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August 1, 2022

SUNZIA TRANSMISSION LLC

SunZia Southwest Transmission Project

Certificate of Environmental Compatibility Application to Amend - Supplemental Project Information

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1.0 BACKGROUND

On February 22, 2016, Commission Decision No. 75464 approved a Certificate of Environmental Compatibility (CEC) for the SunZia Project (Case 171), which consists of two 500 kilovolt (kV) transmission lines, one alternating current (AC) and one either AC or direct current (DC), and associated interconnection facilities that will provide a path for new generation sources, including New Mexico wind resources, to the Arizona regional grid. The CEC recognized that the two transmission lines may be constructed at different points in time resulting in each line having a different expiration date. Since the CEC was granted by the Power Plant and Transmission Line Siting Committee (the Committee) and approved by the Commission, SunZia Transmission LLC (SunZia) has made the decision to construct the first line as DC.

On May 13, 2022, SunZia filed an Application to Amend Decision No. 75464. In Decision No. 78600, the Commission referred SunZia's Application to Amend to the Committee for an evidentiary hearing. To facilitate the Committee's review, SunZia submits this Supplement.

2.0 REQUESTED AMENDMENTS

The Application to Amend requests three modifications to the CEC approved by the Commission in Decision No. 75464. Specifically, SunZia requests amendments to: i) authorize the use of updated DC structure designs and additional structure types to be used in a one-mile area near Pinal Central substation that were identified during detailed engineering efforts; ii) allow for separate assignment and future ownership of each approved transmission line and its associated facilities to enable project financing: and iii) extend the expiration date for Line 1 from February 2026 to February 2028.

SunZia is not requesting amendments to the certificated route or maximum approved tower heights.

3.0 PATTERN ENERGY'S ACQUISITION OF SUNZIA TRANSMISSION LLC

On July 18, 2022, Pattern Energy announced its acquisition of 100% interests in SunZia Transmission LLC, including the first 500 kV transmission line from Southwestern Power Group, wholly-owned subsidiary of MMR Group, Inc. The second 500 kV transmission line authorized by the CEC will be owned by El Rio Sol Transmission, LLC, a wholly-owned subsidiary of MMR Group, Inc. Under the terms of the transaction, Pattern Energy is responsible for the current CEC which authorizes both lines. In order for each transmission line approved in the original CEC to be financed, constructed, and operated by each respective owner, the Application to Amend requests the CEC be bifurcated to allow for separate ownership of each line. Following approval of the bifurcation request, the CEC related to the second transmission line will be assigned to El Rio Sol Transmission, LLC under Arizona Corporation Commission (ACC) administrative procedures. As set forth in the Application to Amend, SunZia is not requesting any changes to existing CEC conditions. Rather, if the requested bifurcation is granted, both CECs will contain the same conditions. This includes conditions that were specifically designed for the SunZia Project such as Condition 26 (helicopter only construction near Paige Canyon) and Condition 37 (Pima County Mitigation Measures), which will remain in place for each transmission line.

Via an open market, Federal Energy Regulatory Commission-approved solicitation process that was administered by a third-party expert, SunZia awarded 3,000 megawatts (MW) of transmission capacity of the first SunZia transmission line to Pattern Energy's wind projects. The Federal Energy Regulatory

Commission approved the subscription of an initial 1,500 MW of SunZia's first line to Pattern Energy in 2017 and subsequently approved the remaining 1,500 MW of the first line in May 2022. The capacity solicitation process for the 1,500 MW related to the second transmission line has not yet been conducted.

Pattern Energy is a privately-owned developer and operator of wind, solar, transmission, and energy storage projects. Its operational portfolio includes 35 renewable energy facilities that use proven, best-in-class technology with an operating capacity of more than 5,900 MW in the United States, Canada, Japan, and Mexico. Pattern Energy brings extensive expertise and experience in developing complex clean energy infrastructure projects and is guided by a long-term commitment to serve customers, protect the environment, and strengthen communities.

4.0 PURPOSE AND NEED

As explained in the Application and this Supplement, the requested amendments will facilitate the economic and new capacity benefits from full build out of both transmission lines, as well as maximize system reliability. The over $4 billion privately funded Project will provide substantial economic benefits to Arizona, including significant employment opportunities during its construction period and substantial revenues to state and local jurisdictions, including the Arizona State Land Department, throughout the life of the Project.

