ROW in the LAUs is mostly unsuitable or is not mapped. Unmapped habitat is assumed to be unsuitable given that it is in mountain grassland areas or within the existing ROW and subject to vegetation management (i.e., tree removal and debris clearing). The project area is generally below the elevation range for Canada lynx and does not contain the boreal forest habitat typically associated with the species. The forested stands within the project area are generally low density and are not likely to support snowshoe hare populations, the primary prey species. While sagebrush communities adjacent to or integrated with coniferous or conifer/aspen stands may provide an important alternate prey resource for lynx (e.g., jackrabbits) (ILBT 2013), suitable denning habitat does not exist within the project area, and the project area is not located adjacent to suitable lynx denning or foraging habitat. Canada lynx habitat is generally unsuitable or marginal in the project area, and it is unlikely that any lynx home range would include the project area.

**Table 18. Lynx Habitat Types within Existing Right-of-Way in Spring Creek and Traver Mesa LAUs (GMUG NF)***

| Habitat Type | Spring Creek LAU (acres) | Traver Mesa LAU (acres) |
|---|---|---|
| Suitable | 3.0 | 0.4 |
| Unsuitable | 37.8 | 0.0 |
| Not Mapped | 20.4 | 0.45 |
| Total | 61.2 | 0.85 |

*Primary Suitable and Secondary Suitable Habitat Combined.
Source: Howe 2012.

### *3.5.7 Visual/Aesthetic Resources*

Visual resources include the natural and human modified landscape. The visual quality of the landscape is influenced by vegetation, slope, topography, rocks, water bodies, man-made structures, and landscape modifications. The existing visual quality of the proposed project area is influenced by the presence of roads, oil and gas development including pipeline corridors, well pads, and evaporation facilities, power transmission lines, agricultural land uses, and towns and

communities including Montrose, Norwood, Redvale, and Cahone. Twelve KOPs with a potential view of the transmission line were identified (described in greater detail in Section 3.5.7.3).

#### *3.5.7.1 Visual Resource Classification*

The BLM, GMUG NF, and SJNF each use a different system to assess and categorize visual resources. The BLM uses the Visual Resource Management system (VRM) to objectively and systematically evaluate scenic values and appropriate levels of management. The VRM system was used for the proposed project area in the UFO and TRFO. Proposed project areas within the UFO and TRFO jurisdictions are categorized as Visual Resource Class II (Christiansen 2014). The objective of Class II is to retain the existing character of the landscape. The level of change to the landscape should be low. Management activities may be seen but should not attract the attention of the casual observer. Any changes to the landscape must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

The USFS uses two methods for managing visual resources, the Visual Management System (VMS) and the Scenery Management System (SMS). Prior to 1995, the VMS was used in National Forests to assess visual resources and provide measurable scenery management standards (USFS 1974). This system is currently used in the GMUG NF. Forest plans updated since 1995 use the SMS to assess visual resources. The SMS is used in the SJNF.

According to the SMS, all operations are required, to the extent practicable, to harmonize proposed actions and operations with scenic values through measures such as the design and location of operating facilities, including roads and other means of access, vegetative screening of operations, and construction of structures and improvements which blend with the landscape (36 CFR 228.8(d)). The SMS is applied to establish Scenic Integrity Objectives (SIOs) (USFS 1995). The SIOs for the SJNF in the project area have a “moderate” rating. As defined by the NFS, the moderate rating allows changes with a “slightly altered” appearance to remain visually subordinate to the surrounding landscape. The Visual Quality Objective (VQO) for the GMUG is “Modification”.

#### *3.5.7.2 Key Observation Points*

Twelve representative KOPs were selected for this assessment by the BLM and USFS visual resource specialists and HLA during site visits in June and July 2014. KOP selection included concentrations of users or viewers, or representative views for travelers or drivers. KOP selection was based on the recreational uses of BLM roads, scenic overlooks, campgrounds, a trailhead, locations in the bottom of the Dolores River Canyon, and USFS roads and trails. (Appendix C - Visual Resources Report; [HLA 2015]). No KOPs were identified by the SJNF within forest boundaries, although six of the KOPs are near the forest boundary on TRFO land. Table 19 lists the selected KOPs, and Figure 25 shows the KOP locations.

**Table 19. Key Observation Points in the Proposed Project Area**

| | Location | View | Amenities | Land Owner | Special Designation* |
|---|---|---|---|---|---|
| KOP 1 | South Rim of the Dolores River Canyon | Dolores River Canyon | Parking, restroom, trail, and developed scenic overlook | BLM TRFO | SRMA |
| KOP 2 | South Rim of Dolores River Canyon | Dolores River Canyon | Parking | BLM TRFO | SRMA |
| KOP 3 | County Road 90 at the entrance to the GMUG NF | GMUG NF | None | GMUG NF | N/A |
| KOP 4 | Unaweep Tabaguache Scenic and Historic Byway | Representative view of transmission line and poles visible on the GMUG NF | None | GMUG NF | N/A |
| KOP 5 | NF Road 402 intersection with high-use ATV trails on the Uncompahgre NF | ATV trails on the GMUG NF | ATV trails, campground | GMUG NF | N/A |
| KOP 6 | Town of Basin, Colorado | Town of Basin, Colorado | None | Private | N/A |
| KOP 7 | Cottonwood Ledges Campground | Cottonwood Ledges Campground | Campground | BLM UFO | N/A |
| KOP 8 | Lower Spring Creek Trailhead | Lower Spring Creek | Trailhead | BLM UFO | N/A |
| KOP 9 | Dolores River Canyon bottom | Dolores River | Dispersed camping site | BLM TRFO | LWC, SRMA, W&S Rivers |
| KOP 10 | Dolores River Canyon bottom | Dolores River | Dispersed camping site | BLM TRFO | LWC, SRMA, W&S Rivers |
| KOP 11 | Dolores River Canyon bottom | Dolores River | Dispersed camping site | BLM TRFO | LWC, SRMA, W&S Rivers |
| KOP 12 | Dolores River Canyon bottom | Dolores River | Dispersed camping site | BLM TRFO | LWC, SRMA, W&S Rivers |

*Lands with wilderness characteristics (LWC); Special Recreation Management Area (SRMA); Wild and Scenic Rivers (W&S Rivers)

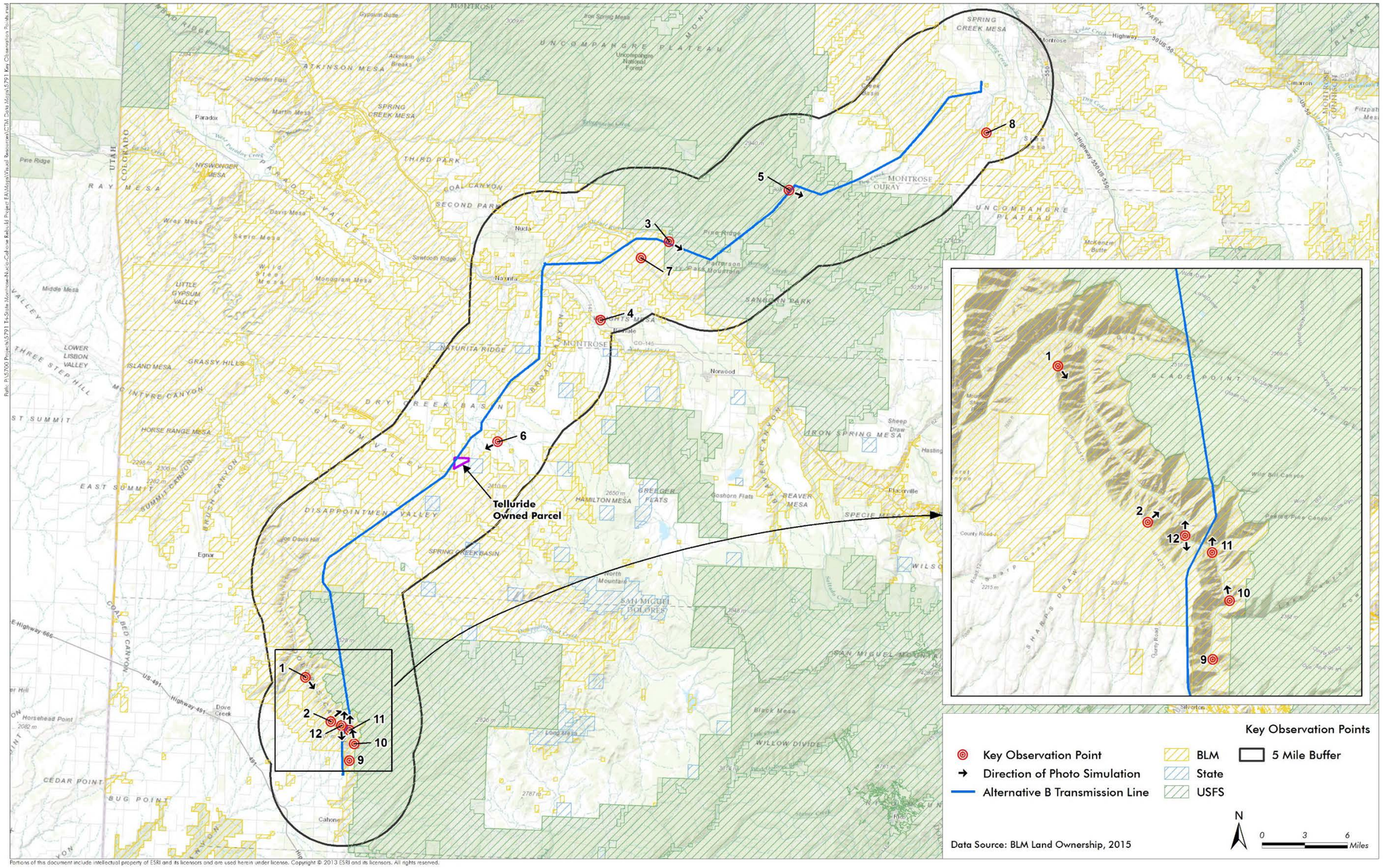


**Figure 25. Key Observation Points and Location and Direction of Photo Simulations**

#### *3.5.7.3 Character Regions*

To determine if the Proposed Action met the BLM Visual Resource Class II criteria and USFS VQO and SIO standards as viewed from the twelve KOPs, landscape character regions were identified and referenced during the field observations.

A region's appearance, or landscape character, is based on the region's physical characteristics consisting of the visible physical, biological, and cultural attributes. A landscape character may range from predominantly natural landscapes to those with highly visible cultural features. The existing landscape character description includes the natural scenic attributes of the landscape with the existing land use pattern. There are four definable character regions in the proposed project area including pinyon-juniper forest, montane forest, montane valley, and arid canyon described as follows:

1) The Piñon-Juniper forest region is prevalent in the project area near the Dolores River, San Miguel River, and Spring Creek canyons and in multiple locations between basins and valleys. Long distance views are unobstructed or partially obscured when the viewer is in close proximity to the low-growing trees and large rocks or rock outcrops. The mostly-unobstructed views are of large areas of rock outcrops, native piñon and juniper trees 10 to 15 feet tall, boulder fields and vertical rock cliffs in canyons, and areas of bare soil sparsely populated with low-growing native shrubs, grasses, and forbs. In some locations, other than the canyons, small amounts of man-made forms in some views include fences, roads, rural residences or agricultural structures, and a few utilities. Although the power line is typically visible due to the absence of tall obstructions, most views from highways and roads include fences, rural residential and agricultural buildings, and other overhead utility lines. The ROW clearing corridor is visible from some locations, but does not create strong contrasts with the surrounding landscape because the ground colors and textures in the clearing corridor typically match the adjacent undisturbed ground surfaces.
2) The Montane Forest region is throughout the entire project area, although not continuously. It is mostly in the GMUG NF along the Divide Road, NF Road 402, in the SJNF along most of the north rim of the Dolores River Canyon, and in the BLM TRFO jurisdiction along most of the south rim of the Dolores River Canyon. Views are typically relatively short distance due to the high density of deciduous and evergreen trees. Some long distance but narrow views are present along roads, trails, and the existing power line clearing corridor. However, the existing clearing corridor is not visible from most recreation facilities, such as the Iron Springs Campground, where the edge of the clearing corridor is not noticeable only 0.5 miles from the nearest campsite. Montane Forest views include relatively small portions of sky, and are therefore heavily shaded and mostly monochromatic, except for some rock outcrops, creeks, and low-growing herbaceous plants, such as native wildflowers. The power line typically has very low visibility due to the screening effects of forest trees and mountainous topography. However, the clearing corridor is highly visible from some locations, and frequently for long distances. The clearing corridor through the forest produces strong contrasts of color, texture, line, and form with the surrounding trees when visible.
3) The Montane Valley region is in the southern portion of the project area along the Unaweep Tabaguache Scenic and Historic Byway, and in the central portion of the

project area including Disappointment Valley, Big Gypsum Valley, and Dry Creek Basin. The region is visually characterized by mostly unobstructed views of the sky, distant mountain ranges, and sparsely-vegetated open areas of sages, grasses, wildflowers, rock outcrops, and bare soil. Views are mostly unobstructed in all directions, with any man-made forms extending above the horizon highly visible. Some views include agricultural land development, very low-density residential areas with highly visible man-made forms of fences, paved and unpaved roads, overhead utilities, and small communities including Redvale, Coventry, and Norwood. This region is exemplified by the Dry Creek Basin and includes a large amount of visual variety with Piñon-Juniper forests in the southeast portion, Sage shrublands in most of the valley floors, and Ponderosa Pine forests visible in the distance, with unobstructed views of mountains beyond the valley in all directions. The existing power line is highly visible near the town of Montrose and in the southwest corner of the Dry Creek Basin within the Montane Valley region. The existing clearing corridor on the GMUG NF is visible to the northeast from CR 90 and the Unaweep Tabaguache Scenic Byway near Redvale. Other existing power line locations with high visibility are isolated and relatively short in length. These isolated locations are visible from nearby trails and rural roads.

4) The Mixed Forest Canyon region is the Dolores River Canyon in the southern portion of the project area, and the Spring Creek Canyon in the northern portion. Both canyons have extensive visual variety in large rock outcrops, diverse landforms, rivers, arroyos, forests, and meadows. Many colors are present in both canyons, and change seasonally due to the presence of deciduous trees and a large variety of herbaceous plants. Views from the canyon rims are long distance and include surrounding forests, plains, and mountain ranges. Most views within the canyons are short distance and contain a large variety of plant species, rocks, landforms, and water. The power line and clearing corridor typically have weak contrasts with the surrounding landscape due to the large variety of color, texture, line, and form in the existing landscape. However, the power line structures are highly visible if viewed against a background of sky because of the strong color and line contrasts with the sky and strong form contrasts with the horizon line.

### *3.5.8 Lands with Wilderness Characteristics*

The existing conductor spans the Snaggletooth Unit of lands with wilderness characteristics boundary (USFS 2013 and BLM 2015), specifically where the existing line crosses the Dolores River canyon. The Snaggletooth Unit of lands with wilderness characteristics takes into account the existing transmission line corridor, and specifically excludes all ground disturbance associated with the existing transmission line, including tower structures and pads and access roads.

BLM-managed lands with wilderness characteristics provide opportunities for a range of uses and benefits as part of the BLM's multiple use mission. Per BLM Manual 6310, in order for lands to qualify as lands with wilderness characteristics, the area must possess sufficient size, naturalness, and outstanding opportunities for either solitude or primitive and unconfined recreation (BLM 2012). In addition, it may also possess supplemental values.

The TRFO RMP directs that lands managed to protect wilderness characteristics are not available for location of new ROWs, and that the modification of existing authorizations that

would add new disturbance outside the boundary of the existing ROW is prohibited. However, adjustments to existing ROWs or other authorizations may be allowed *if effects to wilderness characteristics are reduced or eliminated* (emphasis added) (RMP, Section 3.2; BLM 2015).

# 4 ENVIRONMENTAL EFFECTS

The resource effects described in this section are based on the alternatives described in Section 2 in accordance with 40 CFR 1502.16. The effects analysis considered the benefits associated with the project design criteria and EPMs incorporated into the Action Alternatives to reduce and avoid adverse effects. An environmental effect is defined as a change in the quality or quantity of a given resource due to a modification in the existing environment resulting from project-related activities. Effects may be beneficial or adverse, may be a primary result (direct) or secondary result (indirect) of an action, may be localized or regional, and may be permanent and long-term or temporary and short-term. CEQ regulations (40 CFR 1500-1508) define the effects that must be addressed and considered by federal agencies in satisfying the requirements of the NEPA process. This includes direct, indirect, and cumulative effects:

- Direct effects are caused by the action and occur at the same time and place (40 CFR 1508.8).
- Indirect effects are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on natural systems (40 CFR 1508.8).
- Cumulative effects are the incremental effects to the environment from the Proposed Action added to effects associated with other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7). In order for a cumulative effect to occur, the effects of one project overlap in space and time with the effects of another project.

Effects may vary in degree from a slight discernible change to a considerable change in the environment. If a change would be indiscernible or immeasurable, it is described in this section as no effect. For this EA, the magnitudes of environmental and social effects were defined as high, moderate, low, negligible, and no effect (please note that these terms of magnitude do not relate to visual contrast rating determinations or other resource-specific determination language). Beneficial effects are indicated as such; if not specified, effects are adverse.

- High level effects are obvious and readily detected and measured.
- Moderate effects are easily detected or measured.
- Low effects are measurable but limited in magnitude.
- Negligible effects are barely discernible and not easily measured.
- A “No effect” magnitude is not measurable or discernible.

Regulatory standards, literature, and best professional judgment guided the effects determinations.

The duration of an effect was also considered for each resource. Short-term effects occur during and immediately after project-related activities. Duration of effects are either short-term or temporary (less than 3 years) or long-term (greater than 3 years).

The impact analysis area for most resources is the boundary of the proposed ROW. For some threatened and endangered species, the impact analysis area is about 4 miles. Visual effects were considered non-detectable beyond 5 miles.

## 4.1 Introduction

The level of detail in the analysis of effects is related to the anticipated magnitude of the effect and the identification of issues during agency and public scoping. Those issues that were identified during scoping and retained during the general internal analysis process are: access, roads and transportation; cultural resources; forest and timber resources; geology; soils; threatened, endangered or candidate animal species; visual resources; and lands with wilderness characteristics. Other resources have a less rigorous level of detailed analysis and are summarized in Section 3.

In many cases, EPMs have been incorporated into the Action Alternatives that serve to avoid or minimize the effects. In those cases, the reader may be referred back to Section 2 and Tables 8 and 9.

### *4.1.1 General Analysis Assumptions and Guidelines*

Analytical methods are described briefly per NEPA requirements (40 CFR 1502.24). Because the proposal is to improve an existing transmission line, quantification of effects are mostly expressed based on the acreage of the resource effects within the ROW, clearing, or direct disturbance (i.e., grading) limits. For cultural resources, effects are based on the number of historic properties potentially affected. Visual resource effects are based on potential effects to visual quality's contrast and views from KOPs. The following general assumptions were used to evaluate resource effects from the proposed action and alternatives:

- Access – new roads for realignment areas have been identified and evaluated at widths described in Section 2 (specifically, 30-foot total width was evaluated except at the north rim of the Dolores River Canyon upgrade-in-place, where 75-foot total width was evaluated).
- Reclamation – in realignment areas, existing roads no longer required for transmission line access, as well as existing structure footprints, would be reclaimed as described in Section 2.
- Clearing – Forested Areas–in pre-cleared areas (existing ROW), assumed 25 feet of clearing effects on either side of existing 100-foot ROW corridor. In fully forested areas (new ROW) assumed full 150-foot clearing corridor (75 feet either side of new centerline). For canyon spans: no effects calculated beneath line.
- Grading – Direct ground disturbance calculated for pole/structure locations and new access roads. For canyon span: no grading effects calculated. Pole Structures: assumed 6,500 square feet of disturbance and used existing pole locations where design is not yet completed for new/reroute locations. (Note that this results in a slight overestimate of effects, because wood H frames would only have a 4,800 square foot disturbance footprint, and fewer new structures would be needed.) Exception: Dolores River Crossing structures and dead-end structure footprints assumed 30,000 square feet of

disturbance. Where the pole footprint overlaps the road footprints, effects would be calculated as "pole" effects and double-counting would not occur.

The analysis in this EA tiers to the analysis completed in the 2006 EA for the access right-of-way and transmission line maintenance (BLM 2006). The effects from maintenance and improvements of existing access roads were disclosed in a FONSI (BLM 2007b) and ROW Grant (BLM 2007a). The current EA incorporates, by reference, the 2006 EA and includes summary analysis of the resource impacts from the 2006 EA. Assumptions for analyzing and disclosing those previously-authorized impacts are as follows:

- Existing road impact width ranges from about 8 feet to about 30 feet, depending on the location. For purposes of analysis, the existing impact evaluation was based on an average of a 16-foot wide road.
- Future average construction footprint of the authorized access road improvements (throughout the entire project) will be 30 feet. This is the dimension authorized under the DR associated with the 2006 EA (BLM 2006), and represents the maximum impact Tri-State could currently implement.
- Revegetation activities following construction would return the existing authorized access road disturbance footprint to the existing footprint of about 16 feet. This is the average width that Tri-State needs to accommodate bucket trucks and other vehicles needed to access the ROW for maintenance activities (including replacement of existing structures under the No Action Alternative), maintenance activities following construction (after line improvement to 230-kV), and wreck-out of the existing line under any Action Alternative. For purposes of analysis, impacts to all resources except Forest and Timber Resources are assumed to be short-term. For Forest and Timber Resources, the construction footprint for authorized access road improvements is assumed to be long-term, due to the time required for forest regeneration.

