SunZia Transmission Project Environmental Mitigation Summary Report

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Introduction

The SunZia Transmission Project (the "Project") is committed to advancing important environmental mitigation projects in addition to those standard and selective mitigation measures identified in the Project review under the National Environmental Policy Act. The Project proponents have worked with environmental stakeholders to develop a robust set of mitigation projects that will collectively serve as a role-model for best practices in environmental mitigation. While these mitigation projects are diverse in scope, they are centered on the geographies and ecosystems within which the Project would be located. By and large, they are focused on acquisition and protection of habitat, research and monitoring, impact minimization, and additional mitigation such as conservation project funding. These mitigation projects are concentrated on benefits to migratory birds and their habitat but are not limited to those conservation objectives. These mitigation projects do not encompass the full extent of the Project's environmental mitigation and stewardship commitments and objectives but represent a substantial set of meaningful conservation projects that go over and above the minimum mitigation obligations of the Project in compliance with federal, state, and local law.

Acquisition of Conservation Lands and Easements

Bingham Property

The Bingham Property is an approximately 140 acre property located in Pima County, Arizona in proximity to the proposed route of the SunZia Transmission Project. The Bingham Property is located along Edgar Canyon, a major tributary of the San Pedro River within the Lower San Pedro Watershed. The Project will purchase the Bingham Property and will cause it to be transferred to Pima County subject to in-perpetuity conservation restrictions.

The Bingham Property consists of approximately 76 acres of Chihuahuan Desertscrub, 50 acres of Arizona Upland Sonoran Desertscrub, approximately 8 acres of riparian and xeroriparian, and approximately 5 acres of grassland. These vegetative communities include numerous saguaro (*Carnegiea gigantea*) and paniculate agave (*Agave parryi* and *A. palmeri*) and the property is important habitat utilized by a variety of wildlife including mountain lion (*Puma concolor*) and coatimundi (*Nasua narica*). The property is effectively surrounded by lands that are part of the Pima County Multi-Species Conservation Plan (MSCP) Mitigation Lands. The MSCP provides conservation value for a suite of species protected and not protected under the Endangered Species Act pursuant to Section 10 of the Endangered Species Act. The Bingham Property contains modeled habitat for 14 MSCP-covered Priority Vulnerable Species and may provide suitable habitat for two listed species (ocelot, Sonoran desert tortoise) and over 55 other special status species. The Bingham Property is located entirely within the *Sierra Madre Occidental Bird Conservation Region: San Pedro River Watershed and West*, which is priority habitat for migratory birds.

The Project has an option to purchase the Bingham Property, which it entered into with the landowner prior to the landowner putting the property on the market for sale to the public. The Project will purchase the Bingham Property prior to commencement of operations of the first line of the project. The Project will cause the Bingham Property to be encumbered with one or more restrictive covenants providing in perpetuity protection for the property and subsequently transfer fee simple ownership to Pima County for inclusion in its MSCP Mitigation Lands.

Indian Hills Farm

Indian Hill Farms is an approximately 1,225 acre property in the Middle Rio Grande Valley (MRGV) of Central New Mexico. The property is located along the Rio Grande River and adjacent to the Sevilleta National Wildlife Refuge (NWR). Indian Hill Farms includes 700-acres of irrigated farmland serviced by both senior (pre-1907) and MRGCD water rights. The Project will purchase Indian Hills Farm and expects transferring ownership of the property to a conservation organization or state or federal agency with the ultimate purpose of seeing the property transferred to USFWS for incorporation into the Sevilleta NWR, or else to the New Mexico Department of Game and Fish, to be managed as habitat for wildlife and, particularly, migratory birds such as sandhill cranes (*Antigone canadensis*).

The Middle Rio Grande Valley is an important segment of the Central Flyway and is heavily utilized by wintering waterfowl, particularly sandhill cranes and including large wintering populations of both lesser and greater sandhill cranes. The MRGV hosts a robust system of state and federal public lands and water rights managed relatively holistically that include the Bosque del Apache NWR in the south, managed by USFWS, as well as the Ladd S. Gordon Waterfowl Complex (Bernardo, Belen, Casa Colorado, and La Joya

state Wildlife Management Areas) in the north, managed by New Mexico Department of Game & Fish. The Sevilleta NWR does not have water rights and the MRGV has increasing issues with water availability. The Indian Hill Farms, if converted to migratory bird habitat, would not only add significant migratory bird habitat to the Sevilleta NWR but also materially extend the existing system of land managed for migratory birds and other wildlife. The addition of and conversion to conservation purpose of this property would increase the ecological resilience of the MRGV, particularly in the context of climatic changes.