4.1 Economic Benefits

SunZia's two transmission lines will deliver widespread economic and fiscal benefits across south-central Arizona, with an estimated $154 million in direct fiscal benefits to governments, communities, schools, and landowners. Over $20 million of this direct fiscal benefit is expected to benefit the Arizona State Land Department, supporting Arizona public schools, colleges, universities, hospitals, and other public entities. The Project is anticipated to deliver an additional $1.1 billion of broader economic impact including in-state purchases and lodging. The Project will create up to 400 construction jobs in Arizona during peak construction. Once operational, up to 14 permanent staff will be located within Arizona to operate and maintain the Project.

4.2 Regional Reliability and Capacity

During the ACC 2022 Summer Preparedness Workshop, Arizona utilities discussed potential reliability challenges for this summer, and noted the importance of resource planning, sufficient reserve margins, resource diversity, and overall preparedness as key to summer reliability.[1] Arizona is not alone in its continued attention to summer reliability. According to the North American Electric Reliability Corporation (NERC) 2022 Summer Reliability Assessment, the Southwest Reserve Sharing Group, which includes Arizona, New Mexico, and parts of California and Texas, faces insufficient resource availability to meet demand and cover reserves during peak risk hour around 7:00 p.m. local time, under a summer peak, and will likely need to locate additional external assistance for imports.[2] In addition, in March 2022, the Bureau of Reclamation announced a likely decline of Lake Powell below 3,525 feet in elevation, threatening the ability for Glen Canyon Dam to generate hydropower, which is critical for system

[1] Special Open Meeting – AU-99999A-22-0048 – 2022 Summer Preparedness. April 27, 2022. https://www.azcc.gov/live
[2] https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_SRA_2022.pdf. P. 34

regulation. Two drought response actions have since been implemented, reducing annual release volumes and power production from Glen Canyon Dam.[3]

These acute summer reliability challenges could grow significantly over the next several years without substantial capacity additions. The 4,500 MW of capacity delivered through this transmission project, 3,000 MW of which are intended to come online by 2026, can provide new capacity for customers in Arizona, a state that is experiencing significantly increased load growth, and the broader southwestern region. Further, the New Mexico wind generation profile is highly complementary to solar generation throughout Arizona and the Southwest, with wind generation ramping up during the evening peak hours.

Transmission optimization and expansion is critical for Western reliability as the resource mix changes and as Arizona and other western states face historic drought and extreme weather events. New transmission allows grid operators to tap into the diverse set of renewable generation resources during times of critical need.

5.0 PROJECT SCHEDULE

With respect to the first line, construction is scheduled to commence in 2023 with completion in the fourth quarter of 2025. This planned completion date is close to the current expiration date of February 22, 2026. Supply chain challenges due to COVID-mitigation, current inflationary economic conditions, and geopolitical events are well known and widespread. Because construction of the line will depend on a large network of suppliers, services, and products, supply chain disruptions could affect the Project schedule. To provide certainty to lending markets that the Project's approval would not expire prior to construction completion, the amendment application requested a two-year extension for the first line, from February 2026 to February 2028 . The development schedule for the second line does not require an amendment to the second line's existing 2031 expiration date.

6.0 UPDATED DC STRUCTURE DESIGN

SunZia intends to construct the first line as a DC transmission line. The DC structure designs included in the 2015 CEC application assumed the use of a ground electrode system that uses an earth return path for DC current. Design considerations and the desire to minimize ground disturbance and project impacts resulted in the decision to use dedicated metallic return conductors (MRCs) instead of a ground electrode (earth return) system. The updated DC structures are designed to include two MRCs to be installed along with shield wires and the DC pole conductors for the length of the first line.

The MRCs will typically carry minimal current during the bi-pole operation for any unbalance of current between each of the DC poles. When one of the DC poles is out of service during a planned mono-pole operation, or under an emergency outage of one of the DC poles, the remaining pole remains in service. Under this operating condition, the MRCs will carry the same amount of current as the pole conductors as the return path to the other converter station, and is self-contained on the transmission line. Therefore, the use of the MRCs will not impact underground infrastructure between the converter stations due to an injection of the return DC current via a ground electrode system.