#### *4.1.2 Organization of the Effects Analysis*

Analysis of effects for this section is arranged by alternative. The Action Alternatives (Alternative A - Proposed Action and Alternatives C, with different combinations of the routing options) as well as the No Action-Alternative B and associated effects are in the sections that follow with specific resource effects presented for each alternative. Effects that are common to all Action Alternatives (i.e., are along the transmission line corridor, in substation footprints, or staging areas that all routes would follow) are described in the Alternative A analysis. Those effects include disturbance and clearing in all areas except those associated with realignment and routing options.

### 4.2 Summary of Effects

The summary of effects for resources analyzed at the Dolores River crossing and Dry Creek Basin is shown in Table 20. See Appendix E for more information including a complete summary and basis for determination.

**Table 20. Summary of Effects for Routing Options in the Dry Creek Basin and Dolores River Crossing**

| | Access, Roads, and Transportation | Forest and Timber Suitable Timber | Geology | Lands with Wilderness Characteristics | Soils | Gunnison Sage-Grouse Occupied Habitat | Visual |
|---|---|---|---|---|---|---|---|
| **Dolores River Crossing Routing Options** | | | | | | | |
| **Dolores River Crossing realignment only (Alternative A)** | 2.2 miles new access road; 3.3 miles reclaimed access road | 36.5 acres clearing in suitable timber | 11.8 acres of effect to high landslide hazard areas. Flat slopes (<10%) for construction and maintenance. | Move structure away from canyon and reduce ROW width in Dolores River Canyon. Decrease in time visible to river user. | Total 11.8 acres of new surface disturbance | Not applicable | Taller structures, new access road and wider ROW. KOP 1: low to moderate effects in views of the north rim. KOP 2: moderate to high effects in views to the north. KOP 12: line removed from views to east, west, and south from KOP 12, realignment is in view to north. KOP 10 and KOP 11; beneficial effects due to visual screening and increased distance to line. Effects offset by removal of powerline from existing position; also, powerline is an expected component of the landscape and used as a frame of reference for river users. |
| **Dolores River Crossing upgrade-in-place only (Alternative C)** | 0.9 miles new access road; 1.7 miles reclaimed access road | 5.2 acres clearing in suitable timber | 13.0 acres of effect to high landslide hazard areas. Extreme slopes (>30%) for construction and maintenance. | Move structure away from canyon and reduce ROW width in Dolores River Canyon. Increase in time visible to river user. | Total 13.0 acres of new surface disturbance | Not applicable | Taller structures, new access road and wider ROW. KOP 1: low to negligible effects due to distance. KOP 2: moderate effects in view to east over the long-term due to new structures/road. KOP 11: beneficial effects due to visual screening. Beneficial: KOP 10 and 11: Moderate effects, but powerline is an expected component of the landscape and used as a frame of reference for river users. |
| **Dry Creek Basin Routing Options** | | | | | | | |
| **Dry Creek Basin upgrade-in-place only (Alternative A)** | No new access road; no reclaimed access road | Lands generally not suitable for timber production | 5.2 acres of effect to high landslide areas | Not applicable | Total 8.0 acres of new surface disturbance | New long-term disturbance of 7.3 acres to occupied habitat. Fewer structures and perch discouragers would reduce the presence of avian predators, providing a net benefit to GuSG. Current reduced habitat effectiveness on 4,901 acres would continue. Existing road use (authorized in 2006 EA) would disturb a maximum of 33 acres, including 17.6 acres long-term. ). | Taller structures; negligible effects to KOP 6 due to distance. |
| **Dry Creek Basin realignment only (Alternative C)** | 9.0 miles new access road; 7.3 miles reclaimed access road | Lands generally not suitable for timber production | 28.8 acres of effect to high landslide areas | Not applicable | Total 39.6 acres of new surface disturbance | New long-term disturbance of 22.7 acres to occupied habitat. Fewer structures and perch discouragers would reduce the presence of avian predators, providing a net benefit to GuSG. Restored existing roadways total 14 acres in occupied habitat. Long-term reduced habitat effectiveness on 857 acres. Improved habitat effectiveness on 2,163 acres. Existing road use (authorized in 2006 EA) would disturb a maximum of 6.8 acres, including 3.6 acres long-term. | High effects at KOP 6 to residents and to SH 141 travelers. Beneficial effect to U29 Rd travelers in middle of basin. |

*NOTE: Effects to Cultural resources are negligible for the routing option segments and are not included in this summary table.*

## 4.3 Alternative A: Proposed Action

### *4.3.1 Access, Roads, and Transportation*

#### *4.3.1.1 Effects common to all Action Alternatives*

Overall effects to access, roads, and transportation are expected to be negligible to low from the short-term use of existing public access roads and several new roads during construction and maintenance. Removal of the existing 115-kV transmission line/structures and construction of the new 230-kV transmission line would use existing roads as much as possible to minimize construction of new access roads. Approximately 6 miles of new access roads would be required under the different Action Alternatives. New pole structures would be located at the same location as existing structures to the extent possible. However, the wider span between poles on the new 230-kV line would require construction of new spur roads to access new pole locations, except where downline roads are used. Roads no longer needed to access transmission line structures would be decommissioned, reclaimed, and revegetated if there is no government agency benefit to keeping them open.

Road improvements on federal land would follow applicable USFS and BLM road standards for the specific road classification within the existing 30-foot ROW. However, transport of long poles may require widening of road curves or other improvements that exceed the existing ROW. Where widening is not feasible, helicopters may be used to transport poles. It is anticipated that much of the existing road system requires minimal improvements to accommodate construction of the new transmission line. However, brush and tree removal and minor to extensive grading would be required on some of the existing roads prior to construction of the new transmission line.

Effects to existing access roads from transport of equipment and materials required for construction are expected to be negligible and short-term, because anticipated use would be limited, of short duration and damaged roads would be restored (see Table 8). Existing transmission line access roads would be improved as necessary for construction and maintenance vehicles under the permitted 2007 ROW grant. The effects of road improvements and maintenance activities within the existing ROW were disclosed in the 2006 Transmission Line Maintenance EA (BLM 2006) and are not addressed further in this document. New roads and actions outside of the existing road and transmission line ROW are addressed by this EA.

New roads would be constructed to access new pole locations and for relocation of the transmission line in the Dry Creek Basin or across the Dolores River Canyon, as discussed for the routing option. The miles of new road construction and miles of road that can be decommissioned is estimated for each alternative, with minor changes expected during final design. New roads would typically consist of short spurs off of existing roads and in most cases would be closed to public access. Stringing and pulling electrical conduit between structures would require off-road vehicle travel with temporary effects. Ground disturbances from off-road activities would be restored and revegetated as needed. Roads no longer needed would be reclaimed and revegetated per BLM/USFS decommission requirements. EPMs (AR-1 through AR-7), as summarized in Table 8, would be implemented to minimize environmental effects associated with road work.

No new roads are needed for expansion of the Montrose substation. The Cahone substation expansion would require approximately 0.4 miles of new road. Construction of the new Nucla substation likely would use an existing short driveway off SH 141 for access.

Helicopters would be used to deliver poles or install transmission line structures where access by road is not feasible and to expedite construction. Helicopters would deliver workers and/or materials from staging areas to the construction site. The number of transmission line structures that need to be delivered or installed by helicopter would be determined during final design. Helicopter access would also be needed periodically over the life of the proposed project for transmission line inspection (similar to current operations).

New roads required for construction access and long-term maintenance of transmission line facilities would be special use routes closed to the general public. Designated motor vehicle use by vehicle class and time of year restrictions on BLM roads and NFSRs would not change. Existing public access for recreation activities would be maintained and would not change from existing conditions. Roads that are no longer needed for access to transmission line structures and that would be decommissioned would not affect existing public access on state and federal lands. Access to private in-holdings within federal lands would not be affected. Planned new administrative roads and decommissioning of existing administrative roads would be consistent with existing USFS and BLM Travel Management Plans and LRMPs (Boggy-Glade Travel Management Plan [USFS 2011]; Uncompahgre Travel Plan [USFS 2000]; UFO Resources Management Plan Amendment/EA [BLM 2009]; and the TRFO LRMP [USFS and BLM 2013; USFS 2013; BLM 2015]). There would be no effect to any Roadless Areas or Scenic Byways.

Construction activities would result in a short-term increase in traffic for delivery of equipment, materials, and workers. Total construction duration would be less than 2 years, with about 7 to 10 months for each section (see schedule summary in Proposed Action description, Table 6). Because the majority of the proposed project area is located in rural areas with low traffic volumes, effects to public traffic are expected to be negligible. Detours or traffic delays may be necessary in some locations to facilitate construction activities. Road improvements and ROW tree clearing for the Nucla to Cahone section transmission line in 2016 would increase traffic slightly on SH 141, CR 190, and NFSR 504 for about 8 weeks. Expansion of the Montrose 345-kV yard in 2016 would also increase traffic slightly on SH 62, SH 550, and SH 491 for about 12 weeks. In 2017, with work on the Nucla to Cahone section of transmission line, increased traffic would occur from April to October on a variety of state, county, NFSR, and BLM roads. Primary travel would occur on SH 141, CR 190, CR 29W, CR 15, CR 16, CR M, CR J, and NFSR 504. Worker travel from Ridgeway, Montrose, Cortez, and Norwood to the project area would slightly increase traffic along SH 62, SH 550, SH 491, and SH 145. Construction activities in 2018 would increase traffic primarily along SH 90 and NFSR 504 for about 6 to 7 months. Construction of the new Montrose substation would require access from SH 50 and SH 90 over about 6 months, but only a small workforce would be involved. Tri-State would be responsible for applicable permitting and traffic control for work on public roads. There would be no long-term change in traffic volumes or access on public roads following construction.

Future maintenance of the road system supporting the 230-kV line would be similar to ongoing maintenance on the 115-kV line. Routine inspection would require access by pick-up trucks and ATVs. The road prism for access routes would be maintained to allow for travel by a bucket truck or other maintenance vehicle. Access routes would be graded periodically as necessary in

accordance with BLM and USFS maintenance requirements. Construction and operation of the new 230-kV line access roads would comply with all seasonal restrictions and EPMs required for routine construction and maintenance activities.

#### *4.3.1.2 Effects unique to Proposed Action Alternative*

The existing downline access road through the Dry Creek Basin would require minor improvements for construction access with effects as disclosed in the 2006 EA (BLM 2006). A new Dolores River Canyon transmission line crossing would require construction of about 2.2 miles of new access roads on SJNF and TRFO land on both the north and south rims. These special use routes would be closed to public access. A total of about 3.3 miles of existing transmission line access roads would be decommissioned and reclaimed. Transportation effects in the Dolores River crossing area and the Dry Creek Basin are expected to be negligible and short-term.

### *4.3.2 Cultural Resources*

The cultural resource assessment considered the effects of the proposed undertaking on historic properties within the APE. During the assessment of effects, agencies must consider whether "an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association" (36 CFR 800.5 {a}{1}).

#### *4.3.2.1 Effects common to all Action Alternatives*

Adverse effects to historic properties may occur directly from the construction of new pole structures, construction of new or improvement of existing access roads, construction of a new substation, and other surface disturbances. Indirect adverse effects to historic properties are possible within the existing 100-foot ROW or within 50 feet of proposed additional clearing limits. At this time, the SHPO has reviewed agency determinations of historic property eligibility and either has concurred or has asked for eligibility changes; those requested changes were accepted by the agencies and are reflected in the following analysis. The SHPO will provide an overall proposed project effect determination as part of Section 106 consultation.

A cultural resources survey would take place prior to road construction, and any effects to potential historic properties would be avoided, minimized, and mitigated under the treatment plan in the MOA. Effects also would be avoided, minimized, and mitigated by EPMs CR-1 to CR-7 and VG-1 (see Table 8). For all Action Alternatives, effects to cultural resources are expected to be negligible where avoided or minimized, and localized, low, and long-term where mitigated. Mitigation of archaeological properties requires excavation to obtain significant information; as a result of mitigation, the property is effectively destroyed.

#### *4.3.2.2 Effects unique to Proposed Action Alternative*

Planned new roads associated with Alternative A have not been surveyed to identify historic properties. These areas would be surveyed and evaluated for effects to historic properties per Section 106 of the NHPA prior to construction if this alternative is selected and mitigated as needed according to the treatment plan in the MOA.

### *4.3.3 Forest and Timber Resources*

#### *4.3.3.1 Effects common to all Action Alternatives*

In areas common to both Action Alternatives, the increase in the ROW width would result in clearing of 48.2 acres of suitable timber lands including 13.8 acres of aspen timber resources and 34.4 acres of conifer timber resources on the GMUG NF. There would be no effects to timber resources from the improvements to the existing Montrose and Cahone substations or the new Maverick 230-kV substation and associated double circuit structures between the new Maverick 230-kV substation (Reams property) and the existing 115-kV substation at the Nucla power plant, because there are no timber resources in this area. There may be clearing required for about 6 miles of new access road anticipated to be needed; however, since the location of those roads has not been identified, effects cannot be quantified.

The increase in the ROW width also would result in 107.8 acres of additional clearing on the SJNF. Most (81.7 acres) of the area that would be cleared are designated as lands generally not suitable for timber production or harvest. The remainder (26.1 acres) of the area that would be cleared is designated as lands suitable for timber production.

Effects to forest and timber resources are expected to be moderate and long-term for all Action Alternatives due to the acres of timber cleared.

#### *4.3.3.2 Effects Unique to Proposed Action Alternative*

**Dry Creek Basin Upgrade-in-Place.** In the Proposed Action, the increase in the ROW width associated with the Dry Creek Basin improvements would result in 20.2 acres of clearing, in addition to the acres described above in "impacts common to all action alternatives". Clearing would occur in sparse stands of Pinyon-Juniper. All of the areas that would be cleared are designated as *lands generally not suitable for timber production or harvest*. There would be no effect on existing or future timber resources.

**Dolores River Canyon Crossing Realignment.** In the Proposed Action, the new 150-foot ROW associated with the Dolores River Canyon crossing realignment within the SJNF would result in approximately 40.2 acres of new clearing including 8.4 acres of *lands suitable for timber production*; 28.1 acres of other *tentatively suitable lands where timber harvest may occur*; and 3.8 acres of lands *generally not suitable for timber production or harvest.* Removal of the existing access road would result in 4.8 acres of reclamation (Table 21). Timber resource recovery is very slow, but about 1.6 acres would eventually (20+ years) be suitable for timber harvest. Timber resource effects in the Dolores River Canyon realignment would be low and long-term.

**Table 21. Proposed Action Effects to Timber Resources Based on Timber Suitability Classifications at the Dolores River Canyon Crossing Realignment**

| Component | Timber Suitability Designation (SJNF) | Acres |
|---|---|---|
| ***Clearing*** | | |
| 150-foot New ROW | Lands Generally Not Suitable for Timber Production or Harvest | 3.8 |
| | Lands Suitable for Timber Production | 8.4 |
| | Other Tentatively Suitable Lands Where Timber Harvest May Occur | 28.1 |
| ***Reclamation*** | | |
| 12-foot Access Road | Lands Generally Not Suitable for Timber Production or Harvest | 3.2 |
| | Lands Suitable for Timber Production | 1.0 |
| | Other Tentatively Suitable Lands Where Timber Harvest May Occur | 0.6 |

In total, Alternative A would have about 13.8 acres of new clearing in aspen and about 34.4 acres in conifer on the GMUG NF and about 34.6 acres of new clearing in Lands Suitable for Timber Production (SJNF). The loss of lands suitable for timber production from ROW clearing and road construction under Alternative A would be moderate and long-term. In addition, Tri-State is authorized to disturb up to 79 acres of suitable timber along existing access roads.

### *4.3.4 Geology*

No mineral resources would be affected by Alternative A or any of the alternatives.

Geologic hazards including landslides, corrosive soils, and shallow bedrock could have negligible to low and long-term effects to proposed project construction and maintenance activities. Small areas of expansive soils are present in some locations, but would have negligible effects on proposed construction. The Proposed Action includes about 76.8 acres with high susceptibility to landslides, and 11.8 acres near the Dolores River crossing. In addition, Tri-State is authorized to disturb up to 253.1 acres of lands with a high susceptibility to landslides along existing access roads.

### *4.3.5 Soils*

Construction activities for all Action Alternatives would result in soil disturbance, with the potential for erosion, soil loss, and soil compaction. Soil disturbances would occur from improvement of existing roads, construction of new roads, vegetation removal, excavation and drilling for new poles, removal of the existing transmission line, vehicle travel, wire stringing, expansion and construction of a new substation, establishing staging areas, and other construction disturbances. Many of the soil disturbances would be short-term, with revegetation following construction, while others, such as construction of new roads and substations would result in a long-term loss of soil productivity.

Planned use of existing roads to the extent feasible would minimize soil disturbance. However, it is anticipated that about 6 miles of new roads, depending on the alternative, would need to be constructed to access new pole locations. New roads would be designed according to designated maintenance levels with adequate drainage and erosion control measures to minimize effects to soils and water. New roads would remain long-term access routes for long-term maintenance. Existing access roads to abandoned pole sites would be reclaimed and revegetated. Specific

roads for reclamation would be determined during final design when all new pole sites have been identified.

Effect assumptions are described in Section 4.1.1. Construction disturbances at pole structures mostly would be temporary except for the actual footprint of the poles and foundation. Soil compaction is likely from construction equipment at each pole site and vehicle travel for stringing operations. Soil disturbance and erosion from installation of pole structures would have a short-term minor effect on soil resources, with minimal potential for effecting soil stability and long-term productivity. Restoration and revegetation measures following disturbance (see Section 2.3.6.14.2) would avoid or minimize soil effects.

Staging areas, construction pads, and "pull sites" for stringing wire would result in temporary soil disturbances. Temporary construction staging areas would be needed to store poles, equipment, and vehicles, in addition to helicopter staging areas. Staging areas would be located within existing disturbed areas on private lands to the extent possible (see Section 2.3.6.5.1). Upon completion of construction, these areas would be reclaimed and revegetated unless part of an active road or other land use. Construction pads needed for work on steep slopes would temporarily disturb soils until construction is completed and the sites are restored. Construction pads would be located within the ROW. Grading and earth work would be limited to the minimum necessary to provide a safe work area. Prior to any earthwork, erosion and sediment control measures would be implemented to minimize erosion and soil loss. Helicopter staging areas needed for storing fuel and landing would have temporary effects on soils from compaction. Specific staging and construction sites would be identified during final design, but would be located in existing disturbed areas where possible. Incidental soil disturbance or compaction from timber cutting and vegetation removal would have short-term effects on soils.

Expansion of the Montrose and Cahone substations would result in soil disturbance on about 10 acres at each site. The new Nucla substation would affect about 20 acres. Grading and site work for the substations along with construction of the facilities would result in a long-term loss of soil productivity. Temporarily disturbed portions of the sites would be stabilized and revegetated.

Implementation of planned stormwater management BMPs (Section 2.1.12) and restoration and revegetation measures (Section 2.1.13.2) would minimize soil loss and long-term effects. Specific EPMs that would reduce soil effects include those for soils (S-1 to S-4) and water quality and erosion (WQ-1 to WQ-21) in Table 8. Revegetation success for disturbed areas would depend on site specific soil types, slope, and aspect. All of the soils in the proposed project area have varying degrees of limitations affecting potential erosion and revegetation. Shallow depths to bedrock on mesa and canyon soils are more difficult to revegetate because of the limited water holding capacity. A high percentage of rocks in canyon and mountain soils can also affect revegetation success. Clayey and alkaline soils in valleys also have limitations in revegetation. Temporary soil disturbance and compaction from off-road vehicle travel would be minor and localized. Temporarily disturbed areas would be scarified prior to revegetation to reduce compaction. No work would be conducted when soils are excessively wet to minimize compaction, rutting, and effects to vegetation cover.

Ongoing maintenance including clearing woody vegetation around pole structures or under lines would result in minor short-term disturbance to soil resources. Vegetation root structures would generally remain intact and soil stability would not be adversely affected. Vehicle access for

maintenance of facilities would occur along designated roads, which would be maintained to minimize erosion and soil loss.

Under Alternative A, about 160.6 acres of direct soil disturbance would have a low long-term effect on soil resources with implementation of EPMs. In addition, Tri-State is authorized to disturb up to 419 acres of soils along existing access roads.

### *4.3.6 Threatened, Endangered, or Candidate Animal Species*

This section addresses federally threatened and endangered species that would potentially be affected by the Action Alternatives, specifically, the GuSG and Canada lynx. Western yellow-billed cuckoo habitat is not present and this species would not be affected by any Action Alternatives, or by the No Action Alternative. Mexican spotted owl surveys were negative in 2012, 2013, and 2014; therefore the Dolores River Canyon potential habitat is considered unoccupied. None of the Action Alternatives or the No Action Alternative would affect the Mexican spotted owl.

#### *4.3.6.1 Canada lynx*

The effects within lynx habitat are common to all Action Alternatives. The existing transmission line corridor is designated as unsuitable habitat due to management (e.g., ROW clearing) or fire activity; neither Alternative A nor C would directly affect Canada lynx habitat in the existing corridor. Additional ROW clearing would occur in the Spring Creek LAU and Traver Mesa LAU (Table 22). Approximately 5.6 acres of the clearing in the Spring Creek LAU would affect suitable habitat, while 15.3 acres of clearing would affect unsuitable habitat. An additional 9.8 acres has not been mapped. In the Traver Mesa LAU, there would be approximately 3.5 acres of additional clearing of which 2.7 acres are mapped as suitable habitat.

