BLM

United States Department of the Interior
Bureau of Land Management
New Mexico State Office
301 Dinosaur Trail
Santa Fe, NM 87508

Environmental Assessment for the
SunZia Southwest Transmission Project Mitigation Proposal
Torrance and Socorro Counties, New Mexico
NEPA Number
DOI-BLM-NM-900-2015-1

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NATIONAL SYSTEM OF PUBLIC LANDS

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LIST OF ACRONYMS

AC	Alternating current
AFB	Air Force Base
Applicant or SunZia	SunZia Transmission, LLC
AUM	Animal Unit Months
BGEPA	Bald and Golden Eagle Protection Act
BHCA	Bird habitat conservation area
BLM	Bureau of Land Management
BMP	Best Management Practices
CFR	Code of Federal Regulations
CWA	Clean Water Act
DC	Direct current
DoD	Department of Defense
DOI	Department of the Interior
EA	Environmental Assessment
EMF	Electromagnetic fields
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
Final EIS	Final Environmental Impact Statement and Proposed Resource Management Plan Amendments for the SunZia Southwest Transmission Project
FLPMA	Federal Land Policy and Management Act of 1976
FONNSI	Finding of No New Significant Impacts
FTB	Fluidized thermal backfill
HPTP	Historic Properties Treatment Plan
kV	Kilovolt
KOP	Key Observation Point
LWC	Lands with wilderness characteristics
MBTA	Migratory Bird Treaty Act
MIT	Massachusetts Institute of Technology
Mitigation Proposal	Mitigation measures proposed by Department of Defense
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Grave Protection and Repatriation Act
NCUA	Northern Call-up Area

NEPA	National Environmental Policy Act of 1969
NESC	National Electric Safety Code
NMBGMR	New Mexico Bureau of Geology and Mineral Resources
NMSLO	New Mexico State Land Office
NMWQCC	New Mexico Water Quality Control Commission
NRHP	National Register of Historic Places
OHV	Off-highway vehicle
OPGW	Fiber optic groundwire
PA	Programmatic Agreement
PM_{10}	Particulate matter less than 10 micrometers in diameter
$PM_{2.5}$	Particulate matter less than 2.5 micrometers in diameter
POD	Plan of Development
PRMP	Paleontological Resources Monitoring Plan
Project	SunZia Southwest Transmission Project
PRTP	Paleontological Resources Treatment Plan
RFF	Reasonably foreseeable future actions
RMP	Resource Management Plan
ROD	Record of Decision
SE	Selective mitigation measure
SLRU	Scenic level rating unit
SRMA	Special recreation management area
SSURGO	Soil Survey Geographic Database
ST	Standard mitigation measure
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VRI	Visual resource inventory
VRM	Visual resource management (BLM)
WSA	Wilderness Study Area
WSMR	White Sands Missile Range
XLPE	Cross-linked polyethylene

CHAPTER 1 – INTRODUCTION

The Final Environmental Impact Statement and Proposed Resource Management Plan Amendments for the SunZia Southwest Transmission Project (Final EIS) document was completed in June 2013. The Final EIS analyzed and disclosed the potential effects of the proposed SunZia Southwest Transmission Project (Project). The Project would include two 500-kilovolt (kV) transmission lines, substations, and ancillary facilities that would be located on federal, state, and private lands between central New Mexico and central Arizona. SunZia Transmission, LLC (Applicant, or SunZia) has submitted an application for right-of-way to construct, operate, and maintain the Project on public land administered by the Bureau of Land Management (BLM). This chapter includes the Project background and the following sections: Objectives, Decisions to be Made, Cooperating Agencies, Plan Conformance, and Issue Identification.

BLM published the Notice of Availability of the Final EIS in the Federal Register on June 14, 2013. Based on unresolved issues identified during the National Environmental Policy Act (NEPA) process relating to the potential impact to military readiness and operations, the Department of Defense (DoD) objected to a segment of the Agency preferred alternative route in the Northern Call-up Area (NCUA). The NCUA is north of White Sands Missile Range (WSMR) and includes public lands managed by the BLM, New Mexico State Trust lands, private landowner holdings, and some small DoD fee out-holdings.

Certain impacts to WSMR's mission were confirmed through a DoD-commissioned study conducted by the Massachusetts Institute of Technology (MIT) Lincoln Laboratories (Cole et al. 2014). The MIT study concluded that the military mission at WSMR would be affected by vertical obstructions due to low level flights. Following the MIT study, a compromise position was reached between the Department of the Interior (DOI) and the DoD that included mitigation of mission impacts by burial of portions of the line. The mitigation strategy was set forth in a letter dated May 27, 2014, from the Secretary of Defense to Secretary of Interior. The May 27 letter indicated a subsequent mitigation proposal would be forthcoming. This mitigation proposal was provided in a correspondence dated June 4, 2014, from the Undersecretary of Defense to the Director of the BLM. The Applicant sent a letter to DoD accepting the mitigation proposal and the DOI agreed to consider the mitigation proposal as part of the proposed action. The mitigation measures proposed by DoD are as follows.

(1) Burial of a Portion of the Power Lines
(2) Hold Harmless Clause for the Right-of-way Agreement
(3) Procedures to Allow for Unimpeded Testing to Occur During Construction and Maintenance of the Power Lines.
(4) Procedures for Micrositing[1] the Power Lines to Minimize WSMR Operational Impact.

BLM is utilizing this assessment to examine whether the environmental impacts associated with the components of Measure 1 of the Mitigation Proposal (the burial of a portion of the power

[1]Micrositing is defined to include adjustments to the power line alignment within the study corridor to accommodate environmental mitigation, terrain features or other physical constraints, construction access, right-of-way conflicts, or other factors identified during engineering prior to construction.

lines) require BLM to supplement the Final EIS, i.e., whether the Mitigation Proposal is considered a substantial change in the proposed action or represents significant new circumstances or information relevant to environmental concerns that differ from those disclosed and analyzed in the Final EIS.To mitigate potential impacts to the DoD-mission capability, DoD determined it is necessary to bury at least 5 miles of the 500 kV transmission lines to accommodate a minimum required set of type and diversity of low altitude tests possible in the vicinity of the proposed transmission lines. These burial sites are located along the BLM Preferred Alternative route identified in the Final EIS (Subroute 1A2). The three segments identified by DoD for burial are located in the eastern (at least 2 miles), central (at least 2 miles), and western (at least 1 mile) regions of the call-up area (see Figure 1-1). This EA sets forth the specific locations of each of the three underground line segments and examines whether the environmental impacts associated with burying these three segments differ from the environmental impacts analyzed in the Final EIS. Proposed Mitigation Measures 2, 3, and 4 would not result in significant impacts to the quality of the human environment, and they are outside the scope of this EA.

1.1 Objectives

The objective of the Mitigation Proposal is to minimize impacts of the proposed SunZia Project on WSMR's test and training missions in the NCUA. The BLM is utilizing this EA to document its determination as to whether it must supplement the Final EIS. In accordance with the Council on Environmental Quality NEPA regulations, an agency must supplement an EIS if "the agency makes substantial changes in the proposed action that are relevant to environmental concerns" or there are "significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts" (40 CFR 1502.9(c)(1)). Agencies, including the DOI, have utilized an EA as one option to determine and document the necessity of supplementing an EIS. See also 40 CFR 1501.3(b) and 43 CFR 46.300(b).

This EA takes a "hard look" at the Mitigation Proposal to determine whether it represents a "substantial change in the proposed action" or "significant new circumstances or information" relevant to environmental concerns that were not fully discussed or significantly differ from the impacts analyzed in the Final EIS. This EA evaluates only the portions of the BLM Preferred Alternative route in the NCUA that are part of the Mitigation Proposal. This EA describes in detail the Mitigation Proposal to bury up to at least 5 miles of transmission line in the three segments, assesses the environmental impacts of burying these segments, and describes and compares these environmental impacts to the impacts of the BLM Preferred Alternative analyzed in the Final EIS. This EA incorporates by reference the SunZia Final EIS.

1.2 Decisions to be Made

The BLM, through this EA, will determine if the changes to the BLM Preferred Alternative route in the NCUA associated with the Mitigation Proposal, including potential changes in the construction and operation of the Project, would result in substantially different environmental impacts from those analyzed in the Final EIS. The BLM will also determine whether or not there would be significant changes to the BLM Preferred Plan Amendment Alternative for the Socorro Resource Management Plan (RMP), as identified in Section 2.6 of the Final EIS.

SunZia Southwest Transmission Project

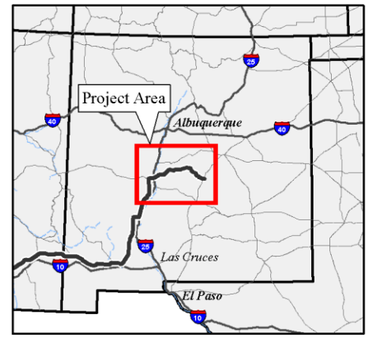
Mitigation Proposal
Overview Map

Legend

Project Features
- BLM Prefered Alternative (Final EIS)
- Mitigation Proposal Segment

Land Ownership
- Bureau of Land Management
- U.S. Forest Service
- U.S. Fish and Wildlife Service
- National Park Service
- Department of Defense
- State
- Private

Reference Features
- Highway
- Township Boundary
- County Boundary
- Jurisdiction Boundary
- WSMR Northern Call-up Area
- Restricted Airspace - R5107C & H



0 5 10 15 20
Miles

N

Belen
Bernardo
Socorro
San Antonio
Bingham
Carrizozo
Corona
VALENCIA COUNTY
SOCORRO COUNTY
TORRANCE COUNTY
LINCOLN COUNTY
Sevilleta National Wildlife Refuge
Bosque del Apache NWR
White Sands Missile Range
Gran Quivira unit of Salinas Pubelo Missions National Monument
Central Segment
Eastern Segment
Western Segment
PROPOSED SUNZIA EAST SUBSTATION

Figure 1-1 Overview Map

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1.3 Cooperating Agencies

Cooperating agencies having jurisdiction by law or special expertise that would be affected by the Mitigation Proposal addressed in this EA are listed as follows:

- New Mexico State Land Office (NMSLO)
- Department of the Army, WSMR
- DoD Siting Clearinghouse, Office of the Deputy Under Secretary (Installations and Environment)

The affected area of the Mitigation Proposal includes BLM, New Mexico State Trust lands, and private lands (See Figure 1-1).

The NMSLO is a cooperating agency for this EA, recognized to have special expertise and jurisdiction by law, as a right-of-way permit on New Mexico State Trust lands in the NCUA would be authorized by NMSLO.

The WSMR and the OSD are cooperating agencies for this EA, recognized to have jurisdiction by law and special expertise in the following areas:

a. Jurisdiction by law with regards to national surface/defense mission management responsibilities on lands administered by and under the jurisdiction of the DoD.

b. Special expertise concerning national defense and airspace management responsibilities under the jurisdiction of the DoD.

c. Specific jurisdiction by law and special expertise as it relates to WSMR and special expertise applicable to the military operations and readiness activities occurring in the designated restricted airspace above the "call-up" area.

The BLM is the only federal agency that manages land on which the Mitigation Proposal would require a right-of-way.

1.4 Plan Conformance

The BLM Preferred Alternative described in the Final EIS includes proposed plan amendments to the Socorro and Mimbres RMPs for specific corridor locations along the BLM preferred route. A description of proposed plan amendments is located in Sections 2.6 and 4.18 of the Final EIS. The BLM preferred plan amendment alternative is the 400-foot-wide corridor that would be included as an amendment to the RMPs for conformance with visual resource management (VRM) and right-of-way management objectives. The Mitigation Proposal would not change or require proposed plan amendments different from those identified and analyzed in the BLM Preferred Alternative in the Final EIS.

The following plan amendments, as described in the Final EIS, would still apply for the Mitigation Proposal:

- A plan amendment would be required for the Socorro RMP for locations along Link E101b where the Project would cross a right-of-way avoidance area for VRM Class II management and other areas managed for VRM Class II objectives. The Mitigation Proposal for the Western Segment would affect approximately 3.45 acres of the right-of-way avoidance area compared to 8.25 acres for the BLM Preferred Alternative.
- A plan amendment would also be required for the Socorro RMP for other locations along Link E101b associated with the Mitigation Proposal where the proposed Project would affect VRM Class II managed lands, resulting in non-conformance due to a change that would range from strong to moderate/strong project contrast. Approximately 8.6 acres of Class II managed lands would be affected as a result of the Mitigation Proposal compared to 10.5 acres affected for the BLM Preferred Alternative as identified in the Final EIS.

1.5 Issue Identification

For purposes of the EA, individual landowners and allottees (or leases) with ranch properties located in the three transmission line burial segment corridors in Torrance and Socorro counties were contacted. Meetings were held in August 2014 and included on-site visits with several members of the ranching community to discuss the Mitigation Proposal. The meetings included site visits with the landowners, BLM, Project representatives, and NMSLO and DoD personnel.

Issues were discussed to focus on the potential impacts resulting from the burial of the transmission lines that would affect residences, and ranching operations that differ from what BLM identified and considered in the Final EIS. The effects of overhead and underground transmission lines were discussed. A key issue stated by the ranchers was to minimize disturbance to fences, gates, water pipelines, wells, and other ranch facilities during construction. In response to the discussions with ranchers, the placement of proposed transmission line burial alignments (micrositing) and transition station sites were modified, reflecting the alignment presented in the EA.

CHAPTER 2 – PROPOSED ACTION AND ALTERNATIVES

2.1 Description of Proposed Action and Plan of Development

The proposed action is described in the Final EIS (BLM 2013) in Chapter 2 of the Final EIS, Section 2.4. The proposed action is for the BLM to issue a right-of-way grant to SunZia for the construction and operation of two 500-kV transmission lines along an identified route from the proposed SunZia East Substation in New Mexico to the existing Pinal Central Substation in Arizona. This EA addresses the proposed mitigation measure to construct, operate and maintain three segments for up to a total of approximately 5 miles of the BLM preferred alternative transmission line route located in Torrance and Socorro counties using underground (burial) instead of overhead transmission lines. As described in Chapters 1 and 2 of this EA, the purpose of developing the underground segments is to reduce the impacts to military testing missions carried out by the WSMR as provided under the DoD Mitigation Proposal (DoD 2014). This project description is the basis for the analysis of impacts in Chapter 3 of this EA.

A final plan of development (POD) would be required to be approved by the BLM prior to any construction or surface disturbing activities occurring on the right-of-way. A BLM Notice to Proceed authorization would not be issued until the final POD has been approved by the BLM. In the interim, a Preliminary POD (BLM 2012) has been prepared and is available for review at the BLM New Mexico State Office or online[2]. The final POD would include detailed engineering, mitigation, and environmental mapping upon approval of the final and approved route alignment and the design of the underground segments. The POD would detail the methods and procedures that would be used in construction of the Project and serves as a reference for contractors, construction crews, agency personnel, resource inspectors, and environmental compliance monitors. In addition to a detailed project description, the POD would contain Best Management Practices (BMP) and mitigation measures; specify environmental compliance field activities; and include a number of plans developed to achieve regulatory compliance and resources protection, including:

- Construction Plan and Program
- Flagging, Fencing, and Signage Plan
- Transportation Management Plan
- Fire Protection Plan
- Blasting Plan Methodology
- Erosion, Dust Control, and Air Quality Plan
- Hazardous Materials Management Plan
- Emergency Preparedness and Response Plan Guidelines
- Environmental Compliance Management Plan
- Biological Resources Protection Plan
- Avian Protection Plan
- Noxious Weed Management Plan

[2] http://www.blm.gov/nm/st/en/prog/more/lands_realty/sunzia_southwest_transmission.html

- Cultural Resources Historic Properties Treatment Plan (HPTP)/Monitoring and Discovery Plan/Native American Grave Protection and Repatriation Act (NAGPRA) Plan of Action/Programmatic Agreement (PA)
- Paleontological Resources Treatment Plan (PRTP)
- Stormwater Pollution Prevention Plan Methodology
- Right-of-way Preparation, Reclamation, and Monitoring Framework Plan

An Avian Protection Plan and migratory bird conservation strategy would be approved by the U.S. Fish and Wildlife Service (USFWS) prior to the BLM's Notice to Proceed. The vegetation management plan will be included in the final POD as part of the Biological Resources Protection Plan.

2.1.1 Proposed Transmission Lines

Two 500-kV overhead transmission lines would be constructed for the proposed Project. Both alternating current (AC) and direct current (DC) configurations are being considered as design options, as follows:

- **Option A –** Two transmission lines would be constructed and operated, each as a 500-kV single-circuit, AC facility.
- **Option B –** One transmission line would be constructed and operated as a 500-kV single-circuit AC facility, and one transmission line would be constructed and operated as a 500-kV single-circuit DC facility.

Each transmission line would extend between the proposed SunZia East Substation and the Pinal Central Substation for approximately 500 miles, depending on the alternative route selected. The transmission line components include structures, foundations, conductors, insulators and associated hardware, groundwire, and fiber optic cable facilities.

In response to the Mitigation Proposal, the overhead lines would be constructed in the same manner as proposed in the Final EIS, but the transmission lines would be buried underground in three segments of the proposed right-of-way, as specified in the Mitigation Proposal, instead of installing conductors overhead on steel towers. The underground segments would be located in the BLM preferred alternative study corridor, Subroute 1A2 (Final EIS, Figure 2-4), in portions of Torrance and Socorro counties. Transition stations would also be constructed to connect the underground cables with the overhead conductors at each terminal of the underground segments, as shown on the map in Figure 1-1 and Figures 3-1, 3-2, and 3-3. Typical design characteristics for the proposed overhead transmission lines are provided in Chapter 2, Section 2.4 of the Final EIS (BLM 2013). Figure 2-1 is a diagram of the typical transmission line and right-of-way configuration.

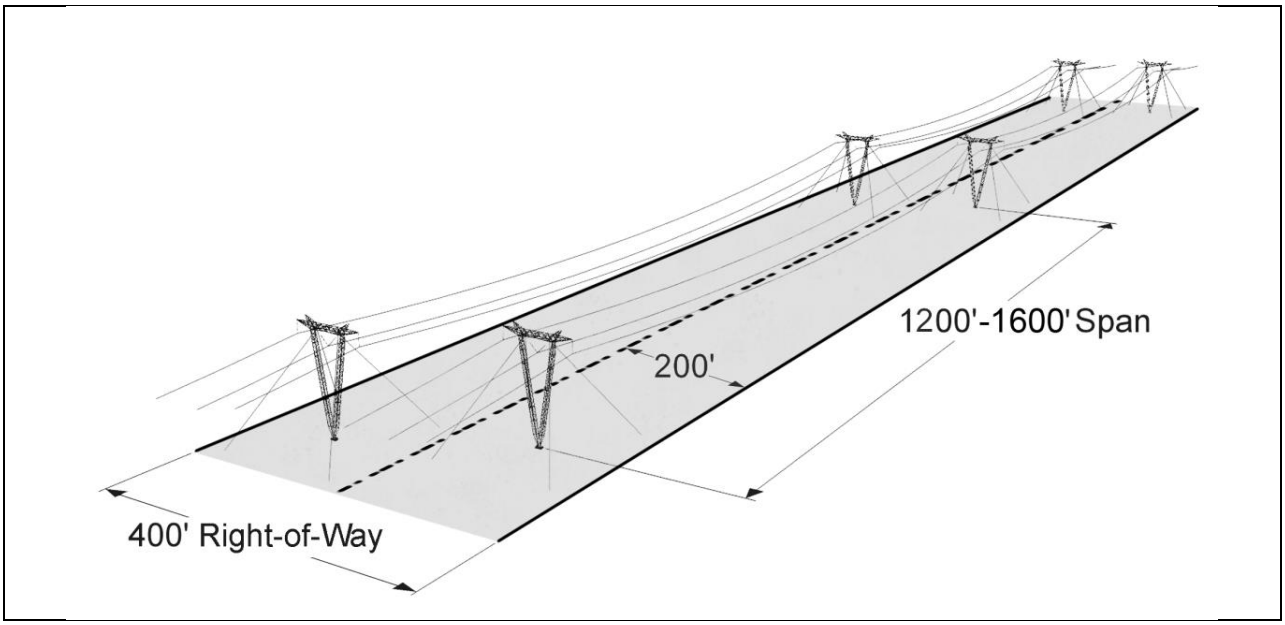

Figure 2-1 Typical 500-kV Transmission Line and Right-of-way Configuration

2.2 Construction, Operation, and Maintenance of Underground Segments

Following is a description of the construction, operation, and maintenance requirements for development of three underground segments of the proposed Project. The locations of the three segments are shown on the map in Figure 1-1.

The Eastern and Central segments would each be approximately 2 miles in length, and the Western Segment would be approximately 1 mile, a total of approximately 5 miles. Development of the 500-kV underground cable system would require the following principal components.

2.2.1 Cable System

The extruded cable with XLPE, or cross-linked polyethylene, insulation consists of a copper conductor with an extruded semi-conductive conductor shield; extruded XLPE insulation, outer semi-conductive insulation shield; a shielding system made with either lead, aluminum, or copper (which also serves as a moisture barrier); and finally a plastic jacket to complete the cable. (Figure 2-2) The diameter of the cable is approximately 6 inches. Two sets of three independent cables would be installed in two separate duct banks to complete the system for each 500-kV circuit. A fourth cable could be added in each duct bank to serve as a spare and used in the event of a failed cable. As a minimum, a spare duct (conduit) would be installed for a spare cable.

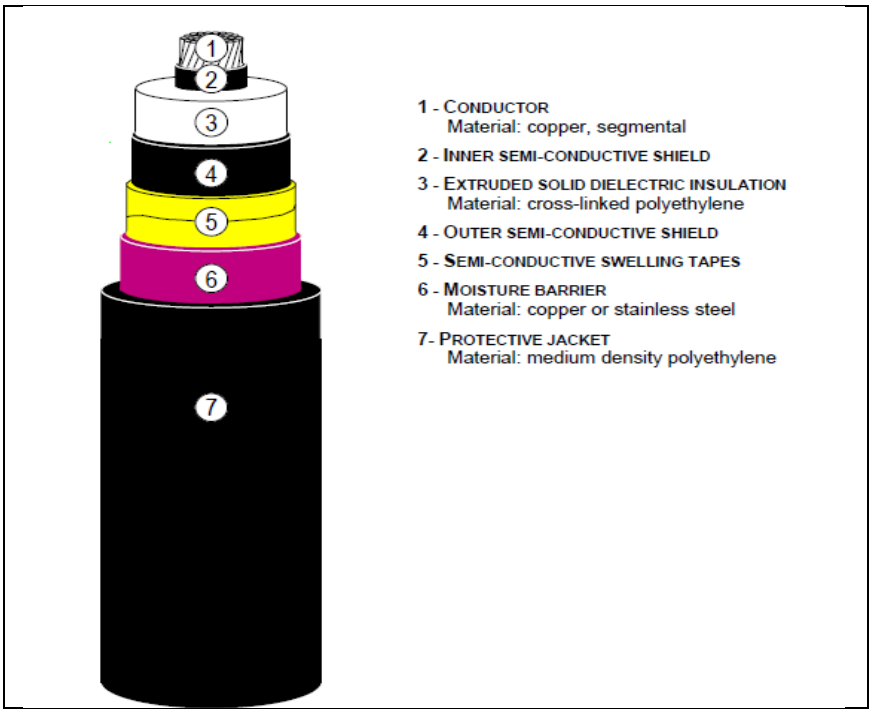

Figure 2-2 Typical Cable

2.2.2 Ducts

Ducts are used to allow for ease of pulling the 500-kV cables and are placed in a concrete-encased duct bank in a trench arranged to minimize thermal effects. Temperatures due to increased local heating of the underground 500-kV cables would be expected to be minimal when compared to ambient conditions. The Project would require four 8-inch-diameter ducts per duct bank and two duct banks per circuit, where one of the four ducts in each duct bank would be used as a spare in the event of a cable failure to facilitate pulling a replacement cable. Figure 2-3 depicts the proposed general arrangement concept for the duct banks. A minimum spacing of 15 feet is required between the duct banks. This spacing facilitates safe construction and maintenance activities and is necessary for proper maneuverability and related operation and installation of equipment in the field. Ducts for a communications cable and a continuity conductor (groundwire) are included in the duct bank.

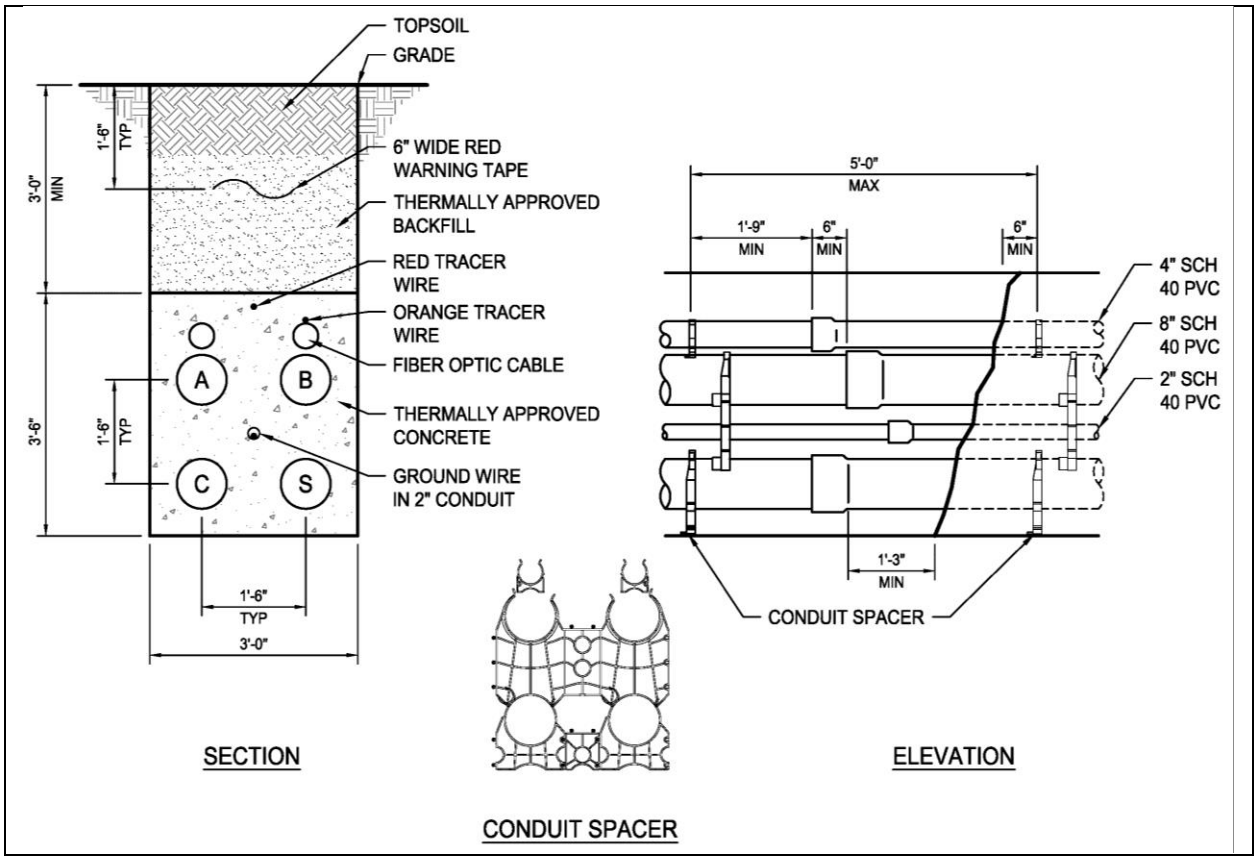

Figure 2-3 Duct Bank General Arrangement and Sections

2.2.3 Vaults

Underground vaults, or manholes, are required when the distance of the underground segment exceeds the length of a reel of cable. Vaults are needed along an underground transmission line for below-ground access to facilitate cable installation, maintenance requirements, and future repairs. As shown in Figure 2-4, the typical inside dimensions for each vault would be 7 feet wide by 30 feet long, containing two 3-foot diameter covered openings (manholes). The manholes would be secured with locks to allow only limited access for inspections and maintenance after construction is completed. The vaults would typically be placed at each cable splice location, approximately every 1,500 feet along the length of each of the four duct banks. The factors contributing to the final placement of the vaults would be allowable pulling tensions, sidewall pressure on the cable as it is pulled around a bend, terrain, and the maximum length of cable that can be transported on a reel based on the reel's width, height, and weight.