Installation of the MRCs on the structures will avoid the need for two independent ground electrode facilities that may have been up to 600 acres in size, to be located about 15 to 55 kilometers away from

[3] https://www.usbr.gov/uc/water/crsp/cs/gcd.html

the AC/DC converter stations. Without the MRCs, these facilities would have been needed to maintain electrical current continuity during emergency conditions when an unexpected outage of the DC line would result in the electrical current flowing through the earth for a short period of time (typically 10 minutes to less than an hour). Each ground electrode facility would have consisted of a network of drilled deep earth wells (electrodes), grouted to a depth of 100 feet or more. Installation of MRCs on the DC structures will avoid ground disturbance that would have resulted from construction of the ground electrode system.

7.0 PROJECT UPDATES: NEW MEXICO

The Bureau of Land Management (BLM) issued a right-of-way grant to SunZia in September 2016 following evaluation under the National Environmental Policy Act that required an Environmental Impact Statement and a Record of Decision. In New Mexico, SunZia requested changes to the Project's route. As a result, in March 2020 SunZia applied to the BLM and United States Forest Service to request amendment of the BLM right-of-way grant to address changes that resulted from advance design and engineering of the Project. The requested amendments evaluated in a Draft Environmental Impact Statement (Draft EIS) that was issued for public review on April 29, 2022, are limited to:

1. Routes modifications in Hidalgo, Luna, Sierra, Valencia, Torrance and Socorro counties, New Mexico to address private landowner and military concerns from the White Sands Missile Range.[4]
2. Approval of right-of-way on BLM land for access roads and temporary work areas.
3. An optional location for a high-voltage direct-current (HVDC) substation (SunZia West) in Pinal County, Arizona. Following issuance of the Draft EIS, SunZia determined that it will not use the optional location for SunZia West. Rather, a decision was made to locate SunZia West in the CEC-approved location that is no more than one mile east of the Pinal Central Substation.

The BLM allowed for public comment on the Draft EIS during a 90-day period that ended on August 1, 2022. In addition, the BLM hosted three public meetings to provide information and answer questions about the Draft EIS.

SunZia was determined to be a covered project under Title 41 of the Fixing America's Surface Transportation Act (FAST-41) and was added to the Permitting Dashboard as of July 29, 2021. The Permitting Dashboard is a public website that tracks Fast-41 projects (link to dashboard: https://www.permits.performance.gov/permitting-project/sunzia-southwest-transmission-project). The Dashboard indicates a decision from the BLM on the right-of-way grant amendments is expected by April 26, 2023.

8.0 RESOURCES ASSESSMENT OF THE PROPOSED CHANGES

The Application to Amend summarized the environmental effects of the requested changes. The attached Exhibit provides a supplement to the resource analysis prepared by POWER Engineers, Inc. As explained in the supplement, the requested amendments will have no additional impacts with respect to

[4] The Draft EIS also included a potential route modification in Pinal County. SunZia no longer requires a route modification in Pinal County after successfully acquiring private right-of-way along the BLM-approved route, which is located within the CEC-approved corridor. The Project remains within the CEC-approved corridor.

land use, cultural resources, visual resources, recreation, noise, and communication. This is because the same mitigation measures proposed and adopted in the original CEC are unchanged and will be as effective to mitigate the impacts of the changes as the impacts of the Project as originally approved. There may be an increase in the potential for avian collision due to changes in the wire design and configuration, but with the application of mitigation measures, such as perch deterrents, impacts would remain the same.

9.0 CHANGES TO ORIGINAL APPLICATION

Changes to the original application form that are associated with the requested amendments are shown below with additions in underline and deletions in strikethrough.

1. **Name and address of Applicant:**

SunZia Transmission LLC
~~3610 N. 44th Street, Suite 250~~
~~Phoenix, AZ 85018~~
1088 Sansome
San Francisco, CA 94111

2. **Name, address and telephone number of a representative of Applicant who has access to technical knowledge and background information concerning the application, and who will be available to answer questions or furnish additional information:**

~~Tom Wray~~
~~Project Manager~~
~~SunZia Transmission LLC~~
~~3610 N. 44th Street, Suite 250~~
~~Phoenix AZ 85018~~
~~Phone: 602-808-2004~~

Natalie McCue
Natalie.McCue@patternenergy.com
281-536-0247

3. **Dates on which Applicant filed a Ten Year Plan in compliance with A.R.S. § 40-360.02, in which the facilities for which this application is made were described:**

Since the original application, the Applicant has filed 10-year plans for the Project on:

January 30, 2017
January 31, 2018
January 31, 2019
January 30, 2020
January 29, 2021
January 28, 2022

4. **Description of the proposed facilities:**

a. Description of electric generating plant:

No changes, N/A

b. Description of the proposed transmission line:

i. Nominal voltage, description of structures and substations, and purpose

1) Nominal voltage for which the lines are designed:

No changes.