**Table 22. Additional ROW Clearing by Lynx Habitat Type**

| Habitat Type | Spring Creek LAU (acres) | Traver Mesa LAU (acres) |
|---|---|---|
| Suitable | 5.6 | 2.7 |
| Unsuitable | 15.3 | 0.0 |
| Not Mapped | 9.8 | 0.8 |
| **Total** | **30.7** | **3.5** |

Despite the increase in ROW, the lynx's ability to disperse would be maintained and habitat fragmentation from the additional clearing of 8.3 acres of mapped suitable habitat would be negligible. Given the poor quality habitat conditions, effects to lynx from all Action Alternatives are negligible. A preliminary determination of may affect, not likely to adversely affect has been made for the lynx.

#### *4.3.6.2 Gunnison Sage-Grouse*

##### **4.3.6.2.1 Management and Effect Analysis Approach**

The consolidation of linear impacts conforms to the policies and recommendations of the TRFO RMP and the 2005 GuSG Rangewide Conservation Plan (RCP) that apply to the Action Alternatives (RSC 2005). The Action Alternatives have implemented design features and EPMs that conform to these policies and recommendations. The RCP recommends that construction of structures and/or actions that may modify GuSG habitat, or that may increase mortality of GuSG,

follow species-specific guidelines for avoiding or reducing disturbance. The guidelines identify disturbance to GuSG to include: structures or actions that may modify habitat; structures that may affect the bird by potentially increasing collision risks and exposure to predation; and human activities that may cause disturbance to the bird themselves (i.e., anthropogenic noise or movement), especially during critical seasonal use periods.

The final TRFO RMP (BLM 2015) includes desired conditions, objectives, standards and guidance pertaining to activities in GuSG habitat. Portions of the plan that pertain to GuSG include the following:

*Desired Conditions*

- 2.4.15 "Areas identified as critical habitat or proposed critical habitat for special status wildlife species have the characteristics to support sustainable populations, promoting recovery of the species"
- 2.4.17 "Management actions maintain or improve habitat conditions for special status species, contributing to the stability and/or recovery of these species"

*Objectives*

- 2.4.20 "Gunnison Sage-Grouse (*Centrocercus minimus*): improve habitat for Gunnison sage-grouse when conducting resource management actions within occupied habitat"

*Guidelines*

- 2.4.60 "Projects in occupied Gunnison sage-grouse habitat should be designed to mitigate or avoid the direct or indirect loss of habitat necessary for maintenance of the local population or reduce to acceptable levels the direct or indirect loss of important habitat necessary for sustainable local populations. Projects will incorporate special reclamation measures or design features that accelerate recovery and/or re-establishment of affected sage-grouse habitat as much as possible".

The TRFO RMP adopted most of the guidance provided in the RCP and BLM IM No. 2014-100 (BLM 2014): Gunnison Sage-Grouse Habitat Management Policy on Bureau of Land Management-Administered Lands in Colorado and Utah. Under the RMP (BLM 2015), the recommendations in the IM and RCP are now guidance to be implemented for protecting important habitats across the range of the GuSG. Guidance pertaining to power lines includes no surface occupancy within 0.6 miles of an active lek ("Lek Habitat"), prohibiting surface disturbing activities and disruptive activities within four miles of active leks from March 1 through June 30, prohibiting surface disturbance and disruptive activities in winter habitat from December 1 to March 15, avoid routing above-ground transmission or distribution lines within occupied habitat, and constructing structures that limit risk of collision and predation. All habitat within the range of GuSG in the Dry Creek Basin is considered occupied habitat. Effect indicators tied to these recommendations were identified to evaluate potential effects of the alternatives on GuSG (Table 23).

**Table 23. Gunnison Sage-Grouse Effect Indicators, Effect Metrics, and Basis for Effect Metrics**

| Effect Indicator | Effect Metric | Basis for Effect Metric |
|---|---|---|
| Proximity to active lek | Area affected within 0.6 miles of lek sites | BLM RMP 2015, RSC 2005 and BLM IM 2014 |
| Disturbance to GUSG occupied habitat | Area affected within Dry Creek Basin occupied habitat | BLM RMP 2015, RSC 2005 and BLM IM 2014 |
| Disturbance to critical habitat | Area affected in footprint of clearing and grading; indirect effects for ROW | Critical habitat mapping from 74 FR 69312-69355, November 20, 2014. |
| Effect from avian predators | Number and design features of overhead structures that reduce perch availability | Manzer and Hannon 2005; Bui 2009; Coates and Delehanty 2010; Coates et al. 2014, Howe et al. 2014 |
| Fragmentation – loss of habitat effectiveness (HE) | Area of decreased habitat effectiveness within 1000-meter influence zone from structures, roadways, and transmission lines | Carpenter et al. 2010; Doherty et al. 2006; Holloran et al. 2010; Dinkins et al. 2014; Pruett et al. 2009a; Pitman et al. 2005 |
| EMF, Corona | Qualitative | Ferni and Reynolds 2005; Douglas and Jeffery 2014; Tyler et al 2014; APLIC 2012 |

Indirect habitat loss can occur if GuSG avoid areas adjacent to above-ground structures. Little research has been conducted on the response of GuSG to transmission lines; much of the information available is extrapolated from other closely related grouse species. The GuSG is a member of the subfamily *Tetraoninae*, which consists of prairie grouse species that have similar habitat requirements and exhibit lekking behavior. For purposes of determining the habitat area potentially affected by the existing and alternative transmission lines, all species in this subfamily were assumed to serve as reasonable proxies for GuSG.

The increased presence of avian predators associated with powerlines may affect GuSG use of habitat near powerlines. Avian predators, such as eagles, hawks, and common ravens and other corvids, frequently forage on the young, eggs, and adults of many animals, including sage-grouse (Schroeder and Baydack 2001). Raven populations in desert environments are increasing (Sauer et al. 2008) and, therefore, pose an increased threat to sage-grouse nest success. Although no nesting by avian predators currently occurs directly in the existing transmission line ROW, eagles, hawks, and ravens were observed within the proposed project area during 2014 and 2015 field surveys (see Section 3.4.3). In general, sage-grouse that nest within or near areas with unnaturally high raven numbers may be especially vulnerable to nest depredation. Ravens commonly select man-made features, such as tall structures (e.g., transmission line towers), for building nests (Knight and Kawashima 1993; Knight et al. 1995; Coates et al. 2014; Howe et al. 2014; Bui et al. 2010). Dinkins et al. (2012; 2013) documented that greater sage-grouse avoid areas with high levels of avian predator activity, and Howe et al. (2014) discovered that raven nesting decreased with every 0.62-mile (1-kilometer) increase in distance from a transmission line. Also, the probability for raven nesting was found to increase where the transition between intact, undisturbed habitat and disturbed habitat, known as edge habitat, increased. Breeding ravens hunt live prey an average of 0.44 miles (707 meters) from their nests (Howe et al. 2014). Coates and Delehanty (2010) showed that an increase in raven density of 1 raven per 2,471 acres

(10 square kilometers) increased greater sage-grouse nest depredation by 26 percent. Manzer and Hannon (2005) also found that sage-grouse nest survival was eight times greater in landscapes with less than three corvids/741 acres (1 square kilometer) when compared with areas with greater than three corvids/741 acres (1 square kilometer).

Although little research has been published on GuSG spatial movements in relation to high-voltage transmission lines (greater than 69-kV), many recent studies have documented that prairie grouse avoid human disturbances and predator-dense habitats in proximity to transmission lines. Dinkins et al. (2014) found that greater sage-grouse hen survival was negatively associated with power line density. The avoidance of manmade structures, particularly vertical structures such as transmission lines, buildings, and wind turbines, has been documented to increase fragmentation of prairie-chicken habitat (Hagen et al. 2004; 2011; Pruett et al. 2009b). In both greater and lesser prairie-chicken populations, birds tend to avoid otherwise suitable habitat that contains vertical manmade structures (USFWS 2012b). This avoidance behavior results in a reduction of "effective habitat" (Hagen et al. 2011; USFWS 2012b). Avoidance behavior and reduction of "effective habitat" in various grouse species is often attributed to increased perch availability for avian predators leading to increased predation risk and behavioral avoidance of overhead structures (Hagen et al. 2004; Pruett et al. 2009a, 2009b; Dinkins et al. 2014).

While no research has been conducted on GuSG that quantifies the avoidance of power lines, numerous studies have documented the avoidance of infrastructure associated with oil and gas development by greater sage-grouse (Carpenter et al. 2010; Doherty et al. 2006; Holloran et al. 2010). Studies on similar grouse species have also identified fragmentation effects of powerlines. Yearling male greater sage-grouse avoided nesting within 0.6 miles (950 meters) of oil and gas infrastructure, including power lines (Holloran et al. 2010). In a study on the effects of power lines and roads on lesser and greater prairie-chickens, Pruett et al. (2009a) found that prairie-chickens crossed roads more frequently than power line ROWs. No specific avoidance distance was identified for prairie-chickens; however, as described above, 85 percent of nests were more than 1.25 miles (2,000 meters) from power lines. Pitman et al. (2005) reported the mean nesting distance of lesser prairie-chickens from transmission lines was 0.8 miles (1,319 meters); very few nests were found within 1,312 feet (400 meters) of a transmission line.

Available information indicates that:

- Transmission lines may fragment GuSG and other grouse species habitat and can attract avian predators.
- Sage-grouse, including GuSG, have been documented to avoid anthropogenic features and select habitat to avoid avian predators.
- Lesser and greater prairie-chickens have been documented to avoid transmission lines by more than 0.62 miles (1,000 meters) for nesting.

Based on this information, a 0.62 miles (1,000-meter) zone of influence was used to evaluate the decrease in habitat effectiveness based on grouse avoidance of transmission lines, energy development, anthropogenic features, and avian predators.

The height of vertical structures may also have an effect on habitat use. The visibility of transmission line structures to GuSG depends on structure dimensions (height and width), the number of structures, the bird's ocular capabilities, topography, and land cover (UWIN 2010).

Structures for any Action Alternative would be about 30 to 60 feet taller and 5 to 6 feet narrower than existing structures (see typical structures and dimensions shown in Figure 18 and Figure 19). All Action Alternatives would result in taller, narrower, and fewer overall structures located in GuSG occupied habitat in the Dry Creek Basin compared with the existing transmission line. Transmission line structure dimensions and GuSG conservation have been discussed and debated in peer-reviewed literature only recently and with no conclusive results. An increase in structure height would theoretically increase the line-of-sight distance from that structure for wildlife on the ground. No studies have been completed regarding transmission line structure height differences in relation to GuSG or greater sage-grouse avoidance distances or behaviors. Information about sage-grouse vision, the bird's ocular stimuli, and how those stimuli affect the bird's behavior is also limited. Several studies have compared potential effects between various structure types (wind turbines, oil and gas, transmission lines) to sage-grouse, but there are no relevant peer-reviewed research papers analyzing the effects to ground-dwelling birds based on a specific change in transmission line pole structure height. The Utah Wildlife in Need (UWIN) Cooperative's Report, *Contemporary Knowledge and Research Needs Regarding the Potential Effects of Tall Structures on Sage-grouse* (UWIN 2010) found no definitive studies on the effects of tall structure height, density, etc., on sage-grouse habitat, including seasonal use and landscape variability. Because of this uncertainty and lack of knowledge and the fact that pole structure height would be similar for all Action Alternatives, structure height was not factored into the effective habitat analysis. In addition, the proposed height increase of structures associated with the Action Alternatives in the Dry Creek Basin would be partially offset by the reduced number of pole structures compared to the No Action Alternative.

#### 4.3.6.2.2 Active Lek Proximity and Disturbance to Occupied and Critical Habitat

Under Alternative A the transmission line would be improved in place in GuSG habitat and although greater in magnitude, the types of direct (surface disturbance to occupied habitat) and indirect (noise and human activity from construction) effects would be similar to heavy maintenance activities under the No Action. This EA is tiered to the 2006 EA/DR (BLM 2006), which authorized Tri-State's use of 118 miles of existing access roads for maintenance and repairs to the existing transmission line. However, no consultation with the USFWS on impacts to GuSG was performed, because the species was not listed at the time. Alternative A would use most of the previously authorized roads for construction access and long-term maintenance, although portions of these roads would be upgraded to accommodate construction equipment. After construction, upgraded roads would be restored to a maintenance width of about 16 feet.

There would be no direct effects to active GuSG leks, or within the recommended 0.6 miles avoidance buffer. The distance from the center of the one known active lek to the Proposed Action (Alternative A) is approximately 3.8 linear miles. Alternative A would result in a total of 7.3 acres of low, new long-term surface effects to occupied GuSG habitat from new structure installation, including 5.1 acres of critical habitat. Ground disturbance from Alternative A road improvements during construction would affect 33.0 acres of occupied habitat, including 23.6 acres of critical habitat. After construction, most of the surface disturbance would be restored, with only a small maintenance road remaining over the long-term. The remaining access roads would affect 17.6 acres of occupied GuSG habitat, including 12.6 acres within critical habitat, (Table 24).

**Table 24. Surface Disturbance of Gunnison Sage-Grouse Habitat by Alternative in Dry Creek Basin**

| Surface Disturbance | Alternative A (upgrade-in-place in Dry Creek Basin) | | | Alternative B (No Action) | | | Alternative C (realignment in Dry Creek Basin) | | |
|---|---|---|---|---|---|---|---|---|---|
| | Maximum Disturbance[2] (acres/miles) | Restored[3] (acres) | Long-term Disturbance[4] (acres) | Maximum Disturbance[2] (acres/ miles) | Restored[3] (acres) | Long-term Disturbance[4] (acres) | Maximum Disturbance[2] (acres/ miles) | Restored[3] (acres) | Long-term Disturbance[4] (acres) |
| Existing Access Road[1] | 33.0/9.7 | 15.4 | 17.6 | 33.0/9.7 | 15.4 | 17.6 | 6.8/2.4 | 3.2 | 3.6 |
| -- *Critical Habitat* | *23.6/6.5* | *11-* | *12.6* | *23.6/6.5* | *11-* | *12.6*[3] | *5.1/1.4* | *2.4* | *2.7* |
| New Access Road[1] | -- | -- | -- | -- | -- | -- | 31.2/9.0 | 14.6 | 16.6 |
| -- *Critical Habitat* | -- | -- | -- | -- | -- | -- | *26.8/7.4* | *12.5* | *14.3* |
| | | | | | | | | | |
| New Pole Structures[1] | 7.3 | -- | 7.3 | -- | -- | -- | 6.1 | -- | 6.1 |
| -- *Critical Habitat* | *5.1* | -- | *5.1* | -- | -- | -- | *5.4* | -- | *5.4* |
| | | | | | | | | | |
| Total Overall Disturbance[1]/ Restoration[3] | 40.3 | 15.4 | 24.9 | 33.0 | 15.4 | 17.6 | 44.1 | 17.8 | 26.3 |
| *Total Critical Habitat Disturbed* | *28.7* | *11* | *17.7* | *23.6* | *11* | *12.6* | *37.3* | *14.9* | *22.4* |

[1]Surface disturbance to occupied habitat, including critical habitat
[2]Maximum acres disturbed based on 30-foot wide maximum disturbance corridor for potential road upgrade activities.
[3]Restoration = repair of short-term construction impacts; Reclamation = repair of long-term damage from road footprints. Based on 16-foot wide existing ROW disturbance corridor to be fully restored after construction.
[4]Based on 16-foot wide permanent roadway disturbance corridor.

**Table 25. Habitat Avoidance by Gunnison Sage-Grouse and Conservation Benefits by Alternative**

| Avoidance/Benefit | Alternative A (upgrade-in-place in Dry Creek Basin) | Alternative B (No Action) | Alternative C (realignment in Dry Creek Basin) |
|---|---|---|---|
| | **Occupied Habitat (includes critical habitat)** | | |
| Area of Reduced Habitat Effectiveness due to Transmission Line Avoidance[1] (acres) | 4,901 | 4,901 | 1,141 |
| Area of Increased Habitat Effectiveness (acres) | 0 | 0 | 3,760 |
| Existing Road Reclaimed[2] (acres/miles) | 0/0 | 0/0 | 14.0/7.3 |
| Distance to nearest active lek (miles) | 3.8 | 3.8 | 4.9 |
| | **Critical Habitat** | | |
| Area of Reduced Habitat Effectiveness due to Transmission Line Avoidance[1] (acres) | 3020 | 3020 | 857 |
| Area of Increased Habitat Effectiveness (acres) | 0 | 0 | 2,163 |

[1]Based on 1,000 meter buffer of alignment and subtracting overlapping zone of influence with Hwy 141.
[2]Restoration = repair of short-term construction impacts; Reclamation = repair of long-term damage from road footprints

#### 4.3.6.2.3 Effect of Avian Predators

All Action Alternatives would considerably reduce perching opportunities for avian predators associated with the transmission line because all structures in the Dry Creek Basin would be self-supporting steel monopoles equipped with perch discouragers (Figure 19). Alternative A would have 50 steel monopoles with perch discouragers compared to 72 wooden H-frame structures without perch discouragers in occupied GuSG habitat under existing conditions. Research has found that raptor and corvid nesting and perching was significantly reduced with the installation of perch discouragers on transmission lines (Lammers and Collopy 2007; Slater and Smith 2007). Alternative A would reduce the number of structures by about 32 percent and additional design features including steel monopole structure and perch discouragers would reduce and minimize perch and nesting opportunities for avian predators in GuSG occupied habitat (see EPMs, Table 8 and POD Appendix B). Fewer structures with fewer perching surfaces would reduce the frequency and duration of avian predator perching and nesting. Reducing avian predator perching and nesting opportunities would likely reduce the presence of avian predators in general, which would likely provide a net benefit and contribute to recovery for GuSG in the Dry Creek Basin.

#### 4.3.6.2.4 Fragmentation/Connectivity

The two main infrastructure corridors that traverse GuSG habitat in the Dry Creek Basin are SH 141 and the existing transmission line. Because the Alternative A would use the existing transmission line corridor there would be no change in habitat fragmentation from existing conditions. Alternative A would likely continue to reduce GuSG habitat effectiveness to a distance of about 0.62 miles (1,000 meters), or on about 4,901 acres of occupied habitat due to avoidance of tall structures, including 3,020 acres in critical habitat (Table 25). Habitat effectiveness would continue to be reduced on 4,978 acres of occupied habitat due to potential avoidance of SH 141. Avoidance of overlapping zones of influence from both tall structures and SH 141 would continue to reduce habitat effectiveness on an additional 1,029 acres. This analysis only accounts for a geographic avoidance of physical structures and does not account for any eventual behavioral response to the expected decrease in avian predators resulting from fewer available perch structures under Alternative A.

In addition to the analysis of adverse impacts of fragmentation to GuSG, this EA evaluates the conservation benefits to GuSG provided by the various alternatives. Because Alternative A would be constructed within the existing alignment and would not eliminate or reduce any sources of fragmentation or habitat avoidance there would be no benefits to increased habitat effectiveness or lek buffer distance (Table 25). This assumes that the installation of perch discouragers would not affect GuSG avoidance of tall structures and has negligible positive effect on fragmentation.

Habitat connectivity in the Dry Creek Basin could be improved if one or more of the habitat restoration, protection, or conservation projects described in Appendix B of the POD were implemented, such as removal of early stage pinyon-juniper in critical habitat, restoration of grass and forb communities in sagebrush rangelands, or development/enhancement of water sources. Other potential projects described in Appendix B of the POD could improve habitat connectivity and contribute to conservation of GuSG in the Dry Creek Basin and/or the larger San Miguel Basin population.

#### 4.3.6.2.5 Electromagnetic Field

The Electromagnetic Field (EMF) is the physical field produced by the combination of the electric field and magnetic field. It is associated with all transmission lines. The EMF is highest immediately surrounding a transmission line; it decreases rapidly with distance away from a transmission line (Fernie and Reynolds 2005). The EMF strength is directly proportional to the voltage of the transmission line (e.g., a 230-kV transmission line generates a stronger EMF than a 115-kV transmission line).

For all alternatives, potential GuSG exposure to EMFs related to the proposed project would be negligible, because the EMF diminishes rapidly with distance away from a transmission line (Fernie and Reynolds 2005), and GuSG are currently known to generally occupy a different area than the existing SH 141 ROW corridor within the Dry Creek Basin. There is also evidence that birds and some mammals can see ultraviolet (UV) light, part of the electromagnetic spectrum, with varying capabilities and sensitivities (Douglas and Jeffery 2014; Tyler et al. 2014). Some literature suggests the UV discharge may potentially increase the visibility of transmission lines to wildlife at night (Douglas and Jeffery 2014; Tyler et al. 2014). Most of the available literature describes the physiological ability of mammals and some birds to observe UV light and the advantage of installing markers that emit or reflect UV light to aid birds in detecting structures to avoid collisions. Overall, information from the literature remains inconclusive about UV avoidance behavior on various wildlife species, including sage-grouse. The UV light effect on GuSG is potentially one of several factors contributing to the reduction in habitat effectiveness.

#### 4.3.6.2.6 Corona Effect

Corona is the phenomenon when the electric field at a particular point reaches a sufficiently high value to cause ionization of the surrounding air. When this ionization, or corona, does occur, it can be both visual (sparks) and audible (popping, hissing), potentially increasing visual disturbance to GuSG and contributing to the reduction in habitat effectiveness. On transmission lines, conductors, insulators, and hardware can all serve as sites for corona. In most cases, conductor corona is more prevalent than insulator or hardware corona. The point at which corona occurs on conductors depends primarily on the voltage (higher voltage, more potential for corona), conductor diameter (increased diameter decreases the potential for corona), and conductor spacing (increased spacing reduces the possibility of corona). Conductor surface condition and atmospheric conditions can also have an effect on the potential for corona. It is generally acknowledged that the audible noise resulting from corona is more noticeable at higher voltages (345-kV or higher) and that the phenomenon is rarely noticed in fair weather conditions (APLIC 2012).