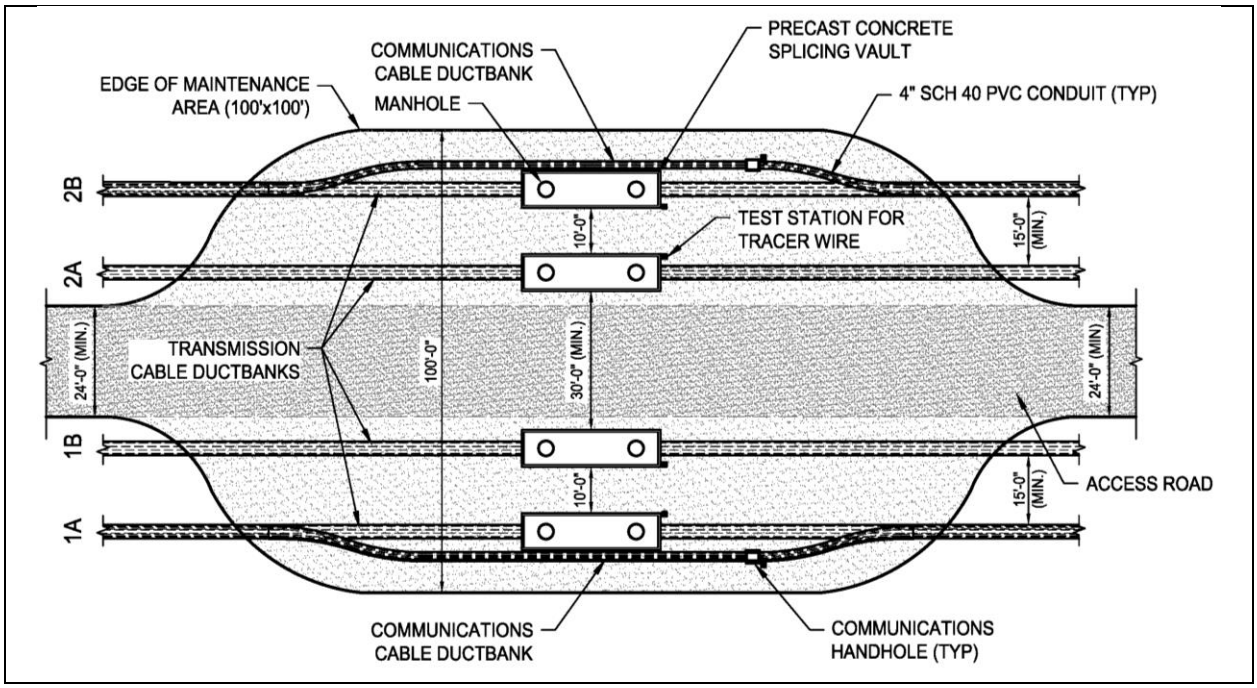

Figure 2-4 Typical Underground Ductbank and Vault Arrangement

2.2.4 Transition Stations

Transition stations are required to terminate the underground cables and to connect to the overhead transmission line conductors. A total of six transition stations would be required for three underground segments. Each of the transition stations would contain A-frame style dead-end structures (approximately 75 feet above grade) with pedestal-style termination structures, controls including relays and switching equipment, bus work, and a concrete block storage building (approximately 900-square-foot floor area and 20 feet in height). Each station site would be surrounded by an 8-foot-high, chain-link fence.

The four intermediate transition stations (T2, T3, T4, and T5) would each be contained in a 3-acre site (approximately 360 feet by 350 feet) as shown in Figure 2-5. The general arrangement for the transition stations located at the two outer ends (T1 and T6) of the corridor is shown in Figure 2-6, and a typical section of a transition station is shown in Figure 2-7. The T1 and T6 transition stations would require a slightly larger site (approximately 350 feet by 600 feet) to accommodate circuit breakers in addition to the other components and would, therefore, be contained in a 5-acre site.

The transition stations for the Eastern and Central segments (T1, T2 and T3) would be located on New Mexico State Trust land. The Central Segment transition station (T4) would be located on private land. The Western Segment transition station (T5) would be located on BLM land within the Project right-of-way, and the Western Segment transition station (T6) would be located on New Mexico State Trust land.

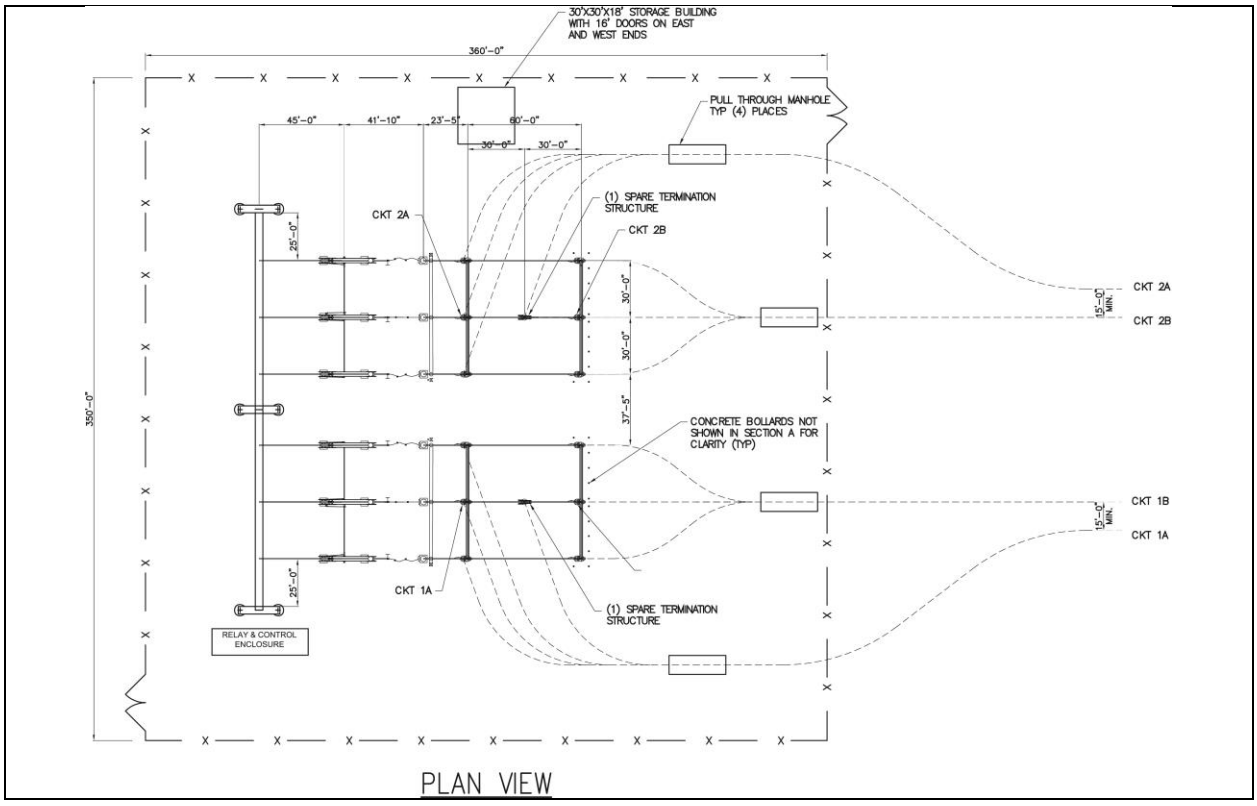

Figure 2-5 Transition Station Layout

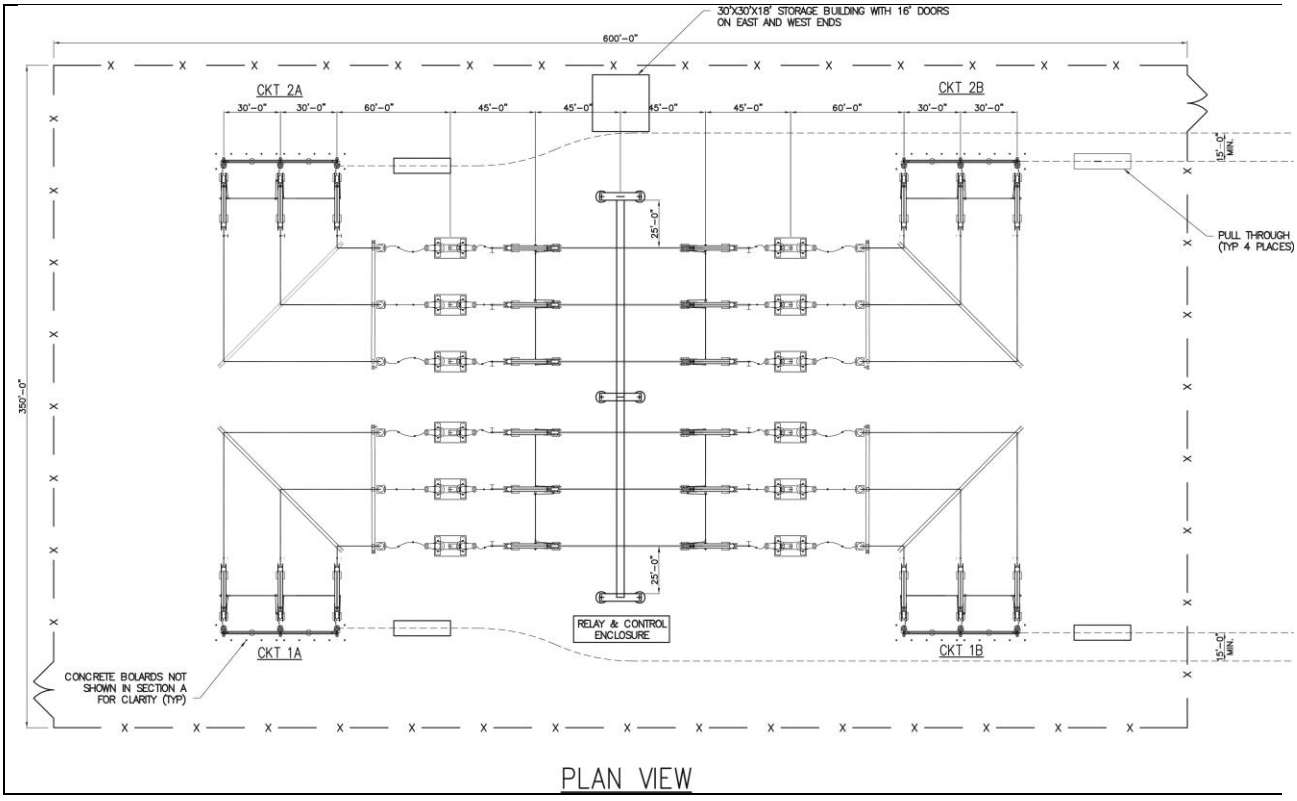

Figure 2-6 Transition Station Layout, With Circuit Breakers

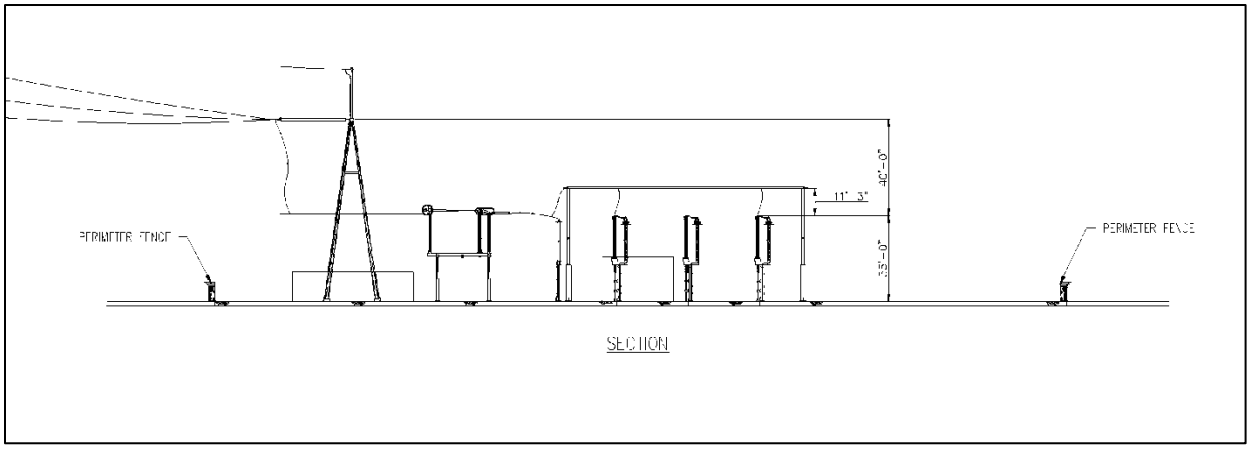

Figure 2-7 Transition Station Section, With Circuit Breakers

2.3 Construction

Construction includes clearing the area in the right-of-way to provide access for installation of the underground components and transition stations, excavation (trenching), installation of duct banks, installation of vaults, backfilling, pulling cables, cable splicing and terminating, and construction of the transition station.

2.3.1 Road Construction

All access roads would typically be constructed with a minimum travel-surface width of 24 feet, and berms and/or drainage ditches on both sides of the travel surface, for a total width of 30 feet. In steep terrain, total widths of disturbance could exceed 30 feet due to cut and fill conditions. In addition, roads may be routed around specific areas due to topographical constraints (terrain) or to avoid sensitive resources.

All access roads in the underground segments would be permanent, and utilized to access manhole (vault) locations and transition stations. If these roads are located in level terrain, the travel surfaces could be minimized to a width of 20 feet with 2-foot-wide berms and/or drainage ditches on both sides of the travel surface for a total width of 24 feet. The permanent roads for access would be similar to the permanent maintenance and access roads as identified in the Final EIS for overhead transmission lines.

2.3.2 Trenching

Open cut trenching would be used to place the required underground transmission line conduit system or duct bank. Typical trench dimensions would be a minimum depth of 6.5 feet below grade and a minimum width of 3 feet to accommodate the duct banks (see Figure 2-3). The trench would be stabilized with temporary bracing to prevent a collapse during construction. Any trench in excess of 5 feet would require stepped slopes or shoring to prevent a collapse opening up to 6 feet wide at the ground surface. Trenching operations are typically staged such that a

maximum of 600 to 800 linear feet of trench is open at any one time. Excavation would take place at the leading edge of the trench, followed by the installation of conduit. The conduits would then be backfilled, first with a high-strength thermal concrete encasement and then with a lower-strength thermal backfill (typically consisting of either a concrete slurry mix and/or specially-selected native soil depending on the geotechnical properties) to within 1 foot of grade. Native soil, more conducive to revegetation, would be installed in the top sections of the trench to a level matching the existing grade. Steel plating may be positioned over the open trench to minimize surface disruptions and provide protection during non-working hours.

Trenches would be opened using surface excavation equipment, such as large excavators and possibly bulldozers with a ripping tooth. Excavation through rock, where it is close to the surface, can be achieved with the use of drills and rock hammers, or as a last resort, by blasting.

Standard Mitigation Measure 9 would apply for the Project at all locations: Watering facilities (e.g., tanks, developed springs, water lines, wells, etc.) would be repaired or replaced if they are damaged or destroyed by construction activities to their predisturbed condition, as required by the landowner or land management agency. If necessary, confined explosives with managed detonations may be used in isolated areas, which would generally be contained within 10 to 20 feet from the surface. Where applicable, geotechnical testing would be conducted to identify the conditions of and potential effects to wells or other developed groundwater facilities. Blasting would not be used where it could cause damage to developed water sources and facilities.

2.3.3 Duct Bank Installation

A concrete-encased duct bank would be installed in each of four parallel trenches, separated by a minimum of 15 feet between each of the duct banks. The individual conduits (ducts) in the duct bank are supported by spacers placed in the trench, and then high-strength concrete slurry is used to fill the spaces surrounding the ducts up to 3.5 feet from the bottom of the trench. Specialized backfill, a low-strength concrete slurry also known as fluidized thermal backfill (FTB), would be used to cover the duct bank to a minimum depth of 36 inches over the duct bank (unless supplemental protection is provided). FTB is engineered with a specific thermal resistivity to assist in heat dissipation of the cable system, thus increasing the maximum continuous power transfer. Approximately 1 foot of topsoil backfill is placed over the FTB up to the existing grade. For security, red tracer wire is placed on top of the duct bank below the FTB fill, and a red warning tape is installed below the topsoil fill level. Duct bank installation would be scheduled to coincide with trench excavation to minimize the length of time an open trench is exposed.

2.3.4 Vault Installation

Vaults are precast, concrete units delivered to the site by truck and lowered into the trench. Each vault would be delivered in two or more pieces and joined together in position. A concrete surface cover containing two manholes is installed on the top of the vault. The manholes would be sealed after cable splicing and testing for security. These manhole covers are installed flush with grade and would be marked with signage to assist with location during emergencies or maintenance activities. A hand hole would be provided for access to the communications cable near each vault site. The typical installation time frame of each vault is approximately 1 week,

beginning with excavation, placement, compaction, and finally resurfacing of the excavated area. Entrance to the manholes would not be allowed while any of the cables are energized.

2.3.5 Cable Pulling, Splicing, and Termination

Upon completion of the civil construction, cables are installed in the duct banks. Prior to installation of the cable, the ducts would be tested and cleaned by pulling a mandrel and swab through each of the ducts. If the mandrel is pulled successfully and the swab indicates no presence of foreign material, the duct is declared suitable for installation of the cable. Cable installation procedures and equipment would be based on environmental conditions, equipment and material placement, and pulling requirements.

Each cable segment is installed, spliced at each of the vaults along the route, and terminated at the transition sites where the cable connects to overhead conductors. The typical setup (Figure 2-8) would be to set the reel of cable at the transition structure or at one of the vault locations and place the pulling rig at the opposite end. The cable should always be pulled from the transition structure to the nearest vault. Direction of pull between vaults should be determined based on the direction that results in the lowest pulling or sidewall tensions. Using wire rope, each section of cable is installed into its respective duct, while workers apply water-based lubricant to the cable jacket to minimize the frictional forces placed on the cables.

Figure 2-8 Cable Pulling Setup

Additional (spare) cables could be installed in each circuit at the time of construction. This cable would be spliced and terminated along with the three cables in one-half of the circuit. It would be available to be placed in service relatively quickly if a fault occurred on one of the primary cables for each circuit.

Before termination or splicing operations begin, the cables are trained into the correct position using heat blankets. This process removes the curvature of the cable from being on the reel while also relieving any longitudinal strain exerted on the cable during pulling operations. After all the cable is pulled into the vaults from each direction, splicing of the cable would commence. This process would be followed until all the cable has been pulled, terminated, or spliced. When fully in place, the cable would be tested.

2.3.6 Transition Station Construction

Preparation and construction at the transition station sites would require the following:

- Cut-and-fill grading (terrain dependent)
- Placement and compaction of structural fill to serve as a sub-base under the foundations for equipment
- Subsurface grounding grids
- Subsurface control conduits
- Grading to maintain drainage patterns
- Oil spill containment facilities
- Gravel-surfaced yard
- Gravel-surfaced parking areas approximately 100 by 100 feet
- Gravel-based roads (a minimum of 24 feet wide, based on site-specific conditions)
- Fencing and gates
- Facility construction
- Revegetation with native plants, where practicable

2.3.7 Equipment and Material Transportation

During construction, the well-established public road network in the Project area would afford ready access to most Project work sites for vehicles and equipment. Along the route, construction equipment, materials, and support vehicles are anticipated to use existing public roads to reach work sites. During construction, personnel traveling to and from work sites, as well as the movement of construction equipment, may cause temporary localized increases in traffic. When heavy equipment must be transported along public roads for delivery to the work sites, temporary disruptions in local traffic patterns or delays may occur. In addition, alternate traffic routes, which direct traffic away from distinct work sites, may be used. However, any such traffic-volume increases would be localized and limited to the construction phase, as would any potential alternate traffic routes.

Transportation of the cable reels to the site would require special tractor trailer rigs travelling on state-approved routes to avoid height limitations on several bridges in route to the job sites. The cable reels would weigh approximately 75,000 pounds and be designed with a 12.5-foot maximum diameter to stay under the 16-foot height limitation of many major bridges.

Thermally approved concrete and FTB would be delivered to the job site by concrete trucks, typically with an 8 cubic yard capacity, from ready-mix plants located in Mountainair or Socorro. Alternatively, volumetric cement mixers could be used for duct bank installation in conjunction with conventional cement mixers for transition station construction.

Emergency vehicle and local access must be coordinated with local jurisdictions as necessary.

2.3.8 Construction Duration

Construction of the Mitigation Proposal segments would occur in sequential phases and be completed within the same construction period as the Project. The total duration of construction

for the Mitigation Proposal would be approximately 2 years including the two 500-kV transmission lines with underground construction with transition stations.

The following describes a typical sequence of construction for one of four parallel transmission cable ductbanks and associated vaults for an approximate 1,500-foot-long portion of underground construction. It is anticipated that construction of multiple 1,500-foot-long portions of underground construction could occur simultaneously. Trenching operations are typically staged such that a maximum of 600 to 800 linear feet of trench is open at any one time.

Vaults are typically installed first. The excavation and installation of a vault on each end of a 1,500-foot portion of underground construction would take approximately 1 week. If soil conditions have significant rock, additional time could be required for excavation and installation of vaults.

Excavation of the trench and installation of the ductbanks would follow vault installation. Trenching would occur from vault to vault. The ductbank installation is a multi-step operation with time required for materials to cure. A 1,500-foot ductbank (one trench) excavation and installation is anticipated to take approximately 10 days in typical soil conditions.

2.3.9 Labor Force and Equipment

The estimated workforce and equipment required to construct the Mitigation Proposal segments and transition stations are listed in Tables 2-1 and 2-2. The Mitigation Proposal would consist of sequential phases of construction at each segment, and each line would be constructed independently at different time periods. An estimated total of 163 workers would be required for construction of each underground transmission line segment, and approximately 70 workers would be needed to construct each new transition station. Actual construction workforce at any one time would be less than the maximum due to sequential phases of construction. In total, the maximum Mitigation Proposal construction workforce, which includes personnel for construction of underground segments and transition stations, would be 233 if the work were to take place simultaneously to install parallel lines or separate segments to accelerate the construction schedule.

Table 2-1. Estimated Personnel and Equipment for Underground Transmission Line Construction (per segment)

Activity	Equipment Type	500-kV AC or DC Line	
		Quantity of Equipment	Personnel (per line)
Material Yard/ Receiving/Distribution	3/4-ton Pickup	4	14
	10,000 lb. Forklift	2	
	50-ton Crane	2	
	Tractor Trailer (flatbed)	6	
	20-ton Boom Truck	3	
Survey (Construction Staking)	1/2-ton Pickup	2	4
	ATVs	2	
Soil Borings	3/4-ton Pickup	2	6
	Drill Rig	2	
Right-of-way Clearing	3/4-ton Pickup	3	4
	Chainsaw	2	
	Hydro Axe	1	

Table 2-1. Estimated Personnel and Equipment for Underground Transmission Line Construction (per segment)			
		500-kV AC or DC Line	
Activity	**Equipment Type**	**Quantity of Equipment**	**Personnel (per line)**
Roads and Access	1-ton Pickup	2	6
	Cat D-6	1	
	Grader	1	
	Dump Truck	2	
	Water Truck	3	
Vault Installation (2 crews)	1/2-ton Pickup	2	18
	1-ton Pickup	2	
	Excavator	2	
	Loader/Backhoe	2	
	Boom Truck	2	
	75-ton R/T Crane	2	
	Cat D-6 dozer	1	
Duct Bank Excavation (4 crews)	1/2-ton Pickup	5	60
	2-ton Flatbed	5	
	Excavator	4	
	Air Compressor	4	
	Rock Drill	4	
	Dump Truck	4	
	Front End Loader	4	
	Concrete Truck –Volumetric	4	
	30-ton R/T Crane	4	
	Water truck	4	
	Tractor	4	
	Trailer –Flatbed	4	
	20-ton Boom Truck	4	
	Cat D-6 dozer D-8 dozer	2 2	
Underground Cable Installation (1 crew)	1/2-ton Pickup	2	15
	1-ton Flatbed Truck	1	
	Water Truck	1	
	Tractor	2	
	Reel Trailer	2	
	Cable Puller	1	
	20-ton Boom Truck	2	
	120-Ton Crane	1	
	Air Compressor	1	
Cable Splicing (3 crews)	1/2-ton Pickup	3	32
	1-ton Flat Truck	6	
	Truck –Cable splicer	3	
Restoration	1/2-ton Pickup	2	4
	Tractor with Disc	1	
	Cat D-4	1	
	Hydro Seed Truck	1	
Contractor Management/ Compliance Monitors	1/2-ton Pickup	10	20
	ATV (Inspection)	2	
Total Personnel[1]			**163**

[1]Assume each segment would be worked separately. Two duct banks would be worked concurrently.

Table 2-2. Estimated Personnel and Equipment for Underground Transmission Line Construction (per transition station)			
		500-kV Transmission (per transition station)	
Activity	**Equipment Type**	**Quantity of Equipment**	**Personnel**
Material Yard/Receiving/ Distribution	3/4-ton Pickup	2	3
	5-ton R/T Forklift	2	
	50-ton Crane	1	
	Tractor Trailer	1	
	30-ton Boom Truck	1	
Construction Staking	1/2-ton Pickup	1	2
Soil Borings	3/4-ton Pickup	1	2
	Drill Rig	1	
Site Clearing and Grading	3/4-ton Pickup	2	14
	1-ton Pickup	2	
	Cat D-6	2	
	Grader	2	
	Semi with Dump Trailer	4	
	Water Truck	2	
	Scrapers	2	
	Roller Compactors	2	
Foundations/Raceway/Grounding	1/2-ton Pickup	3	12
	3/4-ton Pickup	4	
	Drill Rig	1	
	Loader/Backhoe	2	
	Boom Truck	1	
	Concrete Truck	1	
	Excavator	1	
	Dump Truck	2	
	10-ton R/T Forklift	1	
	Mini Excavator	2	
	Air Compressor	2	
	Trencher	2	
	Roller Compactor	2	
	Hand Compactor	3	
Structure and Equipment Installation	1/2-ton Pickup	4	15
	1-ton Line Truck	2	
	200-ton Crane	1	
	30-ton Boom Truck	4	
	Air Compressor	3	
	Man Lifts	4	
	50-ton Crane	2	
	Generator	2	
	5-ton R/T Forklift	4	
Wiring	1/2-ton Pickup	1	12
	1-ton Line Truck	1	
	Generator	2	
	5-ton R/T Forklift	1	
Testing and Cleanup	1/2-ton Pickup	2	5
	Bucket Truck/Boom with Basket	2	
Contractor Management and Compliance	1/2-ton Pickup	5	5
Total per Transition Station			**70**

2.4 Operation, Maintenance and Decommissioning

To maintain functionality of the transmission grid, all equipment installed as part of the system is maintained or inspected on a scheduled basis to ensure functionality, reliability, and longevity of the system. Installation of 500-kV underground transmission facilities is very limited in the United States, and no meaningful data is available concerning operation and maintenance of these types of facilities. It is assumed underground transmission facilities would be operated, and maintained in a manner similar to other Extra High Voltage circuit currently operating today. Catastrophic failures of the cable or facilities are not anticipated.