2) Description of proposed structures:

The transmission line will be constructed using primarily ~~Guyed "V"~~ galvanized steel lattice structures. The typical structure height will be 135 feet, ~~ranging between 100 and 170 feet in certain conditions,~~ with a typical span between structures of 1,400 feet. Similar structure types will be used for either the AC or DC transmission lines, except that each DC structure will contain only two sets of bundled conductors, versus three sets for an AC structure. In addition, the guyed structures will be vertical for the DC transmission line, compared to V-shaped towers for the AC transmission line. The DC structures will also hold two metallic return conductors. The structures will have a dulled gray metal finish, and conductors will have a non-specular finish in order to reduce visibility. In addition to the Updated DC Structures described above, SunZia also requests the option to use double-circuit AC structures, modified single-circuit AC dead-end structures or modified single-circuit AC tubular structures in the less than one mile AC section between SunZia West and the existing Pinal Central Substation. Exhibit G contains conceptual illustrations of proposed structures that may be used for the Project. Specific tower configurations will be determined during the design phase. The Application to Amend includes all updated and new structure types developed during the design phase.

3) Description of proposed substations:

No changes.

4) Purpose for constructing said transmission line and substations:

No changes.

ii. General Location

1) Description of geographical points between which the transmission line will run:

No changes.

2) Straight-line distance between such geographic points:

No changes.

3) Length of the transmission line route:

No changes.

iii. Detailed Dimensions:

1) Nominal width of right-of-way requested:

No changes.

2) Nominal length of spans:

No changes.

3) Typical height of structures above ground:

No changes.

4) Maximum height of supporting structures:

No changes. Maximum height remains 199 feet.

5) Minimum height of conductor above ground:

No changes.

iv. Estimated costs of proposed transmission lines and substation

No changes.

v. Description of proposed route and substation locations:

No changes.

vi. Land Ownership:

No changes.

5. **Jurisdictions:**

a. Areas of jurisdiction (as defined in A.R.S. Section 40-360) affected by this route:

No changes.

b. Designation of proposed sites or routes, if any, which are contrary to the zoning ordinances or master plans of affected jurisdictions:

No changes.

6. **Description of the environmental studies Applicant has performed:**

   No changes, other than supplemental analyses conducted for this amendment proceeding and analyses being developed for New Mexico route updates.

7. **Rationale for selection of Proposed Route:**

   No changes.

August 1, 2022

SUNZIA TRANSMISSION LLC

SunZia Southwest Transmission Project

Certificate of Environmental Compatibility Application to Amend - Supplemental Environmental Information

PROJECT NUMBER:
161983

PROJECT CONTACT:
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Certificate of Environmental Compatibility Application to Amend - Supplemental Environmental Information

PREPARED FOR: SUNZIA TRANSMISSION LLC

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ACRONYMS AND ABBREVIATIONS

ACRS	aluminum core steel reinforced
BLM	Bureau of Land Management
CEC	Certificate of Environmental Compatibility
DC	direct current
EIS	Environmental Impact Statement
kV	kilovolt
MRC	metallic return conductor
NEPA	National Environmental Policy Act
OPGW	optical ground wire
PA	Programmatic Agreement
POWER	POWER Engineers, Inc.
Project	SunZia Southwest Transmission
SunZia	SunZia Transmission LLC

1.0 INTRODUCTION

In May of 2022, SunZia Transmission LLC (SunZia) filed an Application to Amend to modify Decision No. 75464, which approved the Certificate of Environmental Compatibility (CEC) for the SunZia Southwest Transmission Project (Project). This application to amend the CEC has three components: A) add additional structure types to address the structural design changes that resulted from detailed engineering efforts associated with the Direct Current (DC) facility; B) bifurcate decision no. 75464 into two certificates to provide for separate ownership of each line, which enables the projects to be financed; and C) extend the CEC expiration date for Line 1. SunZia is not seeking any amendments to the approved corridor authorized by the CEC.