For all Action Alternatives, the proposed increase in line voltage increases the possibility of corona. This increase, however, has been offset by the selection of a much larger conductor (1.345-inch diameter vs. the existing 0.72-inch), larger phase spacing (19.5 feet vs. the existing 15.5 feet), and other project design components such as polymer insulators that exhibit less corona than glass or porcelain (existing) insulators at the same voltage and installation of corona rings to further reduce the effects of corona. These devices are designed to lower the electric field around an insulator below the threshold that will cause corona. Additionally, EHV fittings have been specifically designed and fabricated with smooth surfaces, rounded edges and recessed hardware to reduce the potential for corona to occur.

Similar to EMF, for all Action Alternatives, GuSG exposure to corona during the proposed 230-kV transmission line operation would be negligible because of the project design described above, the location of the transmission line away from known concentrations of grouse, the generally dry conditions in Dry Creek Basin that are not conducive to produce corona, and the rapid decline in both audible and visual corona effects with distance from the transmission line. Relative to the No Action Alternative, an overall decrease in the corona effect is anticipated due to the decrease in structures and decrease in opportunity for corona to occur (57 fewer conductors).

### *4.3.7 Visual Resources*

Long-term and short-term effects to visual resources common to all Action Alternatives would be low to moderate. Long-term effects to visual resources common to both Action Alternatives would include the existing transmission line upgrade mostly within the existing alignment, including a 50 percent wider ROW with vegetation clearing in forested areas, taller structures, larger diameter conductors, some different structure types, construction of the Maverick 230-kV substation near Nucla, additions to the existing Montrose and Cahone substations, and new maintenance roads. Short-term visual effects would include construction activities associated with the proposed transmission line such as the presence of equipment and vehicle traffic and staging areas for storage of construction materials. Visual effects from fugitive dust potentially produced during construction would be avoided or minimized by incorporation of design features A-1 through A-4 (see Table 8). The proposed construction period would be from April to October during 2017 and 2018.

Visual effects were assessed and analyzed from 12 KOPs (Section 3.5.7 and Figure 25; Appendix C – Visual Resources Report [HLA 2015]). Most existing views from KOPs include the existing transmission line, vegetation clearing corridor, and some maintenance roads. Therefore, the upgrade of existing structures, conductors, and vegetation clearing corridors would not noticeably change existing views. For example, in southeast views from KOP 4 on the Tabaguache Unaweep Scenic Byway (SH 145), the existing vegetation clearing corridor in the forest is highly visible to eastbound travelers. Because the clearing is approximately 15 miles away from the KOP, the proposed 50-foot increase in total clearing width would not be perceptible from the KOP.

Effects to visual resources from additions to the existing Montrose and Cahone substations would be negligible because of the presence of the existing substations at the same locations and no visibility from KOPs.

No KOPs would have visibility of the proposed Maverick 230-kV substation. Although views of the proposed substation from SH 141 would be unobstructed, the site and surrounding area is an existing industrial land use, composed of a highly-visible, open, gravel parking area for construction vehicle and materials storage. Viewers along approximately 1.5 miles of SH 141 would have short duration views of the substation from moving vehicles. Therefore, long-term effects to visual resources would be low due to the short duration views and the presence of existing ground disturbances and overhead power lines. Because the proposed Nucla substation is on private land, and no KOPs have visibility of the proposed site, existing BLM VRM, and USFS SIOs and VQOs would not be affected. Effects to visual resources of the proposed structures between the proposed Maverick 230-kV substation and the existing Nucla substation,

near the intersection of SH 141 and SH 145 would be negligible because the existing structures and conductors in the same location are highly visible.

Within the SJNF, no KOPs were identified by the SJNF in the project area. The north crossing structure would require changing the SIO within a 0.25-mile radius from moderate to low, where the landscape character can be moderately altered.

#### *4.3.7.1 Effects Unique to Proposed Action Alternative*

##### 4.3.7.1.1 Dry Creek Basin

The upgrade to the existing alignment in Dry Creek Basin would have similar visibility as the existing structures, conductors, and maintenance roads, as seen from KOP 6 and SH 141 (see Figure 25 and photos in Appendix C, Visual Resources Report). In the basin, the existing alignment crosses SH 141 at the southwest end, and is adjacent to SH 141 at the northeast end. Therefore the existing alignment is not visible from KOP 6 and most of SH141 in the basin due to the long distance between the alignment and potential viewers, and would be viewed with a background of sage prairie and mountains. Additionally, views of the alignment crossings at SH 141 are short duration views because the alignment is viewed from moving vehicles. There would be low new, long-term effects to visual resources in Dry Creek Basin.

##### 4.3.7.1.2 Dolores River Crossing

Low to high long-term increased visibility at the Dolores River crossing is expected due to taller structures and a wider ROW, and increased visibility at KOP 2. Due to the site-specific context (including low volume, duration, and frequency of visitor use and the presence of the existing transmission line as an expected frame-of-reference in the landscape), the overall effects are expected to be low to moderate. The proposed alignment would cross the canyon approximately 1.2 miles closer to the scenic overlook (KOP 1) than the existing alignment. The distance between the scenic overlook and proposed transmission line would be approximately 3.5 miles. Impacts to visual resources would vary depending on the direction of the view. Effects to visual resources in views of the north rim (southerly and southeasterly views) would be low to moderate. As seen in Photo 1D of Appendix C, Visual Resources Report, although the northern structure is visible above the skyline, it is relatively small in the view. Other visible man-made features include a radio tower on the north rim, the town of Dove Creek to the west, and the developed overlook (KOP 1). Although some of the proposed structures would be more visible, the conductors and structures would be visible in only one direction from the scenic overlook, would be relatively small in the view, and would be viewed primarily against a background of forest and canyon walls (with the exception of the north rim structure).

Effects to visibility in views from KOP 2 to the north would be moderate to high due to the close proximity of the structures and conductors. There would be effects to visual resources from KOP 2, the BLM cul-de-sac, in views to the north. Depending upon the viewer's specific location on the canyon rim near the vehicular cul-de-sac, some views of the structures would be completely or partially-obscured by vegetation, and others would be unobstructed. Additionally, public use of this location is very limited. The site is unsigned and accessed only by unmarked 4-wheel drive access roads. According to local residents, the area might be used infrequently and seasonally by hunters. Visitor use is low in frequency, duration and volume at KOP 2.

Effects to visual resources from KOP 10, at the Dolores River in the canyon bottom, in views to the north and upwards, would be negligible because the north canyon rim structure would be

visible, but approximately 0.5 miles further away from the KOP than the visible existing structure. Contrasts of the proposed and existing structures would be similar. Views to the east, west, and south would remain unchanged.

Effects to visual resources from KOP 11, at the Dolores River in the canyon bottom, would be beneficial in views to the north, because the crossing would not be visible due to the screening effects of trees and topography (the existing alignment is in view from KOP 11). Views to the east, west, and south would remain unchanged.

Effects to visual resources from KOP 12, at the Dolores River in the canyon bottom, would vary dependent upon the direction of the view. In views to the east, west, and south, effects would be eliminated because the crossing would be north of the KOP, and therefore not visible in any other direction. In views to the north, the effects would be moderate because the south rim structure and most of the conductors would be highly visible without obstruction.

Some existing transmission line structures and conductors are visible from the Dolores River in the canyon bottom, KOPs 10, 11, and 12. Recreational boaters floating the river have views of some structures and conductors in the vicinity of KOPs 10, 11, and 12, but for limited durations due to the movement of the boats downstream. The transmission line is visible along the river at river mile 2 and 5 for periods of time. The transmission line is an expected part of the landscape and is used as a frame of reference for boaters during the rare occasions when the river has boatable flows (about every 7 to 8 years). During low-flow conditions, boaters have visibility of some existing structures and conductors for approximately 45 minutes, in downstream and overhead views. Recreational boaters floating the river during low-flow conditions would have visibility of some proposed structures and conductors for approximately 20 minutes also near KOPs 10, 11, and 12. The duration of views of the proposed structures and conductors would be shorter than of the existing structures and conductors due to the screening effects of the canyon walls and existing trees in relationship to the river alignment.

Portions of the existing power structures (poles and lines) are visible from KOPs 1, 2, 10, 11, and 12 as part of the characteristic landscape. The degree of change as a result of this alternative would meet the BLM VRM Class II standards. There would be low to moderate change between the existing and proposed transmission line visual resources.

#### *4.3.8 Lands with Wilderness Characteristics*

The proposed Dolores River crossing under Alternative A would not affect lands with wilderness characteristics. There would be no ground disturbance within lands with wilderness characteristics. New facilities including structures and access roads would be located above and outside of the Dolores River Canyon rim, which generally defines the upper topographic boundary of the lands with wilderness characteristics in the Snaggletooth Unit. In addition, the existing structures and access roads that are located below the Dolores Canyon rim (but also outside of lands with wilderness characteristics) would be removed and reclaimed. Removal of the existing structures including transmission line and access roads and completion of revegetation could potentially increase the area within the canyon that meets the criteria for lands with wilderness characteristics. The BLM may subsequently amend the RMP and expand the Snaggletooth Unit lands with wilderness characteristics.

The proposed Dolores River Canyon transmission line crossing in Alternative A would not result in any direct surface disturbance within lands with wilderness characteristics and would not

affect the size, naturalness, or outstanding opportunities for solitude or primitive, unconfined types of recreation on lands with wilderness characteristics because all new surface disturbance would be located outside of lands with wilderness characteristics. Noise and activity associated with construction of the transmission line upgrade could adversely affect opportunities for solitude within the canyon for a period of about 7 months. Visual effects associated with the Dolores River crossing are discussed previously.

This alternative is consistent with the language and guidance of the RMP, in that no new ground disturbance to lands with wilderness characteristics would occur, and the visual effect of the conductor crossing the canyon would meet VRM Class II standards. In addition, the proposed alignment would reduce effects to wilderness characteristics by reducing the visibility of structures from within the canyon after existing infrastructure below the rim is removed and the existing access roads and structure locations are reclaimed. As part of the proposed action a narrower ROW (less than 100 feet) would be granted for the span through the Dolores River Canyon. Therefore, low, long-term beneficial effects are expected to Lands with Wilderness Characteristics.

## 4.4 Alternative B: No Action Alternative

### *4.4.1 Access, Roads, and Transportation*

There would be no change to the existing access and transportation system under the No Action Alternative, which uses about 235 miles of federal, state, county, and private roads. Tri-State would continue routine road maintenance on existing roads for which it has responsibility, in accordance with the 2006 Transmission Line Maintenance EA (BLM 2006) as it has in the past. Tri-State is authorized for disturbance of up to about 431 acres along 118.6 miles of existing access roads. Any new road development on BLM or USFS land would be subject to review and permitting requirements. There would be no new effects to access, roads and transportation.

### *4.4.2 Cultural Resources*

Under the No Action Alternative, any identified historic properties within the existing 100 foot ROW and access road alignments would require consideration of potential adverse effects from ongoing maintenance activities and potentially be subject to mitigation under a treatment plan. There would be no new effects to cultural resources.

### *4.4.3 Forest and Timber Resources*

In the No Action Alternative, there would be no timber harvesting associated with the existing ROW other than ongoing maintenance and clearing of trees under the transmission line. The status of most forest vegetation types – in the mature stage due to lack of disturbance (e.g., fire or harvesting) with dense stand conditions – would not change. Areas that have been treated (i.e., thinned or harvested) more recently may not be available for harvesting activities in the near term. In addition, Tri-State is authorized to disturb up to 83 acres of suitable timber along existing access roads. There would be no new effects to forest and timber resources.

### *4.4.4 Geology*

No mineral resources would be affected by the No Action Alternative. Geologic hazards (specifically unstable slopes) at the existing crossing of the Dolores River Canyon would continue to create a threat to safety, and require ongoing maintenance to stabilize transmission line structures. Tri-State is authorized to disturb up to 265 acres of lands with a high

susceptibility to landslides along existing access roads. There would be no new effects to geology.

### *4.4.5 Soils*

Under the No Action Alternative there would be no construction activity or surface disturbance and therefore, there would be no new effects to soils. Ongoing maintenance of existing access roads and work on the transmission line would result in minor long-term soil disturbances; those effects are disclosed in the 2006 EA (BLM 2006). Tri-State was authorized to disturb up to 431 acres of soils along existing access roads. If the No Action Alternative is selected, all existing structures would need to be replaced. Over time, there would be disturbance along the corridor as structures are replaced and roads are upgraded as authorized to maintain the existing transmission line at 115-kV.

### *4.4.6 Threatened, Endangered, or Candidate Animal Species*

Neither the Western yellow-billed cuckoo habitat nor the Mexican spotted owl would be affected under the No Action Alternative. There would be no change in lynx habitat under the No Action Alternative. For more explanation, refer to the discussion of wildlife in Section 3.4.11.

#### *4.4.6.1 Gunnison Sage-Grouse*

Under the No Action Alternative, negligible effects to the GuSG from EMF, UV, and Corona effects from the existing 115-kV line would continue; there would be no new effects. Under Alternative B, the existing transmission line in Dry Creek Basin GuSG habitat would remain in place. The indirect effects (noise and human activity from construction) from regular maintenance activities would be anticipated to increase in frequency as the existing line and structures age and decline. There would be no direct effects in known active GuSG lek buffers (0.6 miles from active leks; the distance from the center of the one known active lek to the existing line is approximately 3.8 linear miles. In order to continue to maintain the 115-kV line, more frequent and major maintenance activities would be required (refer to Section 2.3.2), which would involve the improvement of access roads in places to ensure safe access to any structures that need to be replaced. Disturbance from improvement of existing access roads is shown in Table 24.

Under the No Action Alternative, perching opportunities for avian predators provided by the existing 72 transmission line structures would continue to affect the GuSG. The two main infrastructure corridors that fragment GuSG habitat in the Dry Creek Basin are SH 141 and the existing transmission line; this fragmentation and reduction in habitat effectiveness due to the avoidance of tall structures would continue (Table 25).

### *4.4.7 Visual Resources*

Existing views from all KOPs would not change in the No Action Alternative. Therefore, the existing BLM VRM class, and USFS SIOs and VQOs would not be affected. There would be no new effects to visual resources.

### *4.4.8 Lands with Wilderness Characteristics*

Under the No Action Alternative, the existing Dolores River crossing and infrastructure would remain unchanged, and would not affect lands with wilderness characteristics. There would be no new beneficial effects to lands with wilderness characteristics.

## 4.5 Alternative C: Dolores River Crossing Routing Option (Alternative A Incorporating Upgrade-in-Place at Dolores River Crossing)

### *4.5.1 Access, Roads, and Transportation*

Tri-State is authorized for disturbance of up to about 425 acres along 117 miles of existing access roads. In addition to use of existing access roads, a total of about 7.3 miles of new access roads would be constructed under Alternative C: Dolores River crossing routing option, and about 1.7 miles of existing roads would be decommissioned and reclaimed. Upgrading the transmission line in-place through the Dry Creek Basin would require improvements to existing access roads per the 2006 Transmission Line Maintenance EA (BLM 2006). Upgrading the Dolores River crossing in-place would require construction of about 0.9 miles of new special use road for new pole locations on NFS lands and reclamation of multiple spur roads to pole locations that would no longer be needed. Overall, effects to access, roads, and transportation for Alternative C would be negligible to low and short-term similar to Alternative A.

### *4.5.2 Cultural Resources*

Effects to historic properties under Alternative C are the same as Alternative A. However, the identification of historic properties (pedestrian survey) along the proposed Dolores River crossing and the Dry Creek Basin reroutes has not been completed. These areas would be subject to identification efforts and evaluated for effects to historic properties per Section 106 of the NHPA, potentially subject to mitigation efforts under a treatment plan.

### *4.5.3 Forest and Timber Resources*

See Section 4.3.2.1 for effects common to all Action Alternatives. In Alternative C: Dolores River crossing routing option, the increase in the ROW width and new access road associated with the Dolores River crossing within the SJNF would result in new clearing of approximately 31.9 acres of lands *generally not suitable for timber production or harvest*, about 2.6 acres of *land suitable for timber harvest*, and about 2.6 acres of *tentatively suitable lands*. In total, Alternative C: Dolores River crossing routing option would have about 13.8 acres of new clearing in aspen and 34.4 in conifer on the GMUG NF, and about 28.7 acres of new clearing in *land suitable for timber production* (SJNF). Effects to forest and timber resources are expected to be moderate and long-term due to a total of 79.5 acres of new clearing in suitable timber. In addition, Tri-State is authorized to disturb up to 83 acres of suitable timber along existing access roads.

**Dolores River Crossing Upgrade-in-Place.** These areas are on extremely steep slopes inaccessible or uneconomical for logging. Removal of portions of the existing access road would result in 2.2 acres of reclamation (Table 26). There would be no effect on existing or future timber resources.

**Table 26. Dolores River Crossing Upgrade-in-Place Effects to Timber Resources Based on Timber Suitability Classifications**

| Component | Timber Suitability Designation (SJNF) | Acres |
|---|---|---|
| ***Clearing*** | | |
| Additional 25-foot ROW | Lands Generally Not Suitable for Timber Production or Harvest | 4.9 |
| | Lands Suitable for Timber Production | 1.4 |
| | Other Tentatively Suitable Lands Where Timber Harvest May Occur | 2.6 |
| New Road | Lands Generally Not Suitable for Timber Production or Harvest | 6.8 |
| | Lands Suitable for Timber Production | 1.3 |
| | Other Tentatively Suitable Lands Where Timber Harvest May Occur | 0.0 |
| ***Reclamation*** | | |
| 12-foot Access Road | Lands Generally Not Suitable for Timber Production or Harvest | 2.2 |
| | Lands Suitable for Timber Production | 0.03 |

### *4.5.4 Geology*

Mineral resources would not be affected by any Action Alternative or the No Action Alternative.

Geologic hazards under Alternative C are described in Alternative A, Section 4.3.4.

A preliminary engineering geologic hazard evaluation was conducted by Kleinfelder for the Dolores River crossing in the southern portion of the study area (Kleinfelder 2014). The evaluation included a desktop review of the site geology and a site reconnaissance to assess the potential for slope stability hazards in the areas proposed for new transmission line towers at the existing alignment for the Dolores River crossing. The evaluation concluded that landslides, rockfalls and other hazards could be minimized by careful structure placement and design. However, a new road alignment would be required to traverse unstable slopes at the crossing, and there would be ongoing maintenance and stabilization activities required. The Alternative C: Dolores River crossing routing option footprint would include about 78.0 acres of new disturbance with high susceptibility to landslides. Effects are expected to be low and long-term. In addition, Tri-State is authorized to disturb up to 259 acres of lands with a high susceptibility to landslides along existing access roads.

### *4.5.5 Soils*

Most soil disturbance for Alternative C: Dolores River crossing routing option would be the same as Alternative A. Upgrading the Dolores River crossing in-place would result in soil disturbances similar to the remainder of the line; however, the steep terrain on the rim of the canyon increases the potential for soil loss during construction and over the long-term from maintenance access. The new design would remove two structures closest to the rim (one on each side), which are located on erodible steep slopes. However, the access road and new structures would still be located on steep terrain resulting in a large soil disturbance footprint due to cut and fill slope requirements. Soil effects along a new 0.9-mile road with a ROW of up to 75 feet would disturb about 9 acres of soils. Reclaiming the road from the 16-foot width required for construction access to 12 feet wide for long-term permanent maintenance access would reduce the area of soil disturbance and potential erosion. Revegetation of cut and fill slopes following construction would reduce erosion, but some soil loss is likely over the long-

term in this steep terrain along access roads. Abandonment and reclamation of about 7.3 miles of existing access roads to the current pole locations would reduce erosion and soil loss over the long-term. Under Alternative C: Dolores River crossing routing option, about 161.9 acres of direct soil disturbance would occur. In addition, Tri-State is authorized to disturb about 425 acres of soils along existing access roads.

### *4.5.6 Threatened, Endangered, or Candidate Animal Species*

Under Alternative C: Dolores River crossing routing option, federally threatened and endangered species that would potentially be affected by the Action Alternatives are the GuSG and Canada lynx. The western yellow-billed cuckoo and Mexican spotted owl would not be affected by any of the Action Alternatives or the No Action Alternative.

For the Canada lynx analysis, lynx habitat occurs only in portions of the transmission line alignment common to both Action Alternatives. Effects to Lynx under Alternative C would be the same as for Alternative A.

For the GuSG, the alignment within the Dry Creek Basin would be the same as Alternative A; therefore, all effects to GuSG would be the same as Alternative A.

### *4.5.7 Visual Resources*

Effects to visual resources common with all Action Alternatives are described under Alternative A, Section 4.2.6. Differences between Alternative A and Alternative C: Dolores River crossing routing option are only at the Dolores River crossing. Additional information is in the Visual Resources Report, Appendix C (HLA 2015). Overall, effects to visual resources are expected to be low and long-term project-wide, with moderate localized effects at KOP 2, KOP 10, KOP 11 and KOP 12.