The conservation value of the Indian Hills Farm cannot be overstated. Anthropogenic alterations to the Rio Grande in the MRGV over the past century have resulted in irreversible changes to riverine function and significantly reduced the amount of available floodplain habitat for wildlife. It is increasingly important to identify, protect, restore, and actively manage large open spaces within the historic floodplain to support wildlife, including wintering migratory waterbirds. Furthermore, farmland in the MRGV is rapidly being converted by residential and commercial development, reducing open space and de facto wildlife habitat; conserving this property will eliminate the risk of future conversion.

The Project has been developing a conceptual plan in consultation with conservation stakeholders for how Indian Hill Farms could be effectively converted from a traditional alfalfa farming operation to a functional conservation and wildlife management area. Work to date has involved developing a geographic information system (GIS) database, documenting existing surface and groundwater rights, evaluating soil conditions, identifying a range of site-adapted native vegetation types and their associated irrigation requirements (i.e., water budget) for both establishment and maintenance. Based on this work, the Indian Hills Farm has the potential to support a variety of native habitat including the establishment of sandhill crane roosting habitat using water rights to maintain standing winter water. The Indian Hills Farm, if converted to migratory bird habitat, would provide for a diversification of suitable migratory bird habitat, reducing the reliance on existing managed habitat and increase resiliency of populations from crop failure, disease, and limited water resources in the MRGV. Final conservation objectives for the Indian Hills Farm will rely upon further engagement by USFWS and New Mexico Department of Game and Fish.

Research and Monitoring

Avian Collision Avoidance System Rowe Sanctuary study

The Avian Collision Avoidance System (ACAS) is a near-ultraviolet power line illumination device initially developed to minimize sandhill crane (*Antigone canadensis*) collisions with power lines at the Iain Nicholson Audubon Center at Rowe Sanctuary along the Platte River in Nebraska. A preliminary test of the efficacy of ACAS at Rowe Sanctuary appeared to significantly reduce crane collisions with an illuminated span of a power line where collisions were known to frequently occur. The SunZia Southwest Transmission Project provided support for an expanded, third-party test of the second generation of ACAS at Rowe Sanctuary.

Large-bodied birds which may lack maneuverability, such as cranes and waterfowl, are particularly susceptible to midflight collisions with power lines and other obstacles which bisect their flight paths. While marking power lines with bird flight diverters is generally an effective way to avoid or minimize collisions, in high-risk areas (e.g., areas where power lines are near heavily used foraging or roosting sites), collisions may persist. During the first test of ACAS, researchers demonstrated an 82% decrease in

dangerous flights (i.e., flights that could expose birds to collision) by cranes within proximity to the illuminated power line, a 71% increase in evasive maneuvers outside of 25 meters from the illuminated power line, and an overall decrease of 98% in crane collisions with the illuminated line. Following the initial study, the developers of ACAS and researchers affiliated with Rowe Sanctuary identified potential improvements to ACAS as well as refinements to the study design which could lead to an enhanced understanding of how near-ultraviolet illumination of power lines affects cranes and other birds particularly susceptible to collision risk. The Project provided support for an expanded, third-party test of second-generation ACAS technology at Rowe Sanctuary. Findings from this test were similar to the first study, although failure of one of the ACAS devices being tested midway through the study led to somewhat equivocal results.

Avian Collision Avoidance System SunZia Deployment Study

The Avian Collision Avoidance System has shown great promise as a tool for avoiding and minimizing impacts of powerlines to large-bodied waterfowl such as sandhill cranes. The conditions for sandhill crane collision risk at the Rowe Sanctuary are relatively unique in the degree of high collision risk relative to other locations where sandhill cranes have a material risk of collision with powerlines. There is need for additional testing and evaluation of the ACAS technology to transmission lines in areas of lower collision risk. The Project will fund research evaluating the efficacy of ACAS where it will be deployed on the Project at the project crossing of the Rio Grande in New Mexico.