POWER Engineers, Inc. (POWER) conducted an assessment of the additional structures and their potential to result in different impacts to environmental resources other than those associated with the currently approved structure type and if the use of this additional structure type would change the Project's environmental compatibility. POWER prepared and submitted a declaration summarizing the results of the assessment and concluded that the proposed additional structure types are environmentally compatible with the original CEC. This report provides additional information on the rationale, approach, and methods that were employed as part of the assessment.

2.0 UPDATED DC STRUCTURE DESIGN

SunZia intends to construct the first line as a DC transmission line. The DC structure designs included in the 2015 CEC application assumed the use of a ground electrode system that uses an earth return path for DC current. Design considerations and the desire to minimize ground disturbance and project impacts resulted in the decision to use dedicated metallic return conductors (MRCs) instead of a ground electrode (earth return) system. The updated DC structures are designed to include two MRCs to be installed along with shield wires and the DC pole conductors for the length of the first line.

The MRCs will typically carry minimal current during the bi-pole operation for any unbalance of current between each of the DC poles. When one of the DC poles is out of service during a planned mono-pole operation, or under an emergency outage of one of the DC poles, the remaining pole remains in service. Under this operating condition, the MRCs will carry the same amount of current as the pole conductors as the return path to the other converter station, and is self-contained on the transmission line. Therefore, the use of the MRCs will not impact underground infrastructure between the converter stations due to an injection of the return DC current via a ground electrode system.

Installation of the MRCs on the structures will avoid the need for two independent ground electrode facilities that may have been up to 600 acres in size, to be located about 15 to 55 kilometers away from the AC/DC converter stations. Without the MRCs, these facilities would have been needed to maintain electrical current continuity during emergency conditions when an unexpected outage of the DC line would result in the electrical current flowing through the earth for a short period of time (typically 10 minutes to less than an hour). Each ground electrode facility would have consisted of a network of drilled deep earth wells (electrodes), grouted to a depth of 100 feet or more. Installation of MRCs on the DC structures will avoid ground disturbance that would have resulted from construction of the ground electrode system.

All of the mitigation measures that would have been applied to the original DC structures can and will be applied to the new DC structures where required. This includes the use of non-specular conductors, the use of "dulled" metal or self-weathering finishes, and the use of helicopters at designated locations for installation as required by the current CEC.

3.0 ASSESSMENT METHODS AND RATIONALE

Impacts on the environment can result directly (caused by the action and occurs at the same time and place) or indirectly (caused by the action and is later in time or farther removed in distance, but still reasonably foreseeable) and can be temporary (short term) or permanent (long term).

A key to assessing reasonably foreseeable impacts is to determine the types and amount of ground disturbance that could occur based on the design and typical specifications of the proposed facilities, construction techniques (including equipment used, extent and duration of the construction), requirements for operation of the transmission line and associated facilities, activities associated with routine maintenance, and design features of the proposed action for environmental protection.

Most of the reasonably foreseeable impacts that could occur, including ground disturbance, would result from the following construction activities:

- Upgrading existing roads or constructing new roads for access where needed.
- Preparing structure sites, multi-purpose construction yards, staging areas, helicopter refueling sites, and communication regeneration station sites.
- Assembling and erecting tower structures.
- Stringing conductors (e.g., wire-pulling/tensioning/splicing sites).

In addition, impacts on some resources would occur following construction from the presence of the transmission lines and access roads. Also, periodic maintenance activities could result in temporary impacts.

The design characteristics related to ground disturbance for the new structures, which includes the average number of structures per mile, size of structure work area, size of roads, and number of pulling/tensioning/splicing sites are **identical** to those documented in the original CEC (see Exhibit B). Furthermore, the construction activities as outlined above are unchanged. Therefore, it was determined that the use of the additional structure types would not result in an increase in ground disturbance, either temporarily or permanently.

POWER also confirmed that use of the additional structure types would not change the right-of-way width, route, or location of Project facilities. Therefore, the environmental resources inventoried in the original CEC would be **identical**. Environmental resources only susceptible to ground disturbance impacts include air quality, land use, earth resources, paleontological resources, socio-economic resources, water resources, wildland fire ecology, and vegetation. Since the design characteristics and location of the Project are unchanged, no further assessment of impacts to these resources was deemed necessary.

The only changes in the additional structure types deemed to warrant further assessment included the increase in average structure height (but not an increase in the overall structure height previously approved), the addition of the MRCs and the additional cross arms. Environmental resources that could potentially be impacted as a result of these changes include visual resources, biological resources (avian and wildlife), and cultural resources (indirect visual impacts on historic properties). The methods and rationale used to assess impacts to these resources is discussed in more detail below.