The following practices are generally accepted utility maintenance standards for typical equipment that is used in transmission installations.

2.4.1 Splicing Vault and Cable Inspections

The inspection of splicing vaults and cables would be conducted yearly for the first 5 years and then every 3 years. The inspection requires three qualified personnel typically using a one-ton truck with trailer, and normally would start with opening each splicing vault to inspect for the presence of water and remove it if present. Prior to entering any underground facility, an atmospheric test must be performed on the enclosure and the results of the test must be satisfactory. If the atmosphere is found to be unsuitable, work must stop until the situation is resolved. Once in the vault, all ground connections should be visually inspected for corrosion or mechanical damage. Cable supports and mounting hardware should be secure and free of rust and corrosion. Cables and splices should be inspected for signs of deterioration or movement as well as being securely mounted to supporting brackets.

It is recommended that each of these maintenance activities take place every year for the first 5 years, while the warranty is in effect, after which the inspection activities should take place no less than every 3 years.

After the visual inspection has been completed, an infrared test is conducted to measure the temperature of the cables and splices. This information is documented and is useful in determining if there is a variance between components, which could indicate a problem, or it can be compared with previous readings to see if there is an overall degradation of the system. The route of the duct bank installation should be observed for any depressions or low areas. These could be evidence of settling of the duct system and could potentially stress the cables or splices in adjacent vaults.

2.4.2 Transition Stations

A typical cycle would be functional testing of equipment in each station every 3 years. The relay and control enclosure and support systems require maintenance, and these functions are performed on a monthly basis to ensure security of the site and reliability of the system. Typically, one qualified individual would be scheduled to conduct a monthly inspection starting with a visual inspection of the yard, paying close attention for presence of bird contamination of insulators, structures, or terminations.

An annual infrared inspection is conducted on all bus connections and attachment points to identify abnormalities due to heating. This activity could be coordinated with the cable inspections. Terminators should be inspected to determine if the insulator skirts are chipped or cracked. If so, they must be repaired or replaced. Where circuit breakers are used, periodic maintenance would be required as per manufacturer recommendations. Depending on the type of breaker used, outages would be taken for periods of 1 to 2 weeks to maintain and inspect internal components. Typical maintenance cycles for this equipment are 4 to 6 years.

Lightning arrestors should be checked for signs of tracking and chipped or cracked skirts. In addition, ground connections should be checked to ensure tightness. These inspections should be performed every year.

2.4.3 Repair and Restoration

If a splice were damaged, the restoration activities would take place only at the splicing vault location. Should a cable replacement be required, restoration activities would take place at the vault location at each end of the affected cable.

Minor and anticipated repairs to the transition stations and underground cable segments might require the temporary de-energization of the facilities. Repairs to the transition stations are assumed to be equivalent to repairs required in a typical 500-kV substation. If there is a failure in the underground segment requiring a minor repair, repairs would typically progress as follows: (1) the spare cable would be spliced to allow replacement of services of temporary de-energization and (2) the failed segment of cable would be removed and replaced. The type of work associated with removing and replacing a failed segment of underground transmission line would be consistent with the work associated with the initial pulling of the transmission line that occurred after installation of the duct banks, as described in Section 2.3 of this EA.

If emergency restoration is required, then similar activities would occur as during construction, depending upon the nature of the failure. Damage to a cable section may require excavation of the duct bank in the affected cable run as well as repairs taking place at each adjacent vault location.

2.4.4 Decommissioning

The term of the BLM right-of-way grant to allow use of federal land would be limited to 50 years, although the useful life of the Project facilities is projected to be at least 50 years and up to 75 years. The transmission lines and associated facilities would be decommissioned at the end of the useful life of the Project if the facilities were no longer required (after 50 years, or longer with a new right-of-way grant or renewal). Subsequently, conductors, insulators, concrete pads, and above grade hardware would be dismantled and removed from the right-of-way. Tower and pole structures would be removed and foundations broken off at least 2 feet below ground surface. For the underground segments, the conductor cables would be removed for salvage and vaults would be backfilled with slurry or native soil. Project roads would be removed and the impacted areas restored. Roads may be left in place at the discretion land management agency or

individual land owner. All areas of permanent disturbance would be restored in accordance with a Termination and Reclamation Plan approved by the BLM Authorized Officer.

2.5 No Action Alternative

The Final EIS included the analysis of a No Action alternative to provide a baseline for comparison of environmental effects that could occur with implementation of action alternatives and to demonstrate potential consequences of not meeting the purpose and need of a proposed action (see Final EIS, Section 2.3.1). As stated in the Final EIS, under the No Action alternative the BLM would not grant a right-of-way for construction and operation of the proposed Project and it would not amend any planning decisions. The Project facilities, including transmission lines and substations, would not be built and existing land uses and present activities in the Project study area would continue. The No Action alternative does not consider the potential for additional actions that could occur contingent on the denial of the proposed action or alternatives. Service by the existing transmission system in the study area would continue.

For purposes of this EA, the No Action alternative would be the construction and operation of the proposed SunZia Transmission Project lines as described in the Final EIS (i.e., overhead and not underground). The ROD would be issued to approve the overhead transmission line project without the burial of portions of the lines described in the Mitigation Proposal.

2.6 Alternatives Considered but Eliminated from Detailed Analysis

The Western Segment alignment of the BLM Preferred Alternative route, located on BLM and private lands south of the Sevilleta National Wildlife Refuge, was modified in response to potential construction constraints for the burial of the transmission lines. The Project Applicant has proposed an alternative to construct the transmission line along the Western Segment with shorter, overhead transmission line structures that would reduce the typical heights from 135 feet to less than 100 feet along the modified alignment for approximately 1 mile.

The change to lower structures would appear to reduce the potential for interference with low-level missile flights along the Western Segment. Unlike the overhead transmission alignment along the BLM Preferred Route, the overhead lines along the modified route would be located below and directly north of a steep landform that is higher than the towers. Missiles would be required to fly above the structures to clear the landform. Construction of this overhead alternative would also mitigate visual resource impacts. Because the modified alignment would be located below the landform between the transmission lines and the Wilderness Study Area (WSA), it would result in lower impact to views from the WSA, and potentially reduce the amount of non-conformance with the VRM Class II area.

This alternative has been considered, but was eliminated because the DoD's Mitigation Proposal specifically required that the transmission lines be buried. Therefore, this alternative would not meet BLM's objectives.

Another alternative was considered to construct and operate underground transmission facilities across the entire length of the Project but was eliminated from further consideration. Burial of

the entire Project is considered technically infeasible due to potential reliability concerns, operational risks, environmental impacts, and high construction cost (See Section 2.3.3 of the Final EIS).

Another alternative was considered to construct and operate underground transmission facilities across the entire length of the Call-up Area but was eliminated from further consideration. Similar to the reasons above, burial of the this portion of the Project is considered technically infeasible due to potential reliability concerns, operational risks, environmental impacts, and high construction cost.

2.7 Mitigation

Mitigation measures that have been specified for application in the Project are described in the Final EIS (Proposed Action and Alternatives, Section 2.4.12, pp. 2-88 through 2-99). A summary of these mitigation measures is provided in the following description and tables. These mitigation measures would be implemented for construction and operation of the proposed overhead transmission line as applicable, as well as the segments to be constructed underground and associated facilities described in this EA.

Mitigation includes specific means, measures, or practices that would reduce or eliminate effects of the proposed action or alternatives. Mitigation may be used to reduce or avoid adverse impacts to environmental resources, whether or not they are significant in nature. Standard mitigation (ST) measures are those that apply to the Project as a whole. These measures typically address specific environmental policies, BMPs, planning guidelines, or regulatory requirements. Standard mitigation measures are listed in Table 2-3.

Selective mitigation (SE) measures (Table 2-4) were developed in collaboration with the BLM and cooperating agencies and include measures or techniques recommended or required by the agencies or landowners. As such, selective mitigation measures provide a planning tool for minimizing potential adverse impacts. Where warranted, selective mitigation measures are recommended to reduce potential impacts in specific locations. These measures would be modified as appropriate, to reduce impacts associated with specific resource concerns (e.g., cultural, biological, visual) for the selected route and included prior to Project construction in the final POD. Additional site-specific NEPA analysis would be completed as required (e.g., where construction of new access routes would be located outside of the proposed right-of-way). The construction contractor(s) would adhere to the measures identified during the engineering/design phase, as well as those measures that address construction and reclamation activities. The compliance inspection contractor (CIC) would be responsible for the oversight of the implementation of these measures, to ensure the Applicant and the construction contractor(s) meet the intent of the mitigation measures.

In compliance with Section 7 of the ESA, mitigation to address the loss of critical habitat would be implemented. Such mitigation measures may include on-site or off-site compensation or habitat replacement, to be specified by the USFWS in the Biological Opinion. The U.S. Army Corps of Engineers would also participate in this mitigation plan as required under Section 404 of the Clean Water Act (CWA) to address the potential loss of wetlands or riparian resources.

To address potential impacts to migratory birds, and in compliance with the Migratory Bird Treaty Act (MBTA), Executive Order 13186, and the Bald and Golden Eagle Protection Act (BGEPA), mitigation measures have been prescribed in the Final EIS (and included in this EA). Among others, standard mitigation measures include preconstruction surveys (ST 25, Table 2-3), and selective measures include installing bird diverters to increase visibility of wires (SE 15, Table 2-4)

Additional mitigation measures to reduce the potential for avian collisions would be specified in detail in the final POD, and associated Avian Protection Plan and conservation strategy as approved by the USFWS, to be implemented during construction and operation of the Project. The USFWS would participate in the mitigation planning process to facilitate the eventual approval of the Avian Protection Plan, which would identify certain measures that may include, but would not be limited to, the following:

- Applying special structural design to decrease the heights of groundwires and conductors
- Marking wires (bird diverters) and/or using special structure design to increase visibility to birds
- Monitoring to ensure mitigation measures are implemented
- Conducting additional avian studies, surveys, and/or monitoring to record the presence of birds and incidence of avian collisions, and provide data that could be useful to minimize the potential for collisions with the Project, as well as with existing and future power lines in other locations
- Conducting habitat equivalency, or resource equivalency, analyses for calculating in-kind replacement of lost ecological functions and values (services), as determined applicable, to improve the breeding productivity of migratory birds

Table 2-3. Standard Mitigation Measures

Standard mitigation measures are part of the Project description; they are applied to all alternatives considered in the impact assessment.

	Mitigation Measure	Mitigation Application Phase		
		Engineering, Design, and Location	Construction	Operations
1	Prior to construction, a detailed POD will be developed to further describe Project features, selective mitigation, and procedures. At a minimum, the POD will address Project design, construction and operation considerations, biological considerations (including noxious weed management), cultural resources, paleontological considerations, hazardous materials management, and reclamation considerations.	●	●	●
2	All vehicle movement outside the right-of-way would typically be restricted to designated access, contractor acquired access, or public roads.	●	●	●

Table 2-3. Standard Mitigation Measures				
Standard mitigation measures are part of the Project description; they are applied to all alternatives considered in the impact assessment.				
		Mitigation Application Phase		
	Mitigation Measure	**Engineering, Design, and Location**	**Construction**	**Operations**
3	The boundary of construction activities would typically be predetermined, with activity restricted to and confined within those limits. No paint or permanent discoloring agents would be applied to rocks or vegetation to indicate survey or construction activity limits.		●	
4	The alignment of any new access roads or overland route would follow the designated area's landform contours where possible, provided that such alignment does not additionally impact resource values. This would minimize ground disturbance and/or reduce scarring (visual contrast).	●	●	
5	In construction areas where grading is not required, vegetation would be left in place wherever possible, and original contour would be maintained to avoid excessive root damage and allow for regrowth. All existing roads would be left in a condition equal to or better than their condition prior to the construction of the transmission lines, as determined by the appropriate land-managing agency.	●	●	
6	To limit new disturbance, existing access roads in the Project area would be used to the extent practicable, provided that doing so does not additionally impact resource values.	●	●	●
7	Construction holes left open overnight would be appropriately fenced or covered to prevent damage to wildlife or livestock.		●	
8	In construction areas (e.g., marshalling yards, structure sites, spur roads from existing access roads) where grading is required, surface restoration would be implemented as required by the landowner or BLM Authorized Officer. The method of restoration would normally consist of returning disturbed areas back to their natural contour, reseeding (where required), cross drains installed for erosion control, placing water bars in the road, and filling ditches.		●	
9	Watering facilities (e.g., tanks, developed springs, water lines, wells, etc.) would be repaired or replaced if they are damaged or destroyed by construction activities to their predisturbed condition, as required by the landowner or land management agency. Temporary watering facilities would be provided for wildlife and livestock until permanent repair or replacement is complete.		●	

Table 2-3. Standard Mitigation Measures				
Standard mitigation measures are part of the Project description; they are applied to all alternatives considered in the impact assessment.				
		Mitigation Application Phase		
	Mitigation Measure	**Engineering, Design, and Location**	**Construction**	**Operations**
10	Nonspecular conductors would be used, where specified by the BLM Authorized Officer, to reduce visual impacts.	●	●	
11	"Dulled" metal or self-weathering finish structures would be used to reduce visual impacts, if specified by the BLM Authorized Officer.	●	●	
12	Structures and/or groundwire would be marked with high-visibility devices where required by government agencies (e.g., Federal Aviation Administration [FAA]).	●	●	●
13	On agricultural land, right-of-way would be aligned, in so far as practicable, to reduce the impact to farm operations and agricultural production.	●		
14	Prior to construction, all supervisory construction personnel would be instructed on the protection of cultural and ecological resources. The training program outlined in the HPTP would be implemented. To assist in this effort, the construction CIC or a resource specialist would address: (a) federal and state laws regarding antiquities and plants and wildlife, including collection and removal; (b) the importance of these resources and the purpose and necessity of protecting them.	●	●	
15	Cultural resources would continue to be considered during post-EIS phases of Project implementation, in accordance with a PA executed for the Project. This would involve efforts such as intensive surveys, documentary and archival research, and/or visual modeling to inventory and evaluate potential impacts to historic properties within the areas of potential effect, as identified in the PA (direct and indirect). This would also require preparation and approval of a cultural resource inventory report, and the preparation and implementation of an approved HPTP to avoid, minimize, or mitigate adverse effects, as appropriate to each historic property.	●	●	●
16	Project Owners would respond to complaints of line-generated radio or television interference by investigating the complaints and implementing appropriate mitigation measures. The transmission line would be evaluated on a regular basis so that damaged insulators or other line materials that could cause interference are repaired or replaced.			●
17	Project Owners would apply necessary mitigation to eliminate problems of induced currents and voltages onto conductive objects sharing right-of-way, to the mutual satisfaction of the parties involved.	●	●	●

Table 2-3. Standard Mitigation Measures				
Standard mitigation measures are part of the Project description; they are applied to all alternatives considered in the impact assessment.				
		Mitigation Application Phase		
	Mitigation Measure	**Engineering, Design, and Location**	**Construction**	**Operations**
18	Roads would be built as near as possible at right angles to the streams and washes. Culverts or temporary bridges would be installed where necessary. All construction and operations activities shall be conducted in a manner that would minimize disturbance to vegetation, drainage channels, and intermittent or perennial stream banks.	●	●	●
19	To the extent practicable, structures would be sited with a minimum distance of 200 feet from stream banks.	●		
20	All requirements of those entities having jurisdiction over air quality matters would be adhered to, any necessary dust control plans would be developed, and permits for construction activities would be obtained. Open burning of construction trash would not be allowed unless permitted by appropriate authorities.		●	
21	Fences and gates would be repaired or replaced to their original, predisturbed condition, as required by the landowner or the BLM Authorized Officer if they are damaged or destroyed by construction activities. New temporary and/or permanent gates would be installed only with the permission of the landowner or the BLM. Temporary gates not required for postconstruction access control (see SE 6) would be removed following construction completion, and the area restored in accordance with the POD (see ST 1).		●	●
22	Transmission line materials would be designed and tested to minimize corona. Bundle configuration and larger diameter conductors would be used to limit the audible noise, radio interference, and television interference due to corona. Tension would be maintained on all insulator assemblies to ensure positive contact between insulators, avoiding sparking. Caution would be exercised during construction and operations to avoid scratching or nicking the conductor surface, which may provide points for corona to occur.	●	●	●
23	During operation of the transmission lines, the right-of-way would be maintained free of nonbiodegradable debris. Slash would be left in place or disposed of in accordance with requirements of the landowner or management agency.		●	●
24	In consultation with appropriate land-management agencies, specific mitigation measures for paleontological resources would be developed and implemented to mitigate any identified adverse impacts. These measures would include: preparation of a PRMP;	●	●	

Table 2-3. Standard Mitigation Measures				
Standard mitigation measures are part of the Project description; they are applied to all alternatives considered in the impact assessment.				
		Mitigation Application Phase		
	Mitigation Measure	**Engineering, Design, and Location**	**Construction**	**Operations**
	paleontological surveys; personnel education; monitoring ground disturbance for fossils; curation of fossils; and deposition of fossils in a paleontological repository.			
25	Preconstruction surveys for species listed under the ESA or specified by the appropriate land management agency as sensitive or of concern would be conducted in areas of known occurrence or suitable habitat. Timing of the surveys would be determined by species, coordinated with agency wildlife biologists, and completed prior to construction. Monitoring of construction activities would be required in some areas to ensure that effects to these species are avoided during construction. If Bald Eagle or Golden Eagle nests are identified during preconstruction surveys, seasonal restrictions on construction within a specified buffer would be implemented in coordination with the USFWS and/or species survey protocols, as appropriate, and comply with the BGEPA. Preconstruction nesting-season surveys for migratory birds, and surveys for Burrowing Owls in suitable habitat, would be conducted as needed to comply with the MBTA.	●	●	●
26	Preconstruction native plant inventories and surveys for noxious weed species as stipulated by the appropriate land-administering agency would also be conducted once transmission line centerline, access roads, and tower sites have been located.	●	●	
27	Surveys for bat roosts would be conducted within ¼ mile of the Project right-of-way in areas that potentially contain caves, karst features, or mines. Occupied bat roosts would be avoided.	●	●	
28	Paniculate agave plants (*Agave palmeri, A. parryi,* and *A. chrysantha*) and saguaro cacti (*Carnegiea gigantea*) within the known range of the Lesser Long-nosed Bat or Cactus Ferruginous Pygmy-owl would be avoided or salvaged for replanting within the right-of-way or suitable adjacent habitat. Only agaves not possessing flower stalks would be salvaged, and only saguaros of transplantable size (15 feet or less in height) would be salvaged.	●	●	
29	Electrical facility design would be in accordance with "Suggested Practices for Raptor Protection on Power Lines" (Avian Power Line Interaction Committee [APLIC] 2012).	●		
HPTP – Historic Properties Treatment Plan PRMP – Paleontological Resources Monitoring Plan				

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Table 2-4. SunZia Selective Mitigation Measures

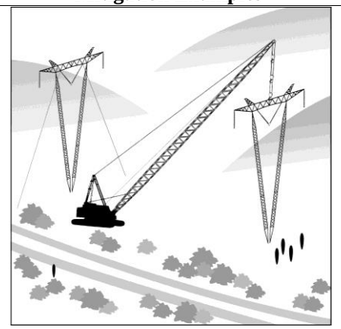
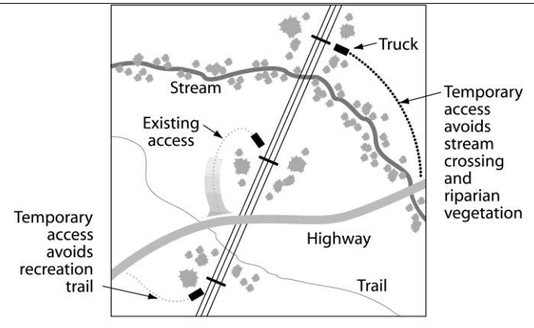
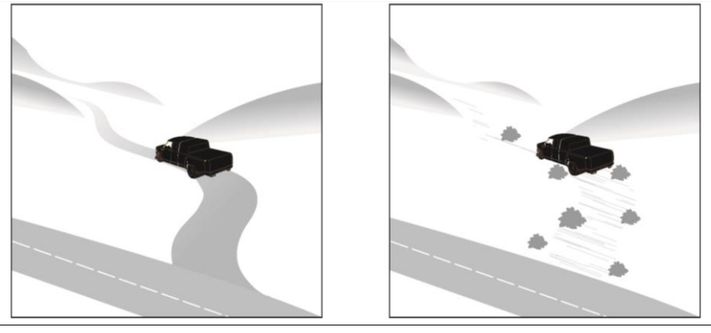
Mitigation Measure	Mitigation Examples	Mitigation Application Phase			Mitigation Effectiveness								
					Water Resources		Earth Resources		Biological Resources				
		Engineering, Design, and Location	Construction	Operations	Streams/ Washes	Wetlands/ Springs	Geology/ Soils	Paleontology	Sensitive Wildlife Species	Sensitive Plant Species	Land Use	Visual Resources	Cultural Resources
1. No widening or upgrading of existing access roads would be undertaken in the area of construction and operations, except for repairs necessary to make roads passable, where soils and vegetation are very sensitive to disturbance, or where existing archaeological sites are present.		●	●	●	●	●	●			●	●	●	●
					Avoiding unnecessary access road upgrades would limit the amount of habitat disturbed or removed. In addition, the avoidance of road upgrades would minimize increases to vehicular traffic, thereby reducing the potential for indirect effects such as damage or loss of vegetation, spread of noxious weeds, harassment of wildlife, vandalism of cultural resources, and disturbance to sensitive land uses (e.g., parks, preservation, and recreation areas).								
2. There would be no blading of new access roads in select areas of construction and operations. Existing crossings would be utilized at perennial streams, designated recreational trails, and irrigation channels. Off-road or cross-country access routes would be used for construction and maintenance in select areas. This would minimize ground disturbance impacts. These access routes must be flagged with an easily seen marker, and the route must be approved in advance of use by the BLM Authorized Officer or landowner.		●	●		●	●	●		●		●	●	●
					Selective Mitigation Measure 2 is effective for the same reasons as Selective Mitigation Measure 1. Minimizing ground-disturbing construction activities in the same vicinity as streams would limit disturbance to riparian areas and/or streambeds, thereby avoiding turbidity and sedimentation. In addition, it would limit land use conflicts with trails and/or disruption of sensitive views.								
3. Overland access (i.e., drive-and-crush or cut-and-clear) would be used to the greatest extent possible in areas where no grading would be needed to access work areas. Drive-and-crush is vehicular travel to access a site without significantly modifying the landscape. Vegetation is crushed, but not cropped. Soil is compacted, but no surface soil is removed. Cut-and-clear is considered as brushing off (removal) of all vegetation to improve or provide suitable access for equipment. All vegetation is removed using above-ground cutting methods that leave the root crown intact.		●	●	●	●	●	●		●	●	●	●	
					Overland access would avoid or minimize the removal of surface soil and vegetation, reducing the potential for erosion and loss of habitat. In addition, avoiding the construction of a new road would reduce the potential for increased traffic and the associated indirect effects.								

Table 2-4. SunZia Selective Mitigation Measures

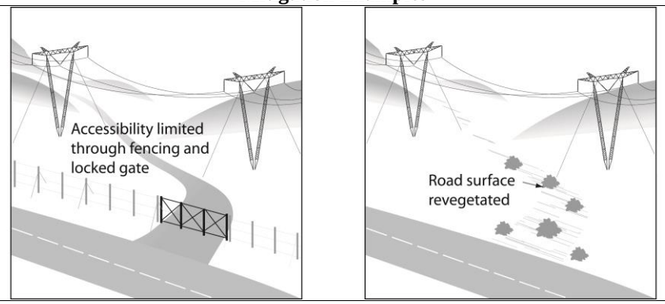
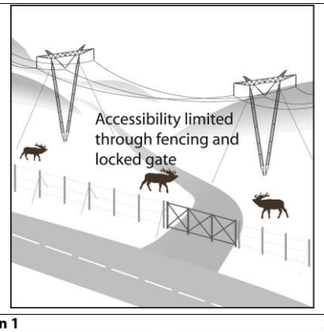
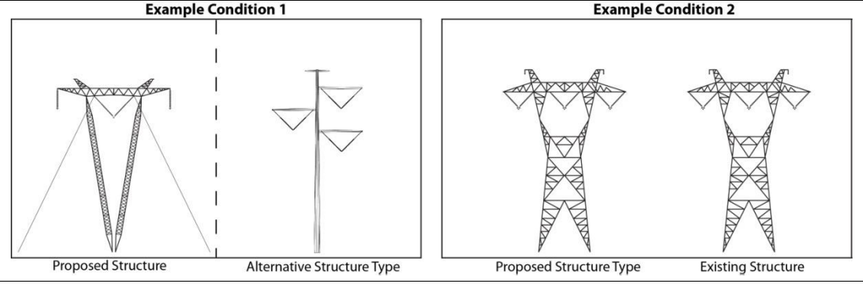
Mitigation Measure	Mitigation Examples	Mitigation Application Phase			Mitigation Effectiveness									
					Water Resources		Earth Resources		Biological Resources					
		Engineering, Design, and Location	Construction	Operations	Streams/ Washes	Wetlands/ Springs	Geology/ Soils	Paleontology	Sensitive Wildlife Species	Sensitive Plant Species	Land Use	Visual Resources	Cultural Resources	
4. All new access roads not required for maintenance would be permanently closed using the most effective and least environmentally damaging methods appropriate to that area (e.g., stock piling and replacing topsoil, or rock replacement), with concurrence of the landowner or appropriate land management agency. This would limit new or improved accessibility into the area.			●	●	●	●	●		●	●	●	●	●	Closing access roads where they are not needed after construction protects the resources in that area from further disturbance for reasons described in SE 1.
5. In addition to standard reseeding and recontouring practices (see ST 8), a detailed Project reclamation plan would be developed to mitigate site-specific resource impacts.			●	●	●	●	●		●	●	●	●		
6. To minimize disturbance to sensitive habitats or resources, access roads required for operations purposes would be gated or otherwise blocked from public access. Fences would meet BLM or other applicable agency/owner specifications.			●	●					●	●	●		●	Limiting access to sensitive areas would reduce the potential for indirect effects associated with increased traffic.
7. Modified tower design or alternate tower type would be used to minimize ground disturbance, operational conflicts, visual contrast, and/or avian conflicts.		●	●	●					●		●	●		Flexibility in designing the tower or use of different tower types would allow tower structures to be adapted to specific site situations (i.e., Condition 1 – New Route, Condition 2 – Existing Corridor). For example, in areas where there are sensitive views and an existing transmission line, structures used for the Project would match the existing structures, minimizing visual contrast. Structures with perching opportunities for aerial predators where sensitive grassland species occur may be used.