The Dolores River crossing upgrade-in-place option would have fewer, but taller structures than the existing line, within the same alignment. Structure type would be different from the wooden structures currently supporting the crossing. The new taller structures would be more visible, but would be set back from the rim about 314 feet from the location of the existing crossing structure on the north rim, and about 69 feet on the south rim. The proposed construction and maintenance access road with cut and fill slopes, would be highly visible from KOP 2 in views to the east-northeast. Reclamation and revegetation of the cut and fill slopes of the maintenance access road would mitigate, but not eliminate the visible contrasts of the road. The view of the new structures and road would be to the northeast from KOP 2. Views in other directions would not include the proposed structures, road, and conductors. The taller towers and new access road with cut and fill slopes would be more visible than the existing structures and road due to size and location. Effects to visual resources would be low from KOP 1 and moderate from KOP 2. From KOPs 10, 11, and 12 the larger structures would be more visible due to size; but, from the canyon bottom, the proposed maintenance access road would not be visible. As noted in Section 4.3.7.1.2, the existing transmission line structure are visible at river mile 2, 5, and at the crossing, and are an expected part of the landscape. The crossing is a frame-of-reference for river users. In addition, use at KOP 2 and along the river is rare (see discussion in Section 4.3.7.1.2).

Because the proposed Dolores River Canyon crossing would be in the same location as the existing crossing, existing BLM VRM class II and USFS SIOs would not be affected.

#### *4.5.8 Lands with Wilderness Characteristics*

Under Alternative C: Dolores River crossing routing option, upgrade-in-place, the line would remain in a corridor that was specifically excluded from lands with wilderness characteristics designation, and would therefore not affect this designation. Existing tower structures would be removed, and new tangent structures would be placed further back from the existing positions (314 feet on the north rim and 69 feet on the south rim; see Figure 13). These new towers would still be below the canyon rim, but would be outside of the lands with wilderness characteristics boundary. Existing roads accessing eliminated poles would be reclaimed, and a new access road would be constructed; however, all new ground disturbance would be located outside of lands with wilderness characteristics.

Similar to Alternative A, this upgrade-in-place alternative would not result in any direct ground disturbance within lands with wilderness characteristics and would not affect the size, naturalness, or outstanding opportunities for solitude or primitive, unconfined types of recreation on lands with wilderness characteristics because all new ground disturbance would be located outside of lands with wilderness characteristics. Construction activity could adversely affect opportunities for solitude within the canyon during the 7-month construction period. Visual effects associated with the Upgrade-in-Place option at the Dolores River crossings are discussed above.

This alternative is consistent with the language and guidance of the RMP (USFS 2013 and BLM 2015), in that the transmission line would remain within the existing ROW, and no new disturbance to lands with wilderness characteristics would occur. As part of Alternative C, a narrower ROW (less than 100 feet) would be granted for the span through the Dolores River Canyon. Because the existing alignment impedes on the natural topography of the land, once the area below the Dolores River Canyon rim is reclaimed, structures are removed and the road is revegetated, additional acreage of lands with wilderness characteristics could be added to the Snaggletooth Unit. Therefore, low, long-term beneficial effects are expected to lands with wilderness characteristics.

### 4.6 Alternative C: Dry Creek Basin Routing Option (Alternative A Incorporating Dry Creek Basin Realignment Option)

#### *4.6.1 Access, Roads, Transportation*

Tri-State is authorized for disturbance of about 392 acres along 107.9 miles of existing access roads. In addition to use of existing access roads, a total of about 17.6 miles of new access roads would be constructed under Alternative C: Dry Creek Basin routing option and about 10.7 miles of existing roads would be decommissioned and reclaimed. Rerouting of the transmission line through the Dry Creek Basin would require construction of about 9 miles of new downline access road. A similar amount of road along the existing transmission line corridor through the Dry Creek Basin would be decommissioned and reclaimed, including about 4.3 miles on BLM land, 2.6 miles on private land, and 2.1 miles on state land (CPW; Dry Creek Basin SWA). As described for Alternative A, a new Dolores River Canyon transmission line crossing would require construction of about 2.2 miles of new access roads on the north and south rims. These would be special use routes closed to public access. About 1.7 miles of road used to access the existing transmission line crossing of Dolores Canyon would be decommissioned and reclaimed following removal of existing poles. Overall, effects to access, roads and transportation for Alternative C would be negligible to low and short-term similar to Alternative A.

### *4.6.2 Cultural Resources*

Effects to known historic properties under Alternative C: Dry Creek Basin Routing Option are the same as Alternative A, and described in Section 4.3.2. However, the identification of historic properties (pedestrian survey) along the Dry Creek Basin realignment has not been completed. These areas would be subject to identification efforts and evaluated for effects to historic properties per Section 106 of the NHPA, potentially subject to mitigation efforts under a treatment plan.

### *4.6.3 Forest and Timber Resources*

Effects to Forest and Timber Resources under Alternative C: Dry Creek Basin routing option would be the same as under Alternative A for the effects common to all Action Alternatives (Section 4.3.1.2.1) and the Dolores River crossing (Section 4.3.1.2.2) and would be moderate and long-term. For the realignment along SH 141 in the Dry Creek Basin option, minor clearing would occur in *lands generally not suitable for timber production and harvest.* There are no timber resources in the Dry Creek Basin. In total, Alternative C: Dry Creek Basin routing option would have about 13.8 acres of new clearing in aspen and 34.4 in conifer on the GMUG NF, and about 34.6 acres of new clearing in *lands suitable for timber production* (SJNF). In addition, Tri-State is authorized to disturb up to 80 acres of suitable timber along existing access roads.

### *4.6.4 Geology*

Effects to Geology under Alternative C: Dry Creek Basin routing option would be very similar to Alternative A and would be low and long-term. The realignment along SH 141 in the Dry Creek Basin option would have surface disturbance to about 28.8 acres of high susceptibility to landslides, for a total of about 100.4 acres of disturbed lands having this classification for Alternative C: Dry Creek Basin routing option. In addition, Tri-State is authorized to disturb up to 236 acres of lands with a high susceptibility to landslides along existing access roads.

### *4.6.5 Soils*

Realignment of the transmission line through the Dry Creek Basin would introduce new soil disturbances in an area not previously disturbed. Approximately 9 miles of new downline road would be needed for access to this new transmission line route. Because the terrain is relatively flat, soil disturbance and water erosion potential for the downline road and construction work would be low. However, wind erosion would temporarily increase due to new surface disturbance. Revegetation of existing access road network would occur. The total new soil disturbance footprint for Alternative C: Dry Creek Basin routing option is 192.3 acres. In addition, Tri-State is authorized to disturb up to 392 acres of soils along existing access roads. Effects to soils are expected to be similar to Alternative A and range from low, short-term to negligible and long-term.

### *4.6.6 Threatened, Endangered, or Candidate Animal Species*

Under Alternative C: Dry Creek Basin routing option, federally threatened and endangered species that would potentially be affected by the Action Alternatives are the GuSG and Canada lynx. The western yellow-billed cuckoo and Mexican spotted owl would not be affected by any of the Action Alternatives or the No Action Alternative.

For the Canada lynx analysis, lynx habitat occurs only in portions of the transmission line alignment common to all Action Alternatives. Effects to lynx under Alternative C: Dry Creek Basin routing option would be the same as for Alternative A.

#### *4.6.6.1 Gunnison Sage-Grouse*

Effects unique to Alternative C: Dry Creek Basin routing option on GuSG are described below.

##### 4.6.6.1.1 Active Lek Proximity and Disturbance to Occupied and Critical Habitat

This EA is tiered to the 2006 EA (BLM 2006), which authorized Tri-State's use of 118 miles of existing access roads for maintenance and repairs to the existing transmission line. Alternative C would use some of the previously authorized roads for construction access and most of the authorized road for demolition of the existing line. Portions of these roads would be upgraded to accommodate construction/demolition equipment. After demolition most of the existing authorized access roads would be reclaimed and revegetated. Realignment of the transmission line would require construction of new access roads for construction and maintenance. After construction, disturbed areas for new access roads and staging areas would be restored and an average 16-foot wide access road maintained. In addition, most of the access road and structure footprints for the existing transmission line would be reclaimed to native conditions. Although tiered to the 2006 EA, no consultation with the USFWS on impacts to GuSG was performed because the species was not listed at the time.

Under Alternative C: Dry Creek Basin routing option the transmission line would be realigned along SH 141 in the Dry Creek Basin. There would be no direct effects to active GuSG leks, or within the recommended 0.6 miles avoidance buffer. The distance from the center of the one known active lek to Alternative C: Dry Creek Basin routing option would be approximately 4.9 linear miles, or an increase of 1.1 miles compared to the existing transmission line (Table 24). In Alternative C: Dry Creek Basin routing option, no direct or indirect effects would be within 4 miles of an active lek.

Alternative C pole construction would remove a total of 6.1 acres of occupied habitat, including 5.4 acres in critical habitat (Table 24). Alternative C would disturb up to a maximum of 6.8 acres of occupied habitat for existing road improvements and 31.2 acres for new access roads during construction. Approximately 5.1 acres of the existing road improvements and 26.8 acres of the new access road disturbance would occur within critical habitat. After construction most of the construction access, staging areas and other surface disturbance would be restored with only a small access road remaining over the long-term for maintenance. Long-term surface disturbance after restoration would be 3.6 acres (2.7 acres within critical habitat) for the existing access road and 16.6 acres (14.3 acres in critical habitat) for new access roads (Table 24).

Alternative C would co-locate the two major sources of fragmentation of GuSG habitat in the Dry Creek Basin. Although the direct and indirect surface disturbance of all alternatives is very similar (Table 24), combining the transmission line and Hwy 141 into a single disturbance corridor increases the overall effective GuSG habitat available in the basin. Compared to Alternatives A and B, the area of reduced habitat effectiveness for Alternative 3 would be 1,141 acres and the area of increased habitat effectiveness would be 3,760 acres (2,163 acres in critical habitat) of increased habitat effectiveness (Table 25). Approximately 14 acres (9.9 acres of critical habitat) of long-term surface damage from the existing maintenance road would be reclaimed under Alternative C, resulting in a net benefit and contribute to recovery to GuSG occupied and critical habitat (Table 25).

#### 4.6.6.1.2 Effect of Avian Predators

All Action Alternatives would considerably reduce perching opportunities for avian predators associated with the transmission line because all structures in the Dry Creek Basin would be self-supporting steel monopoles equipped with perch discouragers (Figure 19). Alternative C: Dry Creek Basin routing option would have about 54 steel monopoles with perch discouragers compared to 72 wooden H-frame structures without perch discouragers in GuSG occupied habitat under the existing conditions. Alternative C: Dry Creek Basin routing option would reduce the number of structures by about 26 percent and additional design features including steel monopole structure and perch discouragers would reduce and minimize perch and nesting opportunities for avian predators in GuSG occupied habitat. Fewer structures with fewer perching surfaces would reduce the frequency and duration of avian predator perching and nesting. Reducing avian predator perching and nesting opportunities would likely reduce the presence of avian predators in general, which would likely provide a net benefit and contribute to recovery for GuSG in the Dry Creek Basin.

#### 4.6.6.1.3 Fragmentation/Connectivity

Implementation of the realignment along SH 141 in the Dry Creek Basin would improve habitat effectiveness on a total of 2,163 acres compared to existing conditions (see Table 24). This equates to 26 percent increase in effective habitat relative to existing conditions. Removal and reclamation of the existing transmission line could decrease fragmentation and facilitate GuSG movement in the Dry Creek Basin in the long-term.

As described in Section 4.2.5.2.5, two main infrastructure corridors that traverse GuSG habitat in the Dry Creek Basin are SH 141 and the existing transmission line. By re-routing the Dry Creek Basin portion of the transmission line instead of upgrading in place, two relatively distinct linear disturbance corridors (the existing transmission line and SH 141) would be co-located into a single, expanded disturbance corridor under Alternative C: Dry Creek Basin routing option. Co-locating the transmission line disturbance corridor with the existing highway corridor would reduce overall habitat fragmentation, and potentially provide greater connectivity between existing and formerly occupied lek sites within GuSG occupied habitat in the Dry Creek Basin. The realignment would create new surface disturbance in occupied habitat under Alternative C: Dry Creek Basin routing option, but overall would concentrate effects to an overlapping zone of influence along the highway. Based on the information provided above, it is not anticipated that the effect of co-locating the two disturbance sources would further affect GuSG use beyond 0.62 miles (1,000 meters).

### *4.6.7 Visual Resources*

Overall, effects to visual resources along the project area are expected to be low and long-term, project-wide, similar to Alternative A. Effects to visual resources would be high and localized for KOP 6 because the existing alignment is not visible from KOP 6 and most of SH 141 (see Appendix C for photo simulations). The new alignment along SH 141 would be highly visible to travelers along the highway for about 10 minutes (approximate drive-time through the basin) and would be highly visible from KOP 6 and to surrounding residents and landowners. Some views from CR U29 in the central and northern portions of the basin would be improved following removal of the existing structures and conductors and reclamation of the existing alignment.

#### *4.6.8 Lands with Wilderness Characteristics*

Under Alternative C: Dry Creek Basin routing option, effects to lands with wilderness characteristics would be the same as Alternative A and Alternative C: Dolores River crossing routing option and would be beneficial, low and long-term.

### 4.7 Alternative C: Dolores River Crossing and Dry Creek Basin Routing Options (Alternative A incorporating Dry Creek Basin Realignment and Upgrade-in-Place at Dolores River Crossing)

#### *4.7.1 Access, Roads, and Transportation*

Tri-State is authorized for disturbance of up to about 398 acres along 109.6 miles of existing access roads. In addition to use of existing access roads, a total of about 16.3 miles of new access roads would be constructed under Alternative C: Dolores River crossing and Dry Creek Basin routing options and about 9.0 miles of existing roads would be decommissioned and reclaimed as described for Alternative C: Dolores River Crossing routing option and Alternative C: Dry Creek Basin routing option. Overall, effects to access, roads and transportation for Alternative C would be negligible to low and short-term similar to Alternative A.

#### *4.7.2 Cultural Resources*

Effects to Cultural Resources under Alternative C: Dolores River crossing and Dry Creek Basin routing options would be the same as described for Alternative C: Dolores River crossing routing option and Alternative C: Dry Creek Basin routing option.

#### *4.7.3 Forest and Timber Resources*

Effects to Forest and Timber Resources under Alternative C: Dolores River crossing and Dry Creek Basin routing options would be similar as described for Alternative C: Dolores River crossing routing option and Alternative C: Dry Creek Basin routing option and would be moderate and long-term. The Dolores River upgrade-in-place effects are in Section 4.3.3.2 (Table 20). In total, Alternative C: Dolores River crossing and Dry Creek Basin routing options would have about 13.8 acres of new clearing in aspen and 34.4 in conifer on the GMUG NF, and about 28.7 acres of new clearing in *lands suitable for timber production* (SJNF). In addition, Tri-State is authorized to disturb up to 83 acres of suitable timber along existing access roads.

#### *4.7.4 Geology*

Alternative C: Dolores River crossing and Dry Creek Basin routing options would cause surface disturbance to about 101.6 acres of land characterized as highly susceptible to landslides. In addition, Tri-State is authorized to disturb up to 242 acres of lands with a high susceptibility to landslides along existing access roads. Effects are expected to be low and long-term.

#### *4.7.5 Soils*

Effects to soils under Alternative C: Dolores River crossing and Dry Creek Basin routing options would be the same as described for Alternative C: Dolores River crossing routing option and Alternative C: Dry Creek Basin routing option. Under Alternative C: Dolores River crossing and Dry Creek Basin routing options, about 193.5 acres of new soil disturbance would occur. In addition, Tri-State is authorized to disturb up to 398 acres of soils along existing access roads.

#### *4.7.6 Threatened, Endangered, or Candidate Animal Species*

Under Alternative C: Dolores River crossing and Dry Creek Basin routing options, federally threatened and endangered species that would potentially be affected by the Action Alternatives

are the GuSG and Canada lynx. The western yellow-billed cuckoo and Mexican spotted owl would not be affected by any Action Alternatives or the No Action Alternative.

For the Canada lynx analysis, lynx habitat occurs only in portions of the transmission line alignment common to all Action Alternatives. Effects to lynx under Alternative C: Dolores River crossing and Dry Creek Basin routing options would be the same as for Alternative A.

For the GuSG, the alignment within the Dry Creek Basin would be the same as described under Alternative C: Dry Creek Basin routing options (see Section 4.6.6).

#### *4.7.7 Visual Resources*

Effects to visual resources in the Dry Creek Basin would be the same as for Alternative C: the Dry Creek Basin routing option (see Section 4.6.7). Effects at the Dolores River Canyon crossing, would also be the same as described under Alternative C: the Dolores River Canyon crossing routing option (see Section 4.5.7). All other effects to visual resources are common to all Action Alternatives.

#### *4.7.8 Lands with Wilderness Characteristics*

Under Alternative C: Dolores River crossing and Dry Creek Basin routing options, effects to lands with wilderness characteristics would be the same as Alternative C: Dolores River crossing routing option.

### 4.8 Summary of Avoidance, Minimization, Mitigation and Monitoring

For all action alternatives, avoidance, minimization and monitoring measures have been integrated into the proposed design and construction methods (see Section 2, in particular Section 2.3.6.16 and Table 8 and Table 9). The effectiveness of the avoidance and minimization measures has been reviewed for each resource, and no residual effects requiring mitigation have been identified. The avoidance and minimization measures would adequately offset the environmental effects to all resources. Monitoring integrated into the action alternatives would be effective at providing information needed to determine if avoidance and minimization measures are being appropriately implemented and are adequate to protect those resources (see Section 2.3.6.16 and Table 8 and Table 9).

# 5 CUMULATIVE EFFECTS

Cumulative effects result from the incremental effect of an action when added to other past, present, or reasonably foreseeable actions regardless of what agency or person undertakes such other actions. Cumulative effects may be additive (effects of actions add up to create a cumulative effect); countervailing (effects of some actions may balance or mitigate the effects of other actions); or synergistic (the effects of the actions is greater than the sum of their individual effects).

### 5.1 Analysis Areas

The geographic extent of cumulative effects varies by the type of resource and effect. The timeframes, or temporal boundaries, for those effects may also vary by resource. Where alternatives potentially contribute to cumulative effects, spatial and temporal Cumulative Effect Areas (CEAs) and their extent were developed by resource and are shown in Table 27.

For cultural resources and lands with wilderness characteristics, cumulative effects were not considered due to the lack of effects from the Proposed Action, Action Alternatives, or the No Action. For cultural resources, effects would be reduced, avoided, or mitigated through implementation of a treatment plan. For lands with wilderness characteristics, a net benefit is anticipated under both the alignment options at the Dolores River crossing, and the No Action Alternative represents no change from existing conditions; therefore, the Proposed Action, Action Alternatives, or the No Action would not result in any direct or indirect effects and will not result in an accumulation of effects.

**Table 27. Cumulative Effects Analysis Area for Resources Evaluated in Detail in EA**

| Resource | Cumulative Effect Area | Total CEA Extent | Temporal Boundary |
|---|---|---|---|
| Access, Roads and Transportation | The network of access roads identified in the POD, SH 90, SH 14,1 and SH 145, and other local access roads | Access roads identified in the POD and major access routes used by the project and within 10 miles of the project area | During project construction (two 7-month periods)* |
| Cultural Resources | N/A. For all Action Alternatives, effects would be reduced, avoided or mitigated through implementation of a treatment plan. | N/A | N/A |
| Forest and Timber Resources | Timber units adjacent to and within 4 miles of clearing areas within transmission line ROW. | 30,655 acres | 5 years (2-year life of project plus 3 years for vegetation reclamation) |
| Geology and Soils | Drainage areas ($6^{th}$ level hydrologic unit, 12-digit HUC) downgradient to new disturbed areas such as new lengths of access roads, realignment areas, and substation expansion areas. | 490,221 acres | 5 years (2-year life of project plus 3 years for vegetation reclamation) |
| Threatened and Endangered (GuSG) | Occupied habitat area for Dry Creek Basin subpopulation of GuSG. | 49,261 acres | Temporary effects: during project construction (two 7-month periods). Permanent effects: life of project (50 years) |
| Visual Resources | 5-mile viewshed from project area. This area was chosen because it encompasses the entire project area viewshed as seen by travelers on nearby roads. | 563,814 acres. | Temporary effects: during project construction (two 7-month periods). Permanent effects: life of project (50 years) |
| Lands with Wilderness Characteristics | Bradford Bridge to Dove Creek Pump Station. N/A. No effects to lands with wilderness characteristics | N/A | N/A |

*Ongoing use for maintenance of line is not changed as a result of this project so not included in analysis

## 5.2 Past, Present, and Reasonably Foreseeable Actions

The past, present and reasonably foreseeable actions that would contribute to cumulative effects on resources affected by the alternatives primarily include highways and rural roads, trails, transmission lines, fences, rural residential and agricultural buildings, industrial storage and other sites, and oil and gas development.

### *5.2.1 Past and Present Actions*

These past and present actions are present throughout the project area in a broad sense, and specific locations are summarized in the bullets below. In addition, the affected environment described in Chapter 3 includes past and present actions, which result in the existing condition of the project area.