3.1 Visual Resources

As stated in Exhibit E of the original CEC, "scenic areas" for the Project were identified and inventoried based on public comment as described in the SunZia Southwest Environmental Impact Statement (EIS) (Exhibit B-1), existing resource management plans, agency scoping, field investigations, and previous National Environmental Policy Act (NEPA) /siting studies. The methods used to conduct the visual inventory are consistent with and based on the Bureau of Land Management (BLM)'s Visual Resource Management Manual (BLM 1986), the SunZia Southwest Transmission Project EIS, and past visual resource studies conducted for similar projects that have been approved by the state siting committee. The visual assessment study area was focused within a four-mile-wide corridor (two miles on either side of the reference centerline of the transmission line route). The visual resources inventory was conducted on all land regardless of jurisdiction, including public, state, and private land that may be affected by the Project within the study area. Visual resource data collected within the Project study area was based on aerial photographs, topographic maps, planning documents, consultation with participating agencies, and field investigations. This data was reviewed, and an inventory was conducted to determine the quality of scenery, characteristics of sensitive viewers and associated viewing conditions within the study area. The results of the inventory relating to landscape character, scenery (Classes A, B, and C), and sensitive viewers (residential, recreation, and travel routes) can be found in Exhibit E of the original CEC application.

A visual impact assessment involves the identification, characterization, and relative quantification of the level of visual change (contrast) to the landscape and on views from sensitive locations that would result from the construction and operation of a project. Impacts to scenery are assessed based on the scenic quality or character of the landscape in conjunction with the proposed Project's anticipated visual contrast. Visual contrast is defined as the degree of perceived change in form, line, color, and texture that would occur in the landscape as a result of the construction, operation, and maintenance of a project. In the context of SunZia, visual contrast was assessed considering:

> (1) landscape contrast – removal of vegetation (i.e., agricultural crops, orchards, and riparian) in order to prepare the right-of-way for Project access, and to construct and maintain Project facilities, and
>
> (2) structure contrast – the introduction of aboveground facilities into the landscape.

Impacts to sensitive viewers were assessed based on: (1) level of visual contrast as previously described (i.e., new line, co-located, or parallel existing linear features); (2) distance from the Project; (3) viewing condition; (4) visibility (screened or backdropped views); and (5) viewer sensitivity (high or moderate). **Generally, for sensitive viewers, as distance from a project increase, the perception of visual contrast decreases.** For the visual study, Project-specific distance zones were established based on visibility thresholds specific to 500 kV transmission line facilities. Visibility is the perception of form, line, color, texture, and other visual elements in the landscape. **These elements become less detailed and obvious as the distance from a viewpoint increases.** Impacts are anticipated to be highest where new structures are introduced into the landscape for residential viewers with unobstructed views of a project within the immediate foreground distance zone. Residences with similar viewing conditions would have reduced impacts where a project would be co-located with or parallel existing transmission lines, because structure contrast is reduced.

It is important to note that variation in structure height is not a critical issue related to visibility for transmission line facilities, and the factors listed above are more relevant when assessing impacts. Visual impacts are determined based on changes from the existing condition as perceived by viewers or on the scenic quality or character of the landscape. The introduction of a 500 kV transmission line and

associated facilities, as analyzed in the 2015 Application, could cause strong contrasts and potentially high impacts on some viewers where the Project is seen in the foreground and there are no existing similar structures or facilities within the viewshed. These impacts would be primarily result from strong structure contrasts that are introduced into the viewshed where none currently exist. The introduction of structures that are of similar scale, configuration, visual mass and material, **such as those being proposed as part of the Application to Amend**, would also cause strong contrasts and potentially high impacts under these conditions, similar to what was evaluated in the previously approved CEC. High impacts would remain high because the form, line, color, and texture of the viewed landscape substantially changes **with the use of either structure**. Visual impacts created would only minorly and incrementally change form and line contrasts that would occur with the use of either structure.

3.2 Biological Resources

Exhibits C and D of the CEC describe the areas of biological wealth and habitats for rare and endangered species that will be crossed by the Project, as well as other biological resources. This included designated critical habitat for Mexican spotted owl and the southwestern willow flycatcher; proposed critical habitat for the western yellow-billed cuckoo and Northern Mexican gartersnake; Categories 2 and 3 of Sonoran Desert tortoise habitat; and Arizona Wildlife Linkage Corridor. It also listed special-status species that may occur in the vicinity of the Project in Arizona, including a number of avian species.