Table 2-4. SunZia Selective Mitigation Measures

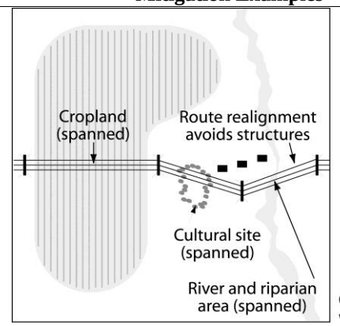
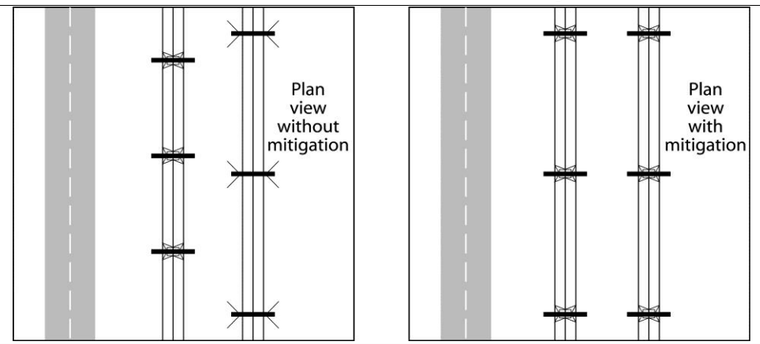
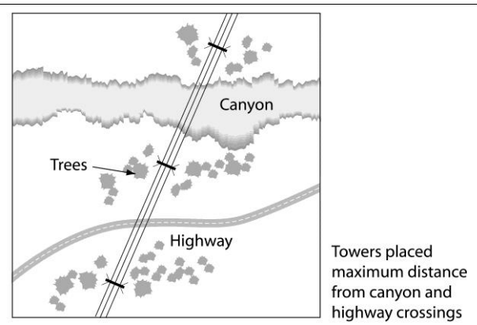
Mitigation Measure	Mitigation Examples	Mitigation Application Phase			Mitigation Effectiveness								
					Water Resources		Earth Resources		Biological Resources				
		Engineering, Design, and Location	Construction	Operations	Streams/ Washes	Wetlands/ Springs	Geology/ Soils	Paleontology	Sensitive Wildlife Species	Sensitive Plant Species	Land Use	Visual Resources	Cultural Resources
8. In designated areas, structures would be placed so as to avoid, and/or to allow conductors to span sensitive features such as riparian areas, water courses, roads, trails, bat roosts, and cultural sites within limits of standard tower design. This would minimize the amount of sensitive features disturbed and/or reduce visual contrast.		●			●	●	●		●	●	●	●	●
					Flexibility in the placement of structures allows for sensitive features to be avoided. Realigning the structures along a route or realigning the route can result in avoiding or minimizing direct impacts to resources, such as cultural and biological, as well as land uses such as agriculture, parks, preservation, hazardous substance remediation, and recreation areas.								
9. Standard tower design would be modified to correspond with spacing of existing transmission line structures where feasible, and within limits of standard tower design. The typical span would be modified to correspond with existing structures, but not necessarily at every location. This would reduce visual contrast and/or potential operational conflicts.		●							●		●	●	●
					Matching tower spacing with existing parallel lines reduces the visual space occupied by the structures and minimizes the amount of contrast between the man-made structures and the landscape.								
10. At highway, canyon, and trail crossings, structures are to be placed at the maximum distance practicable from the crossing to reduce visual impacts.		●									●	●	●
					Placing structures at a maximum distance from major or sensitive crossings (i.e., roads and trails) would reduce visual impacts and potential safety hazards (i.e., vehicle collision with tower).								

Table 2-4. SunZia Selective Mitigation Measures

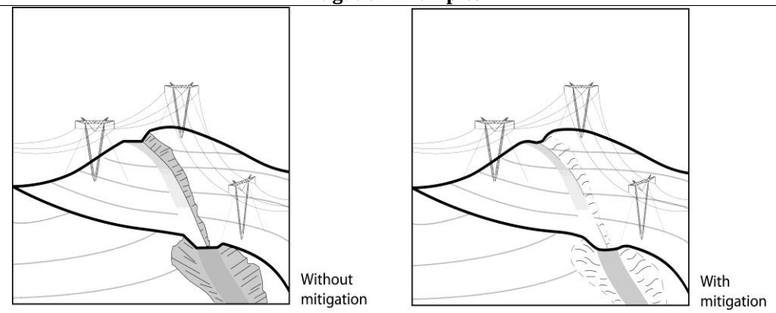
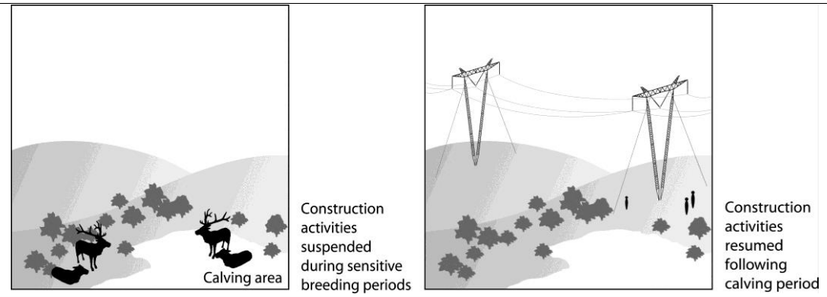
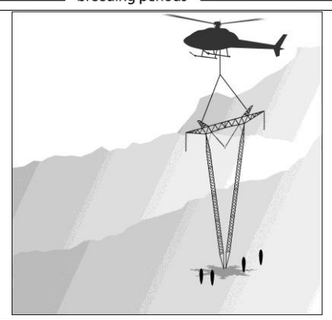
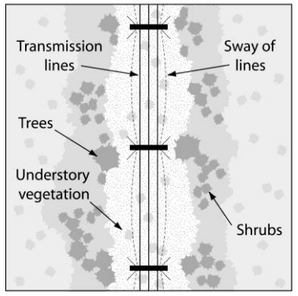
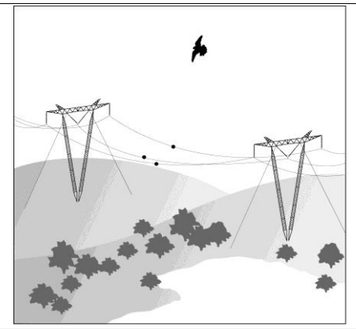
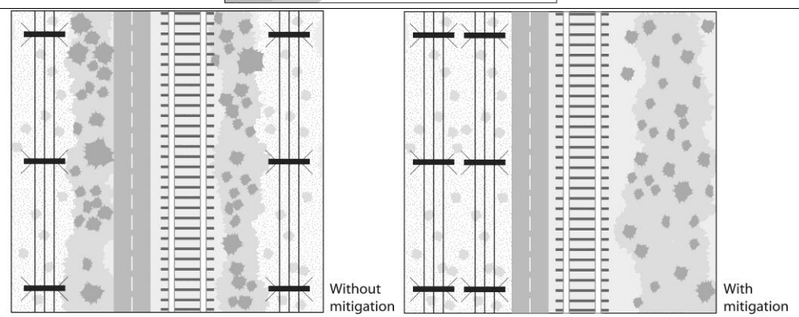
Mitigation Measure	Mitigation Examples	Mitigation Application Phase			Mitigation Effectiveness									
					Water Resources		Earth Resources		Biological Resources					
		Engineering, Design, and Location	Construction	Operations	Streams/ Washes	Wetlands/ Springs	Geology/ Soils	Paleontology	Sensitive Wildlife Species	Sensitive Plant Species	Land Use	Visual Resources	Cultural Resources
11. To reduce visual contrast, mineral or asphalt emulsions (e.g., Permeon™ or approved equivalent) would be applied in rocky areas where newly exposed rock color would create strong landscape contrasts.		●	●									●	●
					The implementation of mineral or asphalt emulsions (e.g., Permeon™ or approved equivalent) would reduce the visual contrast between exposed ground and the surrounding environment. The application of this mitigation would be determined in the field, during or after construction, by the CIC and Authorized Officers.									
12. With the exception of emergency repair situations, right-of-way construction, restoration, maintenance, and termination activities in designated areas would be modified or discontinued during sensitive periods (e.g., nesting and breeding periods) for candidate, proposed threatened and endangered, or other sensitive animal species. Sensitive periods, species affected, and areas of concern would be approved in advance of construction or operations by the BLM Authorized Officer.			●	●					●					
					Restricting construction activities or maintenance during breeding or nesting periods eliminates potential disturbance of wildlife during these critical periods of their life cycles.									
13. Helicopter placement of structures may be used to reduce ground disturbance (e.g., to minimize soil erosion, vegetation loss, and visual impacts) caused by permanent access road construction.			●				●	●	●	●	●	●	●
					Using helicopters to place structures in steep terrain or otherwise sensitive areas reduces land use and natural resource impacts that would otherwise result from ground-disturbing activities. The decrease of ground disturbance would reduce the loss of vegetation, soil erosion, potential damage to cultural resources, and visual impacts.									

Table 2-4. SunZia Selective Mitigation Measures

Mitigation Measure	Mitigation Examples	Mitigation Application Phase			Mitigation Effectiveness									
					Water Resources		Earth Resources		Biological Resources					
		Engineering, Design, and Location	Construction	Operations	Streams/ Washes	Wetlands/ Springs	Geology/ Soils	Paleontology	Sensitive Wildlife Species	Sensitive Plant Species	Land Use	Visual Resources	Cultural Resources
14. To minimize disturbance to riparian vegetation and woodlands, and to reduce visual contrast, clearing of trees in and adjacent to the right-of-way would be minimized to the extent practicable to satisfy conductor-clearance requirements (National Electric Safety Council [NESC] and up to 10 years of timber growth). Trees and other vegetation would be removed selectively (e.g., edge feathering) to blend the edge of the right-of-way into adjacent vegetation patterns, as practicable and appropriate.	 Clearing of trees minimized		●						●		●	●	
					Selectively removing vegetation (i.e., trees) within and along the edges of the right-of-way reduces disruption of habitat, minimizes removal of timber resources, and reduces the visual contrast between the right-of-way and the surrounding environment. Furthermore, "feathering" the edges of the right-of-way instead of cutting trees and vegetation in a straight line results in a more gradual modification to the environment.									
15. To minimize bird collisions, bird diverters would be installed and maintained on groundwires, transmission lines, and/or guywires in areas of heavy bird use (i.e., Rio Grande and other riparian corridors). Groundwires would be replaced with one-inch diameter Fiber optic groundwires (OPGW) to increase visibility where practicable and appropriate.			●	●					●					
					Conductor, groundwire or guywire markings on segments of the transmission lines that cross through, or are adjacent to, heavy bird migration corridors and/or habitat would minimize the risk of avian collision.									
16. To reduce ground disturbance and visual contrast, the separation between the transmission lines and existing utilities, roads, or railroads would be minimized to the extent practicable.			●						●		●	●		
					Consolidating the transmission lines with existing facilities such as roads, railroads, or other utilities (e.g., transmission lines, distribution lines, pipelines, etc.) would typically minimize ground disturbance, habitat fragmentation, and visual contrast. Furthermore, locating the transmission lines within designated utility corridors (where established) minimizes potential land use conflicts and other resource impacts.									

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CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS

3.1 Introduction

Chapter 3 includes a description of the environment and its resources that have the potential to be affected by alternatives of the Mitigation Proposal described in Chapter 2 of this EA, as well as an assessment of potential environmental effects that could result from its construction and operation. The current condition of each resource and the relevant characteristics that may be subject to impacts from the Project are described in Chapter 3 of the Final EIS. Impacts associated with the construction and operations of the proposed Project are described in Chapter 4 of the Final EIS. Environmental resource baseline information and potential effects for the Mitigation Proposal are presented below to allow for the comparison of potential impacts that could result from the Mitigation Proposal segments and the BLM Preferred Alternative as described in the Final EIS. Impacts for the Mitigation Proposal segments were evaluated and compared with impacts of the BLM Preferred Alternative.

Resources that may be affected by the Mitigation Proposal or the Project have been carried forward for analysis in this EA. These resources and land management programs were selected based on federal regulatory requirements and policies and concerns of lead and cooperating agencies that include:

- Climate and Air Quality
- Earth Resources
  - Geology
  - Minerals
  - Soils
- Paleontological Resources
- Water Resources
- Biological Resources
  - Vegetation
  - Noxious and Invasive Weeds
  - Wildlife
  - Special-status Species
- Wildland Fire Ecology and Management
- Cultural Resources
- Visual Resources
- Land Use and Recreation Resources
- Special Designations
- Wilderness, Wilderness Study Areas, and Lands with Wilderness Characteristics
- Social and Economic Conditions
- Environmental Justice
- Health and Safety/Hazardous Materials (electromagnetic fields [EMF], noise)

Information on the existing condition of each of the resources was compiled from the Final EIS and updated as needed. Sources included published and unpublished reports, land use plans, maps, and agency databases. Resource inventories were developed in sufficient detail for the areas in the study corridors[3] to assess the potential impacts that could result from the proposed Project. While the focused impact analyses specifically address impacts to the affected environment in study corridors, resource data have also been collected outside of the study corridors to indicate regional context. Field reconnaissance was conducted to review baseline resource conditions where needed and to verify land use and visual resources data. Federal and

[3]A study corridor is the area surrounding the Project alternative centerlines in which a detailed inventory of existing conditions was completed.

state resource management agencies and private landowners were contacted to refine and verify or supplement information and to solicit information regarding issues, concerns, policies, and regulations. The width of the study corridors along the alternative routes differs for each of the resource disciplines, depending on the area that potentially could be affected (Table 3-1).

Table 3-1. Study Corridors by Resource

Resource[1]	Study Corridor Width (miles)
Earth Resources	2
Paleontological Resources	2
Water Resources	–
• Streams, springs, wells, bodies of water	1,200 (feet)
• Unique or impaired waters	0.5
Biological Resources	8
Wildland Fire Ecology and Management	2
Cultural Resources	–
• Class I Archaeological Survey	0.25
• Class III Archaeological Survey	800 (feet)
• National Registered Historic Places (NRHP) and other areas[2]	6
Visual Resources	6
Land Use, Recreation, Special Designations	6
Health and Safety/Hazardous Materials	0.2

[1]Analysis of air quality, wilderness, lands with wilderness characteristics (LWC), and WSAs is based on regional study area data. Social and economic data in the Project area is based on county and statewide data.
[2]Includes national parks and monuments, and state register properties

To facilitate the analysis of the Mitigation Proposal segments, study corridors are centered on a line referred to as the "reference centerline," which approximates the right-of-way location. The locations of the centerlines for the Mitigation Proposal are shown in Figure 1-1 and are in the study corridors that were analyzed in the Final EIS. The precise location of the right-of-way centerline would be determined through engineering surveys of the selected route prior to transmission line construction. Ancillary facilities would be located in the study corridor associated with each Mitigation Proposal segment, which are included as components of the impact assessment. The precise locations of access roads and ancillary facilities, which include transition stations and temporary construction areas would be determined prior to construction.

Resource data and impacts were assessed along the Mitigation Proposal segments reference centerlines. A comparison of the Project details of the Mitigation Proposal and the BLM Preferred Alternative as described in the Final EIS, including land ownership and ground disturbance, are found in Table 3-2.

These segments are identified in each of the following maps:

- Figure 3-1 Eastern Segment
- Figure 3-2 Central Segment
- Figure 3-3 Western Segment.

The description of the affected environment and impacts in the Project study corridors are shown on the resource maps in the Map Volume of the Final EIS (Figures M1-1 through M10-4).

Table 3-2. BLM Preferred Alternative (Final EIS) and Mitigation Proposal Route Comparison										
		Land Ownership (miles crossed)					Ground Disturbance			
							Temporary Disturbance		Permanent Disturbance	
Group/Subroute	Length of Subroute (miles)	Bureau of Land Management	Bureau of Reclamation	Department of Defense	State	Private/Other	acres	acres/mile	acres	acres/mile
Subroute 1A2										
BLM Preferred Alternative (Final EIS)	230.3	108.1	—	—	40.3	81.9	1,819	7.9	1,270	5.5
Mitigation Proposal	230.4	106.9	—	—	40.7	82.8	1,815	7.9	1,276	5.5
Mitigation Proposal Segments										
Eastern Segment (underground)	2.09	—	—	—	2.09	—	15.2	7.2	7.9	3.8
Eastern Segment (overhead)	—	—	—	—	—	—	—	—	—	—
Eastern Segment (total)	2.09	—	—	—	2.09	—	15.2	7.2	7.9	3.8
Transition Station	—	—	—	—	X	—	—	—	7.6	—
Central Segment (underground)	2.16	0.52	—	—	0.34	1.3	16.2	7.5	8.3	3.8
Central Segment (overhead)	0.73	—	—	—	0.73	—	5.5	7.5	4.3	5.9
Central Segment (total)	2.89	0.52	—	—	1.07	1.3	21.8	7.5	12.6	4.4
Transition Station	—	—	—	—	X	X	—	—	5.6	—
Western Segment (underground)	1.33	0.69	—	—	0.09	0.55	10.0	7.5	5.0	3.8
Western Segment (overhead)	1.21	0.63	—	—	0.58	—	8.7	7.5	8.1	6.7
Western Segment (total)	2.54	1.32	—	—	0.67	0.55	18.7	7.5	13.1	5.2
Transition Station	—	X	—	—	X	—	—	—	7.6	—
BLM Preferred Alternative Route. SunZia East Substation to Pinal Central Substation										
1A2, 3A2, 4C2c (combined)-Final EIS	**515.4**	**184.5**	**0.4**	**—**	**219.9**	**110.6**	**4,077**	**7.9**	**2,859**	**5.5**
1A2, 3A2, 4C2c (combined)-Mitigation Proposal	**515.5**	**183.3**	**0.4**	**—**	**220.3**	**111.5**	**4,073**	**7.9**	**2,865**	**5.5**

Notes: Totals may not sum, due to rounding.
Total may include overlap of facilities.
"X" indicates facility land ownership location; linear measurement is not included

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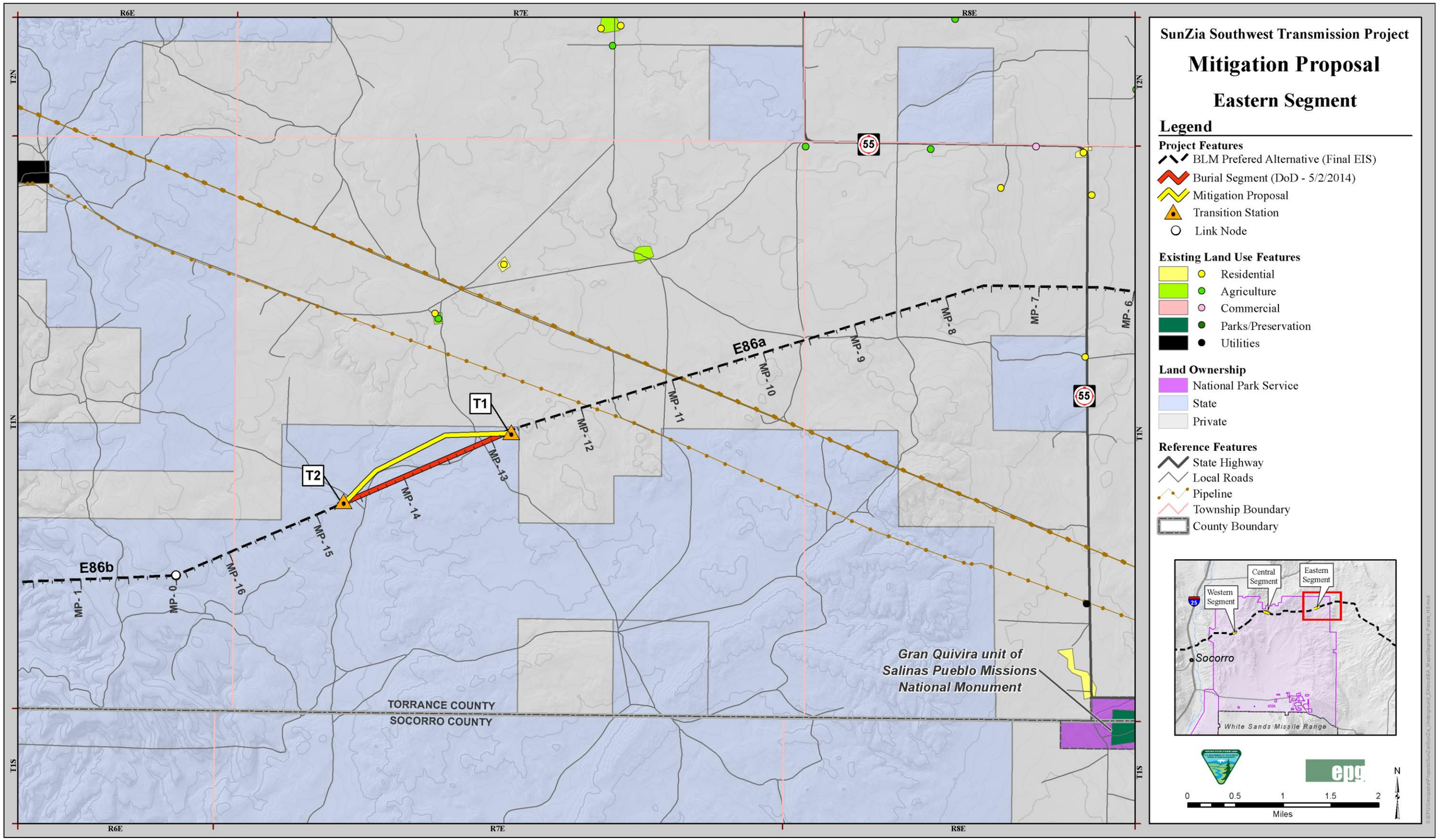

Figure 3-1 Eastern Segment

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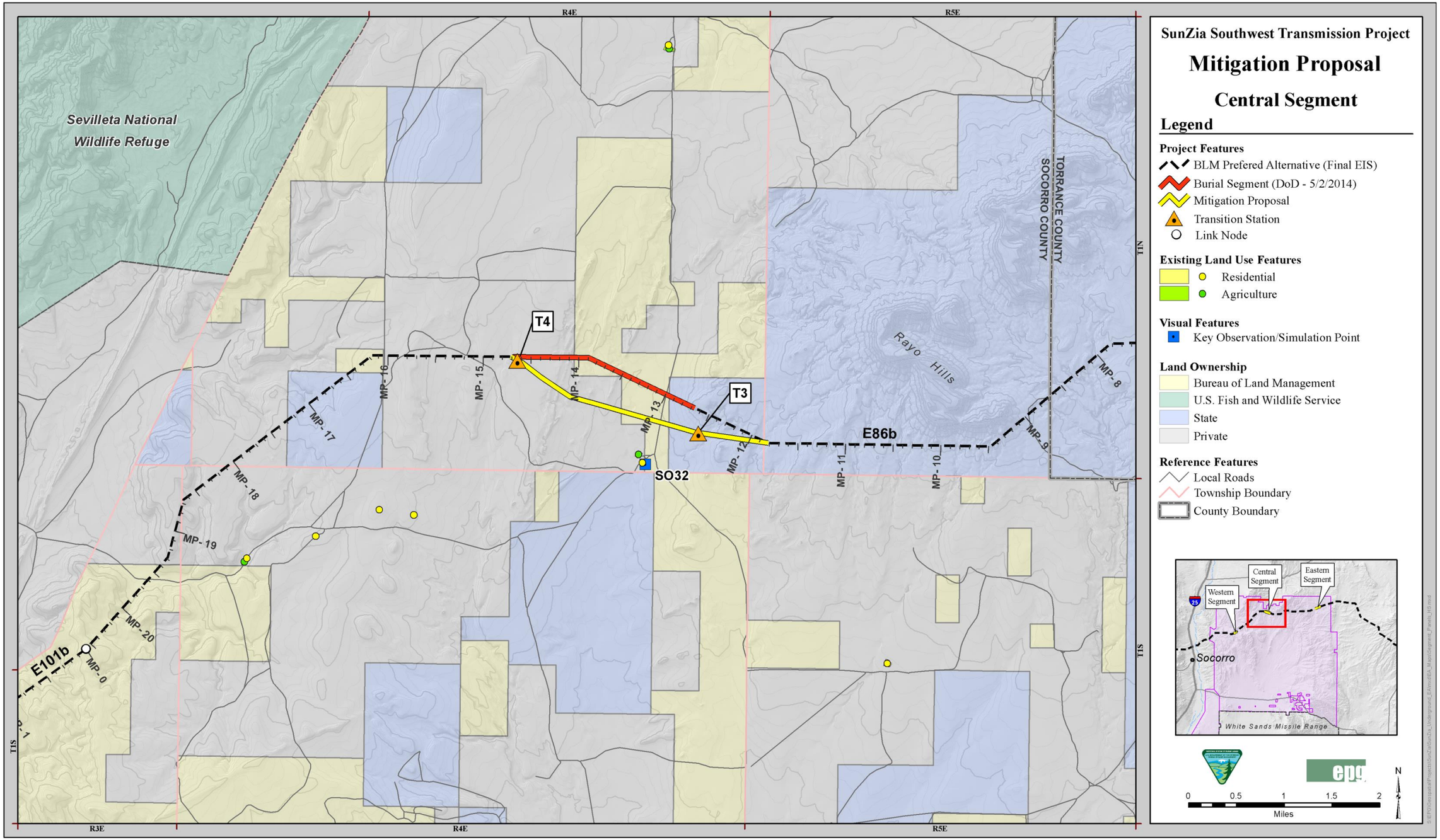

Figure 3-2 Central Segment

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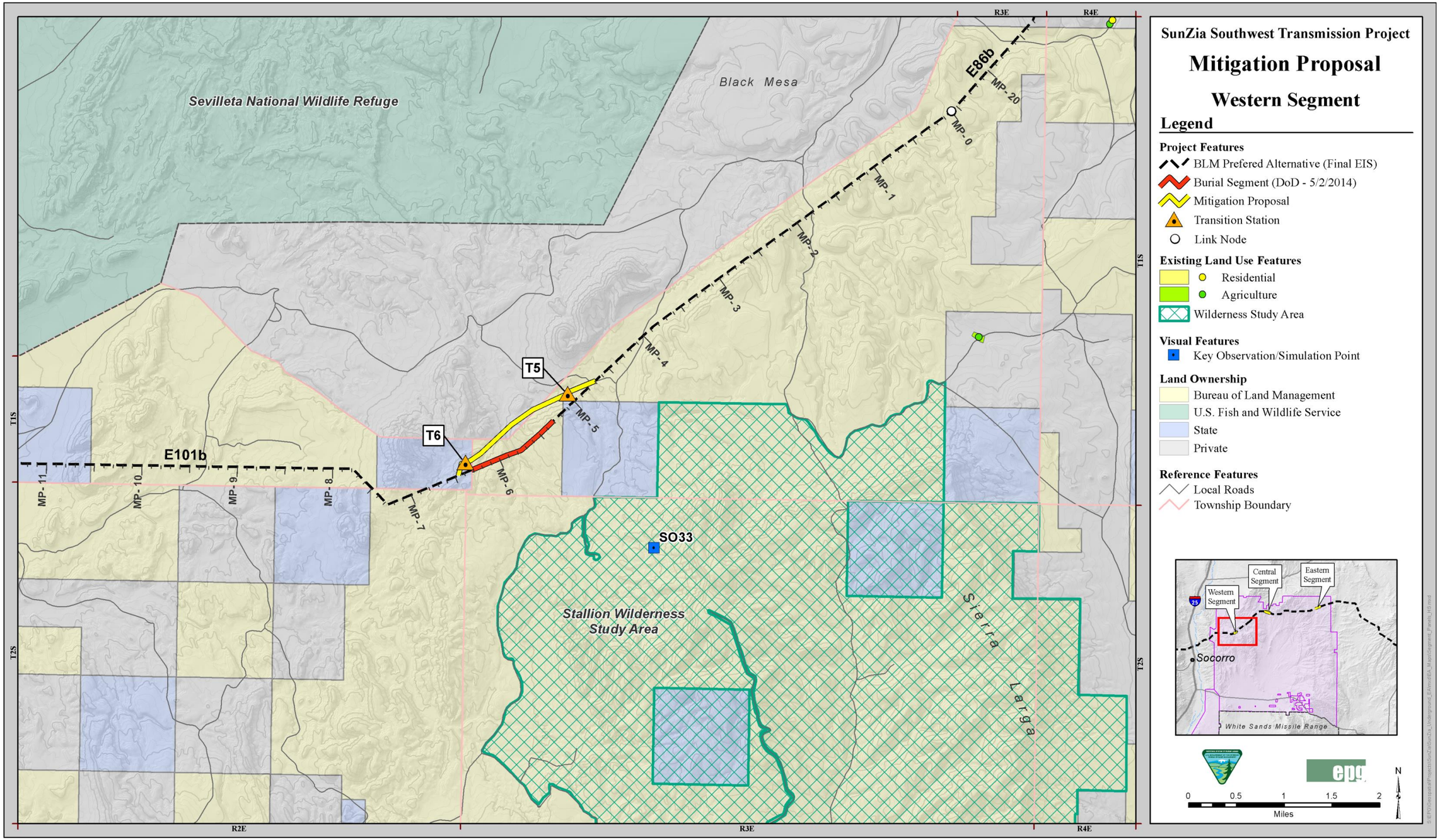

Figure 3-3 Western Segment

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The Mitigation Proposal addressed in this EA is composed of segments of Subroute 1A2 of the BLM Preferred Alternative as analyzed in the Final EIS. Specifically, the Mitigation Proposal segments are located, from east to west, along portions of Links E86a (Eastern Segment), E86b (Central Segment), and E101b (Western Segment).