- Existing oil and gas development activities in the area near the Dry Creek Basin, including from the intersection of SH 141/145 south to the southern end of the project area. Existing facilities include gas wells, pipelines, access roads, compression stations, storage/staging yards, and evaporation and other processing facilities. Kinder-Morgan natural gas pipeline on GMUG across the Uncompahgre Plateau has ROW adjoining the MNC Tri-State improvement project;
- Ongoing farming, grazing, ranching, and other agricultural activity including fences, buildings, and other infrastructure;
- Transportation infrastructure, including SH 141, SH 145, SH 90, other local and regional roadways, and private inholding driveways;
- Energy infrastructure, including multiple 345-kV, 230-kV, 115-kv, and distribution lines throughout the project area, including the San Miguel Power Administration (SMPA) transmission line on the Uncompahgre Plateau which has ROW adjoining the MNC Tri-State improvement project;
- Communication infrastructure including the Raspberry Communications Site (Township 47 N, Range 12 W, Section 21) on the Uncompahgre Plateau;
- Nucla Generating Station north of the intersection with SH 141/145 and small coal-powered generating facility;
- Other extractive industries, including the existing Hankins Quarry for flagstone within the Dry Creek Basin;
- Timber clearing, sales, and fire/fuels management activities, specifically including the Upper Tri-State Fuels Treatment Project (on the Uncompahgre Plateau) for areas surrounding the existing 115-kV MNC Tri-State line;
- Recreation on the Uncompahgre Plateau includes camping (Iron Springs Campground, Silesca Cabin Rental), hiking, motorized and non-motorized vehicle use, turkey and big game hunting, boating, fishing, driving for pleasure, and other miscellaneous activities; and
- Recreation use on the SJNF includes driving on the forest roads, dispersed camping, and hunting, and two permitted outfitter guides. Heaviest use in the Tri-State MNC

transmission line area occurs during the fall hunting season. Winter recreation use is very rare as most roads become snow-closed.

### *5.2.2 Reasonably Foreseeable Actions*

Reasonably Foreseeable Actions (RFAs), as defined in the BLM NEPA Handbook (Section 6.8.3.4; [BLM 2008]), are defined as those actions for which there are existing decisions, funding, formal proposals, or which are highly probable, based on known opportunities or trends. The following RFAs have been identified from actions posted on the BLM and USFS Schedule of Proposed Action (SOPA) lists, and from agency specialists' best professional judgment and local knowledge. The table below also identifies the primary resources potentially affected in a cumulative manner.

**Table 28. Reasonably Foreseeable Actions, Locations, and Effects Analyzed**

| General Location | Name and Summary of Action | Resources Affected/Analyzed |
|---|---|---|
| GMUG (northern project area, Ouray District) | Various forest harvest, treatments and fuels reductions on the Uncompahgre Plateau (total about 1,300 acres in vicinity of project area); various small salvage sales. These are small (<$10,000 value) contracts of beetle killed Douglas-fir or windthrown spruce. Only one, Spruce Up, is ongoing and should be completed this season (2015). Potential for additional small sales in the area given the ongoing Douglas-fir beetle mortality on the plateau and the history of the spruce in the area blowing down. | Forest and Timber Resources and Access, Roads, and Transportation |
| Dry Creek Basin | Hamm Canyon Well Pad (GuSG cumulative effects) – Access to the site, which is in the Dry Creek Basin, could be via San Miguel County roads 29U and 16Z plus about 2.2 miles of two-track road on BLM land. The 16Z and two-track access roads would be improved to a 35-foot ROW. Use of the improved road would remove all oil and gas traffic from U29, substantially reducing traffic on U29. | Threatened, Endangered, or Candidate Animal Species (specifically GuSG) and Access, Roads, and Transportation |
| Dry Creek Basin | Healthy Lands Initiative West Highway Gunnison Sage-Grouse Habitat Improvement Project – Treatment of up to 905 acres of pinyon-juniper encroached shrublands to improve habitat suitability for GuSG in Dry Creek Basin. | Threatened, Endangered, or Candidate Animal Species (specifically GuSG) |
| Dry Creek Basin | Northwest Pipeline (Williams) Pipeline ROW project – Addition of cathodic protection to existing pipeline ROW | Threatened, Endangered, or Candidate Animal Species (specifically GuSG) |
| Dry Creek Basin | Hankins Quarry – Renewal of existing permit for flagstone quarry in Dry Creek Basin | Threatened, Endangered, or Candidate Animal Species (specifically GuSG) |
| Dry Creek Basin | Gunnison Sage-Grouse RMP amendment. | Threatened, Endangered, or Candidate Animal Species (specifically GuSG) |

| General Location | Name and Summary of Action | Resources Affected/Analyzed |
|---|---|---|
| BLM, South end of Project Area (Dolores River) | West Dolores Rim Hazardous Fuels Reduction – Ongoing removal of fuels along the Dolores River West Rim. | Forest and Timber Resources |
| SJNF; South end of Project Area | Glade Landscape Rangeland Management Analysis Area - Analysis Area overlaps with the Tri-State MNC project area. Potential cumulative effects from domestic cattle grazing, during the summer months. | Geology and Soils |
| SJNF; South end of Project Area | Boggy-Glade Travel Management Decision (implementation in progress) – Tri-State MNC EA analysis included roads designated as open to public use as displayed on Motor Vehicle Use Map. Decision includes ATV trail south of Salter Canyon that is not yet implemented on the ground. Includes minor projects like signage or placing boulders at a few locations but no other large scale ground disturbing activities ongoing or in the near future. | Access, Roads, and Transportation |
| SJNF; South end of Project Area on East side of Dolores River | The Lake Canyon Forest Health Project – This project is in the implementation stage south of Glade Canyon along the rim and includes cutting beetle killed pine trees, mastication of oak brush, thinning live trees, and prescriptive burning. It is in its second year of implementation with some units cut last year, some cut this year and estimate additional units to be active for two more years. | Forest and Timber Resources and Access, Roads, and Transportation |
| Approximately 4 miles to the NW of Tri-State's Nucla power plant | SMPA ROW amendment to allow rebuild and upgrade of Nucla Substation | Visual Resources |
| From near Montrose to near the Nucla substation | Montrose to Moab Trail system improvements using existing USFS and BLM roads | Visual Resources and Access, Roads, and Transportation |
| West of the Montrose substation and within a half mile of the MNC line where it first intersects SH 90 | Proposed shooting area and parking lot | Visual Resources and Access, Roads, and Transportation |

## 5.3 Cumulative Effects of Alternatives

### *5.3.1 Access, Roads and Transportation*

Existing federal, state, county, and private roads in the vicinity of the project area provide access for a variety of uses including regional travel; recreation, agricultural, and commercial activity; oil, gas, and mineral industries; transmission line maintenance; and land management operations. Primary highways in the vicinity of the project area are SH 90, SH 145, SH 141, and numerous county, NF and BLM, and private roads. Past and present activities have included construction of new roads and ongoing road maintenance and repair. The existing road network provides a beneficial cumulative effect to the region by providing safe travel and access to public and

private lands. Roads to the existing transmission line allow Tri-State to access the 115-kV line for maintenance. Ongoing road maintenance by the responsible private land owner, BLM, and USFS would continue to provide access to public lands for multiple uses.

A number of RFAs near the project area would affect access and transportation. Proposed road improvements and new roads associated with the upgrade to the Tri-State transmission line would contribute to cumulative transportation effects. On BLM-managed and potentially other federal lands between Montrose and Nucla, Montrose County is proposing ROW for a Four-Wheel Drive (4WD) system of existing access roads that would provide a 4WD linkage between Montrose and Moab and could increase traffic on SH 90 and other local access routes. Montrose County also is proposing a potential shooting range and access near the north end of the project area, which also could increase traffic on SH 90. Various small salvage sales in the GMUG NF to restore forest health would involve use of existing access roads and possible new short-term roads used for timber removal operations. Similar activities associated with the Lake Canyon Forest Health Project could temporarily increase logging trucks on local roads at the south end of the project area on the SJNF. The development of the Hamm Canyon Well Pad would require improvements to several existing roads and would temporarily increase oil and gas traffic on local and regional roads in the Dry Creek Basin. Management of roads and trails under the Boggy-Glade Travel Management Decision would include a number of actions designed to provide for long-term watershed health, water quality, and wildlife habitat, while allowing access for outdoor recreation opportunities. When fully implemented, the public will be able to operate motor vehicles only on the roads and trails in the Boggy-Glade area that have been designated and depicted on a Motor Vehicle Use Map. The effect may be to concentrate vehicle use on fewer roads. Hunting on NFS lands contributes to the heaviest seasonal traffic—during the fall months—and would overlap with the proposed project construction season during September and October.

All of the Action Alternatives would contribute additively to the cumulative effects on roads and transportation from an increase in traffic during construction. Construction activities would be completed on a schedule of two eight-month sessions, one on the Nucla-Cahone section (2017) and one on the Montrose-Nucla section (2018). This may result in short-term cumulative adverse effects on travel and traffic in localized areas from the transport of equipment and materials. There would be no long-term adverse effects on transportation and traffic following construction, as future access for maintenance of the upgraded transmission line would be similar to existing conditions. Cumulative effects on traffic from the Action Alternatives in combination with other RFAs are expected to be negligible because actions are scattered over a large geographic area. New roads constructed for the upgraded transmission line would add to the road network, but the majority of these roads are expected to be short spur roads closed to motorized and mechanized use, so cumulative effects to regional access would be negligible. Local use by non-motorized public would likely occur on these new routes. The No Action Alternative's contribution to cumulative effects on access and transportation would be limited to ongoing maintenance of existing roads.

### *5.3.2 Forest and Timber Resources*

Forest and Timber resources are affected by past actions including past timber sales, ROW clearing, forest fires, and fuel management projects. The actions identified as contributing to cumulative effects include various small salvage sales (about 50 to 100 acres each), Tri-State Ouray District Stewardship Contract Treatments (about 1,300 acres), the West Dolores Rim

Hazardous Fuels Reduction (up to 10,000 acres of thinning and clearing), and the Lake Canyon Forest Health Project (pine thinning, mastication, sanitation /salvage, and prescriptive burning activities over approximately 7,500 acres). These projects have an overall effect of improving forest health and reducing the risk and intensity of insect infestations and catastrophic fire by clearing hazard trees and blowdown areas, and thinning trees to optimal healthy density. The Action Alternatives would result in additional clearing adjacent to an existing ROW corridor, with new clearing corridors needed for both routing options at the Dolores River crossing. Approximately 28 acres of lands suitable for timber production would be become unavailable for timber production for the life span of the powerline. Due to the size of the surrounding forest, this is a negligible effect. ROW limits would be cleared to NERC standards to protect the surrounding forest from potential hazard trees affecting the line and potentially causing fires or outages. The RFA's identified for Forest and Timber resources would primarily have a countervailing effect and balance or mitigate the low direct and indirect effects of the Action Alternatives.

### *5.3.3 Geology and Soils*

Ongoing and reasonably foreseeable future land disturbances from forest health projects, oil and gas development, road work, livestock grazing, and other land use activities have the potential to adversely affect geologic and soil resources where land disturbances occur. Proposed transmission line construction under all of the Action Alternatives would contribute to adverse cumulative effects from construction of new tower structures, roads, stringing operations, and other activities. Most of these activities would have short-term effects on geologic and soil resources with EPMs used to minimize long-term adverse effects. A net increase in new roads under the Action Alternatives (5.3 to 7.3 miles) would contribute long-term adverse cumulative effects on soil and geologic resources to those from other past, present, and RFAs. An upgraded transmission line under the Action Alternatives would have fewer towers than existing conditions, but towers would have a slightly larger permanent footprint. The net result would be a minor change in long-term soil productivity and contribution to cumulative effects. Overall, the Action Alternatives would contribute negligible to low adverse cumulative effects to land stability and soil productivity from temporary ground disturbing activities (a total of about 194 acres of temporary soil disturbance), with a long-term adverse loss in soil productivity from the additional access roads. The No Action Alternative would contribute ongoing adverse effects to geologic and soil stability from maintenance of roads and facilities at the Dolores River Crossing. Cumulative effects would be low to moderate in the localized area surrounding the Dolores River Crossing access roads and other ground disturbance.

### *5.3.4 Threatened, Endangered, or Candidate Animal Species (GuSG)*

The Action Alternatives would contribute to cumulative effects on GuSG in the Dry Creek Basin. Cumulative effects of each routing option, in combination with past, present, and reasonably foreseeable actions in the Dry Creek Basin are described in the following subsections.

Past and present activities affecting GuSG in the Dry Creek Basin include oil and gas development and other mining/extractive industries, development and use of transportation infrastructure, recreation, energy infrastructure including the existing 115-kV transmission line, and agricultural activity. Human activity and vehicle use associated with these activities may affect GuSG behavior, including lekking, and habitat use. Habitat is fragmented by pipelines, well pads, fences, transmission lines, and local, county, and state roads and highways.

RFAs potentially affecting GuSG include the Gunnison Sage-Grouse RMP amendment and the West Highway Gunnison Sage-Grouse Habitat Improvement Project; both projects would contribute to improvement of GuSG habitat in the Dry Creek Basin. The Hamm Canyon Well pad would contribute to improved habitat conditions for Gunnison Sage-Grouse by removing oil and gas traffic from U29. The Hankins Quarry permit renewal would have no additional increase in human activity or vehicle use. The Northwest Pipeline would increase human activity for the fall and one month for one year. During that time, there would be increased human activity, vehicle use, and habitat degradation and removal that could affect GuSG behavior and fragment GuSG habitat.

#### *5.3.4.1 Cumulative Effects of Upgrade-in-Place at Dry Creek Basin (Proposed Action, Alternative A)*

Cumulative effects of the Proposed Action (upgrade-in-place) at Dry Creek Basin on GuSG would be low, with some beneficial and some detrimental effects. The Proposed Action would reduce perching opportunities for avian predators associated with the transmission line. Reducing predation of GuSG in the Dry Creek Basin would contribute to other habitat improvement efforts from implementation of the Gunnison Sage-Grouse RMP amendment and the West Highway Gunnison Sage-Grouse Habitat Improvement Project. However, the upgrade-in-place at Dry Creek Basin would continue to reduce habitat effectiveness on 8,287 acres of GuSG habitat. When combined with the effects of ongoing and reasonably foreseeable oil, gas, and other development, transportation infrastructure, and agricultural activities, the upgrade-in-place at Dry Creek Basin would cumulatively exacerbate fragmentation of GuSG habitat. RFAs identified include Hamm Canyon Well pad, the Northwest Pipeline, and Hankins Quarry permit renewal are on the west side of the Dry Creek Basin, within 4 to 20 miles of the Proposed Action. These activities are in closer proximity to the upgrade-in-place and therefore would have a slightly higher level of cumulative effect. Cumulative effects of new human disturbance and vehicle use during construction and maintenance of the upgrade-in-place at Dry Creek Basin option would be negligible to low, because these effects would be temporary and minimized through implementation of EPMs. Cumulative effects of habitat removal from the upgrade-in-place at Dry Creek Basin would be low.

#### *5.3.4.2 Cumulative Effects of No Action Alternative (Alternative B)*

In order to continue to maintain the 115-kV line, more frequent and major maintenance activities would be required (refer to Section 2.3.3), which would involve the improvement of access roads in places to ensure safe access to any structures that need to be replaced. Cumulative effects of access road disturbance and vehicle use during construction and maintenance of the existing transmission line in the Dry Creek Basin would be negligible to low, because effects would be temporary and minimized through implementation of EPMs. Avoidance of the existing transmission line, in combination with avoidance of SH 141 and other areas of human activity, would continue to cumulatively fragment and reduce effectiveness of GuSG habitat in the Dry Creek Basin.

#### *5.3.4.3 Cumulative Effects of Realignment Option at Dry Creek Basin (Alternative C)*

Similar to the upgrade-in-place at Dry Creek Basin option, the realignment at Dry Creek Basin would reduce perching opportunities for avian predators. The cumulative effects of habitat removal, human disturbance, and vehicle use during construction and maintenance of the

realignment at Dry Creek Basin would also be similar to the upgrade-in-place. However, in the realignment at Dry Creek Basin option, the linear disturbance from the existing transmission line and SH 141 would be co-located into a single, expanded disturbance corridor. Co-locating the two major disturbance corridors in the Dry Creek Basin would result in a cumulative increase in habitat effectiveness on 2,163 acres of occupied GuSG habitat. Reducing avian predator perching and co-locating the transmission line and SH 141 would reduce predation of GuSG, reduce GuSG habitat fragmentation, and potentially provide greater connectivity of GuSG habitat areas. The realignment at Dry Creek Basin option, in combination with habitat improvement projects, would cumulatively improve GuSG habitat quality and reduce fragmentation. As noted previously, the Hamm Canyon Well pad, the Northwest Pipeline, and Hankins Quarry permit renewal projects are in the west portion of the Dry Creek Basin; therefore their cumulative effect would be lower in association with the realignment option than the upgrade-in-place option. Overall, cumulative effects from identified RFA's would be low when combined with the realignment option at Dry Creek Basin.

#### *5.3.5 Visual Resources*

The existing visual landscape includes ROW clearing, roadways, towns and other built environments, oil and gas facilities, and other extractive industries. New visual effects from additional clearing beyond the existing ROW, new access roads, taller structures, and realignment areas would have an additive effect. Widening the ROW from 100 to 150 feet would result in 962 acres of additional ROW acreage under the proposed action, of the 563,814 total acres of the Cumulative Effects Impact area for visual resources (5 miles wide by 176.2 miles long). Within this acreage, trees would be cleared, existing transmission line structures would be removed, and new structures would be installed and maintained. Other forest clearing activities in proximity to viewers could result in cumulative effects. No other RFA's were identified that would have a cumulative effect from the KOPs identified for the project; however, general visual effects would occur throughout the length of the proposed improvement project. A proposed rebuild and upgrade of SMPA's Nucla substation would potentially change the alignment of transmission lines entering the Nucla Power Plant. Any cumulative effects to visual resources from this project would be negligible, as no change in the visual context or contrast is anticipated. Improvement and expansion of the GMUG Montrose to Moab recreation trail system would use existing public access roads on NFS lands and potentially on BLM-managed lands. The use of these existing roads as trails does not change their visibility. A potential shooting area for Montrose County, about 0.5 miles west of the Montrose substation, has been discussed with the BLM although no application has been made at this time. The larger facility and access road could result in a change to the visual landscape. More recreationists could potentially view the upgraded MNC 230-kV project as a result of improvements to the trail system, and from the potential shooting area and parking lot; however, this does not represent a cumulative effect to visual resources.

# 6 CONSULTATION AND COORDINATION

## 6.1 Introduction

The issue identification section of Section 1 identifies issues analyzed in detail in Section 4. Table 12 and ID Team Checklists (available in the project record) provide the rationale for issues that were considered but not analyzed further. The issues were identified through the public and

agency involvement process described in Sections 6.2 and 6.3 below. The scoping summary report documents the results of the public involvement process beginning with public scoping (available at http://www.blm.gov/style/medialib/blm/co/field_offices/uncompahgre_field/southwest_district/swd_documents.Par.45732.File.dat/2014-1106%20Tri-State%20Scoping%20Report.pdf).

## 6.2 Persons, Groups, and Agencies Consulted

Numerous persons, groups, and agencies were consulted during scoping and will be consulted again during the public review of the EA. Consultation with cooperating agencies and other agencies is described in the following sections.

### *6.2.1 Agency Consultation and Coordination*

Federal, tribal, state, and local agencies consulted during the development of this EA are shown below in Table 29.