Information regarding special status species and habitats was based on the results of a literature search, review of previous studies conducted in the Project area, including studies conducted during the NEPA process, data from the United States Fish and Wildlife Service's Information for Planning and Conservation website, Arizona Game and Fish Department Heritage Data Management System Online Environmental Review Tool, Pima County Sonoran Desert Conservation Plan, and the BLM's sensitive species list.

Exhibits C and D of the CEC also discuss the risk of avian collision with the ground wires, conductors, and guywires. The analysis was based on a review of Avian Powerline Interaction Committee information relevant to transmission lines and was not dependent on the specific heights or configurations of the structures. The CEC included measures to mitigate collision risk to birds in identified areas of high risk, including measures to improve the visibility of the wires where practicable (described in detail in Section 4.2), the development of an Avian Protection Plan to mitigate the collision risk for birds, and the development of a Migratory Bird Conservation Plan, to include offsite mitigation actions to offset impacts to migratory bird habitat as well as measures to offset any collision mortality that may result from the Project.

The *2018 Avian Protection Plan* outlines the Project's approach for minimizing impacts to birds, including collision risk, by implementing the same avoidance and minimization measures described in the CEC. The *2018 Migratory Bird Conservation Plan* estimated bird collision mortalities for the Project (and resulting compensatory mitigation requirements) based on published mortality rates for transmission lines and a consideration of the habitat types in the Project area. The estimates were independent of the particular heights and configurations of the Project's structures and are equally applicable to the modified structure design.

3.3 Cultural Resources

As required by the Programmatic Agreement (PA) executed for the Project, an indirect effects inventory and assessment was conducted for cultural resources (Gordon et al. 2019). The methodology for this study included:

- Identify all historic properties with visual sensitivity (typically those properties eligible for the National Register of Historic Properties under Criteria (a), (b), or (c)) within five miles of the Project right of-way and facilities using existing archaeological databases.
- With a geographic information system, conduct a viewshed analysis using a 10-meter resolution digital elevation model to identify properties from step 1 above that are visible from a Project component.
- Conduct in-field visual contrast ratings for each property from step 2 above.
- Complete assessment of indirect effects based on the visual contrast ratings.

The results of this study are described below.

4.0 IMPACT ASSESSMENT

4.1 Visual Resources

Exhibit E of the CEC describes the full range of visual impacts to scenery, residential viewers, and recreation resources, both current and future. These impacts range from low to high.

Because the route of the Project has not changed, the design characteristics related to ground disturbance have not changed, and the **perception of changes in structure height and mass diminished as distance from the Project increases**, the range of impacts as described in the original CEC would not change. Low impacts would remain low, medium impacts would remain medium, and high impacts would remain high. It is also important to note that previously committed to mitigation measures related to reducing impacts to visual resources, as described in Exhibit B of the CEC and referenced below in Section 4.4, remain unchanged.

4.2 Biological Resources

The impact of avian collisions from ground wires, conductors, and structures was discussed in Exhibit C of the CEC and specifically stated:

> "Ground wires, conductors, and structures present collision hazards for some birds, particularly during nocturnal migration in poor weather conditions. Large-bodied species such as cranes and geese, which cannot make abrupt course corrections when obstacles are encountered in their flight path, are also at a higher risk than most bird species. Mitigation measures to improve visibility of ground wires (Selective Mitigation Measure 15) would reduce the collision risk for large birds. This may include the use of bird diverters on ground wires and guywires, and the use of one-inch optical ground wire rather than one-half-inch overhead ground wire where practicable. Although either ground wire type presents a collision risk, larger cables increase the visibility of the line and would create a lower risk than smaller cables. An Avian Protection Plan will be developed to mitigate the collision risk and loss of productivity for all birds. The mitigation measures proposed for identified areas of high collision risk would follow the recommendations of the Avian Powerline Interaction Committee (APLIC), including the application of bird diverters (APLIC 2012). In locations such as the San Pedro River or Picacho Reservoir area, these measures would reduce the risk of collision for sensitive riparian or aquatic bird species such as the Southwestern Willow Flycatcher, Yellow-billed Cuckoo, and Yuma Clapper Rail." (CEC Exhibit C, Page C-57). The discussion of impacts in Exhibit D is similar.