The Mitigation Proposal segments are located approximately 27 miles north of the WSMR in areas along the northern boundary of the WSMR Call-up area. Land in the study area is mostly open range used for grazing, with ownership being a mix of BLM, state, and private. LC 94, a missile launch site approximately 14 miles south of US 60 and 22 miles north of US 380, near the east/west midpoint of the WSMR Call-up area, is leased by the WSMR. The Gran Quivira ruins are located south of SR 55, approximately 20 miles southeast of the town of Mountainair and approximately 7 miles south east of the Eastern Segment.

The town of Socorro, a community of more than 8,800 people, is in the Rio Grande Valley approximately 14 miles southwest of the Western Segment, and 20 miles south of the Sevilleta National Wildlife Refuge. Socorro is the county seat and home to New Mexico Institute of Mining and Technology.

3.2 Climate and Air Quality

3.2.1 Affected Environment

Emissions of air pollutants including greenhouse gases would occur during construction of the BLM Preferred Alternative as described in the Final EIS, which includes construction of transmission structures, access roads substations, and ancillary facilities, and to a lesser extent, during the Project operations phase. Sections 3.2 and 4.2 and Appendix F of the Final EIS describe the affected environment and potential environmental effects that could result from construction, operation, and decommissioning of the BLM Preferred Alternative on climate conditions and air quality. Construction of the Mitigation Proposal, which includes underground segments and transition stations would likewise produce emissions of air pollutants during the construction period and the subsequent operation phase.

A general conformity analysis was used in the Final EIS to calculate emissions and to estimate ambient impacts for the transmission lines, substations, and concrete batch plants. Regulatory requirements potentially applicable to Project components are discussed, and the analysis of general conformity is described. Emissions, impacts, regulatory requirements, and the results of the conformity analysis are presented in Section 4.2.3 of the Final EIS.

The Environmental Protection Agency (EPA) has set National Ambient Air Quality Standards (NAAQS) (see Section 3.2.1.3 of the Final EIS) for air pollutants considered harmful to public health and the environment. Most areas of New Mexico have been designated as attainment or unclassifiable with respect to the NAAQS. Unclassifiable means that the area lacks sufficient air quality monitoring data to determine whether the ambient standards have been attained. From a regulatory standpoint, unclassifiable areas are treated as attainment areas.

3.2.2 Final Environmental Impact Statement Assessment Results

During construction, sources of particulate matter less than 10 micrometers in diameter (PM_{10}) and particulate matter less than 2.5 micrometers in diameter ($PM_{2.5}$) would include grading and earthmoving associated with the development of access roads and work pad and substation areas, digging and drilling to prepare for the structure foundations, constructing and operating the concrete batch plants, and vehicular traffic. Particulate matter emissions from traffic include both tailpipe emissions from fuel burning and fugitive dust from traffic on paved and unpaved roads.

Emissions from nonroad engines (construction equipment) are slightly higher for the SunZia East Substation than for some of the smaller substations; therefore, the dispersion modeling analysis for the SunZia East Substation construction was used to represent the local ambient impacts from all substations because these impacts are expected to be as high as or higher than those from all other substations. For fugitive dust emissions, construction of the Midpoint Substation was modeled instead of the SunZia East Substation because a larger area would be disturbed, thereby increasing emissions. Once again, the most conservative modeling results were used to represent the minor differences in expected impacts between the substations. The results also vary slightly by substation, because the background air pollutant concentrations vary in different areas and because different surface characteristics were used for different substations. Representative background air quality concentrations and surface characteristics were applied to each substation location in estimating impacts. All impacts are predicted to be within regulatory limits (below the applicable NAAQS and/or New Mexico Ambient Air Quality Standards). No significant impacts to air quality (see Section 4.2.2.1 of the Final EIS) would result from the construction or operation of the substations.

3.2.3 Mitigation Proposal Assessment Results

Emissions of air pollutants resulting from construction of the Mitigation Proposal segments would be similar to those occurring during the construction of the BLM Preferred Alternative as described in the Final EIS. For the Mitigation Proposal segments, maximum fugitive dust emissions would occur during trench excavation and access road construction. For the other pollutants (as identified in the Final EIS), maximum emissions from construction equipment would occur during installation of the transmission line structures or underground segments. Emissions from helicopter operations, traffic, and paved and unpaved road traffic were not modeled because individual actions would occur over a large area, resulting in negligible impacts at any given location.

New Mexico has several small, localized areas that are either designated nonattainment, or were formerly nonattainment and now have a maintenance plan (see Section 4.2 of the Final EIS); however, none of these areas occur near or in the vicinity of the Mitigation Proposal segments. There are six proposed transition stations of which none are located in non-attainment or maintenance areas.

There are nine Class I areas in New Mexico. However, because emissions from Project activities would be temporary and localized to the immediate vicinity of the Project, only those Class I areas located closest to such activities are of concern. These areas include the Bosque del Apache

National Wildlife Refuge in south-central Socorro County, which is approximately 21 miles southwest of the closest Mitigation Proposal segment.

Mitigation measures including dust suppression and speed controls would be used to limit particulate matter emissions during both the construction and operational phases of the Mitigation Proposal segments as described in Section 4.2.2.5 of the Final EIS.

3.2.4 Comparison of Impacts Associated with Subroute 1A2 of the BLM Preferred Alternative and the Mitigation Proposal Segments

No severe impacts to air quality or exceedances of emissions levels in non-attainment areas would result from the construction or operation of the Mitigation Proposal, including the underground transmission lines, roads, or transition stations.

The air quality impacts resulting from construction of each of the six proposed transition stations (connecting the three burial segments) would be similar to those of each of the four proposed substations connecting the overhead transmission lines. Because the stations would be built sequentially and at sites separated by at least 1 mile, the impacts would not be combined in any location, and would be temporary.

Although the Mitigation Proposal would be constructed within the same time frame as the entire SunZia Project, from 2 to 3 years, the Mitigation Proposal segments would require a longer duration to construct in localized areas when compared to construction of the overhead segments as described for the BLM Preferred Alternative in the Final EIS. However, the resultant air emissions would be transient as construction progresses; emissions would not occur in one area for a long duration, thereby limiting the intensity of the impact. Additionally, emissions from construction activities would be confined to daytime hours and would occur only during active construction periods.

3.3 Earth Resource

3.3.1 Affected Environment

This section presents an overview of the geology, geological hazards, mineral resources, and soil resources that occur within the Mitigation Proposal study corridors. The earth resources maps (see Map Volume of the Final EIS) display all earth resources within a 6-mile-wide study corridor. For a complete discussion of the regulatory framework, inventory, and impact analysis for the BLM Preferred Alternative see Sections 3.3 and 4.3 of the Final EIS.

3.3.1.1 Geology

All three Mitigation Proposal study corridors are within the Rio Grande Rift Physiographic Province. This rift is a zone of faults that stretches from Mexico to the Colorado-New Mexico state line. The rift began approximately 24 million years ago as a series of topographically closed basins that filled with aeolian, alluvial, and volcanic deposits between the Miocene and Pleistocene epochs (Bartolino and Cole 2002).

The Eastern Segment lies within the Paleozoic San Andres Formation. The Central and Western segments lie within the Paleozoic Yesa Formation.

3.3.1.2 Geological Hazards

Information for geological hazards was obtained from scientific literature, including publications, maps, GIS data, and discussions with agency specialists at the BLM, U.S. Geological Survey (USGS), and New Mexico Bureau of Geology and Mineral Resources (NMBGMR). Geological formations, earthquake epicenters, Quaternary faults, fissures, and percent slope were recorded and mapped using GIS. These data sets were analyzed in study corridors along the Mitigation Proposal segments that are 2 miles wide. Geological hazards in the Mitigation Proposal generally consist of seismicity (earthquakes), Quaternary faults (ground rupture due to displacement), fissures (due to subsidence), and flooding. Each type of geological hazard is discussed in detail in the EIS.

The USGS considers the Rio Grande Valley between Socorro and Albuquerque to be the most seismically active area in New Mexico, having half of the state's larger earthquakes (magnitude 4.5 or greater). No earthquake has been reported in the study corridors for the Mitigation Proposal segments with a magnitude of 4.5 or greater. Several faults are crossed by the Central and Western segments. No subsidence has been reported for Mitigation Proposal segments. There were no 100-year flood data available for the area affected by the Mitigation Proposal.

3.3.1.3 Mineral Resources

Information for mineral resources was obtained from scientific literature including publications, maps, and discussions with agency specialists at the BLM, USGS, NMBGMR, and the state land department of New Mexico. The mineral resources inventory was conducted using the BLM and USGS's Geocommunicator service and LR2000 database. Results were analyzed in study corridors along the Mitigation Proposal segments that are 2 miles wide.

Within the Mitigation Proposal, the Central and Western segments each cross a mining district. There are no mines or leases present in the three segments of the Mitigation Proposal.

3.3.1.4 Soils

The soils in the Mitigation Proposal study corridors are the same types as those in the BLM's Preferred Alternative. The soil surveys used for the EA were compiled from the Soil Survey Geographic Database, which maximizes the detail and accuracy of the soil resource inventory.

The soil resource inventory presents an overview of soils susceptible to water and wind erosion and designated Prime or Unique Farmland. The affected area is dominated by three of the main soil groups: mollisols, entisols, and aridisols. Mollisols, typically associated with grasslands, occur in the eastern part of the area in New Mexico; whereas, entisols (poorly developed soils with little to no structure) and aridisols (arid environment soils) occur throughout the affected area.

The Mitigation Proposal study area is in the Chihuahuan Desert's ecoregion, which includes a large range of subregions such as basins and playas, lava malpais or badlands, grasslands, and

the floodplain of the Rio Grande. The soils of the basins and playas formed in broad, shallow-sloped basins that currently contain or have contained playa lakes, whose soils are generally moderately to highly susceptible to wind erosion.

3.3.2 Final Environmental Impact Statement Assessment Results

The locations of the Mitigation Proposal segments are in the same corridor as the BLM Preferred Alternative described in the Final EIS.

Impacts described in the Final EIS associated with the BLM Preferred Alternative along Links E86a, E86b, and E101b would be low for geologic hazards and mineral resources (see Section 3.3.6.1 of the Final EIS). The impacts to soils are the same as those of Links E86a, E86b, and E101b (see Section 4.3.3.2 of the Final EIS). Moderate impacts are associated with soils that are highly susceptible to water erosion along Link E86.

3.3.3 Mitigation Proposal Assessment Results

In addition to BMPs included as part of the Project description in Chapter 2, selective mitigation measures were developed to mitigate potential high and moderate (initial) impacts to soil resources. Selective mitigation measures applied to reduce these impacts are summarized in Table 2-4.

The authorized agencies would determine which roads on public lands would remain open, restricted, or closed to the public (SE 4) or gated (SE 6), using the most effective and least environmentally damaging methods appropriate, where feasible and documented in the POD. These measures would minimize traffic across minimally or previously undisturbed landscapes, which would limit the exposure of soils susceptible to water or wind erosion.

Heat generated from underground extra-high voltage cables could increase soil temperatures around buried segment locations, resulting in more xeric conditions. However, surface temperatures due to increased local heating of the underground 500-kV cables can be expected to be minimal when compared to ambient conditions. The cables are also placed in conduits, surrounded by thermal backfill, which dissipates heat more efficiently than. This special thermal backfill would be installed at least 4 feet below final returned grade. Very little heating is expected externally or internally at the concrete vaults.

A detailed Project reclamation plan would be developed to mitigate site-specific resource impacts (SE 5), which would aid in returning the land surface to a state close to its original condition; thereby limiting the exposure of soils susceptible to water or wind erosion. Table 3-3 identifies soil types crossed by the Mitigation Proposal segments.

Table 3-3. Soil Types						
Segment	**Soil name**	**Water Erosion**	**Wind Erosion**	**Depth to Bedrock**	**Temporary Acres**	**Permanent Acres**
Eastern	Pinon channery loam, 3 to 20 percent slopes	High	Low	7”-20”	1.45	0.75
	Witt-Harvey-Pinon loams, 1 to 9 percent slopes	Moderate	Low	>60”	13.86	7.14
Central	Netoma-Claunch association, 2 to 10 percent slopes	Low	Moderate	>60”	12.94	6.67
	Winona-Tanbark-La Fonda complex, 1 to 20 percent slopes	Moderate	Low	7”-20”	3.27	1.69
Western	Ponciano very bouldery clay loam, 15 to 60 percent slopes	Moderate	Low	>60”	8.12	4.18
	Harvey-La Fonda association, 1 to 9 percent slopes	Moderate	Moderate	>60”	1.82	0.94
Source: Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at http://websoilsurvey.nrcs.usda.gov/. Accessed [10/06/04].						

3.3.3.1 Eastern Mitigation Proposal Segment

No geologic hazards were identified for the Eastern Segment. No mineral resources were identified for the Eastern Segment. The soil erosion potential for the Eastern Segment would be high to moderate for water and low for wind, which is similar to those for Link E86a of the BLM Preferred Alternative.

3.3.3.2 Central Mitigation Proposal Segment

The Central Mitigation Segment is located in Socorro County along Link E86b of the BLM Preferred Alternative as described in the Final EIS. No impacts from geologic hazards were identified. No mines or leases were identified for the Central Segment, but one mining district is crossed. The soil erosion potential for the Central Segment would range from moderate to low for water and moderate to low for wind, which is similar to those for Link E86b for the BLM Preferred Alternative.

3.3.3.3 Western Mitigation Proposal Segment

For the Western Segment no impacts from geologic hazards were identified. No mines or leases were identified, but one mining district is crossed. The soil erosion potential for the Western Segment would be moderate for water and moderate to low for wind, which is similar to those for Link E101b for the BLM Preferred Alternative.

3.3.4 Comparison of Impacts Associated with Subroute 1A2 of the BLM Preferred Alternative and the Mitigation Proposal Segments

New information relating to the Mitigation Proposal when compared to the findings in the Final EIS would not result in new or substantially different temporary impacts. The following table

identifies permanent and temporary impacts to high and moderate erosion potential (wind and water) for soils that could result from the Mitigation Proposal as compared to the BLM Preferred Alternative as stated in the Final EIS.

Table 3-4. Comparison of Disturbance to High and Moderate Erosion Potential Soils

Subroute 1A2	Temporary Disturbance (in acres)	Permanent Disturbance (in acres)	Totals (in acres)
BLM Preferred Alternative Final EIS	1,477	1,028	2,505
BLM Mitigation Proposal	1,472	1,041	2,513

In conclusion, impacts from geologic hazards, and to mineral resources and soils, associated with the Mitigation Proposal would be similar to those of the BLM Preferred Alternative as described in the Final EIS. Because earth resources are at the ground's surface or below, it is possible that trenching associated with burial of the underground segments could have slightly more impacts to these resources. The total length of these three segments represents approximately 2 percent of Subroute 1A2 (BLM Preferred Alternative Route). Overall, additional impacts that could occur as a result of construction of the mitigation proposal segments are estimated to be of a similar magnitude as those described in the Final EIS.

3.4 Paleontological Resources

3.4.1 Affected Environment

Paleontological resources are any fossilized remains, traces, or imprints of organisms preserved in the Earth's crust, which provide information about the history of life on Earth. Fossils include bones, teeth, shells, leaves, wood, and trackways originally buried in sedimentary deposits. Paleontological resources include not only the actual fossils, but the sedimentary deposits as well.

Paleontological resources occurring on federal and state lands are afforded protection by federal and state law and regulation. Protection for paleontological resources includes requirements for the (1) assessment of areas containing significant paleontological resources that could be directly or indirectly affected, damaged, or destroyed by development prior to, and as a consequence of, authorization of ground-disturbing activities; and (2) formulation and implementation of measures to mitigate potentially adverse impacts, including permanent preservation of the discovered sites and/or permanent preservation of salvaged materials at federal- and state-approved institutions.

Based on the results of preliminary research, the public scoping process, and consultation with the BLM, numerous fossil localities representing several formations, particularly in the vicinity of the Rio Grande Valley (e.g., Camp Rice, Santa Fe Group, Palomas Formations) were identified. For a complete discussion of the regulatory framework, inventory, and impact analysis for the BLM Preferred Alternative see Sections 3.4 and 4.4 of the Final EIS.

3.4.2 Final Environmental Impact Statement Assessment Results

Generally, the location of the Mitigation Proposal segments is in the same corridor as the BLM Preferred Alternative described in the Final EIS. There are no known fossil localities within 1 mile of the Eastern, Central, or Western segments of the Mitigation Proposal and their associated geological formations.

3.4.3 Mitigation Proposal Assessment Results

No paleontological resources were identified for the Eastern, Central or Western Mitigation Proposal segments.

3.4.4 Comparison of Impacts Associated with Subroute 1A2 of the BLM Preferred Alternative and the Mitigation Proposal Segments

The potential fossil yield classifications and potential impacts to paleontological resources by the Mitigation Proposal would be similar to the level of impact described for the BLM Preferred Alternative in the Final EIS.

3.5 Water Resources

3.5.1 Affected Environment

This section presents an overview of the surface water and groundwater resources in the Mitigation Proposal study areas that may be affected by construction and operations of the proposed Project. Water resources include rivers, streams, lakes, other water bodies, groundwater, aquifers, wells, and springs.

The Federal Water Pollution Control Act of 1972 (33 United States Code [USC] 1251-1387) is more commonly known as the Clean Water Act of 1977 (CWA), after major amendments to the Act in that year. The objective of the CWA, as amended, is to restore and maintain the chemical, physical, and biological integrity of the nation's waters. Individual sections of the CWA maintain and protect the nation's water resources.

Protection of water resources in New Mexico for federal and state regulations is implemented at the state level through the New Mexico Water Quality Control Commission (NMWQCC). The responsibilities of the NMWQCC include the CWA, wellhead protection program, and the Sole Source Aquifer Program of the Safe Drinking Water Act (Section 74-6-3.E, New Mexico States Annotated 1987). For a complete discussion of the regulatory framework, inventory, and impact analysis for the BLM Preferred Alternative see Sections 3.5 and 4.5 of the Final EIS.

Information for the water resources inventory was obtained from scientific literature and from government agencies and institutions, including the BLM, USFS, EPA, USFWS, USGS, and the New Mexico Office of the State Engineer. Specific water resources were inventoried within a 2-mile-wide study corridor (1 mile on either side of the centerline).

3.5.2 Final Environmental Impact Statement Assessment Results

The locations of the Mitigation Proposal segments are in the same corridor as the BLM Preferred Alternative described in the Final EIS. The BLM Preferred Alternative, along Links E86a, E86b, and E101b, lies within the Jornada del Muerto watershed. This watershed has two perennial streams crossed by the BLM Preferred Alternative. No state-listed impaired waters, or unique or outstanding waters were identified in the area of Links E86a, E86b, and E101b for the BLM Preferred Alternative. The Mitigation Proposal also lies within the Middle Rio Grande Water Basin, which covers 3,060 square miles in central New Mexico, and averages between 7.6 and 12.7 inches of annual precipitation (Bartolino and Cole 2002). The Middle Rio Grande Water Basin is mostly composed of the Santa Fe Group aquifer system, which averages between 2 and 1,180 feet depth to water. There are nine water wells within 2 miles of the underground segments.

3.5.3 Mitigation Proposal Assessment Results

3.5.3.1 Surface Water

Impacts to surface water could result from placement of structures, earthwork, construction of access roads, or temporary work areas. Direct impacts to perennial and intermittent surface water features could include sedimentation from Project-related disturbance, fugitive dust deposition, temporary and permanent fill associated with development of access routes, removal of riparian vegetation, bank alteration, accidental contamination associated with spills of environmentally harmful material, damage to wetlands, or the introduction of herbaceous and aquatic invasive species. Direct impacts to intermittent surface water features are similar to those for perennial water features, although intermittent streams typically have less associated riparian vegetation and, subsequently, are more prone to erosion. Indirect impacts may result from increased soil erosion due to removal of vegetation.

Construction of access roads would likely require crossing several surface-water resources. These crossings could require the placement of temporary or permanent fill into a stream channel, as well as structures that support the crossing and protect water resources (e.g., culverts, wing walls, etc.).

Temporary impacts would result from access roads or fill used to cross washes that are removed after construction. Types of temporary stream crossings would include: (1) dry crossings with no bank or channel improvement; (2) mechanically grading banks to a slope sufficient to drive equipment and building materials across the channel (bank recontouring and revegetation would follow the work at the temporary crossing); (3) placement of fill that would be removed following the completion of work at the site; or (4) span structures. While temporary, these crossings would have the potential to affect stream morphology and ecological function. Modification of stream banks could result in removal of vegetation that could take many years to recover. Sedimentation potential may increase, depending on the extent of disturbance and recontouring needed. Stormwater discharge and quantity of sedimentation to surface-water resources are often correlated to project-related disturbance.

Permanent impacts would result from road crossings, where structures are placed in the streambed, potentially causing an irreversible loss of riparian vegetation. As stated in ST 18, temporary and permanent roads would be constructed crossing streams at right angles and with the minimum footprint required to safely transfer building materials and construction equipment.

3.5.3.2 Groundwater

Groundwater located in the Mitigation Proposal study area is used for livestock and rural residential water supply. The Project has the potential to impact groundwater resources in areas of shallow groundwater (groundwater that is near the surface), where placement of structures could come in contact with the water table. Impacts to wells could include accidental physical damage to well structures during construction, or accidental contamination of groundwater resources; although these are highly unlikely. Wells also provide connectivity between surface water and aquifers through which contamination could travel. Impacts to springs are similar to those described for perennial surface water features. Potential impacts to groundwater resources include accidental contamination during structure placement or accidental spills of environmentally harmful liquids that have the potential of percolating into shallow groundwater.

Implementation of the Project would not require placement of hazardous material below ground, and shallow groundwater would be identified prior to work occurring in those areas. Impacts to groundwater would be highly unlikely due to appropriate avoidance and mitigation measures. The Project would not impede the flow or depth of groundwater. As stated in ST 9, watering facilities such as developed springs or wells would be avoided but if damaged, would be repaired or replaced. In addition, spill containment facilities and spill prevention procedures will be implemented as described in the POD. As described in Section 2.3.2, geotechnical testing would be conducted where applicable to identify the conditions of and potential effects to wells or other developed groundwater facilities; blasting would not be used where it could affect water sources and facilities.

Overall, there are nine wells within 2 miles of the Mitigation Proposal segments[4]. Depth to ground water data was unavailable for 4 of the 9 wells, and 5 wells had depths to groundwater between 52 and 280 feet. The closest well to the Eastern Segment would be approximately 1.3 miles north of underground construction activities. This well had a depth to groundwater of 280 feet. The closest well to the Central Segment would be approximately 0.5 mile southeast of underground construction activities. No data is available for depth to groundwater for this well. The closest well to the Western Segment would be approximately 0.2 mile north of underground construction activities. This well had a depth to groundwater of 90 feet.

3.5.3.3 Eastern and Central Mitigation Proposal Segment

Following implementation of SE 1-6 and 8-9, and SE 1, 2, and 8 impacts to surface and ground water resources would be low to low-moderate for the Eastern and Central segments. Impacts to groundwater resources would be low, but standard mitigation measures such as replacing wells, siting of structures at least 200 feet from water resources would minimize the impacts to ensure

[4]New Mexico Office of the State Engineer Well Database, http://www.ose.state.nm.us/waters_db_index.html.. Last accessed on 10-05-2014.

that groundwater is not contaminated and wells, springs, pipelines and other water facilities would not be disturbed.

3.5.3.4 Western Mitigation Proposal Segment

Following implementation of SE 1 through 6 and 8-9, and SE 1, 2 and 8 impacts to surface and groundwater resources would be low to low-moderate for the Western Segment. As shown in Figure 3-3, the transition stations could be constructed in or near dry wash channels. To protect structures from potential flood events appropriate design measures, micrositing, BMPs, and other mitigation measures would be applied. These measures would protect drainage flows and reduce the potential for soil erosion.

3.5.4 Comparison of Impacts Associated with Subroute 1A2 of the BLM Preferred Alternative and the Mitigation Proposal.

Impacts to water resources would be similar to those described in the Final EIS. However additional mitigation measures, as described above, would be necessary to minimize the potential to impact surface and groundwater. The mitigation measures and specific design features will be documented in the POD.