**Table 29. Federal, Tribal, State, and Local Agencies Consulted**

| Name | Purpose & Authorities for Consultation or Coordination | Findings & Conclusions |
|---|---|---|
| USFWS | Information on Consultation, under Section 7 of the Endangered Species Act (16 USC 1531) | Coordination between Tri-State, third-party consultants (ERO Resources, Galileo Project), BLM, USFS, and the USFWS has been ongoing since January 2014. Meetings and conference calls occurred on the following dates:<br>• March 12, 2014 conference call (USFWS, BLM, ERO Resources)<br>• April 9, 2014 meeting (USFWS, BLM, Tri-State, ERO Resources, Galileo Project)<br>• August 25, 2014 (CPW, San Miguel County, USFWS, BLM, Tri-State, ERO Resources, Galileo Project, CDOT)<br>• February 6, 2015 meeting (USFWS, CPW, Tri-State, BLM, ERO Resources, Galileo Project)<br>• August 21, 2015 (CPW, San Miguel County, USFWS, BLM, Tri-State, ERO Resources, Galileo Project)<br>• October 2, 2015 (CPW, San Miguel County, USFWS, BLM, Tri-State, ERO Resources, Galileo Project)<br>BLM will submit BA to USFWS when Preferred Alternative is selected. |

| Name | Purpose & Authorities for Consultation or Coordination | Findings & Conclusions |
|---|---|---|
| CPW | Consult with CPW as the agency with expertise on effects on game species | Coordination between Tri-State, third-party consultants (ERO Resources, Galileo Project), BLM, and CPW has been ongoing since January 2014. Meetings and conference calls occurred on the following dates:<br>• July 31, 2014 field review of Dry Creek Basin (CPW, BLM, Tri-State, San Miguel County, ERO Resources, Galileo Project)<br>• August 25, 2014 (CPW, San Miguel County, USFWS, BLM, Tri-State, ERO Resources, Galileo Project, CDOT)<br>• February 6, 2015 meeting (USFWS, CPW, Tri-State, BLM, ERO Resources) |
| CDOT | Consult with CDOT on highway ROW requirements | August 25, 2014 meeting between CPW, San Miguel County, USFWS, BLM, Tri-State, ERO Resources, Galileo Project, and CDOT to discuss ROW requirements along SH 141 |
| Colorado SHPO | Consultation for undertakings, as required by the National Historic Preservation Act (NHPA) (16 USC 470) | Section 106 consultation ongoing since March 2015 and expected to continue through project completion. MOA for SHPO review in progress |
| Jicarilla Apache Nations | Consultation as required by the American Indian Religious Freedom Act of 1978 (42 USC 1531) and NHPA (16 USC 1531) | • March 20, 2014 BLM letter: Invitation to participate as a cooperating agency<br>• August 12, 2014 BLM letter: Tribal Consultation Initiation Letter<br>• September 9, 2014 meeting: Project update provided by BLM |
| Pueblo de Cochiti | Same as above | • March 20, 2014 BLM letter: Invitation to participate as a cooperating agency<br>• August 12, 2014 BLM letter: Tribal Consultation Initiation Letter<br>The Tribe has not responded identifying any concerns. Lack of response is interpreted by BLM to indicate that the Tribe has no concerns relative to the proposed action. |
| Pueblo of Acoma | Same as above | • March 20, 2014 BLM letter: Invitation to participate as a cooperating agency<br>• August 12, 2014 BLM letter: Tribal Consultation Initiation Letter<br>• September 9, 2014 meeting: Project update provided by BLM |
| Pueblo of Isleta | Same as above | • March 20, 2014 BLM letter: Invitation to participate as a cooperating agency<br>• August 12, 2014 BLM letter: Tribal Consultation Initiation Letter<br>• September 9, 2014 meeting: Project update provided by BLM |

| Name | Purpose & Authorities for Consultation or Coordination | Findings & Conclusions |
|---|---|---|
| Pueblo of Jemez | Same as above | • March 20, 2014 BLM letter: Invitation to participate as a cooperating agency<br>• August 12, 2014 BLM letter: Tribal Consultation Initiation Letter<br>The Tribe has not responded identifying any concerns. Lack of response is interpreted by BLM to indicate that the Tribe has no concerns relative to the proposed action. |
| Pueblo of Kewa | Same as above | • March 20, 2014 BLM letter: Invitation to participate as a cooperating agency<br>• August 12, 2014 BLM letter: Tribal Consultation Initiation Letter<br>The Tribe has not responded identifying any concerns. Lack of response is interpreted by BLM to indicate that the Tribe has no concerns relative to the proposed action. |
| Pueblo of Laguna | Same as above | • March 20, 2014 BLM letter: Invitation to participate as a cooperating agency<br>• August 12, 2014 BLM letter: Tribal Consultation Initiation Letter<br>The Tribe has not responded identifying any concerns. Lack of response is interpreted by BLM to indicate that the Tribe has no concerns relative to the proposed action. |
| Pueblo of Nambe | Same as above | • March 20, 2014 BLM letter: Invitation to participate as a cooperating agency<br>• August 12, 2014 BLM letter: Tribal Consultation Initiation Letter<br>The Tribe has not responded identifying any concerns. Lack of response is interpreted by BLM to indicate that the Tribe has no concerns relative to the proposed action. |
| Pueblo of Ohkay Owingeh | Same as above | • March 20, 2014 BLM letter: Invitation to participate as a cooperating agency<br>• August 12, 2014 BLM letter: Tribal Consultation Initiation Letter<br>The Tribe has not responded identifying any concerns. Lack of response is interpreted by BLM to indicate that the Tribe has no concerns relative to the proposed action. |
| Pueblo of Picuris | Same as above | • March 20, 2014 BLM letter: Invitation to participate as a cooperating agency<br>• August 12, 2014 BLM letter: Tribal Consultation Initiation Letter<br>The Tribe has not responded identifying any concerns. Lack of response is interpreted by BLM to indicate that the Tribe has no concerns relative to the proposed action. |

| Name | Purpose & Authorities for Consultation or Coordination | Findings & Conclusions |
|---|---|---|
| Pueblo of Pojoaque | Same as above | • March 20, 2014 BLM letter: Invitation to participate as a cooperating agency<br>• August 12, 2014 BLM letter: Tribal Consultation Initiation Letter<br>The Tribe has not responded identifying any concerns. Lack of response is interpreted by BLM to indicate that the Tribe has no concerns relative to the proposed action. |
| Pueblo of San Felipe | Same as above | • March 20, 2014 BLM letter: Invitation to participate as a cooperating agency<br>• August 12, 2014 BLM letter: Tribal Consultation Initiation Letter<br>• September 9, 2014 meeting: Project update provided by BLM |
| Pueblo of San Ildefonso | Same as above | • March 20, 2014 BLM letter: Invitation to participate as a cooperating agency<br>• August 12, 2014 BLM letter: Tribal Consultation Initiation Letter<br>• September 9, 2014 meeting: Project update provided by BLM |
| Pueblo of Sandia | Same as above | • March 20, 2014 BLM letter: Invitation to participate as a cooperating agency<br>• August 12, 2014 BLM letter: Tribal Consultation Initiation Letter<br>• September 9, 2014 meeting: Project update provided by BLM |
| Pueblo of Santa Ana | Same as above | • March 20, 2014 BLM letter: Invitation to participate as a cooperating agency<br>• August 12, 2014 BLM letter: Tribal Consultation Initiation Letter<br>• September 9, 2014 meeting: Project update provided by BLM |
| Pueblo of Santa Clara | Same as above | • March 20, 2014 BLM letter: Invitation to participate as a cooperating agency<br>• August 12, 2014 BLM letter: Tribal Consultation Initiation Letter<br>• September 9, 2014 meeting: Project update provided by BLM<br>• September 15, 2015 email from Pueblo of Santa Clara: questions about the cultural resources report sent to BLM<br>• September 29, 2014 Pueblo of Santa Clara email, request for copy of 2013 Cultural Resources Inventory of study area<br>• November 5, 2014 BLM email: transmittal of file transfer site information to retrieve the cultural resources technical report |

| Name | Purpose & Authorities for Consultation or Coordination | Findings & Conclusions |
|---|---|---|
| Pueblo of Taos | Same as above | • March 20, 2014 BLM letter: Invitation to participate as a cooperating agency<br>• August 12, 2014 BLM letter: Tribal Consultation Initiation Letter<br>The Tribe has not responded identifying any concerns. Lack of response is interpreted by BLM to indicate that the Tribe has no concerns relative to the proposed action. |
| Pueblo of Tesuque | Same as above | • March 20, 2014 BLM letter: Invitation to participate as a cooperating agency<br>• August 12, 2014 BLM letter: Tribal Consultation Initiation Letter<br>The Tribe has not responded identifying any concerns. Lack of response is interpreted by BLM to indicate that the Tribe has no concerns relative to the proposed action. |
| Pueblo of Zia | Same as above | • March 20, 2014 BLM letter: Invitation to participate as a cooperating agency<br>• August 12, 2014 BLM letter: Tribal Consultation Initiation Letter<br>The Tribe has not responded identifying any concerns. Lack of response is interpreted by BLM to indicate that the Tribe has no concerns relative to the proposed action. |
| Pueblo of Zuni | Same as above | • March 20, 2014 BLM letter: Invitation to participate as a cooperating agency<br>• August 12, 2014 BLM letter: Tribal Consultation Initiation Letter<br>• September 9, 2014 meeting: Project update provided by BLM |
| Southern Ute Indian Tribe | Same as above | • March 20, 2014 BLM letter: Invitation to participate as a cooperating agency<br>• August 12, 2014 BLM letter: Tribal Consultation Initiation Letter<br>• September 9, 2014 meeting: Project update provided by BLM<br>• October 15, 2014 meeting: Project update provided by BLM<br>• June 18, 2015 BLM received a letter dated April 9, 2014 |

| Name | Purpose & Authorities for Consultation or Coordination | Findings & Conclusions |
|---|---|---|
| The Hopi Tribe | Same as above | • March 20, 2014 BLM letter: Invitation to participate as a cooperating agency<br>• April 4, 2014 letter from the Hopi indicating that they deferred decision about Cooperating Agency status to the SHPO<br>• August 12, 2014 BLM letter: Tribal Consultation Initiation Letter<br>• August 18, 2014 Hopi letter to BLM indicating interest in ongoing consultation and requesting a copy of the cultural resources inventory<br>• September 9, 2014 meeting: Project update provided by BLM<br>• October 15, 2014 meeting: Project update provided by BLM<br>• November 5, 2014 BLM email: transmittal of file transfer site information to retrieve the cultural resources technical report |
| The Navajo Nation | Same as above | • March 20, 2014 BLM letter: Invitation to participate as a cooperating agency<br>• April 25, 2014 Navajo Nation letter: Tri-State Right-of-Way Grant<br>• May 5, 2014 Navajo Nation letter to BLM declining Cooperating Agency status<br>• August 12, 2014 BLM letter: Tribal Consultation Initiation Letter<br>• September 9, 2014 meeting: Project update provided by BLM<br>• September 24, 2014 Navajo Nation letter to BLM requesting to be notified if cultural sites are inadvertently discovered during proposed project implementation |
| Ute Mountain Ute | Same as above | • March 20, 2014 BLM letter: Invitation to participate as a cooperating agency<br>• August 3, 2014 consultation with BLM. Ute Mountain Ute indicated they want to be kept informed of potential effects of proposed project<br>• August 12, 2014 BLM letter: Tribal Consultation Initiation Letter<br>• September 9, 2014 meeting: Project update provided by BLM<br>• October 15, 2014 meeting: Project update provided by BLM |
| Ute Tribe of the Uintah & Ouray Reservation | Same as above | • March 20, 2014 BLM letter: Invitation to participate as a cooperating agency<br>• August 12, 2014 BLM letter: Tribal Consultation Initiation Letter<br>• October 15, 2014 meeting: Project update provided by BLM |

### *6.2.2 Cooperating Agencies*

A cooperating agency is any federal, state, or local government agency or Indian tribe that enters into a formal agreement with the lead federal agency to help develop an EA. More specifically, cooperating agencies "work with the BLM, sharing knowledge and resources, to achieve desired outcomes for public lands and communities within statutory and regulatory frameworks" (BLM Land Use Planning Handbook H-1601-1 [BLM 2005]).

The BLM invited 21 agencies and 25 tribes (see Table 29 above for a summary of tribal consultation) to participate in the Tri-State MNC Transmission Improvement EA as cooperating agencies. Seven agencies are participating in the NEPA process as Cooperating Agencies with the BLM: SJNF, GMUG NF, San Miguel County, Montrose County, Dolores County, and the Colorado Energy Office.

Interactions with the cooperating agencies have and will continue to include periodic project briefings and reviews of preliminary internal draft sections of EA. The BLM will continue to engage the cooperating agencies throughout the preparation of the EA. Additional information is in the project scoping report.

## 6.3 Summary of Public Participation

Public involvement is a vital and legal component of the EA process. Public involvement vests the public in the decision-making process and allows for full environmental disclosure. Guidance for implementing public involvement under NEPA is codified in 40 CFR Section 1506.6, thereby ensuring that federal agencies make a diligent effort to involve the public in the NEPA process.

Scoping is an early and open process for identifying the key issues related to a Proposed Action. Information collected during scoping may also be used to develop the alternatives to be evaluated in detail in a NEPA document. Both internal and external scoping are conducted during the process. Section 6.3.1 of the 2008 BLM NEPA Handbook (BLM 2008) describes internal and external scoping as follows.

*"…internal scoping is simply the use of BLM and cooperating agency staff to help determine what needs to be analyzed in a NEPA document. Internal scoping is an interdisciplinary process; at a minimum, use scoping to define issues, alternatives, and data needs. Additionally, this is an opportunity to identify other actions that may be analyzed in the same NEPA document"*

"*External scoping involves notification and opportunities for feedback from other agencies, organizations, tribes, local governments, and the public. . . External scoping can be used to identify coordination needs with other agencies; refine issues through public, tribal and agency feedback on preliminary issues; and identify new issues and possible alternative"*(BLM 2008).

Public involvement is being conducted in the following phases for the Tri-State MNC Transmission Improvement Project environmental review process:

- Public scoping prior to NEPA analysis to determine the scope of issues and alternatives to be addressed (complete: May 5 to June 4 2014)
- Public outreach, news releases, and newspaper advertisements (as needed)
- Collaboration with federal, state, local, and tribal governments, and cooperating agencies (ongoing)

- Public review of and comment on the Preliminary EA, which analyzes likely environmental effects of the Proposed Action and alternatives (anticipated Fall 2015)

This scoping summary report documents the results of the public involvement process beginning with public scoping.

### *6.3.1 Mailing list and Letters to Interested Parties*

Public scoping comments were solicited via a scoping letter dated May 5, 2014, that was mailed to the appropriate agencies, specific interested parties, and to the general public. Letters to interested parties were mailed to approximately 900 addresses. The scoping letter announced the opportunity for public input and initiated the start of the scoping period. Various parties provided comments, and a total of 17 individual letters were received. Those included federal, state and local agencies (CPW, Department of Energy (DOE)-Western Area Power Administration, San Miguel County, and Dolores County); non-governmental organizations/groups (San Juan Citizens Alliance, Empire Electric Association, Inc., Colorado Plateau Mountain Bike Trail Association) and members of the public (both businesses and private citizens).

### *6.3.2 Press Releases and Website Posting*

The scoping letter was also posted on the BLM Uncompahgre website (http://www.blm.gov/co/st/en/district_offices/southwest/TriState230kVRebuild.html). Maps and frequently asked questions (FAQs) also were published on the BLM website. Information also has been posted on both the GMUG NF and SJNF web sites since April 2014 (follow links to current and past Schedules of Proposed Actions at http://www.fs.fed.us/sopa/forest-level.php?110204 and http://www.fs.fed.us/sopa/forest-level.php?110213). The 30-day Public Scoping Period ended June 4, 2014. Legal Notices were posted in the two local newspapers of record (the Grand Junction Daily Sentinel and the Durango Herald) and the BLM and USFS websites were updated to include project information.

The EA is anticipated to be posted for public comment in late Fall 2015. A copy of the EA will be available for public review at the libraries shown in Table 30.

**Table 30. Libraries and other Locations where a Copy of the EA is Available**

| | |
|---|---|
| Ann Zugelder Library<br>307 N. Wisconsin,<br>Gunnison, CO 81230 | Montrose Regional Library<br>320 South 2nd Street<br>Montrose, CO 81401 |
| Old Rock Community Library<br>504 Maroon Avenue<br>Crested Butte, CO 81224 | Naturita Public Library<br>107 West 1st Avenue<br>Naturita, CO 81422 |
| Somerset Library<br>3764 Colorado 133<br>Somerset, CO 81434 | Paradox Library<br>21501 Six Mile Road<br>Paradox, CO 81429 |
| Cedaredge Public Library<br>180 SW 6th Ave.<br>Cedaredge, CO 81413 | Nucla Public Library<br>544 Main Street<br>Nucla, CO 81424 |
| Crawford Public Library<br>545 Hwy 92<br>Crawford, CO 81415 | Mancos Public Library<br>211 West First Street<br>Mancos, CO 81328 |
| Delta Public Library<br>211 W 6th St.<br>Delta, CO 81416 | Dolores Public Library<br>1002 Railroad Ave, P.O. Box 847<br>Dolores, CO 81323 |

| | |
|---|---|
| Ann Zugelder Library<br>307 N. Wisconsin,<br>Gunnison, CO 81230 | Montrose Regional Library<br>320 South 2nd Street<br>Montrose, CO 81401 |
| Hotchkiss Public Library<br>149 E. Main Street<br>Hotchkiss, CO 81419 | Anasazi Heritage Center Library<br>27501 HWY 184<br>Dolores , CO 81323 |
| Paonia Public Library<br>2 Third Street, [P.O. Box 969]<br>Paonia, CO 81428 | Durango Public Library<br>1900 East Third Ave.<br>Durango, CO 81301 |
| Norwood Public Library<br>1110 Lucerne St, Box 127<br>Norwood, CO 81423 | Ridgway Public Library District<br>300 Charles Street<br>Ridgway , CO 81432-0560 |
| Wilkinson Public Library<br>100 W. Pacific<br>Telluride , CO 81435-2189 | Ouray Public Library<br>320 6th Avenue<br>Ouray, Co 81427 |
| Adult Dolores County Public Library<br>525 North Main Street<br>Dove Creek, CO 81324 | Fort Lewis Mesa Branch Library<br>11274 State Hwy 140<br>Hesperus, CO 81326 |
| Rico Branch Library<br>2 N. Commercial St<br>Rico, CO 81332-0069 | Central Library<br>443 N. 6th Street<br>Grand Junction, CO 81501 |
| Cortez Public Library<br>202 North Park<br>Cortez , CO 81321-3355 | BLM Colorado State Office<br>2850 Youngfield Street<br>Lakewood, CO 80215-7093 |
| Norwood District Office<br>1150 Forest<br>Norwood, CO 81423 | Grand Mesa, Uncompahgre, &<br>Gunnison National Forests<br>2250 Highway 50<br>Delta, CO 81416 |
| BLM Southwest District Office and Forest Service<br>Ouray Ranger District<br>2465 South Townsend Avenue<br>Montrose, CO 81401 | BLM Tres Rios Field Office and Forest Service<br>Dolores Ranger District<br>29211 Highway 184<br>Dolores, CO 81323-9308 |
| San Juan National Forest<br>15 Burnett Court<br>Durango, CO 81301 | |

### *6.3.3 Comment Analysis*

This section will be completed after the public comment period on the EA, which is anticipated to be posted for public comment in Fall 2015.

### *6.3.4 List of Commenters*

This section will be completed after the public comment period on the EA, which is anticipated to be posted for public comment in Fall 2015.

### *6.3.5 Response to Public Comment*

This section will be completed after the public comment period on the EA, which is anticipated to be posted for public comment in Fall 2015.

## 6.4 List of Preparers

Representatives from the BLM (UFO and TRFO), and the USFS (GMUG NF and the SJNF), as well as ERO Resources Corporation and Galileo Project (private third-party contractors), assisted

in the preparation of the EA. Table 31 through Table 36 list names, titles and agencies of representatives, as well as the sections of the document for which they were responsible.

**Table 31. Preparers from the BLM TRFO**

| Name | Title | Responsible for the Following Section(s) of this Document |
|---|---|---|
| Chad Meister (State) | Natural Resource Specialist | Air Quality/ Greenhouse Gas Emissions/Wildlife-aquatic |
| Forrest Cook (State) | Natural Resource Specialist | Air Quality/Wildlife-aquatic |
| Julie Bell | Archaeologist | Cultural Resources/Native American Religious and other Concerns/Wetlands/Riparian Zones |
| Gina Jones (SWDO) | NEPA Coordinator (Office Point of Contact/Project Lead) | NEPA Compliance |
| Jessica Montag (State) | Socio-economic Specialist | Environmental Justice/ Socio-Economics |
| Mike Jensen | Rangeland Management Specialist | Farmlands (Prime or Unique)/Floodplains/Invasive Species/ Noxious Weeds/ Rangeland Health Standards/Soils/Special Status Plant Species/Threatened, Endangered or Candidate Plant Species/Vegetation Excluding USFWS Designated Species |
| Nate West | Supervisory Wildlife Biologist | Fish Habitat/ Migratory Birds/Special Status Animal Species/Threatened, Endangered or Candidate Animal Species |
| Brad Pietruszka | Survey Range Technician | Forest Resources (HFRA Project)/ Fuels/Fire Management |
| James Blair | Geologist | Geology and Solid Minerals/ Paleontology |
| Jeff Christenson | Outdoor Recreation Planner | Lands with Wilderness Characteristics/Recreation/Visual Resources/ Wild and Scenic Rivers/ Wilderness/WSA |
| Harrison Griffin | Realty Specialist (Office Point of Contact) | Lands/Access |
| Robert Garrigues | Natural Resource Specialist | Oil and Gas |
| Kay Zillich | AML Specialist | Wastes (hazardous or solid) |
| Kelly Palmer | Hydrologist | Water Resources/Quality (drinking/surface/ground) |

**Table 32. Preparers from the BLM UFO**

| Name | Title | Responsible for the Following Section(s) of this Document |
|---|---|---|
| Chad Meister (State) | Natural Resources Specialist | Air Quality |
| Julie Jackson | Recreation Planner | Areas of Critical Environmental Concern/Access/Land with Wilderness Characteristics/Recreation/Visual Resources/Wilderness/WSA |
| Edd Franz | Recreation Planner | Areas of Critical Environmental Concern/Access/Land with Wilderness Characteristics/Recreation/Wild and Scenic Rivers/ Wilderness/WSA |
| Teresa Pfifer | Realty Specialist | Cadastral Survey/Realty Authorizations |
| Glade Hadden | Archaeologist | Cultural Resources/Native American Religious and other Concerns/ Paleontology |
| Jessica Montag (State) | Socio-economics Specialist | Environmental Justice |
| Bruce Krickbaum | Planning and Environmental Coordinator | Environmental Justice/Socio-economics/Law Enforcement |
| Jedd Sondergard | Hydrologist | Farmlands (Prime or Unique)/Floodplains/Soils/Water – Ground/Water – Surface (Clean Water Act and others) |
| Ken Holsinger | Natural Resource Specialist/Fire Management Specialist | Fish Habitat/Migratory Birds/ Threatened, Endangered or Candidate and Special Status Animal Species/ Threatened, Endangered or Candidate and Special Status Plant Species/Wildlife-aquatic/Wildlife-terrestrial |
| Kelly Homstad | Fire Use Specialist | Forest Resources (HFRA Project)/Fuels/Fire Management |
| Rob Ernst | Geologist | Geology and Minerals |
| Lynae Rogers | Rangeland Management Specialist | Invasive Species/ Noxious Weeds |
| Angela LoSasso | Rangeland Management Specialist | Rangeland Health Standards |
| Amanda Clements | Ecologist | Upland Vegetation Excluding USFWS Designated Species/Wetlands/Riparian Zones |
| Alan Kraus (UFO/GJFO) | Hazardous Materials Specialist | Wastes (hazardous or solid) |