The exhibit concluded that although impacts are likely to occur to sensitive species, with the application of appropriate and effective mitigation measures proposed and committed to by SunZia the potential for impacts would be minimized or avoided.

In assessing the potential for the new typical structure type to impact avian and other wildlife species POWER has concluded:

- Given this would not change the footprint, temporary disturbance, right-of-way, or line routing, the new structures would have the same or similar impacts on wildlife as the original. The "V" insulator vs the "I" insulator configuration are not materially different.
- Avian collision potential in the CEC was based on routing and not on a specific wire configuration. There may be an increase in avian exposure to collision risk as the wire design and configuration consisting of ten wires – six pole conductors, two MRC pole conductors, and two shield wires is an increase from the eight wires that would be used in the original design. However, most avian collisions occur with overhead ground or static wires (APLIC 2012), which remain unchanged.
- The new guyed structure could reduce avian exposure to guy-wire collision risk because the new guys-wires are shorter than those originally proposed.
- The new design includes more horizontal crossarms than the original that could result in increased perch availability for avian predators. The effects of perch availability on sensitive species, such as the Sonoran desert tortoise, were not addressed in the original CEC. The addition of perch deterrents is an option in those areas where desert tortoise was identified, such as Pima County A7 Ranch, and this could reduce the potential impacts to this species.
- Impacts to biological resources are similar, but not the same between the original structure type and the new. With the application of mitigation measures (e.g. perch deterrents and bird flight diverters) to the new structure types, impacts would be the same.

In addition, SunZia has developed a Biological Protection Plan, Avian Protection Plan, and Migratory Bird Conservation Plan in consultation with the BLM. Biological resource studies involving sensitive species and consultations with regulatory agencies and the BLM have continued and are on-going. Mitigation plans for biological resource will be finalized with the BLM and other regulatory agencies prior to construction and incorporated into the Project's Plan of Development.

4.3 Cultural Resources

In Arizona, the indirect effects inventory and assessment study identified 15 historic properties with sensitivity to visual effects of the Project, but of these only two would experience indirect visual adverse effects (Gordon et al. 2019). One is a prehistoric Hohokam platform mound and ballcourt, the other is a prehistoric rock shelter with pictographs. Because the route for the Project is the same, the results of the inventory and assessment are the same. Adverse effects to these properties will be avoided, minimized, and/or mitigated through development and implementation of a Historic Properties Treatment Plan. Mitigation measures and best management practices to reduce visual effects on historic properties can include:

- Site-specific structure placement
- Structure design
- Consolidation of transmission facilities

- Road restoration
- Road closure
- Use of helicopters to decrease ground disturbance
- Reseeding vegetation
- Restoring landscapes to natural contours and color contrasts (Gordon et al. 2019)

As stated in the Application to Amend, the PA that has been executed for the Project and is managed by the BLM is still in effect and unchanged. This PA governs the identification, assessment, and mitigation of adverse effects to cultural resources and requires an assessment of indirect visual effects. It also requires consultation with the Arizona State Historic Preservation Office, Advisory Council on Historic Preservation, Bureau of Indian Affairs, Arizona State Museum, Arizona State Land Department, Cascabel Working Group and Native American tribes. Cultural resource studies and the development of mitigation plans is currently on-going.

The indirect effect the Project will have on cultural resources is unchanged and the management of cultural resource, including the resolution of adverse effects, as required in the PA is unchanged.

4.4 Required Mitigation Measures

Exhibit B of the CEC provides a description of both the standard (project wide) and selective (applied to specific locations) mitigation measures that will be applied to the Project. All of these are still required, and none have been changed.

5.0 CONCLUSIONS

As described above, use of the new structures would result in similar impacts to environmental resources and may create increased avian collision exposure risk. However, impacts for all environmental resources, including biological resources, would be unchanged with the application of existing mitigation measures that have been developed and are required for the Project. As a result, the Project remains environmentally compatible as originally certificated.

6.0 REFERENCES

Avian Powerline Interaction Committee (APLIC). 2012. *Reducing Avian Collisions with Powerlines: the State of the Art in 2012*. Washington, DC: Edison Electric Institute and APLIC.

Bureau of Land Management (BLM). 1986. Manual H-8410-1 - Visual Resource Inventory. BLM. Available online at: http://www.blm.gov/nstc/VRM/8410.html.

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