3.6 Biological Resources

3.6.1 Affected Environment

The regulatory framework, inventory, and impact analysis presented in Section 3.6 and 4.6 and Appendices B1 and B3 of the Final EIS, address biological resources present in the Project area, discuss potential impacts that may result from the Project, and list identified mitigation measures. This section presents detail regarding specific locations of the underground segments, where relevant. For biological resources, this EA focuses on the change in the total amount of temporary and permanent ground disturbance and the change in transmission system components that would replace overhead segments of the transmission line with transition stations and underground segments of the transmission line.

3.6.2 Final Environmental Impact Statement Assessment Results

3.6.2.1 Vegetation

Section 3.6.9.1 of the Final EIS presents the inventory results for Subroute 1A2 of the Project. The Mitigation Proposal is located entirely in the Juniper Savanna Ecotone biome (University of New Mexico 2009), as described in the Final EIS. This vegetation community consists of a network of relatively dense juniper patches in a grassland-like matrix with isolated juniper trees.

3.6.2.2 Noxious and Invasive Weeds

Section 3.6.4 and Table 3-29 in the Final EIS discuss the species of invasive plants listed as noxious weeds by the BLM or State of New Mexico. No site-specific information is available on the presence or distribution of any of these species that may be present in the area affected by the Mitigation Proposal.

3.6.2.3 Wildlife

Section 3.6.5 of the Final EIS discusses wildlife diversity in the Project area in a regional context. As discussed in Section 3.5 of this EA, no permanent surface water resources are present in the areas crossed by the Mitigation Proposal; thus, no fish or aquatic birds are likely to be present.

3.6.2.4 Special-status Species

Potential for one ESA-listed species, the endangered Todsen's Pennyroyal (*Hedeoma todsenii*), was identified in the Final EIS (Section 3.6.6.1) and the Biological Assessment developed for the Project as occurring on Chupadera Mesa in the vicinity of the Mitigation Proposal. The species has never been recorded on Chupadera Mesa as discussed in the Recovery Plan for the species (USFWS 2001), but the geology and vegetation are similar to known locations, and little or no survey information is available from this area.

Additional special-status species that may be present on Subroute 1A2 of the Project area are listed in Appendix B3 and discussed in Appendix B1 of the Final EIS.

As discussed in Section 4.6.3.1 of the Final EIS, "take" of any ESA-listed, proposed, or candidate species would be considered a significant impact. The Final EIS (Section 4.6.4.5) and Biological Assessment included as mitigation measures a commitment to conduct intensive preconstruction surveys in any potential habitat for Todsen's Pennyroyal on and near Chupadera Mesa and to avoid any populations of the plant to the extent feasible through micrositing of structures, access roads, and areas of temporary disturbance. The Biological Opinion provided by the USFWS also requires these conservation measures.

3.6.2.5 Biological Resource Conservation Areas

No biological resource conservation areas are present in the area crossed by the Mitigation Proposal.

3.6.2.6 Agency-identified Issues and Areas of Concern

No wildlife corridors or other sensitive areas for terrestrial wildlife were identified in the area that would be crossed by the Mitigation Proposal. Section 3.6.8.3 in the Final EIS discusses the Chupadera Mesa Bird Habitat Conservation Area (BHCA), an informal designation with an indefinite boundary. This BHCA was identified by the Intermountain West Joint Venture for its relatively intact, contiguous piñon-juniper and juniper savanna vegetation, and associated bird species. BHCAs are identified as areas that may be important to declining bird species or communities, and may be important for current and future conservation actions.

3.6.3 Mitigation Proposal Assessment Results

3.6.3.1 Vegetation

Table 3-2 presents the total acreage of temporary and permanent disturbance that would affect the Mitigation Proposal in comparison with the Project as described in the Final EIS. Development of the Mitigation Proposal would result in the loss of Juniper Savanna Ecotone to permanent disturbance, and a change in vegetation structure where temporary disturbance would be restored. Vegetation management standards for the Mitigation Proposal would require that trees and shrubs be prevented from growing over the duct banks, where roots could compromise the integrity of the system. However, areas of temporary disturbance would be restored to a grass-dominated vegetation community, similar to the grassland component of the surrounding juniper savanna.

3.6.3.2 Noxious and Invasive Weeds

Impacts associated with noxious weeds may result from ground disturbance that can facilitate the invasion or spread of noxious weeds and through the transport of materials that may contain noxious weed seeds. These potential impacts may result from the Project and the Mitigation Proposal.

The Final EIS discusses that a Noxious Weed Management Plan, included as Appendix B2 of the POD, would address survey needs and mitigation for noxious weeds. The Noxious Weed Management Plan would contain mitigation measures that would apply to all ground-disturbing activities and transport of materials that may contain noxious weed seeds. These measures would apply with equal effectiveness to the Mitigation Proposal when compared to the remainder of the Project.

3.6.3.3 Wildlife

Potential impacts to all wildlife species and appropriate mitigation would be as described in Section 4.6.4.4 of the Final EIS. Although the Mitigation Proposal would result in a locally higher acreage of ground disturbance and thus wildlife habitat loss in the specific locations crossed by the Mitigation Proposal, this impact is similar in type and magnitude to the Project as described in the Final EIS. The effects to wildlife as discussed in the Final EIS would be similar to the effects of the Mitigation Proposal.

3.6.3.4 Special-status Species

Intensive pedestrian surveys for the Todsen's Pennyroyal were conducted in September 2014 in potentially suitable habitat on the Eastern and Central segments of the Mitigation Proposal, within the distribution of the species as described in the Biological Assessment. No Todsen's Pennyroyals were found; thus, no impacts to the species are anticipated and no mitigation would be necessary.

Potential impacts to all other special-status species and appropriate mitigation would be as described in Section 4.6.4.5 and Appendix B1 of the Final EIS. The Final EIS included an addendum to Appendix B1 that provided a list of the types of impacts to special-status species

that may occur from the Project (Appendix B1: Table 2). All of these impacts may also occur with the Mitigation Proposal where each species is present but would differ slightly in location (e.g., impacts associated with substations would also be similar with transition stations) and intensity (e.g., temporary disturbance associated with the underground segments would have effects similar to pulling and tensioning areas or structure work areas, but would take place in a longer segment of the right-of-way).

3.6.3.5 Biological Resource Conservation Areas

No biological resource conservation areas are present in the area crossed by the Mitigation Proposal.

3.6.3.6 Agency-identified Issues and Areas of Concern

The Eastern Segment is located in the Chupadera Mesa BHCA. Section 4.6.4.7 of the Final EIS discusses potential impacts to the Chupadera Mesa BHCA that may result from the Project. The acreage of ground disturbance and resulting loss of vegetation and bird habitat in the BHCA would be slightly higher from the Mitigation Proposal when compared to the Project, as described in Section 3.6.4 of this EA. However, potential impacts to birds through mortality resulting from the Mitigation Proposal would be similar to the Project in the overhead segments and transition stations, or lower in the underground segments where overhead groundwire or OPGW would not create a collision risk. Similarly, the amount of potential raptor perching and nesting substrates that may be created by the construction of overhead transmission structures would be lower with the Mitigation Proposal.

3.6.4 Comparison of Impacts Associated with Subroute 1A2 of the BLM Preferred Alternative and the Mitigation Proposal Segments

The results of the Mitigation Proposal assessment indicate that when compared to the findings for the BLM Preferred Alternative in the Final EIS, the Mitigation Proposal would not result in new or substantially different impacts to biological resources.

3.7 Wildland Fire Ecology and Management

3.7.1 Affected Environment

Wildland fire ecology and management is discussed in detail in Sections 3.7 and 4.7 of the Final EIS. All major regulations and regional plans in the area of the Mitigation Proposal that were discussed in the Final EIS remain in effect. These include the following federal and local plans:

- Socorro Field Office Fire Management Plan (BLM 2010a)
- Rio Puerco Field Office Fire Management Plan (BLM 2010b)
- Socorro County Community Wildfire Protection Plan (Socorro County 2006)
- Torrance County Community Wildfire Protection Plan (Torrance County 2007)

3.7.2 Final Environmental Impact Statement Assessment Results

Impacts to wildland fire ecology and management that may occur from the Mitigation Proposal would be similar to or lower than those disclosed in the Final EIS. Typically, impacts associated with transmission lines relate to 1) Increased risk to fire suppression ground crews through an electrocution hazard; 2) Impacts to aerial operations where overhead transmission lines may restrict the ability to drop fire retardant; 3) Impacts to fire ecology by altering the local vegetation structure and fuel loads; and 4) Increasing the risk of ignitions, primarily during construction and maintenance activities.

3.7.3 Mitigation Proposal Assessment Results

Of the potential impacts listed above, risks to aerial and ground fire suppression personnel would be similar to the Project as described in the Final EIS for new overhead portions of the Mitigation Proposal, as well as the transition stations. Potential impacts to all fire suppression personnel would be lower than the Project as described in the Final EIS along the underground portions of the Mitigation Proposal, as the potential electrocution and collision hazard created by overhead transmission lines would not be present.

Potential impacts related to fire ecology and fire ignitions would be similar in type and intensity to those resulting from the Project as described in the Final EIS, as these impacts are primarily driven by the presence of human activity, use of equipment that may ignite fires, and ground disturbance.

3.7.4 Comparison of Impacts Associated with Subroute 1A2 of the BLM Preferred Alternative and the Mitigation Proposal Segments

The results of the Mitigation Proposal assessment indicate that when compared to the findings for the BLM Preferred Alternative in the Final EIS, the Mitigation Proposal would not result in new or substantially different impacts to wildland fire ecology and management.

3.8 Cultural Resources and Tribal Concerns

3.8.1 Affected Environment

Cultural resources include archaeological sites, districts, and objects; standing historic structures; locations of important historic events; and places and living or nonliving things that are important to the practice and continuity of traditional cultures. Cultural resources may involve historic properties, traditional use areas, and places of traditional religious or cultural importance.

This section summarizes the findings of recent Class III pedestrian survey in the Mitigation Proposal study corridors. Survey coverage consists of approximately 7 miles of transmission line corridor (800 feet wide), the Area of Potential Effect (APE), on federal, state, and private lands.

3.8.2 Final Environmental Impact Statement Assessment Results

The methods for the cultural resource study conducted for the Final EIS included a Class I records review and subsequent site sensitivity analyses using predictive modeling (see Sections 3.8.1, 3.8.3, 4.8.2, and 4.8.3 of the Final EIS). The predictive model, used to assess the relative impact each alternative could have on cultural resource sites, identified the potential for 124 sites along the entire length of the BLM Preferred Alternative, which would require mitigation if impacted by the construction of overhead transmission lines (see Section 4.8.3 of the Final EIS).

3.8.3 Mitigation Proposal Assessment Results

Generally, the location of the Mitigation Proposal (underground) segments is in the same corridor as the BLM Preferred Alternative as described in the Final EIS (see Section 4.8.3). The APEs included the BLM Preferred Alternative (overhead line) and the Mitigation Proposal (underground segments). Intensive Class III pedestrian survey of the Mitigation Proposal APE resulted in the identification of 16 new cultural resource sites, of which 9 could be impacted by the proposed action. Impact levels assigned for these newly recorded sites follows the criteria established in the Final EIS (see Section 4.8.3) (Table 3-5).

Impacts associated with construction of the Mitigation Proposal would occur along each segment where surface and subsurface excavations occur, as well as from the construction of roads and other facilities. The anticipated impacts to cultural resources would result from a loss of integrity for cultural resource sites. Types of impacts that could adversely affect historic properties (cultural resources that have been determined eligible for listing on the National Register of Historic Places) during and after construction of the proposed Project consist of: (1) Direct and permanent ground disturbance (surface and subsurface) and (2) indirect and permanent disturbances due to changes in public accessibility and visual intrusions

Measures that could be used to mitigate potential impacts to these sites include standard mitigation and SE 8, which would likely be effective through avoidance or data recovery efforts (see Section 4.8.4).

Table 3-5. Class III Pedestrian Survey Site Summary

LA Number	Resource Type	Eligible (Y/N)	Impact Level	Location
Western				
180344	Prehistoric village	Y	High	BLM Preferred Alternative
180345	Prehistoric lithic scatter /w feature(s)	Y	Moderate	Mitigation Proposal
Central				
180336	Prehistoric artifact scatter w/feature(s)	Y	Moderate	Mitigation Proposal
180347	Prehistoric lithic scatter	Y	Low-Moderate	Mitigation Proposal
Eastern				
180340	Prehistoric lithic scatter	Y	Low-Moderate	BLM Preferred Alternative Mitigation Proposal
180341	Prehistoric artifact scatter	Y	Low-Moderate	BLM Preferred Alternative
180342	Multicomponent (Prehistoric artifact scatter; historic trash scatter)	Y	Low-Moderate	BLM Preferred Alternative

Table 3-5. Class III Pedestrian Survey Site Summary				
LA Number	**Resource Type**	**Eligible (Y/N)**	**Impact Level**	**Location**
180343	Prehistoric artifact scatter	Y	Low-Moderate	BLM Preferred Alternative Mitigation Proposal
180346	Prehistoric lithic scatter	Y	Low-Moderate	BLM Preferred Alternative Mitigation Proposal

3.8.3.1 Eastern Segment

The Class III survey of the Eastern Segment identified a total of five NRHP-eligible sites, which have all been determined to have low-moderate sensitivity. Two sites occur within the BLM Preferred Alternative APE, while three sites occur within both of the APEs. (Table 3-5). Permanent impacts could result from a loss of integrity at all five sites.

3.8.3.2 Central Segment

The Class III survey of the Central Segment identified a total of eight sites. One site has been determined to be of low sensitivity; three have been determined to have low-moderate sensitivity, while the remaining four have been determined to have moderate sensitivity. Two sites occur in the Mitigation Proposal segment APE, and permanent impacts could result from a loss of integrity at both sites (Table 3-5). The remaining six sites lie outside of both of the APEs for the BLM Preferred Alternative and the Mitigation Proposal segment, and would not be impacted by proposed construction.

3.8.3.3 Western Segment

The Class III survey of the Western Segment identified a total of three sites. One high sensitivity site occurs in the BLM Preferred Alternative, one moderate sensitivity site occurs in the Mitigation Proposal segment APE, and the third low sensitivity site occurs outside of either of the APEs (Table 3-5). Permanent impacts could result from a loss of integrity at the two sites located within the APE for either the BLM Preferred Alternative or the Mitigation Proposal segment, respectively.

3.8.4 Comparison of Impacts Associated with Subroute 1A2 of the BLM Preferred Alternative and the Mitigation Proposal Segments

Intensive Class III pedestrian survey of the Mitigation Proposal resulted in the identification of 16 new cultural resource sites, of which 6 could be impacted by the proposed action with the Mitigation Proposal. A total of 3 sites occur in the Mitigation Proposal segments, another 3 occur within the BLM Preferred Alternative APA, and 3 occur in both of the APEs, for the overhead and the Mitigation Proposal (Table 3-5).

In general, the construction of overhead transmission line facilities typically result in a smaller Project footprint, whereas trenching for the proposed underground segments of the transmission lines would likely present fewer opportunities for avoidance of cultural resources. However, the cultural resource sites identified in both of the APEs are of the same degree of sensitivity (i.e., they are low to moderate sensitivity and can be mitigated). Therefore, potential impacts

associated with either the BLM Preferred Alternative or the Mitigation Proposal segments would be similar.

3.9 Visual Resources

3.9.1 Affected Environment

This section addresses visual resources that occur and may be affected by the Mitigation Proposal. Existing visual resources that may be affected by the Mitigation Proposal include scenic quality and sensitive views. In addition, the Mitigation Proposal would be located on BLM lands which have been assigned visual resource objectives. The construction, operation, and maintenance of the Project have been documented and addressed in Section 3.0 of the Final EIS and Maps 9-1E, 9-2E, 9-3E, 9-4E, and 9-5E of the Final EIS Map Volume.

Based on results of the public scoping process and in consultation with the BLM and other agencies, the following areas of concern were identified in the Final EIS with regard to visual resources in the portion of the Project where the Mitigation Proposal would occur:

- Residential views from properties nearest the Mitigation Proposal corridor.
- Recreation views from the Stallion WSA
- Travel route views from WSMR Road 3607

Visual resources on BLM-administered land are managed within the context of the VRM system, as described in BLM Manual 8400 – Visual Resource Management.

The Socorro RMP 2010 identifies general management guidelines for visual resources.

New Mexico counties, including Socorro and Torrance do not have visual resource goals, policies, or objectives identified in their plans.

3.9.2 Visual Resource Inventory and Visual Resource Management Classifications

To inventory and characterize the affected environment for visual resources for the Mitigation Proposal, the following visual components were considered: scenery and viewing locations, including associated Key Observation Points (KOP); distance zones; sensitivity levels (scenic level rating units [SLRU]); visual resource inventory (VRI) classes; as well as BLM VRM classifications and associated objectives. Refer to the Final EIS visual resource section for descriptions of the VRI components and definitions and objectives for VRM classes.

BLM VRM classifications are used to demonstrate Project conformance with regards to established management plans and also inform the applicant what type and intensity of mitigation is required. The VRI and VRM classifications of the three Mitigation Segments are:

- **Eastern Segment**: The eastern segment is not located on BLM lands and therefore VRM Classes are not applicable

- **Central Segment**: The Mitigation Proposal is located on private lands, but it has been classified as Class IV VRI. Recorded VRI data for the Central segment classify the Distance Zone as Foreground/Middle Ground with a Low SLRU and 'B' SQRU. The Central Segment is surrounded by VRM Class IV and would be managed thus.
- **Western Segment**: The Western Segment is located on VRI Class IV BLM lands managed as VRM Class II. VRI data for the Western Segment classify the Distance Zone as Foreground/Middle Ground with a Low SLRU and 'B' SQRU.

Methods for determining viewing locations, KOP locations, and scenic quality are described in the Final EIS Section 3.9.1.2 and in consultation with the BLM.

3.9.2.1 Scenery

Scenery reflects natural landscapes and is comprised of varying levels of landform, vegetation, existence of water, scarcity, adjacent scenery, and cultural modifications; all of which combine to exhibit landscape character (BLM Manual H-8410-1). Inherent to landscape character is scenic quality, which is defined by the BLM as the aesthetic appeal of a tract of land and is expressed as Class A, B, or C. Class A scenery typically has a higher degree of landscape relief, diversity of water, and vegetation, which harmoniously combine and result in a high level of aesthetic appeal. Class B scenery has less variety in the elements that comprise the landscape, but still has some diversity and visual interest. Class C scenery typically does not have much diversity in terms of landscape features and rates the lowest from an aesthetic perspective.

The lands crossed by all three segments of the Mitigation Proposal are all classified as Class B landscapes (see Figure M 9-1E, Final EIS Map Volume).

3.9.2.2 Sensitive Viewers

The inventory of sensitive viewers is represented by KOPs typically organized into three characterizations that include residential views, recreation views, and travel route views. The description of KOPs includes three components: (1) the identification of sensitive-viewer locations and visual sensitivity (low, moderate, or high), (2) distance zones (foreground-middleground, background, and seldom seen), and (3) viewing conditions (Level, Superior, Inferior, Screened, Unobstructed, etc.) (see Figures M 9-2E and M 9-3E, Final EIS Map Volume). These KOPs, which have been inventoried in the field, are described below.

Eastern Segment

Existing high-sensitive viewers are the same as those described in the Final EIS with dispersed residential housing north of the Mitigation Proposal with the nearest residence within approximately 1.5 miles of the centerline of the underground transmission line. Views from this area are level to inferior; however, much of the landscape in which the Mitigation Proposal would be located is screened by vegetation and terrain. There are no public travel routes or recreation areas that would have views of this segment.

Central Segment

Two residential viewers are located in the study corridor. One residential viewer is located approximately 0.5 to 0.75 mile on the south side of the centerline of the underground transmission line (see Figure 3-2). Views from this residence are level and unobstructed with the transition station backdropped against the light hue of the butte.

Western Segment

These are high sensitivity viewers located in the Stallion WSA located approximately 1 mile south of the proposed transition station located at the eastern-most terminus of the Western Segment. The primary recreation use for the Stallion WSA is hiking and camping. These high sensitivity viewers would view the Project in the foreground to middleground for short to moderate durations, but would have longer duration views while in the camping areas. Viewers would have partially obstructed to fully obstructed slightly superior views in the foreground to partially obstructed superior views of the project facilities in the middleground to background from the top of La Cebolla Mountain.

In addition to recreation viewers, High sensitivity viewers traveling along the WSMR Road 3607 would have level partially obscured views of the Project facilities for a short duration looking southwest along the Project route as they travel from north to south towards the WSA but would have fully screened views of the Project as they travel from south to north leaving the WSA.

There are no residential viewers in the study corridor for the Western Segment.

This segment of the Mitigation Proposal would be located on VRM Class II designated lands. The objective for Class II lands is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape. (BLM Manual)

3.9.3 Final Environmental Impact Statement Assessment Results

The location of segments associated with the Mitigation Proposal generally follows the same corridor as the BLM Preferred Alternative as described in the Final EIS. The Final EIS results for the three segments in terms of effects to scenery, effects to viewers, and compliance with VRM classes follows:

3.9.3.1 Eastern Segment

Existing high-sensitive viewers for the Eastern Segment would have Moderate to Moderate-High impacts due to the project crossing Class B scenery and partially screened views due to topography from the Middle-ground of Link E85 from residences. This segment of the BLM Preferred Alternative is expected to be compliant with VRM Class III objectives.

3.9.3.2 Central Segment

High-sensitivity residential viewers for the Central Project Segment would have Moderate to Moderate-High impacts due to the Project crossing Class B scenery and views of the Foreground of Link E80d from residences. The towers would be in the foreground for the residences and would be skylined with unobstructed views. This segment of the BLM Preferred Alternative is expected to be compliant with VRM Class III objectives.

3.9.3.3 Western Segment

High Sensitivity viewers for the Western Segment would have Moderate-High impacts due to the Project crossing Class B scenery and views of the Foreground of Link E101 from the Stallion WSA with skylined views of the proposed towers. This segment of the BLM Preferred Alternative is anticipated to be non-compliant with VRM Class II due to Strong to Moderate-Strong contrast. Travelers heading south along WSMR Road 3607 would pass underneath the BLM Preferred Route Transmission Lines.

3.9.4 Mitigation Proposal Results

Generally, visual impacts associated with the three Mitigation Proposal segments would be lower than impacts from the same viewing locations for the BLM Preferred Alternative (overhead). Each of the three segments would include the typical overhead elements (towers, conductors), but they would be installed underground and would, therefore, not be visible. The transition stations at either end of the underground segments would have a larger footprint than the towers but would have shorter project elements. Other visual impacts associated with the construction and operation of the project with the Mitigation Proposal include the transition stations at either end of the Mitigation Proposal segments, the concrete vaults at 1,500-foot intervals, and a permanent 30-foot-wide access road. Simulations of the Mitigation Proposal (underground construction) action and the BLM Preferred Alternative (overhead line construction) were prepared for critical viewpoints located near the Central and Western segments. The simulations are provided in this EA for comparison with the existing conditions, and to support the analysis of visual impacts (see Appendix A). A discussion of visual impacts is included in the following descriptions for each of the segments.

3.9.4.1 Eastern Segment

Impacts to high-sensitivity residential viewers are expected to be low as the transition station components would be shorter than the BLM Preferred Alternative towers and the vaults and access road would not be visible.

3.9.4.2 Central Segment

Impacts to High-sensitivity residential viewers 0.5 mile south of the Mitigation Proposal are expected to be Moderate to Moderate-High. The transition station components are shorter than the Project towers but would have a larger footprint and low contrast backdropped against the light hue of the butte. The ground-level vault locations would be located on the valley floor and

would be partially screened by topography as they seen from a level viewing position. The Central Segment would be in compliance with the VRM Class III objectives.

3.9.4.3 Western Segment

Impacts to high-sensitivity recreation viewers approximately 1 mile south of the Mitigation Proposal in the Stallion WSA are expected to be Moderate to Moderate-High. The transition stations would be located north of the hills on the northern-most edge of BLM land and would be partially to fully screened by terrain and vegetation. The transition station components would be shorter than the Project towers and would not be seen from the edge of Stallion WSA. However, the tallest element of the western-most transition station (the A-frame) would be seen from the highest point of the Stallion WSA (from the top of La Cebolla Mountain) but would be shorter than the overhead transmission line towers. It would be located on the valley floor, as opposed to the ridge of the hill, and would be backdropped as opposed to skylined. Despite these reduced impacts, the Western Segment would not be compliant with VRM Class II Objectives. However, the area of land on which this segment would occur has already been analyzed and would require a VRM plan amendment in the Final EIS.

3.9.5 Comparison of Impacts Associated with Subroute 1A2 of the BLM Preferred Alternative and the Mitigation Proposal Segments

New information relating to the Mitigation Proposal when compared to the findings in the Final EIS would not result in new or substantially different temporary or permanent impacts.

- **Eastern Mitigation Segment**: The Mitigation Proposal components would not be seen by high-sensitivity residential viewers.
- **Central Mitigation Segment**: The eastern transition station would be unobstructed and would be seen in the foreground but would have fewer impacts than the overhead structures.
- **Western Mitigation Segment**: The transition stations or underground transmission lines would not be seen from the edge of the Stallion WSA but would be partially visible from the top of La Cebolla Mountain. The Mitigation Proposal components would not be seen for travelers heading north along WSMR Road 3607 but would be partially seen for a short duration for travelers heading south. Impacts for the Western Mitigation Segment would be less than the overhead structures.

3.10 Land Use and Recreation Resources

3.10.1 Affected Environment

This section summarizes land use and recreation resources in the Mitigation Proposal study corridors. Existing and planned uses have been documented for the entire 6-mile-wide study corridor (3 miles on either side of the reference centerline) on federal, state, and private land. Project-wide land use and recreation resources are shown on Figures M 10-1 to M 10-4 (see

Final EIS Map Volume). For a complete description of the existing and planned land uses and recreation resources along Subroute 1A2 (see Section 3.10 of the Final EIS).

Based on results of the public scoping process and in consultation with the BLM and other agencies, the following areas of concern were identified in the Final EIS with regard to land use and recreation resources in the portion of the Project affected by the Mitigation Proposal:

- BLM RMP right-of-way avoidance areas
- Right-of-way conflicts with existing residential areas, ranching, and livestock grazing
- Recreation uses, including off-highway vehicle (OHV) areas
- Avoidance of potential interference with military testing and training operations

Existing and future land use categories that occur in the Mitigation Proposal study corridors include:

- **Residential –**: low density single-family rural residential that is classified as 0 to 2 dwelling units per acre.
- **Grazing/Multi-Use/Vacant** – all land uses that did not fit under a specific category, or were not specifically designated for a specific use by the responsible jurisdiction or land management agency.
- **Military** – Telemetry, Radar, Communications, Launch and Impact sites, and Restricted Airspace (Surface to Unlimited) used by the DoD.
- **Agriculture** – agricultural land uses are primarily ranching and grazing.
- **Utilities –** electricity distribution lines and pipelines.
- **Transportation** – minor roads maintained for ranching and military access by Torrance and Socorro counties.
- **Recreation** – federal, state, and local recreational trails and designated OHV areas. Recreation land uses in the study corridor include BLM special recreation management areas (SRMA) designated for multiple recreational activities such as rock climbing and bouldering.
- **Parks/Preservation** – federal, state, and local parks, open areas, and areas protected from development. Parks and preservation areas in the study corridor include the Sevilleta National Wildlife Refuge in New Mexico.