The Project has committed to deploying and testing ACAS at the Project crossing of the Rio Grande in New Mexico to determine whether ACAS is similarly effective in reducing crane collisions with a high-voltage transmission line in the desert Southwest. The deployment of ACAS will not only serve to avoid or minimize crane collisions with the Project but will also test whether extrinsic environmental variables (e.g., relative humidity, ambient temperature, light conditions) might impact the overall efficacy of the system. The results of the test of ACAS at the SunZia crossing of the Rio Grande should help inform whether the widespread use of this system is viable outside of temperate stopover sites (e.g., Rowe Sanctuary) in areas of lower collision risk, and whether it is equally effective on high-voltage transmission lines as lower-voltage power lines. This research will have broader research applicability to potential ACAS deployment in a wider array of conditions of relative collision risk to large-bodied waterfowl such as sandhill cranes.

Bendire's Thrasher Study

The Bendire's thrasher (*Toxostoma bendirei*) (BETH) is a small passerine bird that is among the fastest declining bird species in North America for which basic scientific information on its ecology is lacking. The Project will fund research to be jointly undertaken by scientists from New Mexico State University and USFWS.

The Bendire's Thrasher is globally restricted to arid upland desert habitats in the southwestern region of North America, including large stretches of Chihuahuan Desert habitat. In recognition of sharp BETH population declines, the species has been ranked internationally as threatened by the International Union for Conservation of Nature, identified by USFWS as a Species of Concern, and by the BLM as a Sensitive Species. Additionally, BETH has been listed as a species of continental concern requiring management attention by the Sonoran Joint Venture, and, at a state level throughout its range, listed as a Species of Greatest Conservation Need. The Desert Thrasher Working Group was established to

address priority conservation needs for BETH and the related LeConte's thrasher through research, monitoring, conservation planning, and to serve as a forum for communication and collaboration regarding these species.

The proposed study would occur in the proposed Chihuahuan Desert Audubon Important Bird Area (IBA) in Hidalgo County, New Mexico. The SunZia Transmission Project would bisect the northern portion of this IBA. The study would evaluate survival, breeding behavior, movements, habitat utilization, and mortality of BETH within the Chihuahuan Desert IBA. The study would involve the capture and tagging of birds with radio telemetry devices as well as the purchase and installation of automated radio telemetry towers (e.g., Motus towers) to allow for passive data collection. The Motus towers would also have the potential to capture telemetry data for other bird species in the Chihuahuan Desert IBA for unrelated scientific studies.

The Project will provide funding for the study to be undertaken and the work, final scope of the study design, and ultimate use of the research will be independent from the Project.

Pinyon Jay Study

The Pinyon Jay (*Gymnorhinus cyanocephalus*) is a small passerine bird that is among the fastest declining bird species in the Western United States for which basic scientific information on its abundance and sources of decline are lacking. The Project will fund research to extend ongoing research by scientists from the University of New Mexico.

The pinyon jay is an iconic species of the piñon-juniper habitats and the fastest declining bird in these habitats. In recognition of sharp pinyon jay population declines, the species has been ranked internationally as vulnerable by the International Union for Conservation of Nature, identified by USFWS as a Species of Concern, and by New Mexico Department of Game and Fish as a Species of Greatest Conservation Need. In response to needs for more baseline information to inform potential management priorities, the Pinyon Jay Multi-state Working Group released a Conservation Strategy in 2020. Additionally, a petition to list the species as threatened or endangered under the Endangered Species Act was filed with the USFWS in 2022.

The proposed study would occur in pinyon-juniper habitats in the Gila National Forest in Catron, Grant, and Sierra Counties in New Mexico that have not been systematically surveyed for the presence of pinyon jay. The study will extend field work conducted in 2021 and 2022 with the objective of identifying additional nesting colonies, assessing populations, and analyzing pinyon jay behavior across different vegetative communities. Prior fieldwork indicates the potential for a large and stable pinyon jay population in the survey area, which could have species management implications in the future.