**Table 33. Preparers from the GMUG NF**

| Name | Title | Responsible for the Following Section(s) of this Document |
|---|---|---|
| George Goehl (GMUG) | Civil Engineering Technician | Access/Roads |
| Brian Haas (Secondary) | Forest Archaeologist | Cultural Resources/Native American Religious and other Concerns |
| Niccole Mortenson | NEPA Coordinator | NEPA Compliance |
| Liz Mauch (Ouray Ranger District [RD]) | Lands and Minerals Staff (Project Lead – Point of Contact) | Farmlands (Prime or Unique)/Floodplains/Geology and Solid Minerals/Oil and Gas/Paleontology/Lands |
| Corey Robinson | West Zone Fire Management Officer | Fire/Fuels |
| Curtis Keetch (Secondary; GMUG) | Zone Wildlife Biologist | Fish Habitat/Migratory Birds/Wildlife-Aquatic and Terrestrial/ Threatened, Endangered or Candidate Animal Species/ Threatened, Endangered or Candidate Plant Species/Special Status Animal Species/Special Status Plant Species |
| Dee Closson (Norwood RD) | Lands and Mineral Staff | Land Use Authorizations |
| Elizabeth Stuffings (Norwood/Ouray RD) | Biological Science Technician | Invasive Species/ Noxious Weeds/ Invasive Plant Species |
| Clare Hydock (GMUG) | Rangeland Management Specialist | Rangeland Health Standards/Rangeland and General Vegetation |
| Kris Wist (Ouray RD) | Sup Forest Technician/Wilderness Specialist | Recreation |
| Ben Stratton (Gunnison RD) | Soils Scientist | Soils |
| Todd Gardiner (GMUG) | Forester/Silviculturist | Timber/Silviculture |
| Kevin Colby (Arap/Roosevelt NF) | Landscape Architect | Visual Resources |
| Timothy Stroope | NEPA Coordinator | Overall |

**Table 34. Preparers from the SJNF**

| Name | Title | Responsible for the Following Section(s) of this Document |
|---|---|---|
| Elaine Sherman (Primary; Dolores RD) | District Archaeologist | Cultural Resources/Native American Religious and other Concerns |
| Frank Gonzales (Mancos/Dolores RD) | Fire/Fuels | Fire/Fuels |
| Ivan Messinger (Primary; SJNF) | Wildlife Biologist | Fish Habitat/Migratory Birds/Fish Habitat/Wildlife-Aquatic and Terrestrial/ Threatened, Endangered or Candidate Animal Species/Threatened, Endangered or Candidate Plant Species/Special Status Animal Species/Special Status Plant Species |
| Shauna Jensen (SJNF) | Hydrologist | Floodplains/Soils/Water Resources/ Wetlands/Riparian Zones/Wild and Scenic Rivers |
| Heather Musclow (Dolores RD) | Supervisory Rangeland Management Specialist | Invasive Species/Noxious Weeds/Special Status Plant Species/Threatened, Endangered or Candidate Plant Species/Vegetation Excluding USFWS Designated Species/Rangeland Health Standards |
| Cody Jones (SJNF) | Civil Engineering Technician | Roads and Access |
| Tom Rice (Dolores RD) | Program Management Specialist | Recreation |
| Patrick McCoy (Dolores RD) | Lands and Mineral Staff (Point of Contact) | Lands/Special Designations/ Farmlands (Prime or Unique)/Geology and Solid Minerals/Oil and Gas/ |
| Cara Gildar (SJNF) | Ecologist | Special Status Plant Species/Threatened, Endangered or Candidate Plant Species/ Vegetation Excluding USFWS Designated Species/ Wilderness/WSA |
| Mark Krabath (SJNF) | Supervisory Forester/Silviculturist | Timber/Silviculture |

## Table 35. Preparers from ERO Resources Corporation

| Name | Title | Responsible for the Following Section(s) of this Document |
|---|---|---|
| Aleta Powers | Senior Natural Resource Specialist | Project Manager |
| Karen Baud | Wildlife Biologist | Assistant Project Manager |
| Ron Beane | Senior Wildlife Biologist | Fish Habitat/Migratory Birds/Wildlife-Aquatic and Terrestrial/Threatened, Endangered or Candidate Animal Species/Threatened, Special Status Animal Species |
| Andy Cole | Natural Resource Planner | Socio-Economics/Environmental Justice/Timber Resources/Fire/Fuels |
| Mark DeHaven | Senior Natural Resource Specialist | Travel;/Noise/Air Quality/Soils/EMF |
| Barbara Galloway | Hydrologist | Hydrology |
| Craig Sovka | Geologist | Geology/Hazards |
| David Hesker | Graphic Designer | Graphics |
| Wendy Hodges | GIS Specialist | GIS |
| Sean Larmore | Archaeologist | Cultural Resources/Native American Religious and other Concerns |
| Denise Larson | Ecologist | Invasive Species/Noxious Weeds/Special Status Plant Species/Threatened, Endangered or Candidate Plant Species/Vegetation Excluding USFWS Designated Species/Wetlands/Riparian |
| Bill Mangle | Natural Resource Planner | Recreation/Land use: Grazing and allotments/Land use: Prime Farmland/Land use: Conformance/Wilderness Designations/Wild and Scenic Rivers |
| Adam Petry | Natural Resource Specialist | Fish Habitat/Migratory Birds/Wildlife-Aquatic and Terrestrial/ Threatened, Endangered or Candidate Animal Species/ Threatened, Special Status Animal Species |
| Ed Russell | GIS Specialist | Terrain Mapping |
| Paul Murphey | Paleontologist | Paleontology |
| Mark Holdeman | Landscape Architect | Visual Resources |
| Jill Handwerk | Botanist | Threatened, Endangered or Candidate Plant Species |
| Steve Stevenson | Professional Engineer | Project Design |

**Table 36. Preparers from Galileo Project**

| Name | Responsibility |
|---|---|
| J. Grace Ellis | Facilitator |
| Peter Rocco | Facilitator |

# 7 GLOSSARY AND REFERENCES

## 7.1 Glossary

| Term | Definition |
|---|---|
| Administer | To manage and be responsible for. |
| Aesthetic | Concerned with beauty or the appreciation of beauty. |
| Affect | To have an effect on or cause a difference to. |
| Alluvial | Sand, silt, clay, gravel, or other matter deposited by flowing water. |
| Anchor | Piece of equipment that is installed into the ground to transfer the unbalanced force on a pole or structure to the earth without intermediate supports. |
| Angle structure | A structure that supports the transmission line at points where it changes direction at an angle of 15 degrees or more (also see Turning Structure). |
| Anticline | A ridge-shaped fold of stratified rock in which the strata slope downward from the crest. |
| Archaeological site | A place (or group of physical sites) in which evidence of past human activity is preserved (either prehistoric or historic or contemporary). |
| Area of Potential Effect (APE) | The geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effect is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking. |
| Armored rock crossing | Typically a low water stream crossing that is reinforced with flat rocks. |
| Arroyo | A steep-sided gully cut by running water in an arid or semiarid region. |
| Artifact | A human-made object that is an item of cultural or historical interest. |
| Best management practices (BMPs) | Plans designed to prevent or reduce effects. They represent physical, institutional, or strategic approaches to environmental problems and are practices determined by the discipline to be the most effective at achieving a specific goal. |
| Bollard | One of a series of posts preventing vehicles from entering an area. |
| Boom truck | A utility vehicle with an extendable arm mounted to a bed or roof. |
| Brace | A piece of equipment used solely for additional support to another piece of equipment, such as a cross-arm or transformer. |
| Bus work | Work related to a heavy conductor, often made of copper in the shape of a bar, used to collect, carry, and distribute powerful electric currents, as those produced by generators. |
| Cadastral survey | A survey and demarcation of land to define parcels of land for registration in a land registry. |
| Candidate | Species that are undergoing a status review for consideration of addition to the Federal Threatened and Endangered species list. |
| Circuit | The pathway for an electrical current. |
| Clearance | Clear space between the surface of the conductor and any other surface. Different conductors (depending on voltage) need different clearances as determined by NESC codes. |

| Term | Definition |
|---|---|
| Conductor | The wire cable strung along a transmission line through which electricity flows. |
| Conduit | A tube or trough used for protecting electric wiring. |
| Connectivity | The capability of being connected, especially the ability to connect or communicate with another computer or computer system. |
| Constraint | A limitation on one or more transmission elements that may be reached during contingency, emergency, or normal operating conditions. |
| Corona | An electrical field around the surface of a conductor, insulator, or hardware caused by ionization of the surrounding air. |
| Corona rings | Devices specified at the energized end of each insulator in this line to reduce the effects of corona. |
| Corvid | Any birds of the family Corvidae, which includes crows, ravens, jays, and magpies. |
| Migration corridor | A defined route across land through which a species must travel to reach habitat suitable for reproduction and other life-sustaining needs. |
| Crimp | To embed straw with a spiked roller or disks used to incorporate mulch on bare soil. |
| Critical habitat | As defined by the ESA, a specific geographic area(s) that is essential for the conservation of a threatened or endangered species and that may require special management and protection. Critical habitat may include an area that is not currently occupied by the species but that will be needed for its recovery. |
| Cross arm | A high quality piece of wood mounted on a utility pole used to hold up power lines or other equipment. |
| Cultural resources | The remains of sites, structures, or objects used by humans in the past either historic (at least 50 years old) or prehistoric. Resources that are protected under federal statutes, regulations, and executive orders. More recently referred to as heritage resources by the Forest Service. |
| Culvert | A device used to carry or divert water from a drainage area in order to prevent erosion or facilitate a waterway crossing. |
| Cumulative effects | Effects on the environment that result from the incremental effect of the Proposed Action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions. See 40 CFR 1508.7. |
| Current | The flow of an electrical charge through a conductive material such as the transmission line conductor wires. |
| Dead-end structure | A structure capable of supporting the highest tension of all the attached wires. These are required at the ends of a line, where large angles are turned, where uplift is to be managed or when a tension change is advantageous. |
| Design feature | A best management practice designed to reduce effects through a special action or modification. |
| Direct effects | Effects that occur as a direct result of the action and occur at the same time and place. |
| Disking | Working the upper layer of soil with a disk implements, such as disk harrows or plows used to lessen soil compaction, prepare for seeding, or control weeds. |
| Drill seeding | A mechanical method for planting seed that positions the seeds in the soil and covers them with soil. |
| Effect | A change that is a consequence or result of an action. |
| Electromagnetic field (EMF)/spectrum | The physical fields, both electric and magnetic, created in the vicinity of the transmission line produced when electric transmission is occurring. |

| Term | Definition |
|---|---|
| Emission | The discharge or release of something, often referring to releases to the environment, such as air emissions. |
| Endangered species | Plants or animals that are in danger of extinction through all or a significant portion of their ranges. Plant or animal species identified by the Secretary of Interior as endangered in accordance with the 1973 Endangered Species Act. |
| Environmental justice populations | Low-income and minority populations protected under Executive Order 12898 from disproportionate adverse effects of federal projects. |
| Environmental Protection Measures (EPM) | Measures to avoid or minimize project effects, to which Tri-State has committed. Also may be called proponent-committed measures or BMPs. |
| Eolian | Deposited or eroded by the wind. |
| Ephemeral stream/drainage | A stream that flows only as a direct response to rainfall or snowmelt events; having no base flow from groundwater. |
| Erosion | The wearing away of the land surface caused by running water, wind, or ice. |
| Erosion potential | The likelihood that an area is susceptible to erosion. Erosion potential is assessed using slope and soil properties such as cohesion, drainage, and organic content. |
| Excelsior log | A roll of natural material such as straw or wood shavings contained in a mesh tube used for erosion control. |
| External scoping | External scoping can be used to identify coordination needs with other agencies; refine issues through public, tribal and agency feedback on preliminary issues; and identify new issues and possible alternatives. External scoping serves to build agency credibility and promote constructive dialogue and relations with tribes, agencies, local governments and the public (BLM 2008a). |
| Fiber optic cable | A cable made of many individual glass optical fibers that can transmit large amounts of information at the speed of light. |
| Flocculating process | A chemical process where colloids come out of suspension, widely used in water treatment operations. |
| Floodplain | The land adjacent to a stream or river that is periodically flooded. |
| FONSI | Finding of no significant impact (FONSI). A document issued by a federal agency briefly presenting the reasons why an action for which the agency has prepared an EA has no potential to have a significant impact on the human environment and, thus, would not require preparation of an EIS. |
| Footprint | Referring to the area occupied by a facility or man-made disturbance. |
| Forage | To search for food. |
| Forb | A broadleaf, non-woody plant that is not a grass, sedge, or rush. |
| Fugitive dust | Solid particles of soil that are suspended in the air by wind action and human activity generated or released from earth disturbance. |
| Grading | Earthwork necessary to create a level base, or one with a specified slope. |
| Graminoids | Grasses or grass-like plants. |
| Grid | A high-voltage transmission network. A system of interconnected transmission lines and power generating facilities that allows large quantities of electrical power to be shared on a regional basis. |
| Ground wire | Wires placed above the conductors to route lightning-strike electricity to the ground. |
| Guard structure | Structures designed to prevent ground wire, conductors, or other equipment from falling on an obstacle (roads, railroads, power lines, or structures). |

| Term | Definition |
|---|---|
| Guy wire | A guy wire is a tensioned cable that attaches to a guy anchor, in order to hold a structure to the ground to provide extra stability. |
| Habitat | Habitat is an ecological or environmental area that is inhabited by a particular species of animal, plant, or other type of organism. It is the natural environment in which an organism lives, or the physical environment that surrounds a species population. |
| Habitat fragmentation | The division of continuous habitat into smaller pieces which are partly or fully disconnected from one another, caused by man-made activity. |
| Harrowing | To break up compacted soil using a special implement that breaks up and smooths the surface of the soil. |
| Herbaceous | A flowering plant whose stem does not produce woody tissue and generally dies back at the end of each growing season. |
| Igneous | Relating to rocks produced from intense heat, formed by solidification from a molten state. |
| Indirect effects | Effects that are caused by the action but are later in time or farther in distance, but are still reasonably foreseeable. |
| Insulator | A component made of non-conductive materials that connects the conductor to the suspension structure and prevents the transmission of electrical current from the conductor to the ground. |
| Interdisciplinary team | A collaborative group of agency resource specialists with different expertise who combine skills and resources to present guidance and information for the Environmental Assessment. |
| Intermittent stream/drainage | A stream that flows for several weeks or months in response to precipitation; the source is direct runoff and groundwater discharge. |
| Internal scoping | The use of BLM and cooperating agency staff to help determine what needs to be analyzed in a NEPA document. Internal scoping is an interdisciplinary process; at a minimum, use scoping to define issues, alternatives, and data needs. Additionally, this is an opportunity to identify other actions that may be analyzed in the same NEPA document (BLM 2008a). |
| Issue | A point of disagreement, debate, or dispute with a Proposed Action based on some anticipated environmental effect. |
| Jurisdiction | Under the guidance or protection of a specific agency or regulation. |
| Kilovolt | One thousand volts of electrical power. |
| Lek | An assembly area where animals (as the sage grouse) carry on display and courtship behavior. |
| Loading – Electrical system | The electrical energy that is consumed by a system connected to an energy source in order to perform its function. |
| Loading – Physical line loading | The different forces acting upon a transmission structure including the pole and the conductors themselves. |
| Marshalling yard | See staging area. |
| Minority population | A group of minority persons who live in geographic proximity that could be disproportionately affected by a federal action. |
| Mitigation | An action that can avoid, minimize, reduce, eliminate, replace, or rectify the effect of an action. |
| Mosaic | Made up of different landscape types. |

| Term | Definition |
|---|---|
| Non-native | A species that has been introduced into and has acclimated to an area outside of its normal range. |
| Noxious weeds | Nonnative plants that have been identified by state law as damaging to natural or human resources. |
| OPGW | Fiber optical cable. |
| Paleontological resource | Any fossilized remains, traces, or imprints of organisms, preserved in or on the Earth's crust that are of paleontological interest and provide information about the history of life on Earth. |
| Perch deterrent/Perch discourager | Devices used to keep birds from roosting or landing on structures (power lines, buildings, statues, etc.). |
| Perennial stream/drainage | A stream that flows from source to mouth throughout the year; the source is groundwater and surface runoff. |
| Predation | One species preying on another. |
| Production area | Calving or fawning areas. |
| Pulled back bank | Term referring to the process of pulling soil from a stream bank without disturbing the stream bottom or gradient. |
| Pulling | The process of installing and tightening new wires, such as conductors or optic power ground wires (fiber optic cable). |
| Pulling station/site | The location where equipment is staged for pulling wires. |
| Raptor | A bird of prey. |
| Regime | Changes with time in the rates of flow of rivers and in the levels and volumes of water i n rivers, lakes, reservoirs, and marshes. |
| Residuum | Something left behind. |
| Right-of-way (ROW) | The corridor of land in which transmission structures and conductors are established, operated, and maintained. |
| Rill | A shallow channel cut into soil by erosive action of water. |
| Riparian | Vegetation or habitat situated on the banks of rivers and streams. |
| Riser | The conduit and conductor involved in the transition from overhead distribution to underground distribution. Usually runs down the pole and into an underground pedestal. |
| Roost | A place where winged animals (birds and bats) settle for rest. |
| Sag | The vertical distance between the point where the line is joined to the tower and the lowest point on the line. |
| Scenic Integrity Objective | A desired level of scenic quality based on physical and sociological characteristics of an area. Refers to the degree of acceptable alterations of the characteristic landscape. |
| Scoping | The early and open process of determining concerns and the significant issues related to an action, including feasible alternatives and mitigation measures. |
| Sediment barrier | A permanent or temporary barrier designed to control erosion and prevent sediment from entering waterways. |
| Sedimentary rock | A type of rock formed by the deposition of material at the earth's surface or within bodies of water. |
| Shield wire | A shield wire or ground wire route lightning strikes to ground on a transmission line. The shield wire is the highest wire(s) attached to the top of the structure. |

| Term | Definition |
|---|---|
| Silt fence | A permanent or temporary barrier designed to control erosion and prevent sediment from entering waterways. |
| Silviculture | The cultivating and growing of trees. |
| Slope breaker | A slope breaker or waterbar is a structure that intercepts water on a continuous slope reducing the slope length and speed that water can travel. |
| Snub pole | A pole stub or log which is set or buried in the ground to serve as a temporary anchor. Snub poles are often used at pull and tension sites. |
| Socio-economics | The social science that studies how economic activity affects and is shaped by social processes. |
| Sock line | The line or rope connected to a steel wire that is used to pull the conductors through the structures during installation. |
| Spark arrester | A device designed to prevent sparks or flammable debris from being emitted from a combustion source such as an engine. |
| Special Use Authorization | A legal document such as a permit, term permit, lease, or easement, which allows occupancy, use, rights or privileges on National Forest System Lands for a specific use of land for a specific period of time. |
| Specular | Non-reflective. |
| Splice | A location on a wire where a joint or bond must be created. |
| Spoil | Material brought up during excavation – typically considered waste material. |
| Spur road | A short length of new road extending from an existing road network. |
| Staging area/yard | A temporary area used to store and assemble men, materials and equipment during construction. |
| Straw wattle | Straw wrapped in netting used to control erosion. They detain surface runoff, thus reducing flow velocity, by breaking up slop length. |
| Stringing blocks | A wheeled device that temporarily supports the conductors during installation. |
| Structure | A type of support used to hold up transmission or substation equipment. |
| Substation | The fenced site that contains the terminal switching and transformation equipment that transforms voltage. |
| Survey | To examine and record an area and features of the area. |
| Tackifier | An agent that binds seed, fertilizer, and mulch, usually applied as a liquid to the ground surface often used when seeding slopes. |
| Tamp | To pack down. |
| Tensioner | Mechanical pulling machine. |
| Tensioning sites | Tensioning sites are used for pulling and tightening the conductor and fiber optic cable to the correct tension once they are mounted on the transmission structures. Tensioning sites are located within the right-of-way where possible or just outside of the right-of-way where the line makes a turn or angle. |
| Terrace | A flat area bounded on at least one side by a steep slope. |
| Terrestrial | Living or growing on the land. |
| Threatened species | Any plants or animals that are likely to become endangered species within the foreseeable future throughout all or a significant portion of their ranges and which have been listed as threatened by the USFWS. |

| Term | Definition |
|---|---|
| Tiering | Tiering is using the coverage of general matters in broader NEPA documents in subsequent, narrower NEPA documents (40 CFR 1508.28, 40 CFR 1502.20). This allows the tiered NEPA documents to narrow the range of alternatives and concentrate solely on issues not already addressed. Tiering is appropriate when the analysis for the proposed action will be a more site specific or project-specific refinement or extension of the existing NEPA document. (From BLM NEPA handbook, BLM 2008). |
| Transmission line | The structures, insulators, conductors, and other equipment used to transmit electrical power from one point to another. In this document, the term transmission line also includes the associated access roads. |
| Turbidity | The amount of particulate matter, such as suspended sediment, per unit volume of water. |
| Turning structure | Structures that support the transmission line at points where it changes direction (also see Angle structure). |
| Understory | Vegetation beneath a canopy. |
| Viewshed | An area visible from a defined location. |
| Visual quality objective | A desired level of scenic quality based on physical and sociological characteristics of an area. Refers to the degree of acceptable alterations of the characteristic landscape. |
| Water bar | A shallow ditch or berm dug or graded across a slope to minimize flow and volume down a slope surface designed to minimize erosion. |
| Wetland | Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. |

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