The following BLM, state regulations, and county and local plans were reviewed.

BLM New Mexico

- *Rio Puerco (Albuquerque) Resource Management Plan Revision and Environmental Impact Statement* (BLM 1985). This plan was prepared to formally record the BLM's decisions for managing approximately 8.6 million acres of land including 896,480 acres of public land in Bernalillo, Cibola, Torrance, Valencia, Sandoval, McKinley, and Santa Fe counties.

- *Socorro Field Office, Socorro Resource Management Plan and Record of Decision* (BLM 2010b). This plan has been prepared to allocate resources and provide a comprehensive framework for the BLM's management of 1.5 million acres of public land in Socorro and Catron counties.

New Mexico State

- *New Mexico Certificate of Public Convenience and Necessity.* The New Mexico Public Regulation Commission controls all aspects of transmission line siting in the state. Three permits are required to build a transmission line greater than or equal to 230 kV: (1) Certificate of Public Convenience and Necessity; (2) Location Permit; and (3) Right-of-way Width Determination, which establishes, under New Mexico statute, the requirement for Public Regulation Commission approval on all proposed transmission lines with a right-of-way width greater than 100 feet, regardless of voltage, in cases other than a fee-simple acquisition.

Sensitivity classifications were assigned to land and resource uses that occur in the study area, identifying initial impact levels based on resource sensitivity and Project-related impacts, developing resource-specific mitigation measures to minimize adverse impacts and incorporating mitigation measures to assign final impact levels for each Project alternative. See Sections 4.10.1 and 4.10.2 of the Final EIS for a complete description of the impact assessment methodology and criteria. Impacts for the Mitigation Proposal segments were evaluated and compared with impacts of the BLM Preferred Alternative.

3.10.1.1 Existing and Planned Land Use and Recreation

Land Jurisdiction and Ownership

The study corridors for the Eastern Segment are in Torrance County and the Central and Western segments are in Socorro County. There are no incorporated cities in the Mitigation Proposal study corridors. Federal agencies with land ownership or management responsibilities in the Mitigation Proposal study corridors are the BLM's New Mexico State Office and Rio Puerco and Socorro field offices and USFWS's Sevilleta National Wildlife Refuge. New Mexico state agencies with land ownership or management responsibilities in the Mitigation Proposal study corridors are the NMSLO and the New Mexico Fish and Game Department.

The following describes the existing and planned land uses that are present in the Mitigation Proposal study corridors.

Recreation

Dispersed recreational opportunities are located throughout the Mitigation Proposal segment corridors. No parks, recreational centers, or SRMAs are located in the Mitigation Proposal segment corridors.

Agriculture and Range

Affected lands are mainly federal, state, and privately owned. Federal and state lands are leased to ranchers to graze livestock. Ranching facilities such as cattle tanks and wells are located in the Mitigation Proposal segments study corridors. Please see Section 3.5.3 of this EA for location and depth to groundwater information for these facilities.

The affected BLM lands are in the Socorro Field Office, which manages approximately 252 grazing allotments (BLM 2010c).The BLM's objective is to ensure the long-term health and productivity of these lands, and to create multiple environmental benefits that result in healthy watersheds (BLM 2010d). Livestock grazing is managed in accordance with Rangeland Health Standards. The number of authorized Animal Unit Months (AUMs) on BLM land can vary, depending upon factors such as drought, wildfire, and market conditions. . Individual grazing lessees/permittees of record would be notified where the transmission line right-of-way is authorized by the BLM on public lands.

In addition to BLM-managed grazing allotments, state trust lands in New Mexico are leased for grazing in the study area according to Title 10, Chapter 2, Part 8 of the New Mexico Administrative Code. It is assumed any state trust lands can be leased for the purpose of livestock grazing. There are 649,638 acres and 449,746 acres of New Mexico State Trust land in Socorro County, and Torrance County, respectively.

The Eastern Segment crosses 1 grazing allotment, which contains 31,779 acres of New Mexico State Trust lands. The allotment is estimated at 1,910 AUMs.

The Central Segment crosses 1 grazing allotment (the U Butte Allotment), which contains 3,805 acres of federal lands, 3,781 acres New Mexico State Trust lands, and 3,920 acres of private lands. The allotment is permitted for 624 AUMs. The allotment is located outside the grazing boundary and livestock numbers are not controlled as long as resource conditions do not deteriorate on public lands.

The Western Segment crosses 1 grazing allotment (the Tecolote Draw Allotment), which contain 15,939 acres of federal lands, 2,496 acres of New Mexico State Trust lands, and 20,564 acres of private lands. The allotment is permitted for 2,388 AUMs.

Military

Military installations and airspace designations are shown in the Map Volume of the Final EIS (Figure M 10-3E and M 10-3W) and on Figure 1-1 of this EA. The Northern Call-up Area is located directly north of the WSMR; covers approximately 1.5 million acres; and includes BLM land, New Mexico state land, and private land. The WSMR conducts missile test firings onto the range from the LC 94 launch site near Subroute 1A and the Sulf Site in the northwest portion of WSMR. Missile test firings were conducted 47 times between the two sites in 2009 but can be many more or less per year (WSMR 2009). Pursuant to evacuation agreements, residents and businesses located in this area are required to evacuate their properties for periods of 12 hours, with at least 48 hours between consecutive evacuation periods during these tests.

The majority of the airspace units above and near the WSMR, including airspace units R5107C, R5107H, and R5107E, are classified as joint use. These airspace units are designated a Special Use Airspace, in which the controlling agency is the FAA and the using agency is a military installation. When the Special Use Airspace is in use by a designated military installation, air traffic control is provided by Holloman Air Force Base (AFB). The boundaries of the Special Use Airspace are designated by the FAA; WSMR coordinates with the FAA to use the airspace, but neither the FAA nor WSMR have the authority to regulate land use or structures below 199 feet above ground level. The military installation may prohibit civilian aircraft or projectiles from traversing the airspace without permission. When not in active use by the DoD, control of the airspace units is returned to the FAA.

These airspace units are scheduled and mainly used for research, development testing and experimentation, military training, and civilian contract program development and testing. In addition, aircraft from Holloman AFB, Kirtland AFB, and Fort Bliss Army Airfield operate within the restricted airspace at various times. Civilian and commercial air traffic may enter the restricted airspace only with permission of WSMR Range Control. The major activities conducted within the WSMR restricted airspace include air-to-air and surface-to-air weapons systems tests. Other activities include the operation of aerial drone targets, towed aerial targets, unmanned air systems, space probes, safety chase, aerial photography, and fixed- and rotary-wing security patrols. Training activities in the WSMR airspace include NASA crew training, aircraft weapons delivery, air-to-air combat maneuvers, and other military exercises. A large amount of the airspace is used as safety buffer zones for missile and rocket firings (WSMR 2009).

Right-of-way Avoidance Areas

Right-of-way avoidance areas are designated by the BLM and managed for specific resource objectives. For a full description of Right-of-way avoidance areas crossed by the Project see Section 3.10.3.8 of the Final EIS. Where the Project right-of-way would cross an avoidance area, an RMP amendment may be required as identified in the Final EIS.

3.10.1.2 Mitigation Planning

After the application of standard mitigation, selective mitigation would then be applied to effectively reduce impacts where practicable. See Section 2.5 for a description of standard and selective mitigation measures. Specific applications of selective mitigation are described in the impact analysis results below.

3.10.2 Final Environmental Impact Statement Assessment Results

The locations of the Mitigation Proposal segments are in the same corridor as the BLM Preferred Alternative described in the Final EIS. All Mitigation Proposal segments cross the NCUA north of the WSMR. The Central and Western segments are located in the restricted airspace R5107C and R5107H. Military uses, which include testing and training, are described in Section 3.10.3.7 of the Final EIS.

Impacts described in the Final EIS associated with the BLM Preferred Alternative along Links E86a, E86b, and E101b would be low for planned land use and low-moderate to moderate for existing land use (See Section 4.10.5.2 of the Final EIS). Along these same links, impacts to dispersed recreational activities would be low and no parks, recreational centers or SRMAs would be crossed.

Impacts to BLM lands managed for grazing would be directly impacted by the proposed Project as described in the Final EIS. Construction of the BLM preferred alternative would result in the loss of approximately 0.0001 percent of available grazing land in the BLM Socorro Field Office area.

Impacts to New Mexico state grazing lands would include a reduction of approximately 0.0002 percent from state trust lands in Socorro County and 0.00006 percent from state trust lands in Torrance County.

Link E101b crosses 1.1 miles of a right-of-way avoidance area managed for VRM Class II visual resources. The proposed BLM preferred plan amendment alternative as identified in the Final EIS is a 400-foot-wide corridor, which would result in approximately 53 acres removed from right-of-way avoidance management in the Socorro RMP.

3.10.3 Mitigation Proposal Assessment Results

Temporary impacts associated with construction of the Mitigation Proposal would occur along each segment where excavation and construction of roads and other facilities takes place. The total amount of acres that would be temporarily removed for use of grazing during construction periods would be 111 acres in an area 100 feet wide along the three burial segments. These temporary impacts include increased traffic along access roads, and temporary modifications to fencing, gates, and water facilities. Temporary impacts associated with construction could affect movement of cattle, which could result in indirect impacts to ranching operations associated with herd movement.

Per standard mitigation measures (ST 1 through 9), impacts to ranch facilities and operations would be minimized. Water line locations will be identified in the final POD and field-located prior to any construction and excavation activity in compliance with state law. If facilities are damaged or obstructed, fences, gates, roads, and watering facilities would be returned to their predisturbed condition as required by the landowner or land management agencies. The final POD will include fencing specifications and traffic management practices, such as vehicle speed limits, to avoid interference with livestock movement. Individual ranchers would be notified of construction schedules to adjust herd movement. Cattle would be able to cross the right-of-way unimpeded and graze on lands in the right-of-way that would not be permanently disturbed; however, future rangeland improvements could not be located in the right-of-way. By implementing these mitigation measures and BMPs specified in the final POD, it is unlikely that the manner in which livestock use the area/pastures where the line is installed could result in livestock loss along major access routes during construction or operation if the Project.

Where road construction, grading, or excavation is required, surface restoration would be implemented according to selective mitigation measures and BMPs to be specified in the final

POD and as directed by the landowner or BLM Authorized Officer. The method of restoration would normally consist of returning disturbed areas back to their natural contour, reseeding (where required), cross drains installed for erosion control, placing water bars in the road, and filling ditches (Selective Mitigation Measures, Table 2-4).

No parks, recreational centers, or SRMAs would be impacted by the Mitigation Proposal segments. Permanent impacts associated with the Mitigation Proposal would result in the reduction of grazing lands where access roads, underground vaults, and transition stations are constructed. Although livestock may be exposed to EMFs in the vicinity of either overhead or underground electrical transmission lines, there would be no measurable change in EMF levels at or near the vaults. Additional information is provided in Section 3.15 of this EA regarding EMFs.

Heat would be released above the underground cables, although the temperature levels cannot be determined at this time. The vaults would be covered with soil, with the exception of the manhole covers, and would not generate warmth that could attract livestock during cold periods. Revegetation in the right-of-way could be affected; for example, an increase in temperature could affect the growth rate of vegetation and potentially extend the seasonal growth in cold weather, or shorten seasonal growth in warm weather. It is anticipated there would be no substantial reduction for the forage available for livestock within the affected grazing lands.

3.10.3.1 Eastern Segment

Existing and planned land uses are the same as those described in the Final EIS, which are generally categorized as rural residential with widely dispersed residences and ranching features occurring in the study corridor. This segment crosses rural ranching roads, water facilities (two sections of underground water pipeline), and land used for ranching and grazing primarily through grazing leases on federal and state trust land.

Permanent impacts could result in a reduction of less than 0.001 percent of grazing lands (16 acres) across 1 allotment state trust lands.

3.10.3.2 Central Segment

The Central Segment is located in Socorro County along Link E86b of the BLM Preferred Alternative as described in the Final EIS. Existing and planned land uses are the same as those described in the Final EIS. Residences and associated ranching features occur in the study corridor, approximately 0.75 mile south and 0.6 mile north of the Central Segment, and a county maintained road on BLM land. This segment crosses federal, state, and private land used primarily for ranching grazing.

Permanent impacts could result in a reduction of less than 0.002 percent of grazing lands (2 acres on BLM land, 7 acres on state trust land, and 8 acres on private land for a total of 17 acres) across one allotment.

3.10.3.3 Western Segment

The Western Segment is located in Socorro County along Link E101b of the BLM Preferred Alternative as described in the Final EIS. Existing and planned land uses are the same as those described in the Final EIS, which are generally categorized as rural residential with no residences occurring in the study corridor. This segment crosses land used for ranching and grazing used primarily through grazing leases on federal and state trust land. This segment crosses an avoidance area that is managed by the Socorro RMP for VRM Class II objectives. The mitigation proposal would result in the reduction of 3.5 acres of lands managed for right-of-way avoidance in the Socorro RMP.

Permanent impacts could result in a reduction of less than 0.001 percent of grazing lands (10 acres on BLM land, 8 acres on state trust land, and 3 acres on private land for a total of 21 acres) across 1 allotment.

3.10.4 Comparison of Impacts Associated with Subroute 1A2 of the BLM Preferred Alternative and the Mitigation Proposal Segments

New information relating to the Mitigation Proposal when compared to the findings in the Final EIS would not result in new or substantially different impacts. The following table identifies permanent impacts to grazing lands that could result from the Mitigation Proposal as compared to the BLM Preferred Alternative as stated in the Final EIS.

Table 3-6. Comparison of Permanent Impacts to Grazing Lands

Subroute 1A2	Federal Grazing Lands (acres)	State Grazing Lands (acres)	Private Grazing Lands (acres)	Totals
BLM Preferred Alternative – Overhead	16	20	1	41
BLM Mitigation Proposal – Underground	12	31	11	54

A total of 1,270 acres of land would be permanently disturbed for the BLM Preferred Alternative for the Subroute 1A2 as described in the Final EIS (overhead line construction for 230.3 miles). In conclusion, impacts to planned and existing land use associated with the Mitigation Proposal would be similar in context and intensity as those described for the BLM Preferred Alternative as described in the Final EIS.

3.11 Special Designations

3.11.1 Affected Environment

Sections 3.11 and 4.11 of the Final EIS identify and assess potential impacts to special designations in the Project study area that are crossed by the proposed BLM Preferred Alternative. Special designations are identified in BLM land use planning documents and are either administratively or congressionally designated. Congressionally designated areas may include wilderness areas, WSAs, wild and scenic rivers, national conservation areas, and national scenic or historic trails. Administrative designations may include areas of critical environmental

concern and SRMAs. Special designations protect values and land uses unique to an area, which typically require a more intensive management emphasis than is applied to surrounding public land. Specific management prescriptions are identified for these areas, including the avoidance or exclusion of some activities or uses (i.e., right-of-way leases or grants). Wilderness areas, WSAs, and LWCs are described in Section 3.12

An impact assessment methodology was developed to identify and evaluate potential direct and/or indirect impacts to wilderness, WSA, and LWCs inventory units that would result from the Project (see Section 4.11.2 of the Final EIS for a complete description of the impact assessment methodology). Direct impacts would occur if the Project right-of-way or facilities would be located on lands within the boundaries of a special designation. Indirect impacts to special designations, which may include impacts to air quality, earth, water, visual, wilderness, LWCs, or other resources, are described in their respective resource sections in this EA or the Final EIS.

3.11.2 Final Environmental Impact Statement Assessment Results

There are no special designations crossed by the BLM Preferred Alternative as described in the Final EIS along Links E101a, E86a or E86b in areas of the Mitigation Proposal segments.

3.11.3 Mitigation Proposal Assessment Results

No special designations are crossed or affected by the any of the Mitigation Proposal segments.

3.11.4 Comparison of Impacts Associated with Subroute 1A2 of the BLM Preferred Alternative and the Mitigation Proposal Segments

Overall impacts to special designations would be the same in the Mitigation Proposal when compared to the BLM Preferred Alternative as described in the Final EIS.

3.12 Wilderness, Wilderness Study Areas, and Lands with Wilderness Characteristics

3.12.1 Affected Environment

Sections 3.12 and 4.12 of the Final EIS identifies and assess potential impacts to wilderness areas and WSAs in the Project study area and identifies LWCs that are crossed by the proposed BLM Preferred alternative. Wilderness areas and WSAs are specially designated. Special designations protect values and land uses unique to an area that typically require a more intensive management emphasis than is applied to surrounding public land. LWCs are not administratively or congressionally designated but are BLM lands that have been identified to contain wilderness characteristics. The BLM conducts and maintains inventories regarding the presence or absence of wilderness characteristics. According to Section 201 of the FLPMA, the preparation and maintenance of the inventories does not change or prevent change of the

management or use of the lands. BLM lands identified as having wilderness characteristics are considered when analyzing projects under the NEPA.

An impact assessment methodology was developed to identify and evaluate potential direct and/or indirect impacts to wilderness, WSA, and LWCs inventory units that would result from the Project (see Section 4.12.12 of the Final EIS for a complete description of the impact assessment methodology). Per BLM New Mexico State Office direction, direct impacts would occur for portions of the Project where components (including access, structures, and ancillary facilities) would cross LWCs inventory units or lands designated as wilderness or WSA. The latter condition (i.e., the Project crossing wilderness or WSA) does not occur in the context of the Project. Direct impacts to LWCs inventory units were characterized by the number of acres that would no longer qualify as potential LWCs.

3.12.2 Final Environmental Impact Statement Assessment Results

The Final EIS identified the following results for the BLM Preferred Alternative that could occur along the Mitigation Proposal segments.

- No wilderness areas are located within 3 miles of this subroute; therefore, no indirect impacts were identified.
- Link E101b would be visible from approximately 4,741 acres (20 percent) of the Stallion WSA. The visibility of the proposed link, located less than 0.5 mile north of the WSA boundary, would have an indirect impact to outstanding opportunities for solitude. Although the BLM Preferred Alternative would be visible, due to the size and rugged terrain of the Stallion WSA, there would still be ample opportunity for solitude.
- Link E101b would have direct impacts to the pending LWCs inventory unit adjacent to Stallion WSA, where they cross approximately 2.1 miles of the northern portion of the unit. This unit contains approximately 1,788 acres of BLM-managed land identified as having wilderness characteristics. Construction and operation of the proposed Project would reduce the inventory unit by approximately 102 acres. Direct impacts to the inventory unit could be minimized by relocating Links E101a and E101b (SE 8).

3.12.3 Mitigation Proposal Assessment Results

No Wilderness Areas, WSAs, or LWCs occur within 3 miles of the Eastern and Central segments of the Mitigation Proposal; therefore, potential impacts would be the same as described for the BLM Preferred Alternative in the Final EIS Sections 4.12.3.1, 4.12.4.1, and 4.12.5.1.

3.12.3.1 Western Segment

Link E101b would be visible from approximately 4,037 acres (17 percent) of the Stallion WSA. The visibility of the proposed link, located approximately 0.5 mile north of the WSA boundary, would have an indirect impact to outstanding opportunities for solitude. Although the portions of the Mitigation Proposal would be visible, due to the size and rugged terrain of the Stallion WSA,

there would still be ample opportunity for solitude. See Section 3.9.3.2 for a description of visual impacts assessed from key observation points from in the Stallion WSA.

There is no change in the alignment or proposed construction method along Link E101a or E101b, where they cross approximately 2.1 miles of the northern portion of the pending LWC adjacent to the Stallion WSA. Segments of Links E101a and E101b that would have direct impacts to the pending LWCs inventory unit adjacent to Stallion WSA as described in the Final EIS for the BLM Preferred Alternative would persist and are unaffected by the Mitigation Proposal.

3.12.4 Comparison of Impacts Associated with Subroute 1A2 of the BLM Preferred Alternative and the Mitigation Proposal Segments

Overall impacts would be reduced in the Mitigation Proposal when compared to the BLM Preferred Alternative as described in the Final EIS with regard to wilderness areas, WSAs, and LWCs. When compared to the BLM Preferred Alternative as described in the Final EIS, the Western Segment along Link E101b would reduce the visibility of the project from the Stallion WSA by approximately 3 percent. This reduction of impacts would be due to an adjustment of the alignment that would allow natural terrain features to further screen portions of the Project, as well as some vertical Project features being buried underground that would otherwise be visible.

3.13 Social and Economic Conditions

3.13.1 Affected Environment

Sections 3.13 and 4.13 of the Final EIS identify and assess potential impacts to social and economic conditions that could result from the construction and operation of the BLM Preferred Alternative. Those sections describe the existing social and economic baseline conditions in the study area of the proposed Project, as well as the broader host region that includes portions of Torrance and Socorro counties in New Mexico crossed by the Mitigation Proposal.

The FLPMA requires the BLM to integrate physical, biological, economic, and other sciences in land use planning and to analyze social, economic, and institutional information. The NEPA requires federal agencies to integrate "the natural and social sciences in planning and decision making" (42 USC 4332[2][A]).

Social and economic conditions are assessed with county-level data where data sources are consistent across the Project study area. Data for cities and towns were used to bring clarification to local socioeconomic conditions.

The socioeconomic assessment method is based largely on a Project-specific study conducted by the University of Arizona, Economic and Business Research Center, and New Mexico State University Arrowhead Center (2009). The SunZia Southwest Transmission Project Economic Impact Assessment was developed to support the Final EIS (Charney et al. 2012a; Appendix G-1 of the Final EIS). Components addressed in the study included basic socioeconomic

characteristics of the affected counties (population, density, and per capita income); revenue impacts (expected property tax, sales tax, and state-shared sales tax); and economic impacts (number of jobs created [direct and indirect], labor income, and county-equivalent gross domestic product).

Because the length of a subroute is directly proportional to its estimated economic effect, multipliers (based on the results of the economic impact assessment) were calculated for each county and applied to each alternative subroute on a per mile basis. The economic impacts resulting from construction and operation of the proposed substations have been incorporated in the estimates of impact for each of the transmission line alternatives associated with the affected counties. Social impacts related to population increases, housing, and emergency services are qualitatively discussed and quantified where possible.

3.13.2 Final Environmental Impact Statement Assessment Results

The Final EIS identified the following results for Route Group 1, which includes the BLM Preferred Alternative Subroute 1A2.

There would be no substantial impacts to population or housing as a result of the construction of the Project as described in the Final EIS. Job creation, labor income, and tax revenue estimates vary slightly between subroutes in Route Group 1, including Subroute 1A2, the BLM Preferred Alternative. Economically, Socorro and Sierra counties would benefit the most from the construction and operation phases of the Project because the two counties contain a majority of all subroute mileage. Direct and indirect economic impacts would result in communities such as the city of Carrizozo in Lincoln County (largest city in proximity to the proposed SunZia East Substation); the town of Mountainair in Torrance County[5]; Socorro and the unincorporated community of San Antonio in Socorro County; Elephant Butte, Truth or Consequences, and Williamsburg in Sierra County; and Deming in Luna County. Operations employment would likely have the greatest impact in Doña Ana County and not in the actual location of the transmission line and substation facilities. Typically, grazing could continue in the Project right-of-way during operation of the transmission lines, and more than 80 percent of the right-of-way would likely not be disturbed by construction activities and remain open for grazing.

The following is a summary of socioeconomic impacts associated with Route Group 1 as described in the Final EIS. The approximate range of direct and indirect jobs, income tax revenue, and property tax revenue that could be created in New Mexico is summarized as follows:

- Jobs (job years) generated from construction of transmission lines: 2,108 to 2,206 (1,212 to 1,275 direct and 896 to 931 indirect)
- Income tax revenues generated during construction (not including substations): $33.1 to $32.4 million
- Property tax revenues generated during construction: $9.4 million to $13.7 million
- Property tax revenues during operations: $26.3 million to $49.8 million

[5]Calculations used in the economic impact assessment included Subroute 1A in Socorro County, but Subroute 1A2 crosses 28 miles in Torrance County.

3.13.3 Mitigation Proposal Assessment Results

Impacts associated with population and housing impacts of the Mitigation Proposal would be similar to those described in the Final EIS for the BLM Preferred Alternative in Route Group 1 (see Sections 4.13.4.1 and 4.13.4.2 of the Final EIS). Overall, estimates of the total cost of construction for the entire Project could increase up to 5 percent, while construction costs associated with the New Mexico portion of the Project could increase up to 10 percent. It is anticipated, construction of the Mitigation Proposal underground segments would occur during the same time period as construction of the overall project. Therefore estimates of direct economic impacts associated with jobs and revenues would likely increase during the construction period as additional personnel and materials would be needed. See Tables 2-1 and 2-2 of this EA for a description and quantity of personnel needed for construction of underground segments and transition stations.

It is estimated both direct and indirect effects to jobs and revenue would increase proportionally to overall project costs associated with construction of the Mitigation Proposal underground segments. These direct and indirect effects would likely have the greatest impacts on the communities in proximity to the Mitigation Proposal segments (i.e., Mountainair and Socorro) due to the need for larger quantities of local resources and extended construction time frames in these localized areas. Permanent impacts to ranching operations associated with vegetation removal could reduce AUMs across the Eastern Segment by less than 0.001 percent, the Central Segment by less than 0.002 percent, and the Western Segment by less than 0.001 percent. Grazing could continue in the Project right-of-way during operation of either overhead or underground transmission lines, and more than 80 percent of the right-of-way would likely not be disturbed by construction activities and remain open for grazing.

3.13.4 Comparison of Impacts Associated with Subroute 1A2 of the BLM Preferred Alternative and the Mitigation Proposal Segments

Overall, direct and indirect economic impacts would likely increase with construction of the Mitigation Proposal when compared to the BLM Preferred Alternative as described in the Final EIS. This increase of economic impacts would be due to an increase in total construction costs, and time needed to construct the underground segments. Additionally, economic impacts associated with grazing would be similar for the Mitigation Proposal when compared to the BLM Preferred Alternative.

3.14 Environmental Justice

3.14.1 Affected Environment

Sections 3.14 and 4.14 of the Final EIS identify and assess potential impacts to environmental justice populations that could result from the construction and operation of the BLM Preferred Alternative. Executive Order 12898 (U.S. Department of Housing and Urban Development 1994) requires federal agencies to address high and disproportionate environmental impacts on minority and low-income populations. Should potentially significant and adverse impacts attributable to the proposed Project fall disproportionately on these populations, environmental

justice impacts would result. Those sections describe the existing social and economic baseline conditions in the study area of the proposed Project, as well as the broader host region that includes portions of Torrance and Socorro counties in New Mexico that are crossed by the Mitigation Proposal.

Potential environmental justice populations as described in the Final EIS were geographically identified by census tract, within a 3-mile radius on either side of the BLM Preferred Alternative. In rural areas, census tracts could cover large areas with low population densities. If census tracts in rural and urban areas were identified to be an environmental justice population, land use inventory data (such as field verification and aerial photography) were used to confirm the specific type of land uses that could be impacted by the route. For a complete description of the method of analysis please see Section 4.14.2 of the Final EIS.