Sandhill Crane Telemetry Study

The Rocky Mountain population (RMP) of greater sandhill cranes (*A. c. tabida*) is a priority for research and conservation throughout their range. Along with significant numbers of Mid-Continent lesser sandhill cranes, approximately 80% of RMP cranes utilize roosting and foraging habitats along the Middle Rio Grande in New Mexico during winter months. The Project provided support for the purchase and deployment of high-fidelity satellite telemetry units which were affixed to sandhill cranes, beginning

in 2019, to better understand the movement ecology of this species on the wintering grounds in New Mexico.

Understanding how overwintering RMP cranes select among and move between habitats in the MRGV is important to informing conservation and management measures directed toward this population. Elucidating how overwintering cranes move between priority habitats is particularly important in light of anthropogenic developments which could impact habitats and habitat use, such as high-voltage transmission lines proposed to cross the Rio Grande. Researchers from the USFWS initiated a telemetry-based study of overwintering cranes in the MRGV beginning in 2014 with the goal of identifying characteristics of priority habitats on the wintering grounds, and to better understand connections between breeding areas and the MRGV. Building on this work, researchers supported by the Project collaborated with USFWS researchers to deploy additional telemetry units on overwintering RMP cranes, to not only bolster ongoing efforts to understand habitat use and breeding-wintering linkages, but to also investigate the movement ecology of this population during winter months in the MRGV.

Approximately 40 satellite telemetry units were deployed on RMP cranes during the winters of 2019-2022 along the MRGV in New Mexico. Data collected from instrumented birds were used to develop models of flight heights and movement patterns, and to identify hotspots of use within the MRGV. The results of this study were published in the Journal of Wildlife Management in 2020; the authors included researchers supported by the Project and biologists from the USFWS Southwest Region Migratory Bird Program. The published manuscript not only illuminates the movement ecology of RMP cranes on the New Mexico wintering grounds and can be used to inform strategic siting of anthropogenic developments in the MRGV, but also provides a model for conducting parallel research in similar systems elsewhere. In addition, many of the telemetry units deployed on RMP cranes during the winters of 2019-2022 continue to function and collect valuable data on crane use of priority habitats on the breeding grounds and at stopover/staging sites throughout the Rocky Mountain states and southern Canada.

Soil and water erosion research studies and publications

Desert ecosystems in Arizona such as the Sonoran Desert are sensitive to impacts to soil and water and there is a need for additional research, planning, and land management relating to soil and water resources. During construction of the Project, the Project will provide significant funding to the Redington Natural Resource Conservation District (NRCD) and Winkelman NRCD to conduct research and demonstration projects related to soil and water resources in southeastern Arizona.

The Project will support the Redington and Winkleman NRCDs to conduct research, demonstration projects, and planning efforts. Research may include surveys and research relating to soil, soil erosion prevention, cultivation and range practices, seeding, noxious weed eradication, and the dissemination of relevant research. Demonstration projects would be located within the respective NRCDs on state or private land with the consent and cooperation of the respective agency or landowner to demonstrate water, soil, and soil resource conservation measures and soil erosion control. Planning efforts may include the development and publication of comprehensive plans for the conservation of soil and water resources, as well as engagement with landowners within the Redington and Winkleman NRCDs.

Impact Minimization

Avian Collision Avoidance System Deployment

The Project will install the ACAS technology at the project crossing of the Rio Grande in the MRGV. While the potential collision risk reduction of ACAS at the project crossing of the Rio Grande is not quantified at this time, given the strong results of collision reduction reported at the Rowe Sanctuary, it can be expected to result in a reduction of collision of sandhill cranes and potentially other migratory birds with the Project.

The MRGV is an important migratory corridor within the Central Flyway. The deployment of ACAS to the Project at the Rio Grande crossing will be complementary to an expanded bird flight diverter deployment. Further, a Project Rio Grande crossing paralleling the Western Spirit Transmission Line is likely to increase avoidance behavior of not only the Project but also the Western Spirit Transmission Line itself, which also has bird flight diverters installed at the crossing of the Rio Grande floodplain.

Coupled with research as mitigation evaluating the efficacy of ACAS at the Project crossing in the MRGV, the installation of ACAS at this location is expected to result in a material reduction to collision risk from the Project as a whole and advance not only the ACAS technology itself but also the state of the science on the efficacy of this technology in a more diverse set of collision risk regimes that could have broad applicability to transmission risk to large-bodied waterfowl more generally.

Expanded Bird Flight Diverter Deployment

Installation of bird flight diverters on power lines is an effective tool to avoid or minimize avian exposure to collision. Standard practice for deployment of bird flight diverters as described by the Avian Power Line Interaction Committee (APLIC) calls for installation of diverters on power lines in high-risk areas, such as near wetlands where avian taxa particularly susceptible to collision (e.g., waterfowl) may congregate. The Project will not only mark spans of the Project with bird flight diverters in high-risk areas identified using APLIC guidelines, but in additional sensitive and/or priority habitats across the length of the Project.

The consensus of published research on the effectiveness of bird flight diverters in reducing avian collisions with power lines in different ecosystems is that while the efficacy of individual devices may vary, a significant (i.e., approximately 50% - 80%) reduction in avian collisions can be realized using these devices. The most effective type of bird flight diverters are dynamic, flapper-type devices that combine movement with reflectivity to maximize visibility to birds. Recent developments in bird flight diverter technology have led to improved durability of dynamic devices, which can now be installed safely and efficiently using advanced installation systems (e.g., robot drones). By soliciting stakeholder feedback, from both the conservation community and natural resource agencies, and identifying additional priority areas, the Project has developed a plan for deploying dynamic bird flight diverters in both New Mexico and Arizona on spans totaling over 40 miles. These areas include the Sevilleta National Wildlife Refuge in New Mexico, and large portions of the line in the vicinity of the San Pedro River corridor and the Sulphur Springs Valley north of Willcox Playa in Arizona.

Additional Mitigation

Conservation project funding

Abo Canyon habitat improvement

Water resources in the desert southwest have experienced significant impacts from the spread of invasive plant species including saltcedar (*Tamarix*). The Project will partner with the Claunch-Pinto Soil and Water Conservation District (SWCD) to support the removal of saltcedar and replacement with ecologically appropriate plant species in the Abo Canyon in Torrance County, New Mexico.

Originally introduced to manage floodwater and sedimentation in New Mexico, the saltcedar has had significant impacts on hydrological systems in the southwest, including the Abo Canyon. The Claunch-Pinto SWCD is planning to conduct saltcedar eradication across up to 8 miles of the Abo Canyon. The Project will provide funding for the planting of ecologically appropriate species, such as the coyote willow (*Salix exigua*), in areas where saltcedar is removed. This will result in a reduction of stormwater erosion, recolonization of these areas by saltcedar, and create important habitat for wildlife, including migratory birds.

Buffelgrass Eradication and Black-Tailed Prairie Dog management

Buffelgrass (*Cenchrus ciliaris*) is an invasive perennial grass that grows in areas with warm winter seasons and a summer rainy season with 6 to 24 inches of rainfall a year such as Sonoran Desert habitat. In southern Arizona, buffelgrass is changing the once fire-resistant Sonoran Desert into a flammable grassland. The Project will provide funding to an Arizonan conservation organization to support eradication. The Project's contribution will support buffelgrass eradication and mitigate effects to wildlife (for example, the Sonoran Desert Tortoise [*Gopherus morafkai*] and other desert species, including migratory birds) and Sonoran Desert habitat in southern Arizona. Further, SunZia will support the Arizona Game & Fish Department (AGFD) to undertake Black-tailed Prairie Dog (*Cynomys ludovicianus*) management for grassland habitat impacts in Arizona to defend the important role prairie dogs can play in maintaining long-term grassland health.

Wildlife Water Catchments

Wildlife water catchments are an important wildlife management tool with a long history of use in Arizona under the leadership of AGFD. Wildlife water catchments provide critical water resources year-round but particularly during hot dry summer months, when water is scarce on the landscape, resulting in a more resilient ecosystem. The Project will fund three wildlife water catchments prior to or during construction of the first line of the Project and an additional three prior to or during construction of the second line of the Project.

The Wildlife water catchments will be located in southeastern Arizona, specifically within AGFD Game Management Units 32, 37A and 37B. These Game Management Units are all areas through which the Project would cross. The catchments will be constructed in accordance with the AGFD Wildlife Water Development Standards. The construction of these new wildlife water catchments will provide an important resource for wildlife including resident and migratory birds.