3.14.2 Final Environmental Impact Statement Assessment Results

The Final EIS identified the following results for Route Group 1, which includes the BLM Preferred Alternative Subroute 1A2. Six potential environmental justice tracts across three counties are crossed by the BLM Preferred Alternative. Of the six, one tract in Lincoln County, one tract in Torrance County, and three tracts in Socorro County could experience low to moderate impacts. Census tracts 9602 and 9637 located in Lincoln and Torrance counties are characterized by low-density residential properties, and cross within 0.5 mile of potential environmental justice populations in these tracts. The BLM Preferred Alternative also crosses within a 0.25 mile of low-density residential properties and agricultural areas near the community of Escondida, just north of the city of Socorro. Proximity to these properties indicates the potential for moderate impacts. Higher density environmental justice populations located 1 mile south in Socorro could experience low impacts because of their distance from the line. However, because these populations are spread across many square miles of land, the number of individuals that could be impacted would be much less.

3.14.3 Mitigation Proposal Assessment Results

Potential impacts of the Mitigation Proposal associated with environmental justice populations would be similar to those described in the Final EIS for the BLM Preferred Alternative in Route Group 1 (see Sections 4.14.3.2 of the Final EIS), which estimate low to moderate impacts. These effects would occur to the same potential populations. However, the length of time to construct the Mitigation Proposal underground segments would likely increase some temporary impacts to potential environmental justice populations due to extended construction time frames in localized areas around Mountainair, Socorro, and Escondida. These temporary impacts could include an increase in low-skilled service jobs to supply goods and services to construction workers.

3.14.4 Comparison of Impacts Associated with Subroute 1A2 of the BLM Preferred Alternative and the Mitigation Proposal Segments

Overall, environmental justice impacts would be similar with construction of the Mitigation Proposal when compared to the BLM Preferred Alternative as described in the Final EIS. The

results of the analysis indicated that no significant impacts to environmental justice populations are expected.

3.15 Health and Safety/Hazardous Materials

3.15.1 Affected Environment

Sections 3.15 and 4.15 and Appendix K of the Final EIS describe the affected environment and potential impacts from EMFs, audible noise, radio and television interference, environmental contamination, and hazardous materials related to construction, operation, and decommissioning of the BLM Preferred Alternative. Potential emissions of pollutants considered harmful to public health and the environment are discussed in Section 3.2, Climate and Air Quality (also see Table 3-2, Ambient Air Quality Standards of the Final EIS).

EMFs and corona effects were analyzed using the Bonneville Power Administration's Corona and Field Effects Program software for a variety of conductor configurations and minimum conductor heights relating to the BLM Preferred Alternative as described in the Final EIS. EMF, audible noise, and radio and television interference from a transmission line are based on the electrical and physical characteristics of the transmission line. The Corona and Field Effects Program uses the electrical and physical characteristics of the transmission line to calculate resulting fields and interference effects. Once values were calculated, they were compared to recommended limits for EMF based on the International Commission on Non-Ionizing Radiation Protection. For a complete description of the method of analysis please see Section 4.15.2 of the Final EIS.

3.15.2 Final Environmental Impact Statement Assessment Results

The study results indicated electric field levels anticipated to occur at the Project right-of-way are projected to be below the reference levels for general public exposure, based on the International Commission on Non-Ionizing Radiation Protection guidelines (National Institute of Environmental Health Sciences 2002). The maximum potential magnetic field levels in the right-of way would also be under the reference levels for general public exposure.

Audible noise may result from equipment and vehicles used during Project construction. Where construction would occur near populated areas, noise might be audible and result in temporary impacts and possibly considered only as a nuisance. During operation of the transmission lines and substations, audible noise levels would not exceed the EPA recommended levels of 55 dBA at the right-of-way limits.

Projected levels of radio and television interference, resulting from the operation of transmission lines at the right-of-way limits for the Project, would be below the recommended levels established by the Radio Noise Design Guide and Federal Communication Commission.

Construction and operations activities would comply with all applicable federal, state, and local regulations regarding the use of hazardous substances. BMPs would be applied to ensure that applicable federal, state, and local laws are obeyed. Further, the Project owner and construction

team would coordinate with land management agencies to incorporate health and safety requirements in response to accidental release of hazardous materials.

3.15.3 Mitigation Proposal Assessment Results

Potential impacts of the Mitigation Proposal associated with EMFs, audible noise, radio and television interference, environmental contamination, and hazardous materials would be similar to those described in the Final EIS for the BLM Preferred Alternative (see Sections 4.15.3.2 of the Final EIS). Potential effects associated with operation of the Mitigation Proposal would continue to be within the guidelines of both the Environmental Protection Agency recommended levels of 55 dBA at the right-of-way limits, and Radio Noise Design Guide as well as the Federal Communication Commission. No residences are within 200 feet of construction activities of the Mitigation Proposal underground segments; therefore, increased temporary short-term impacts associated with construction noise are not anticipated.

EMFs would be measurably higher where the overhead lines transition to underground; however, there would be no increase in exposure to any residences. EMFs are generated by the energized cable, but as with a 500-kV overhead configuration EMF will dissipate to a negligible level at the edge of the right-of-way. Extra-high voltage substation facilities are designed to NESC standards with perimeter fencing to contain all of the equipment at a safe distance from both the public and livestock.

3.15.3.1 Comparison of Impacts Associated with Subroute 1A2 of the BLM Preferred Alternative and the Mitigation Proposal Segments

Overall, impacts associated with EMFs, audible noise, radio and television interference, environmental contamination, and hazardous materials would be similar with construction of the Mitigation Proposal when compared to the BLM Preferred Alternative as described in the Final EIS.

3.16 Operation and Maintenance

Operation and maintenance activities that are necessary after project construction include routine inspections and potential repairs and restoration, as described in Chapter 2 (Section 2.4 of this EA). The environmental effects of operation and maintenance of the Mitigation Proposal facilities would be similar to the effects of operation and maintenance for the proposed project described in the Final EIS; however, there are certain aspects that would differ.

The overhead transmission line facilities may be subject to damage or deterioration caused by high winds, fire, lightning strikes, earth shaking, or human caused disturbance from target shooting or other vandalism. Overhead lines are regularly inspected to identify the need for replacement parts due to deterioration over time. When transmission towers or overhead conductors fail, service crews are dispatched to repair or replace the damaged facilities as soon as possible. Repairs are generally made from the ground using cranes, although helicopters may be used to replace conductors or replace insulators, static wires, or towers. Environmental effects that may result from most maintenance activities such as potential soil erosion, vehicular

emissions, or accidental spills are typically confined to existing roads and other previously disturbed areas. Maintenance crews coordinate with the land managers to move vehicles and equipment with a minimal amount of disturbance to ranching operations, and are required to restore the ground surface and any facilities that might be damaged during the repair.

Underground transmission line cables are less-likely to fail as a result of natural or human-caused damage. The most likely type of underground cable failure would occur at splices between cable sections due to defects or wearing out over time. The splices are accessible through vaults (manholes) for repair or cable replacement. As a result, the maintenance would typically be confined to existing, previously disturbed areas that are accessible by surface vehicles. In the unlikely event of a cable failure that occurs in between the vaults (splice points), the trench would be reopened using a process similar to that used for new underground ductbank installation and result in the same levels of ground disturbance as project construction. Maintenance and repair required for transition stations would be similar to that required for typical substations.

Overall, the environmental effects of typical operation and maintenance of the underground facilities would be very similar to that of the overhead facilities, although it is anticipated that repairing the underground facilities would require somewhat longer durations to identify the location of a problem and gain access to repair the damage.

3.17 Cumulative Impacts

A cumulative impacts analysis was completed for the Project in the Final EIS, which included identification of past, present, and future and reasonably foreseeable future (RFF) actions (see Section 4.17 of the Final EIS). The time frame for the analysis was based on a typical 10-year planning cycle for local, state, and federal governments and utility plans. The projects identified as RFFs in Lincoln, Torrance, and Socorro counties in the Final EIS were verified for changes in their development status. No changes in status were identified. Additionally, a search was performed to identify any new projects that may have initiated development and could be considered RFF actions. No new RFFs were identified.

Although there is more potential ground disturbance as a result of construction of the Mitigation Proposal when compared to the Project as described in the Final EIS, the increase in ground disturbance is in the localized areas of the underground segments. Overall, potential ground disturbance for Subroute 1A2 of the BLM Preferred Alternative as described in the Final EIS when compared to Subroute 1A2 with the Mitigation Proposal yields an estimated increase of 1 percent of ground disturbance. Overall the cumulative effects of the Project with construction of the Mitigation Proposal would be similar when compared to the BLM Preferred Alternative described in the Final EIS.

CHAPTER 4 – INDIVIDUALS, ORGANIZATIONS, TRIBES, OR AGENCIES CONSULTED

Consultation and coordination with federal and intergovernmental agencies, organizations, tribes, and interested groups of individuals for the proposed Project have been documented in Chapter 5 of the Final EIS.

Individual landowners and allottees (or leases) with ranch properties located in the three transmission line burial segment corridors in Torrance and Socorro counties for the Mitigation Proposal were contacted. Meetings were held in August of 2014 and included site visits with several members of the ranching community to discuss the Mitigation Proposal. The meetings included site visits with the landowners, BLM, Project representatives, and NMSLO and DoD personnel.

Issues identified by affected landowners included concerns for minimizing disturbance to existing infrastructure related to residential properties and ranching activities (i.e., water pipelines, wells, gates and fences). Results of the meetings included pre-engineering and construction feasibility assessments for suggested locations for underground transmission facilities and transition station.

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CHAPTER 5 – LIST OF PREPARERS AND REVIEWERS

A list of preparers and contributors involved throughout the Project, including BLM staff and consultants, is provided in Table 5-1 and 5-2.

Table 5-1. BLM SunZia Interdisciplinary Team

Name	Title
BLM New Mexico State Office, Lead BLM State	
Adrian Garcia	Project Manager
Jonathan David Goodman	NEPA Planning Coordinator
James Sippel	National Lands Conservation System Coordinator/Wilderness Coordinator
Jane Childress	Lead Archaeologist
Marikay Ramsey	Wildlife Biologist (Threatened and Endangered species, lead for ESA Section 7 consultation)
Jeanne Hoadley	Resources Program Lead (air quality)
Adrienne Brumley	Minerals
Billy "Link" Lacewell	Hazardous Materials Coordinator
Roger Cumpian	Range Conservationist
John Selkirk	Fire and Aviation Specialist
Elaine Lopez	Engineer
Al Sandoval	Geographic Information Systems
Management Oversight	
Jesse Juen	New Mexico BLM State Director
Socorro Field Office	
Virginia Alguire	Lands and Realty
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Brenda Wilkinson	Archaeologist
Gus Hoever	Range Specialist
Management Oversight	
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Cooperating Agency Reviewers – Points of Contact	
New Mexico State Land Office	
Don Britt	Assistant Commissioner, Commercial Resources
Department of Defense Siting Clearinghouse (Office of the Deputy Secretary)	
Michael Aimone	Executive Director (DoD Siting Clearinghouse, Installations/Environment)
U. S. Army, White Sands Missile Range	
Daniel Hicks	Deputy Executive Director

Table 5-2. Consultant Preparers and Contributors		
Name	**Education**	**Involvement**
EPG		
Louise Brown	BA, Administrative Systems	Technical Editing
Caree Griffin	AAS, Drafting	Graphics, Visual Simulations
David Kahrs	MS, Wildlife Conservation and Management BA, Biology	Wildlife Biology and Vegetation Resources
Don Kelly	MUEP, Urban and Environmental Planning BA, Anthropology BA, Philosophy	Project Coordinator, Air Quality, Land use, Socioeconomic, Environmental Justice, Health and Safety
Cara Lonardo	BA, Archaeology	Cultural and Historical Resources
Michael Pasenko	MS, Paleontology BA, Anthropology	Earth and Paleontological Resources
Marc Schwartz	MLA, Landscape Architecture (pending) BS, Forestry	Visual Resources
Mickey Siegel	MCRP, City and Regional Planning BA, Psychology	Project Manager
Mike Skoko	BS, Geography	Geographical Information Systems
Christopher E. Rayle	BA, Anthropology MA, Anthropology	Cultural and Historical Resources
Dustin Sunderman	BS, Anthropology	Cultural and Historical Resources
Steve Swanson	PhD, Anthropology MA, Anthropology BA, Anthropology	Cultural and Historical Resources
Paul Trenter	BSLA, Landscape Architecture	Project Manager
Scott Woods	BS, Geography	Geographic Information Systems
Other Contributors		
POWER Engineers		
Name	**Title**	**Involvement**
Mark Etherton	Managing Engineer	Project Description, Technical Data
Jim Multerer	Principal Engineer	Project Description, Technical Data
Les Hinzman	Principal Engineer	Project Description, Technical Data

CHAPTER 6 – REFERENCES

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Appendix A – Visual Simulations for Comparison with Existing Conditions and Support of the Visual Impacts Analysis

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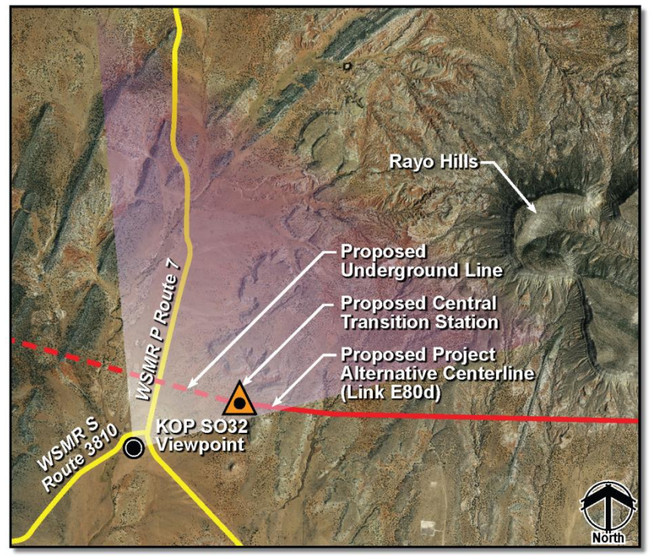
Existing Condition – View northeast from a residence along WSMR S Route 3810 (KOP SO32). Adjacent scenery includes Rayo Hills.



Photograph Location: Viewpoint is approximately 0.6 mile from proposed transmission lines.

Simulation – Central Mitigation Segment. The Project would be seen from a level viewing position.

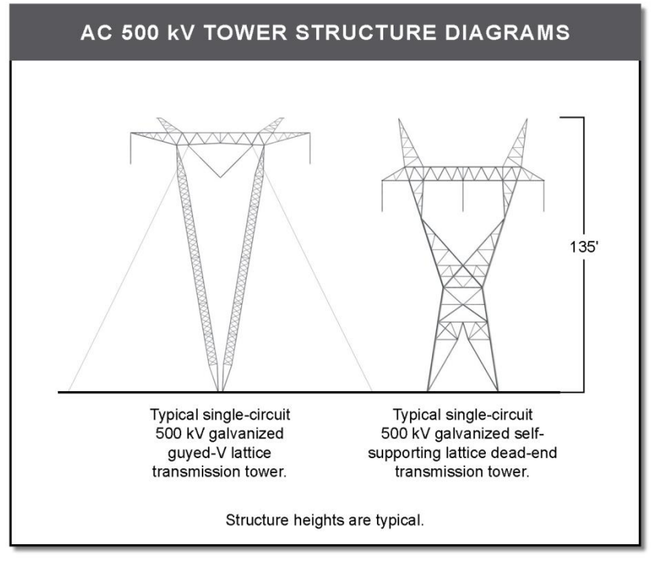


Photo Date and Time: 8-6-14, 3:40 p.m. Focal Length: 50mm
Simulations were prepared using three-dimensional structure models provided by the owner's engineer.
NOTE: Simulation does not include proposed substation, due to lack of engineering details.
Typical Structures would range between 125 and 160 feet above ground with a span of 1,000 to 1,600 feet. Typical conductor sag would be 45 feet above ground.
Facility locations, colors, and heights will differ based on final engineering and design.

SunZia Southwest Transmission Line Project

Simulation 51a

September 2014

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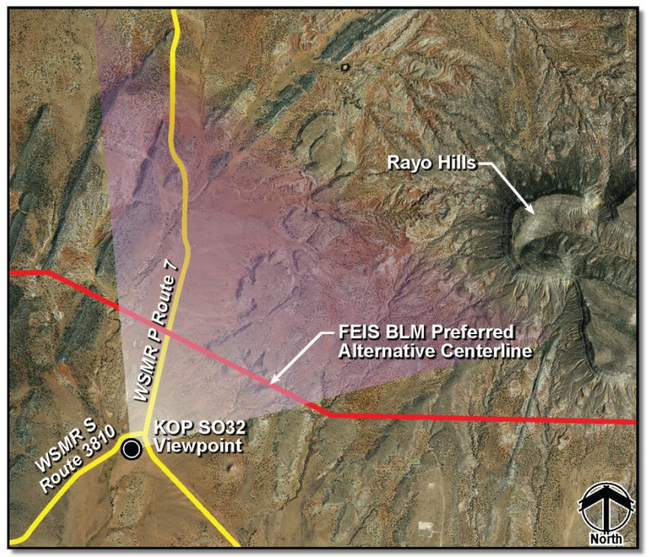
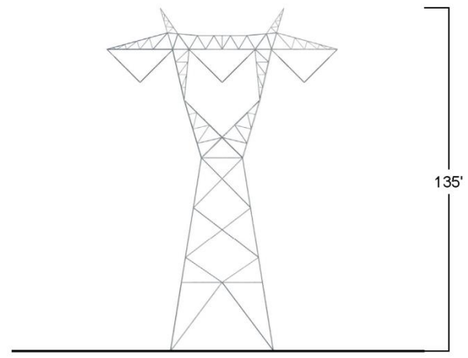
Existing Condition – View northeast from a residence along WSMR S Route 3810 (KOP SO32). Adjacent scenery includes Rayo Hills.



Photograph Location: Viewpoint is approximately 0.8 mile from proposed transmission lines.

Simulation – BLM Preferred Alternative (see AC 500 kV Tower Structure Diagrams), including standard mitigation measures. The Project would be seen from a level and inferior viewing position.

AC 500 kV TOWER STRUCTURE DIAGRAM



Typical single-circuit 500 kV galvanized self-supporting lattice tangent transmission tower.

Structure heights are typical.

Photo Date and Time: 8-6-14, 3:40 p.m. Focal Length: 50mm
Simulations were prepared using three-dimensional structure models provided by the owner's engineer.
NOTE: Simulation does not include proposed substation, due to lack of engineering details.
Typical Structures would range between 125 and 160 feet above ground with a span of 1,000 to 1,600 feet. Typical conductor sag would be 45 feet above ground.
Facility locations, colors, and heights will differ based on final engineering and design.

SunZia Southwest Transmission Line Project

Simulation 51b

September 2014

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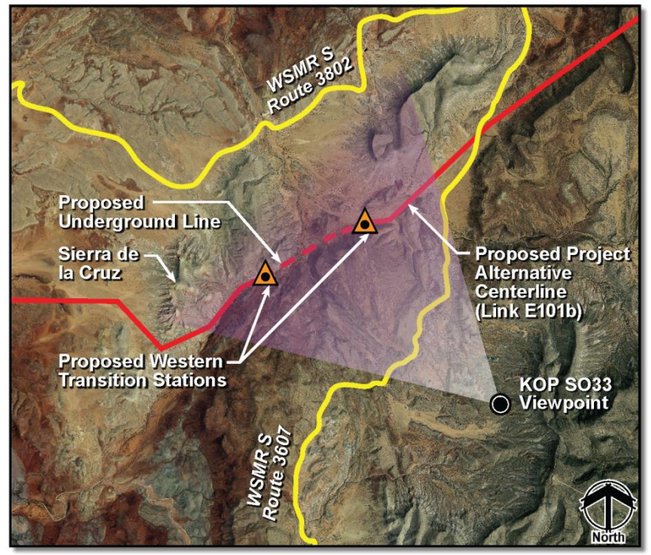
Existing Condition – View northwest from the Stallion Wilderness Study Area (WSA) (KOP SO33). Adjacent scenery includes Sierra de la Cruz.



Photograph Location: Viewpoint is approximately 2.2 miles from proposed transmission lines.

Simulation – Western Mitigation Segment. The Project would be seen from a superior viewing position.

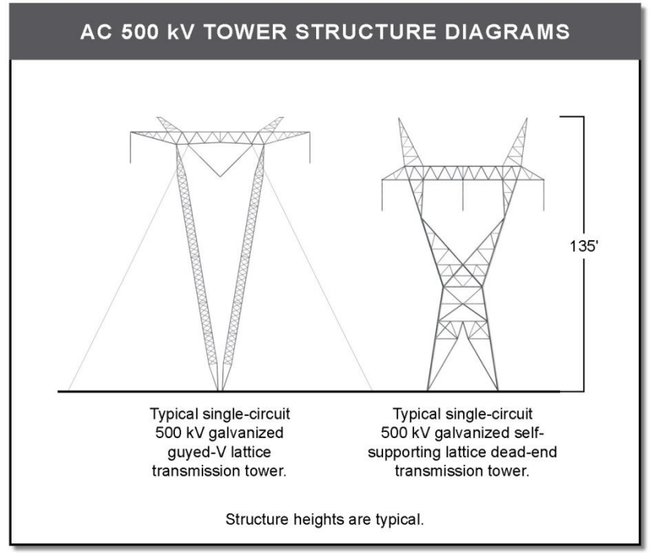


Photo Date and Time: 8-6-14, 10:28 a.m. Focal Length: 50mm
Simulations were prepared using three-dimensional structure models provided by the owner's engineer.
NOTE: Simulation does not include proposed substation, due to lack of engineering details.
Typical Structures would range between 125 and 160 feet above ground with a span of 1,000 to 1,600 feet. Typical conductor sag would be 45 feet above ground.
Facility locations, colors, and heights will differ based on final engineering and design.

SunZia Southwest Transmission Line Project

Simulation 52a

September 2014

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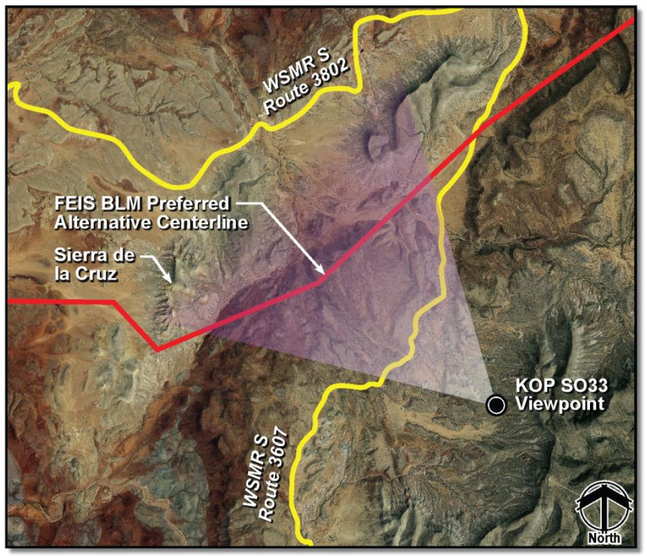
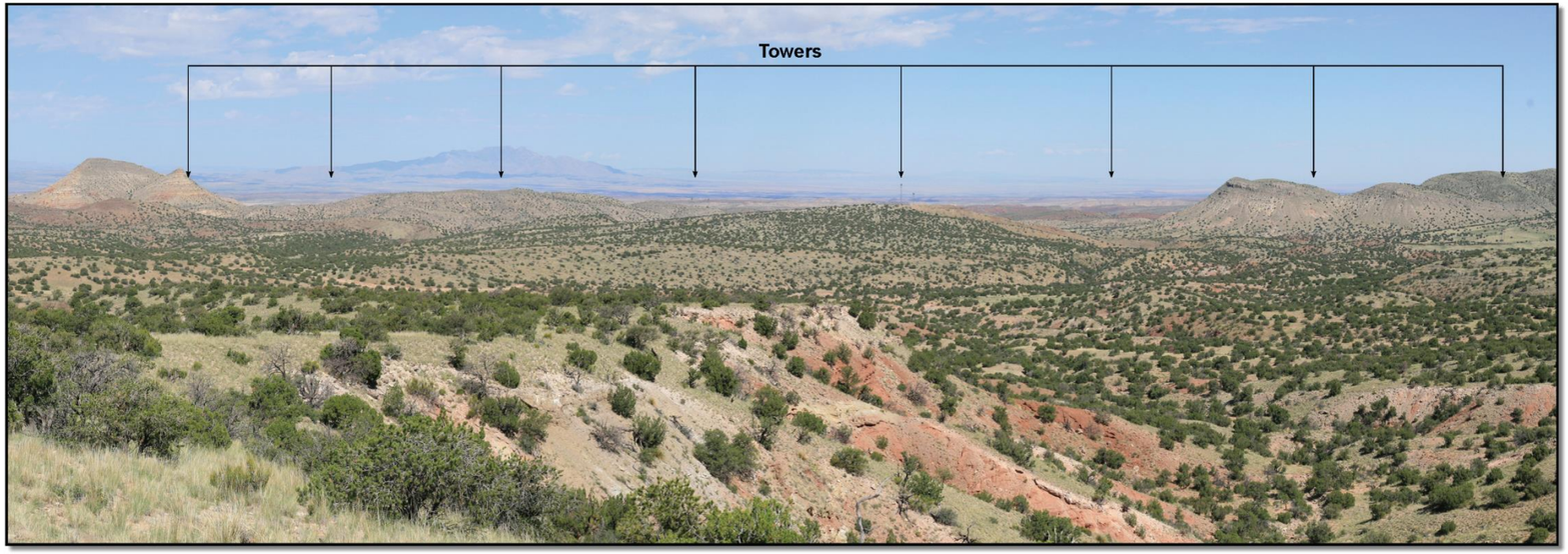
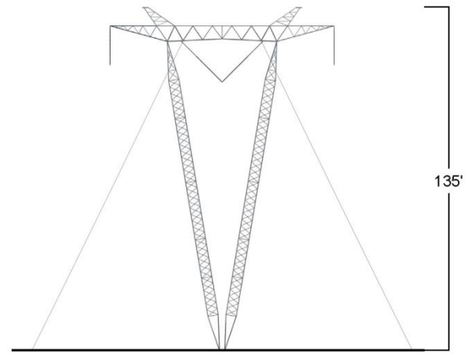


Existing Condition – View northwest from the Stallion Wilderness Study Area (WSA) (KOP SO33). Adjacent scenery includes Sierra de la Cruz.

Photograph Location: Viewpoint is approximately 1.7 miles from proposed transmission lines.



AC 500 kV TOWER STRUCTURE DIAGRAM



Typical single-circuit 500 kV galvanized guyed-V lattice transmission tower.

Structure height is typical.

Simulation – BLM Preferred Alternative (see AC 500 kV Tower Structure Diagrams), including standard mitigation measures. The Project would be seen from a superior viewing position.

Photo Date and Time: 8-6-14, 10:28 a.m. Focal Length: 50mm
Simulations were prepared using three-dimensional structure models provided by the owner's engineer.
NOTE: Simulation does not include proposed substation, due to lack of engineering details.
Typical Structures would range between 125 and 160 feet above ground with a span of 1,000 to 1,600 feet. Typical conductor sag would be 45 feet above ground.
Facility locations, colors, and heights will differ based on final engineering and design.

SunZia Southwest Transmission Line Project

Simulation 52b

September 2014

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